COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC INVESTIGATION OF	**)**	
LOUISVILLE GAS AND ELECTRIC	**)**	
COMPANY AND KENTUCKY	**)**	**CASE NO. 2023-00422**
UTILITIES COMPANY SERVICE	**)**	
RELATED TO WINTER STORM	**)**	
ELLIOTT	**)**	

RESPONSE OF
KENTUCKY UTILITIES COMPANY
AND
LOUISVILLE GAS AND ELECTRIC COMPANY
TO
THE COMMISSION STAFF'S FIRST REQUEST FOR INFORMATION

DATED JANUARY 26, 2024

FILED: February 16, 2024

VERIFICATION

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF JEFFERSON)

The undersigned, **Lonnie E. Bellar**, being duly sworn, deposes and says that he is Chief Operating Officer for Kentucky Utilities Company and Louisville Gas and Electric Company and an employee of LG&E and KU Services Company, 220 West Main Street, Louisville, KY 40202, and 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.

Lonnie E. Bellar

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 14th day of February 2024.

Notary Public

Notary Public ID No. KYNP63286

My Commission Expires:

January 22, 2027

VERIFICATION

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF JEFFERSON)

The undersigned, **Robert M. Conroy**, being duly sworn, deposes and says that he is Vice President, State Regulation and Rates, for Kentucky Utilities Company and Louisville Gas and Electric Company and an employee of LG&E and KU Services Company, 220 West Main Street, Louisville, KY 40202, and 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.

Robert M. Conroy

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 14th day of February 2024.

Notary Public

Notary Public ID No. KYNP61560

My Commission Expires:

November 9, 2026

VERIFICATION

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF JEFFERSON)

The undersigned, **Charles R. Schram**, being duly sworn, deposes and says that he is Director – Power Supply for Kentucky Utilities Company and Louisville Gas and Electric Company and an employee of LG&E and KU Services Company, and 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.

Charles R. Schram

Subscribed and sworn to before me, a Notary Public in and before said County and State this 14th day of February 2024.

Notary Public

Notary Public ID No. KYNP63286

My Commission Expires:

January 22 2027

CAROLINE J. DAVISON
NOTARY PUBLIC
ID # KYNP63286
STATE AT LARGE, KENTUCKY
COMM EXPIRES 01/22/2027

VERIFICATION

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF JEFFERSON)

The undersigned, **David S. Sinclair**, being duly sworn, deposes and says that he is Vice President, Energy Supply and Analysis for Kentucky Utilities Company and Louisville Gas and Electric Company and an employee of LG&E and KU Services Company, 220 West Main Street, Louisville, KY 40202, and 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.

David S. Sinclair

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 14th day of February 2024.

Notary Public

Notary Public ID No. KYNP63286

My Commission Expires:

January 22, 2027

CAROLINE J. DAVISON
COMM EXPIRES
01/22/2027
NOTARY
PUBLIC
ID # KYNP63286
STATE AT LARGE, KENTUCKY

VERIFICATION

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF JEFFERSON)

The undersigned, **Stuart A. Wilson**, being duly sworn, deposes and says that he is Director, Energy Planning, Analysis & Forecasting for Kentucky Utilities Company and Louisville Gas and Electric Company and an employee of LG&E and KU Services Company, 220 West Main Street, Louisville, KY 40202, and 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.

Stuart A. Wilson

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 14th day of February 2024.

Notary Public

Notary Public ID No. KYNP63286

My Commission Expires:

January 22, 2027

CAROLINE J. DAVISON
NOTARY PUBLIC
ID # KYNP63286
COMM EXPIRES 01/22/2027
STATE AT LARGE, KENTUCKY

KENTUCKY UTILITIES COMPANY
AND
LOUISVILLE GAS AND ELECTRIC COMPANY

Response to Commission Staff's First Request for Information
Dated January 26, 2024

Case No. 2023-00422

Question No. 1

Responding Witness: Lonnie E. Bellar

Q-1. Refer to the NERC/FERC October 2023 Report attached to the Commission's December 22, 2023 Order in Case No. 2023-00422 as Appendix A (NERC/FERC October 2023 Report), page 33 and Figure 22, page 42.

a. Explain LG&E/KU's role as a Balancing Authority (BA) and the extent of its responsibility to the other three load serving entities (LSEs) in its footprint. Include in the response whether LG&E/KU receive any compensation for serving as a BA and, if so, from which entities.

b. Explain why LG&E/KU use a 5 percent buffer in its short-term load forecast model. As part of the response, explain how the buffer is calculated and how often the buffer is recalculated.

c. Identify the corporation, limited liability company, or other legal person that acts as the BA for LG&E/KU's service territory and provide an organizational chart showing where that entity is located within LG&E/KU's larger corporate structure.

A-1.

a. LG&E and KU Services Company, as agent for Louisville Gas and Electric Company and Kentucky Utilities Company, is registered with NERC as the Balancing Authority (BA) for the LG&E and KU combined transmission system. As the BA, LG&E/KU are responsible for ensuring the real-time balance of resources (electricity supply) and load (electricity demand) within the metered boundaries defining the LG&E/KU Balancing Authority Area (BAA), which encompasses load and generation interconnected with the LG&E/KU combined transmission system. The LG&E/KU BAA includes the following Load Serving Entities (LSE): Kentucky Municipal Power Agency (KMPA), Kentucky Municipal Energy Agency (KYMEA), Owensboro Municipal Utilities (OMU), and the Louisville Gas and Electric and Kentucky Utilities (LG&E/KU). As the BA, LG&E/KU is responsible for and has the authority to direct operations with respect to load-resource

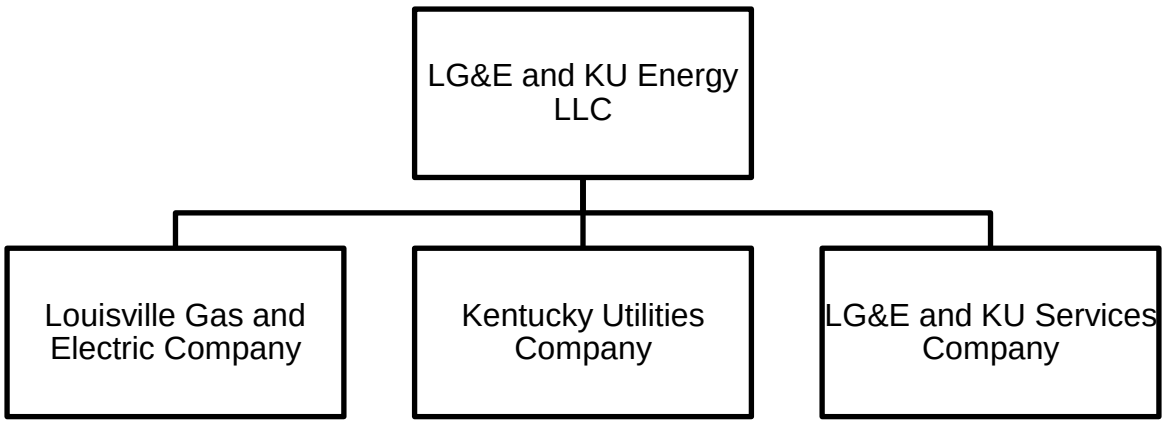
balance within the BAA in real-time and to plan for load-resource balancing within the operations planning horizon (i.e., within one year). As the BA, LG&E/KU is not responsible for resource planning for the LSEs within the BAA, however, LG&E/KU may issue operating instructions to generator operators, transmission operators, and LSEs within the LG&E/KU BAA, take action to shed load, and take such other action as necessary to maintain reliable operation of the LG&E/KU BAA. Costs associated with BA operations are incorporated into the LG&E/KU transmission and ancillary services rates charged under the LG&E and KU Joint Pro Forma Open Access Transmission Tariff (OATT) filed and accepted with the Federal Energy Regulatory Commission. As such, compensation is received for these services from entities that pay transmission rates, including the unaffiliated LSEs listed above.

b. The LG&E/KU BA does not adjust load forecasts provided by the LSEs or assume a forecast margin over what may be already incorporated into the LSE load forecasts. So, the short-term load forecast model does not include a 5% buffer.

LG&E and KU Services Company, as agent for Louisville Gas and Electric Company and Kentucky Utilities Company, is also registered with NERC as the Transmission Operator (TOP) for the LG&E and KU combined transmission system. As the TOP, the Companies perform next day operations planning studies to identify operating concerns and develop/implement mitigating activities. When performing these next-day operations planning studies for the TOP function, the Companies add a 5% margin to the BA load forecast. The 5% buffer is an additional margin that is added to the load forecast when performing the TOP operations planning studies to address potential forecast uncertainties.

c. See the response to part (a).

See attachment being provided in a separate file. See the extract from the organizational chart below showing where LG&E and KU Services Company is located within LG&E/KU's larger corporate structure:


LG&E and KU Energy LLC
Louisville Gas and Electric Company
Kentucky Utilities Company
LG&E and KU Services Company

KENTUCKY UTILITIES COMPANY
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Question No. 2

Responding Witness: Charles R. Schram

Q-2. Provide an explanation detailing how LG&E/KU, in their role as an LSE, create weather forecasts. Include as part of the explanation the sources/inputs relied on, how often the forecast is updated, how many days out the forecast predicts weather, how these weather forecasts are used in short-term load forecasting, and who is responsible for creating, maintaining, and updating the forecasts.

A-2. The LG&E/KU LSE does not create weather forecasts. Instead, the load forecasting models used by LG&E/KU Generation Dispatch personnel use inputs from the weather forecasts of WSI, and Enverus. In addition, LG&E/KU monitors other weather forecasts, including Weather Underground and those from Louisville media outlets, to assess variations in forecasts. The table below describes the weather forecasts used by Generation Dispatch.

Service	Update Frequency	Forecast Days	Uses
Enverus (proprietary providers)	Proprietary	16	Enverus model (days 1-16)
WSI	Twice daily	7	ANNSTLF model (days 1-7)
Weather Underground	Varies	15	Monitor only
Louisville media	Varies	Typically 10	Monitor only

CONFIDENTIAL INFORMATION REDACTED

KENTUCKY UTILITIES COMPANY
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Response to Commission Staff's First Request for Information
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Case No. 2023-00422

Question No. 3

Responding Witness: Lonnie E. Bellar

Q-3. Provide an explanation detailing how LG&E/KU, in their role as BA, create weather forecasts. As part of the explanation include the sources relied on, how often the forecast is updated, how many days out the forecast predicts weather, how these weather forecasts are used in short-term load forecasting, and who is responsible for creating, maintaining, and updating the forecasts.

A-3. The LG&E/KU BA does not create weather forecasts. The LG&E/KU BA receives weather forecast information from the National Weather Service (NWS) of Louisville and StormGeo (a privately held weather service provider), which provides situational awareness and assists in preparations for incoming weather. These services deliver daily briefings and updates on inclement weather conditions up to 72 hours in advance, depending on the severity. The forecasts provide forecast confidence, changes to previous forecasts, current forecast, and impacts.

The LG&E/KU BA load forecast is an aggregate of the load forecasts provided by the four LSEs within the LG&E/KU BAA. The LG&E/KU BA does not separately forecast load for each LSE, but instead reviews the forecasts provided for the LSEs and coordinates with the LSEs to the extent an LSE's load forecast appeared anomalous.

Each Load Serving Entity (LSE) within the LG&E/KU BA Area has its own methodology and inputs into its short-term load forecast modeling process. The LG&E/KU BA does not dictate what sources the LSEs within the LG&E/KU BAA use in developing their load forecasts. Details on weather forecasting for each LSE within the LG&E/KU BAA are provided below:

- See the response to Question No. 2 for information on weather services used by the LG&E/KU LSE for short-term load forecasting.

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KENTUCKY UTILITIES COMPANY
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Response to Commission Staff's First Request for Information
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Question No. 4

Responding Witness: Lonnie E. Bellar

Q-4. Identify and explain any differences in the manner in which LG&E/KU create weather forecasts in their role as an LSE as compared to their role as BA.

A-4. See the response to Question Nos. 2 and 3.

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Response to Commission Staff's First Request for Information
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Question No. 5

Responding Witness: Lonnie E. Bellar / Charles R. Schram

Q-5. State whether LG&E/KU, in their role as an LSE or BA, has changed the way it forecasts weather since Winter Storm Elliott. If so, provide a detailed explanation of those changes.

A-5. See the response to Question No. 2. The LG&E/KU LSE has not changed its sources of weather forecasts since Winter Storm Elliott. The load forecasting models used by Generation Dispatch are designed to use specific forecast inputs. Furthermore, Generation Dispatch already monitors multiple other forecasts as noted in the response to Question No. 2.

See the response to Question No. 3. The LG&E/KU BA also has not changed its sources of weather forecasts since Winter Storm Elliott. The sources the LG&E/KU BA have used for weather and meteorology have been satisfactory.

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Question No. 6

Responding Witness: Lonnie E. Bellar

Q-6. Refer to the NERC/FERC October 2023 Report, page 31.

a. State whether LG&E/KU, in their role as BA, provided any guidance to the three LSEs in LG&E/KU's BA footprint regarding the 90/10 or the 50/50 load forecasts under either normal or extreme winter weather. If so, identify and explain the guidance provided.

b. Explain the multiple contingencies LG&E/KU considered as required by Reliability Standard TPL-001-5.1.

A-6.

a. LSEs within the LG&E/KU BAA submit 90/10 and 50/50 load forecasts on an annual basis per guidance provided by the LG&E/KU Planning Coordinator / Transmission Planner, in accordance with NERC Reliability Standard MOD-032-1.

The guidance provided by the LG&E/KU Planning Coordinator / Transmission Planner in the most recent MOD-032-1 data request for the 90/10 and 50/50 load forecasts is below:

- Winter Peak (50/50): represents 50% probability that loads are below this level and 50% probability loads are above this level. The Winter Peak forecast should represent the system peak total hourly load for December through February.

- Summer Peak (50/50): represents 50% probability that loads are below this level and 50% probability loads are above this level. The Summer Peak forecast should represent the system peak total hourly load for June through August.

- Winter Peak (90/10): extreme cold winter temperatures or represents 90% probability that loads are below this level and 10% probability loads are above this level. The Winter Peak forecast

should represent the system peak total hourly load for December through February.

- Summer Peak (90/10): extreme heat summer temperatures or represents 90% probability that loads are below this level and 10% probability loads are above this level. The Summer Peak forecast should represent the system peak total hourly load for June through August.

Additionally, a kickoff meeting was held by the LG&E/KU Planning Coordinator / Transmission Planner to discuss the MOD-032-1 data request and answer questions from the LSEs.

b. The multiple contingencies (P3, P4, P5, P6 & P7) defined in NERC Reliability Standard TPL-001-5.1 are requirements for the Transmission Planner and Planning Coordinator to follow when performing the annual Planning Assessment for the Long-term Planning Horizon.

The LG&E/KU Winter Assessment that is referenced on page 31 of the NERC/FERC October 2023 Report was performed by the LG&E/KU Transmission Operator (TOP). This assessment evaluated N-1 breaker-to-breaker contingencies as well as generator outages followed by N-1 breaker-to-breaker contingencies (i.e. TPL-001-5.1, P3 multiple contingency) to evaluate import capability of the transmission system following generator outages.

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Question No. 7

Responding Witness: Lonnie E. Bellar / Stuart A. Wilson

Q-7. Explain whether any of LG&E/KU's renewable resources or any renewable resource in their BA footprint were producing and transmitting energy leading up to or during December 22, 2022, through December 25, 2022. Include in the response whether any renewable resources are included as a reliable generation resource in the planning for such events.

A-7. The requested renewable resource generation data for the LG&E/KU LSE is contained in the attachment to the response to JI 1-164(b) in Case No. 2022-00402. For the LG&E/KU LSE, and consistent with the events of Winter Storm Elliott, solar resources are not assumed to be generating energy during peak winter load conditions. From a resource planning perspective, the capacity of the Dix Dam hydro station is assumed to be fully available to serve load during peak events. The Ohio Falls hydro station is assumed to be available at its historical average hourly output level in the winter months.

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Question No. 8

Responding Witness: Lonnie E. Bellar

Q-8. Refer to the NERC/FERC October 2023 Report, page 43, and Figure 23 on page 44. For each column in Figure 23, provide a breakout of the outages by LSE for each LSE in LG&E/KU's BA footprint.

A-8. With respect to the generation owned by KMPA (Paducah units) and KYMEA (Paris unit), there were no planned or unplanned generation outages prior to the winter storm. Daily availability for both the KMPA and KYMEA units was sent each day and real-time changes were coordinated with the LG&E/KU BA.

OMU does not own generation assets.

(Note that OMU, KMPA and KYMEA are not registered as Generator Operators ("GOP"))

See below for the outages for the LG&E/KU LSE.

Planned at the start of 12/21/2022
LG&E/KU LSE: 397 MW*

Planned at the start of 12/23/2022
LG&E/KU LSE: 10 MW

Unplanned at the start of 12/21/2022
LG&E/KU LSE: 138 MW

Unplanned at the start of 12/23/2022
LG&E/KU LSE: 631 MW

*Note: The NERC/FERC October 2023 Report (page 44, Figure 23) indicates that the LG&E/KU LSE had 704 MW of generation outages planned at the start of 12/21/22, but the total should be 397 MW. The information submitted to NERC/FERC indicated that Mill Creek Unit 3 was de-rated from 394 MW to 307 MW, which is a derate of 87 MW net (93 MW gross). It appears that the numbers in the NERC/FERC report reflect a derate of 394 MW for Mill Creek Unit 3, which is incorrect.

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Question No. 9

Responding Witness: Lonnie E. Bellar

Q-9. Refer to the NERC/FERC October 2023 Report, page 44. Explain whether there were any transmission lines or transmission related equipment other than generation resources out of service or derated for any reason during the time in question. If so, explain whether any problems with the transmission system were cured prior to the winter storm Elliott event.

A-9. LG&E/KU restored all planned BES transmission outages prior to Winter Storm Elliott and re-scheduled all planned BES transmission outages scheduled to start during Winter Storm Elliott.

There were two 69kV line outages (listed below) that could not be returned leading up to Winter Storm Elliott due to on-going major conductor replacement projects. Operations planning studies were completed with these lines out of service under expected extreme weather conditions and did not identify any potential reliability issues.

- Millersburg to Sardis 69kV line
- Wofford to Elihu 69kV Line (EKPC Cumberland Falls REA on radial out of Wofford), (EKPC Mt. Victory REA on radial from Elihu).

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Question No. 10

Responding Witness: Lonnie E. Bellar

Q-10. Refer to the NERC/FERC October 2023 Report, page 47. Provide a breakout of all derates and outages in LG&E/KU's BA by unit and LSE from December 23, 2022, through December 25, 2022.

A-10. For the LG&E/KU LSE, this data was provided in Case 2022-00402 as an attachment to the response to PSC 1-99.

With regard to generation units owned by KMPA and KYMEA, there were no derates or generation outages reported from December 23rd, 2022, through December 25th, 2022. Daily availability updates for the KMPA and KYMEA units were communicated each day, and any real-time changes were coordinated with the LG&E/KU BA. (Note that neither KMPA nor KYMEA are registered as Generator Operators).

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Question No. 11

Responding Witness: Lonnie E. Bellar

Q-11. Refer to the NERC/FERC October 2023 Report, page 64.

a. For the period leading up to and during Winter Storm Elliott, provide copies of any public service announcements or other public messaging requesting customers to voluntarily reduce energy consumption.

b. State whether LG&E/KU have estimated the extent to which such messaging those requests resulted in a reduction in demand, and if so, provide those estimates.

A-11. LG&E and KU utilized their customer newsletters, back of bill envelopes, and social channels to help customers understand the importance of conserving energy.

a. See attachments being provided in separate files:
Social posts from Dec. 19-21, 2022
Social posts Dec. 23-24, 2022
KU-PowerSource-December-2022.pdf (lge-ku.com)
LGE-PowerSource-December-2022.pdf (lge-ku.com)
December 2022 bill envelope

b. No. Any such estimates would not be useful or reliable given the difficulty in establishing a causal connection between messaging and any reduction in demand at the relevant time.

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Question No. 12

Responding Witness: Lonnie E. Bellar

Q-12. Explain whether LG&E or KU experienced any outages as a result of Winter Storm Elliott other than those resulting from a lack of generation resources or the inability to import energy. If so, provide a detailed list of outages by company, circuit and outage location, and provide the causes of those outages, the amount of time the outages lasted, and time of service restoration.

A-12. From a transmission equipment perspective, there were no customer outages as a result of Winter Storm Elliott other than those resulting from the need to load shed during the capacity and energy emergency. There were two transmission line outages during the period, which had no impact to customers:

- Delvinta to Lake Reba Tap to West Irvine 161kV, Company: KU, Location: Richmond/Winchester area, Cause: Lake Reba Tap 804 breaker had a low air pressure alarm and the breaker air system was frozen, Start Time: 12/23/2022 1:14:35, End Time: 12/23/2022 11:40:00, Duration: 10h 25m 25s.

- Brown Plant to West Cliff, Company: KU, Location: Danville area, Cause: Gas pressure switch frozen, Start Time: 12/23/2022 7:39:17, End Time: 12/23/2022 10:16:00, Duration: 2h 36m 43s.

For Electric Distribution outages, see attachment being provided in a separate file.

KENTUCKY UTILITIES COMPANY
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Case No. 2023-00422

Question No. 13

Responding Witness: Lonnie E. Bellar

Q-13. Explain, in detail, LG&E/KU's processes for inspecting its transmission system, including but not limited to poles (wood and steel), lines, transformers, substation equipment, and all other equipment, and each inspection process, identify whether LG&E/KU personnel or an outside entity conducts each inspection.

A-13. Transmission Substations: LG&E/KU personnel inspect major equipment and structures inside substations with a focus on safety three times per year. A series of questions are answered by the inspector for each piece of equipment and any mechanical and electrical issues are identified and repaired or scheduled for follow up action. This inspection includes obtaining gauge and operational counter readings on power circuit breakers, capacitors, and power transformers. Inspections and readings are collected on AC systems, DC systems including substation battery readings, and instrument transformers. Inspections of bushings, conductor and bus, and substation disconnect and control house equipment are also completed. This inspection also includes fences, structures, substation grounds, and all major equipment inside the substation yard. All data and information is documented in the software application CASCADE which provides a central repository and work management system that triggers, tracks, and reports on all substation asset data.

Transmission Lines: LG&E/KU personnel perform aerial patrols of all transmission lines twice a year. This patrol looks for any major mechanical issues on the line and identifies any vegetation encroachments. Lines in metropolitan area that cannot be flown are patrolled on foot twice a year by external contractors. All wood structures are inspected as part of a ground patrol every 6 years. This ground patrol inspection includes a visual assessment, with sounding and boring of poles to evaluate the health of the structure. Steel structures are inspected as part of a ground patrol every 12 years by external contractors. This inspection includes excavation around the base of the structures and ultrasonic measurements are obtained to determine steel health. In addition, the base of the structures have protective coatings applied to prevent steel degradation. All data and information for tracking structure inspections is contained in the web and mobile application inSITE. This application provides a geospatial view of all the

transmission line assets along with equipment details and when the next inspections are due.

KENTUCKY UTILITIES COMPANY
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Response to Commission Staff's First Request for Information
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Question No. 14

Responding Witness: Lonnie E. Bellar

Q-14. Provide all inspection reports for transmission system inspections since 2019, and explain what information is documented in the reports and how the reports are organized.

A-14. See attachments being provided in separate files. The information requested is confidential and proprietary and is being provide under seal pursuant to a petition for confidential protection.

Transmission Substations: Substation inspection data is contained in **PSC DR1 LGE KU Attach to Q14 – Att 1 Substation Inspection Data 1 of 2.xlsx** and **PSC DR1 LGE KU Attach to Q14 – Att 1 Substation Inspection Data 2 of 2.xlsx.** The data is organized by Substation, Equipment Type and by date of the inspection.

Transmission Lines: Our transmission line structure inspection data is contained in **PSC DR1 LGE KU Attach to Q14 – Att 2 LKE Transmission Lines Structure Export_2024-02-01_January 2019 to December 2023.xlsx**. Transmission line switch inspection data is contained in **PSC DR1 LGE KU Attach to Q14 – Att 3 LKE Transmission Lines Switch Export_2024-02-01.xlsx**. Both documents contain an export summary of all structures (or switches) inspected during the requested time period. The data is organized by circuit, structure (or Switch), voltage, status (based on inspection) and the date the last inspection was completed.

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Question No. 15

Responding Witness: Lonnie E. Bellar

Q-15. For each year from 2020 through 2023, provide LG&E/KU's annual capital work plan and capital budget for transmission system projects, and if such projects were completed, state when they were completed and provide a comparison of the amounts actually spent on the projects as compared to the budgeted amounts. If additional projects were undertaken in those years that were not included in LG&E/KU's capital work plan or budget, identify those projects by describing each such project and identifying amounts spent on each such project.

A-15. See attachment being provided in a separate file.

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Response to Commission Staff's First Request for Information
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Case No. 2023-00422

Question No. 16

Responding Witness: Lonnie E. Bellar

Q-16. Explain, in detail, LG&E/KU's processes for inspecting their distribution system, including but not limited to poles (wood and steel), lines, transformers, substation equipment and all other equipment (such as the Capacitor and Regulator Inspection Maintenance Program, the Recloser Maintenance / Replacement Program, the Overhead Conductor Program). For each inspection process, identify whether LG&E/KU personnel or an outside entity conducts each inspection.

A-16. The distribution system is inspected per the attached LG&E/KU Electric Operation, Maintenance, and Inspection Plan (OM&I) document dated December 1, 2017. This plan documents the inspection requirements for distribution lines and equipment and distribution substations, including inspection frequency, intent of inspections and record keeping requirements.

Distribution Lines and Equipment

All electric lines, equipment and meters are inspected at intervals not to exceed two years, per 807 KAR 5:006 Section 26. During these inspections, LG&E and KU distribution employees and contractors visually inspect the system, identifying apparent unsafe conditions and damaged and/or defective equipment that may cause system reliability concerns. Poles, lines, crossarms, cut-outs, fuses, lightning arrestors, transformers, capacitor banks, reclosers, and regulators are included in these inspections. Personnel perform the inspection either by foot or vehicle as deemed appropriate for the characteristics of the line. Inspectors use printed circuit maps and an inspection form; if an inspectors identify an item requiring corrective action, they make a note on the circuit map and detail the item on the inspection form. Following inspection, both the map and inspection form are returned to administrative personnel to create corrective, corresponding work requests. The operations centers retain the maps and forms for six years and available for audit.

Wood Poles are also subject to inspection through the attached Wood Pole Inspection and Remedial Retreatment Program. This program details a

progressive order of inspection: Asset Data Inspection, Visual Inspection, Sound and Resistive Drill Inspection and Full Excavation Inspection. All poles with distribution facilities receive asset data inspection and visual inspection on a twelve-year cycle, unless otherwise specified. Poles 15 years of age or older that have been previously treated will additionally be subject to resistive drill or sound and bore inspection, dependent on pole type. Poles 15 years of age or older that have not been previously treated or rejected through other inspections will received a full excavation inspection. Poles that do not pass inspection are marked in the field and reported for remediation. Data from this inspection process is collected and uploaded into a data base. These inspections are performed by contractors.

Capacitors are inspected per the attached AOP for Fixed and Controlled Capacitor Banks, EAOP-SI-003 at intervals not to exceed one year for fixed and non-SCADA connected capacitor banks and not to exceed two years for SCADA connected capacitor banks. Inspection of both fixed and controlled capacitors includes a visual inspection for external damage, blown lightning arresters or fuses, cutout and switch positions, mechanical supports, and insulator condition. Controlled banks are also inspected for controller box damage and operation. Inspection results for the period in question were tracked in Distribution Equipment Tracking system (DETs) and converted into Cascade software in 2023. These inspections are performed by LG&E/KU employees and contractors.

Reclosers are inspected per the attached AOP for hydraulic and electronically controlled reclosers, EAOP-SI-004 at intervals not to exceed one year for hydraulic reclosers and not to exceed two years for electronically controlled reclosers. This includes visual inspection for external damage, blown fuses or lightning arrestors, cutout and switch positions, mechanical supports, and insulator condition. Electronically controlled recloser inspections include verification of control functionality and battery test. Operations data is collected as part of the inspection and logged. Inspection results are tracked in Cascade. These inspections are performed by LG&E/KU employees and contractors.

Louisville secondary network vaults and manholes are inspected per the attached Approved Operating Procedure (AOP) for downtown Louisville secondary network, EAOP-SI-001 at intervals not to exceed 6 months per 807 KAR 5:006. This inspection includes a visual assessment of vault enclosure and structural equipment, vault electrical equipment, manholes and hardware and manhole electrical equipment. Equipment inspections within manhole and vaults include transformers, protectors, cable bus, service conductors and monitoring equipment. Temperature and peaking demand load are recorded during this inspection. These inspections are performed by LG&E employees and contractors.

Lexington area vaults and manholes are inspected per the attached AOP for Lexington area vault and manhole inspection document, EAOP-SI-001-V&M. Inspections are completed at intervals not to exceed 2 years per 807 KAR 5:006. This inspection includes a visual assessment of vault enclosure and structural equipment, vault electrical equipment, manholes and hardware, and manhole electrical equipment. Equipment inspections within manholes and vaults include transformers, cable/conductors, exposed splices, and sump pumps. These inspections are performed by KU employees and contractors.

Distribution Substations

All distribution substations are inspected at intervals not to exceed one year, per 807 KAR 5:006 Section 26. In the period in question substations were inspected on a quarterly basis, beginning January 1, 2024, LG&E and KU transitioned to a 4-month inspection cycle. This change aligns with increased remote monitoring capabilities within substations. Substation inspections are completed with the intent to visually inspect the system and identify apparent unsafe conditions and damaged and/or defective equipment that may cause system reliability concerns. Equipment inspected include site conditions, fencing, warning signage, structures, SCADA systems, station grounds, transformers, tap changers, regulators, circuit breakers, reclosers, capacitors, control houses, station batteries, switchgear, and environmental conditions. Inspections details are specific to the individual substation and customized to the equipment being inspected. LG&E/KU personnel perform all substation inspections and log all records in Cascade. Any deficiencies identified during the inspection are flagged for follow-up action by substation maintenance leadership and corrective work requests are created in Cascade.

In addition to the inspections described above, distribution substations are maintained per the LG&E and KU Reliability Centered Maintenance (RCM) program. Equipment maintenance activities include assessment of internal components of substation equipment, including:

- Circuit Breaker Out of Service Diagnostics
- Circuit Breaker Functional Trip Checks
- Transformer Oil Dissolved Gas Analysis
- Transformer Power Factor testing

For the purposes of response to Question Nos. 16 and 17, maintenance records are not included as part of this data request.

Infrared inspections are performed on distribution substations on annually by LG&E/KU Employees. Inspections evaluate equipment for abnormal heating or significant deviation from normal conditions. Inspection reports are only created for deficiencies and corrective work requests are generated.

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Case No. 2023-00422

Question No. 17

Responding Witness: Lonnie E. Bellar

Q-17. Provide all inspection reports for distribution system inspections since 2019, and explain what information is documented in the reports and how the reports are organized.

A-17. See attachments being provided in separate files. Distribution Lines inspections are completed as a hard copy circuit map and inspection form. As personnel perform the inspection, they hand notate deficiencies on the map indicating location and type of issue. They then detail issue on inspection form. Both the map and inspection form are returned to administrative personnel at each operating center. The deficiencies have work requests created and the hard copy map and inspection form are filed in cabinets at each operating center. Since the records in question are hard copy, it is not feasible to produce them completely as response to this request. Provide in the attached Distribution Lines inspection summary file is one scanned copy per operating center showing the map and inspection form. Each circuit for the period in question, 2019-2023, is available for inspection at each operating center upon request. Frequent PSC audits have reviewed these documents.

Wood pole inspection data is collected in the field via mobile third-party application. Inspectors verify or collect relevant data on pole including owner, classification, height, species, treatment type, circumference, decay, and visual assessment. The inspector then passes or fails the pole based on information input from assessment. Rejected poles are noted in the file as well. Pole numbers on form align with pole information in our GIS system. Inspection information from 2019-2023 is provided in separate files for each year of inspections. A file with acronyms is also attached for reference.

Capacitor inspections are completed in the field then data collected is entered into Cascade. Prior to 2022 information was kept in both hard copy form, DETs or ARM. All electronic information prior to 2022 was transferred into Cascade but formatting did not fully align in all inspections. Therefore, there are two files of information are attached. One attachment has inspections prior to transition to

cascade that have information loaded into the comment section and one attachment with export of data from Cascade sorted by asset and inspection date.

Recloser inspections are completed in the field then data is collected and entered into Cascade as well as completed as part of the distribution lines inspections detailed above. Inspection data can be recorded in Cascade as well as on the inspection forms. Attached is all available recloser data from Cascade from 2019-2023 sorted by recloser equipment number along with specific data collected.

Louisville secondary network vaults and manholes are inspected in the field then data is collected and entered in ARM. Attached is one file with all inspections from 2019-2023 sorted by vault location and inspection date containing all collected data.

Lexington area vaults and manhole inspections are completed as hard copy inspection forms. As personnel perform the inspection, they hand notate condition and deficiencies on the inspection form. Forms are returned to administrative personnel at each operating center. The deficiencies have work requests created and the inspection forms are filed in cabinets at the operating center. Since the records in question are hard copy, it is not feasible to produce them completely as response to this request. Provide in the attached Lexington Vault and Manhole inspection file is one scanned inspection form. Additional vault and manhole inspections from 2019-2023 are available for inspection at the operating center upon request.

Substation Inspections are completed in Cascade during field inspection. Technicians performing inspection have capability to field enter data while completing the inspection. Due to size of data available there are multiple files attached. Each file shows the Substation name, date of inspection, equipment inspected, inspection question and reading. Equipment requiring corrective action is noted as follow-up required. Leadership reviews follow up required indications and creates corrective work requests.

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Question No. 18

Responding Witness: Lonnie E. Bellar

Q-18. For each year from 2020 through 2023, provide LG&E/KU's annual capital work plan and capital budget for distribution system projects, and if such projects were completed, state when they were completed and provide a comparison of the amounts actually spent on the projects as compared to the budgeted amounts. If additional projects were undertaken in those years that were not included in LG&E/KU's capital work plan or budget, identify those projects by describing each such project and identifying amounts spent on each such project.

A-18. See attachment being provided in a separate file.

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Question No. 19

Responding Witness: Lonnie E. Bellar / David S. Sinclair / Charles R. Schram

Q-19. Refer to Mr. Lonnie E. Bellar's rebuttal testimony in Case No. 2022-00402 (Bellar's 2022-00402 Rebuttal), pages 18–19.[1]

a. State what, if any, additional discussions have taken place between LG&E/KU and Texas Gas Transmission regarding Winter Storm Elliott since the final hearing in Case No. 2022-00402 to address the event and reduce the risk of future occurrence.

b. State what, if any, changes Texas Gas Transmission have implemented in response to the events occurring during Winter Storm Elliott. Including the response any proposed changed which have not yet been implemented by Texas Gas Transmission.

A-19.

a. Texas Gas Transmission provided an update on its response to Winter Storm Elliott during an on-site meeting at LG&E/KU in Louisville on November 29, 2023. This was followed by a meeting hosted by TGT at its Slaughters station on November 30, 2023 to review and inspect infrastructure and weatherization upgrades (see attachment to part b.). In addition, TGT held an operations call with LG&E/KU on January 12, 2024, prior to the onset of extremely cold weather. In this call, TGT noted their system checks and preparation, including (1) units started, (2) working with gas control to keep Slaughters and Hardinsburg stations in looping mode, and (3) staffing additional remote locations. TGT indicated they were prepared for weather like Elliott, despite the forecast for a less drastic drop in temperatures for the January 2024 event.

[1] Case No. 2022-00402, *Electronic Joint Application of Kentucky Utilities Company and Louisville Gas and Electric Company for Certificates of Public Convenience and Necessity and Site Compatibility Certificates and Approval of a Demand Side Management Plan and Approval of Fossil* Fuel-Fired *Generating Unit Retirements* (filed Jan. 06, 2023), LG&E/KU's Rebuttal Testimony of Lonnie E. Bellar at 18–19.

b. See the response to part (a). TGT provided a presentation at the November 29, 2023 meeting that is attached as a separate file. The information requested is confidential and proprietary and is being seal pursuant to a petition for confidential protection. See attached summary of the 11/30/23 visit to Slaughters station to observe changes implemented by Texas Gas Transmission.

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Case No. 2023-00422

Question No. 20

Responding Witness: Lonnie E. Bellar / Stuart A. Wilson

Q-20. Refer to Bellar's 2022-00402 Rebuttal, pages 18–19. State whether LG&E/KU has conducted an analysis of the proposed NGCC unit installation at Mill Creek which included analysis of gas compression capability as they relate to expected pipeline pressure conditions, including the costs and risks associated with operating the proposed unit on fuel oil.

A-20. The Companies have procured firm gas transportation services for Mill Creek 5 (see attachment to response to SC 1-36). In addition, the Companies have analyzed gas compression requirements for Mill Creek 5 using gas pressure data from mid-2019 to early 2023. Based on that analysis and discussions with vendors, the Companies currently expect to install compression equipment that would permit Mill Creek 5 to be available under all pipeline pressure conditions experienced over the period analyzed. Finally, the Companies are currently working with Texas Gas Transmission on a broader study to evaluate the potential costs and benefits of additional alternatives for supporting system reliability. The study will include fuel oil backup for Mill Creek 5 and gas storage among other options. This study is expected to be completed by the middle of 2024.

The estimated costs of fuel oil backup for Mill Creek 5 are summarized in the table below. The primary risk associated with fuel oil backup stems from the fact that the industry has very little experience operating this particular class of combustion turbine unit on fuel oil. The current contract for Mill Creek 5 does not include fuel-oil capability, but does not preclude the addition in the future.

Incremental Costs of Dual Fuel Capability for Mill Creek 5

Cost Item	**Cost**
Capital (Tanks, Infrastructure) for 2 Days of Inventory	$25.3 M
Fuel Oil Inventory (O&M; 1.3M Gallons)	$4.3 M
Effect of Testing/Operations on LTSA	$100,000/Yr
Tank Maintenance & Inspections	$250,000/Yr
Annual Fuel Oil for Testing (750,000 Gallons)	$3-4 M

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Case No. 2023-00422

Question No. 21

Responding Witness: Lonnie E. Bellar

Q-21. Refer to Bellar's 2022-00402 Rebuttal, pages 18–19.

a. State whether the software improvements on the simple cycle combustion turbines at Trimble County have been installed. If they have been installed, provide the date of the installations.

b. Explain why the software was not installed prior to the events of Winter Storm Elliott. Include in the response when LG&E/KU became aware of the software improvements.

A-21.

a. Software improvements were made to the following units and installed on the corresponding dates:

- TC5 – 10/2/2023
- TC6 – 10/3/2023
- TC7 – 10/3/2023
- TC8 – 10/4/2023
- TC9 – 10/4/2023
- TC10 – 10/5/2023

b. The TC gas turbines were originally installed in 2002-2004. These machines have a minimum inlet gas pressure for operation below which the units cannot operate. Because the Companies' transportation contracts with Texas Gas have specified minimum delivery pressures, this had not been a concern before Winter Storm Elliott. The software that was subsequently installed was specifically designed and marketed for units that had on-site compression to manage gas compressor operation, not for variable pipeline pressures. Following Winter Storm Elliott, the Companies reached out to the OEM and collectively concluded that this software could be beneficial in this type of atypical event and accordingly installed it. Although the Companies were aware of the software for its originally intended purpose

prior to Winter Storm Elliott, because the site did not have on-site gas compression and had not previously experienced gas pressure supply issues from Texas Gas Pipeline, there was not a justification to purchase the software.

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Case No. 2023-00422

Question No. 22

Responding Witness: Lonnie E. Bellar

Q-22. Provide a detailed list of all unit outages or derates, if any, which have occurred during cold weather events in the last ten years. Provide a detailed explanation for why each unit was out of service or derated. Include in the answer whether the unit had any operational capacity during the period and how long the outage or derate lasted.

A-22. See the attachment to the response to SC 1-7(b) covering the five coldest days in the last ten years. This data includes the GAC ("Gross Available Capacity") during each outage or derate. Also see the response to SC 4-1 in Case No. 2022-00402.

During January 14-21, 2024 (Winter Storm Heather), while the cold weather did not meet the threshold for the five coldest days in ten years, low temperatures in Louisville did reach 3° F, 6° F, and 7° F on three separate days. The Companies did not experience any gas pressure issues on the Texas Gas Transmission and Texas Eastern pipelines and had no outages or derates caused by cold temperatures. See the table attached to JI 1-14(a) for all unit outages and causes during January 14-21, 2024.

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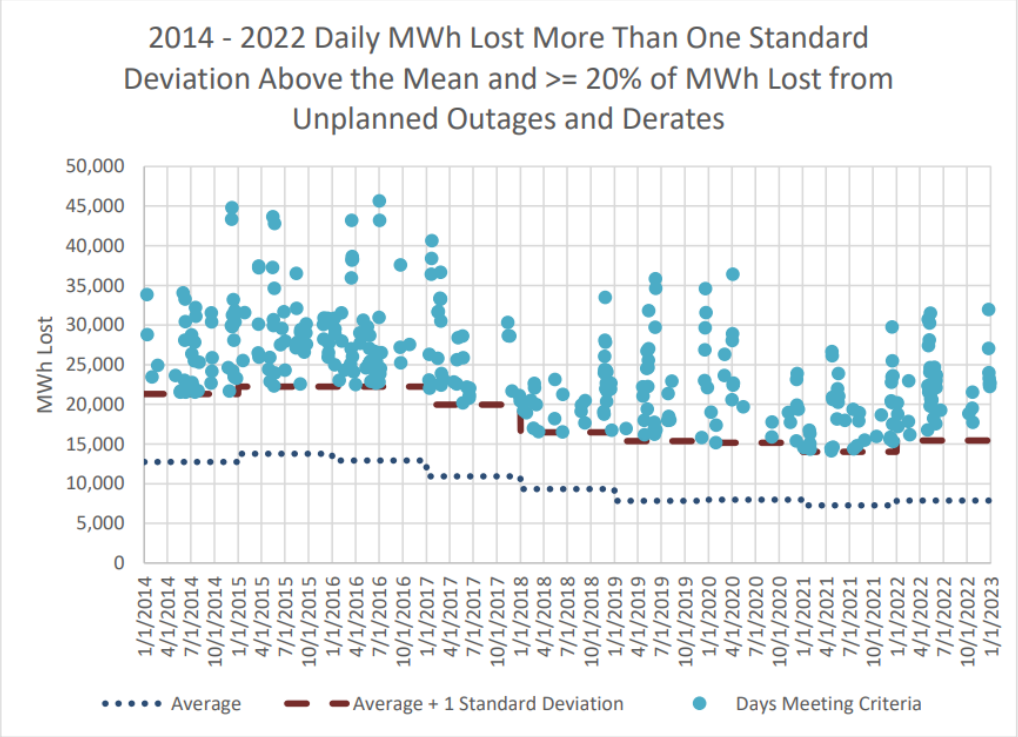
Case No. 2023-00422

Question No. 23

Responding Witness: Lonnie E. Bellar / David S. Sinclair / Stuart A. Wilson

Q-23. Provide a detailed list of all correlated unit outages or derates, if any, which have occurred during cold weather events in the last ten years. Provide a detailed explanation for why each unit was out of service or derated. Include in the answer whether the unit had any operational capacity during that period and how long the outage or derate lasted.

A-23. The Companies' data do not indicate any statistically significant correlation between unit outages or derates and temperature. For example, the Companies' response to PSC PHDR 25 in Case No. 2022-00402 showed that for criteria established by the Commission Staff's request, namely, "dates in which MWh lost is one standard deviation above the average and at least 20 percent of the MWh lost is attributable to forced outages," there was almost no correlation between unplanned outages and temperature (-0.14 in winter and 0.08 in summer).



See also David Sinclair's Rebuttal testimony at page 79-80 and Lonnie Bellar's Rebuttal Testimony at page 18 in Case No. 2022-00402 and the Companies' response to SC 1-14 in this case, the latter of which graphically depicts outage impacts during cold weather events in the last ten years (i.e., the five coldest days of the last ten years).

For outages and derates during cold weather events in the last ten years and their causes, see the response to SC 1-7(b) and its attachment as well as the response to Question No. 22 for January 2024.

One of the primary reasons there is no statistically significant correlation between temperature and outages or derates of the Companies' generating units is that the Companies both prepare in advance for extreme weather events to mitigate adverse impacts and learn from extreme weather events like Winter Storm Elliott to improve future performance. See, e.g., the responses to Question Nos. 19, 20, 21, and 87. Therefore, the Companies anticipate that their unit outages and derates will continue to be weakly correlated, if at all correlated, with temperature.

Finally, assuming a non-trivial cold temperature-correlated outage or derate risk would tend to support the need for more generating capacity, energy storage, or both owned by the Companies. One clear lesson of Winter Storm Elliott is that the Companies should not assume their neighbors will be able to meet any energy shortfall in extreme cold weather events, even when there is ample transfer

capability.[2] Thus, if the Companies' existing and future generating capacity is to be discounted for correlated outage risk, more capacity will be required.

[2] This is also consistent with the Commission's clear orders concerning utilities having sufficient generating capacity to serve their own customers rather than depend on markets. *See, e.g., Electronic Tariff Filing of East Kentucky Power Cooperative, Inc. and Its Member Distribution Cooperatives for Approval of Proposed Changes to their Qualified Cogeneration and Small Power Production Facilities Tariffs*, Case No. 2021-00198, Order at 5, n.10 (Ky. PSC Oct. 26, 2021) ("This Commission has no interest in allowing our regulated, vertically-integrated utilities to effectively depend on the market for generation or capacity for any sustained period of time.").

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Question No. 24

Responding Witness: Lonnie E. Bellar / Charles R. Schram

Q-24. State whether LG&E/KU have any written operating procedures for extreme winter weather events, and if so, provide a copy of those procedures.

A-24. Yes, the LG&E/KU BA has two operating procedures used during extreme winter weather events. These procedures are the LGE/KU System Alerts_Conservative Operations and the EOP-011-1 LGE/KU Capacity and Energy Emergency Operating Plan. See attachment being provided in a separate file.

In addition, LG&E/KU Generation Dispatch follows written operating procedures that are inclusive of all weather conditions. These include:

- Generation Dispatch – BAAL (Balancing Authority ACE Limit) Operational Procedure relevant to NERC Reliability Standards: BAL-001-2

- Generation Dispatch – Balancing Authority and Transmission Operator (BA/TOP) Operational Protocol Operational Procedure relevant to NERC Reliability Standards: BAL-001-2, TOP-001-5, IRO-001-4, IRO-010-4, TOP-003-5

- LG&E and KU Generation Operating Reserves Operational Process relevant to NERC Reliability Standards: BAL-001-2, BAL-002-3

- Generation Dispatch – Generator Commitment, Coordination, and Communication Procedure Operational Procedure relevant to NERC Reliability Standards: COM-002-4, EOP-005-3, EOP-008-2, IRO-001-4, IRO-010-4, IRO-017-1, TOP-001-5, TOP-003-5, VAR-002-4.1

- LG&E/KU Generation Cold Weather Preparedness Plan relevant to NERC Reliability Standards: EOP-011.

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Case No. 2023-00422

Question No. 25

Responding Witness: Lonnie E. Bellar

Q-25. State what changes, if any, have been made to LG&E/KU's winter operating procedures to reduce risk of equipment failure following Winter Storm Elliott.

A-25. With respect to transmission maintenance and operational procedures, Winter Storm Elliott did not indicate any issues with existing procedures or processes that would require LG&E/KU to institute any new operating procedures or processes to reduce risk of equipment failure in cold weather conditions. Prior to any winter event such as Winter Storm Elliott, the Companies' Substation Department will dispatch personnel to conduct thorough substation inspections. These visits are prioritized to facilities that are interconnected to generation, critical substations, and any substation that have known concerns that could present issues during a cold weather event. This could include but is not limited to stations that have pneumatic systems for breaker operations (purge lines to remove moisture), known breakers that may have a slow leak or are near the low indication for SF6 gas (fill with SF6 to prevent callouts during the cold weather event), check functionality of heaters in breaker cabinets, and any transformers that have a nitrogen blanket that could be filled with nitrogen prior to the event (to prevent callouts during the event).

The following changes have been made to LG&E/KU's Generation winter operating procedures to reduce equipment failure following Winter Storm Elliott.

- EW Brown Generating Station
  - Compressed air systems water traps to be blown down more frequently to prevent air operated valve controls from freezing.
  - Additional temporary enclosure to be built over valves at pipe bridge to CCRT.
  - CCRT submerged flight conveyors to be started prior to extreme cold weather event and left running to avoid cold hydraulic fluid viscosity issues.
  - Isolate and drain oxidation air blower attemperator pipe prior to extreme cold to protect against freezing.

- Mill Creek Generating Station

  - Revised door checklist to include those doors that may need to be closed to prevent cold air infiltration.

- Cane Run and Paddy's Run Generating Stations
  - There have been no changes to operating procedures for the power generating equipment.

- Ghent Generating Station
  - There have been no changes to operating procedures for the power generating equipment.

- Trimble County Generating Station
  - Additional electric heaters have been strategically installed targeting essential components.
  - New roll-up doors have been added to improve the efficiency of the unit heating system.
  - Additional automated controls for the Unit 1 plant heating system were installed to streamline operational processes.
  - Documentation updates have been made, including the creation of a cold weather combustion air door operation document for leaders and operations to utilize. Outage documents now incorporate guidelines specific to cold weather operations.
  - Changes in operator actions during unit offline periods involve prompt cooling down and removal of fans, accompanied by the closure of outside combustion air doors to prevent cold air infiltration.
  - Monthly heat trace checks have been increased to weekly routines.
  - A low point drain has been added to demister wash piping, enabling system drainage during cold weather event outages.

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Question No. 26

Responding Witness: Lonnie E. Bellar

Q-26. Refer to LG&E/KU's response to Commission Staff's Post-Hearing Request for Information in Case No. 2022-00402 (LG&E/KU's 2022-00402 Response to Staff's Post-Hearing Request),[3] Item 13, Attachment 2.

a. Identify the plants, if any, that have incorporated changes related to NERC Reliability Standard EOP-012-1 into their cold weather checklists. Provide a detailed explanation of those changes, if any.

b. Provide a copy of LG&E/KU's current cold weather checklists.

c. State whether LG&E/KU have completed the construction of the permanent metal building at E.W. Brown 5 which was scheduled for completion in October 2023.

d. State whether LG&E/KU have conducted additional compression studies as part of the development of Mill Creek 5. Provide a copy of those studies and state whether additional onsite fuel gas compression will be included in the Mill Creek 5 project.

e. Provide a detailed explanation and update regarding the Trimble County 2 water coil air heater study. State whether any proposed changes to the system have been implemented.

f. State whether LG&E/KU is fully compliant with NERC Reliability Standard EOP-012-1. If not, state which recommendation LG&E/KU is not currently in compliance with and provide the date LG&E/KU expects to be in compliance. Additionally, state whether all critical components required

[3] Case No. 2022-00402, *Electronic Joint Application of Kentucky Utilities Company and Louisville Gas and Electric Company for Certificates of Public Convenience and Necessity and Site Compatibility Certificates and Approval of a Demand Side Management Plan and Approval of Fossil Fuel-Fired Generating Unit Retirements* (filed Sep. 15, 2023) Response of Kentucky Utilities and Louisville Gas and Electric Company to the Commission Staff's Post-Hearing Request for Information, Item 13, Attachment 2.

to be identified by the reliability standard will have adequate freeze protection prior to the 2024 winter season.

g. State which units, if any, will not be in compliance with NERC Reliability Standard EOP-012-1 prior to the 2024 winter season.

A-26.

a. The Companies are in the process of incorporating revisions to their generation operations in response to EOP-012, which has an effective date of 10/1/2024.

b. See attachment being provided in a separate file.

c. The Companies have completed the construction of a permanent shelter at E.W. Brown for the 11N2 CT fuel gas reducing station regulating valves.

d. See the response to Question No. 20. See attachment being provided in a separate file. Certain information requested is confidential and proprietary and is being provided under seal pursuant to a petition for confidential protection.

e. The Trimble County unit 2 water coil air heaters (WCAH) study is ongoing. The study has included the following tasks:

- Investigating any potential flow leaks or unexpected use/recirculation in the condensate system that would have contributed to the dearator level instability:
- Reviewing the design of the WCAHs;
- Testing the condensate pumps to see if they are operating at design condition;
- Reviewing boiler inlet temperature control logic including control of flow to the WCAH; and
- Reviewing deaerator level control logic

Thus far the study has shown that the three condensate pumps are operating as designed, and the WCAHs performed satisfactorily with respect to the design conditions. The review of boiler inlet temperature controls indicated the boiler inlet temperature set point had some margin, so it has been lowered such that it requires less heat transfer from the WCAH prior to entering the air preheaters. The unit also returned to firing a 70%/30% eastern bituminous to PRB coal blend which lowered the moisture in the fuel entering the boiler, reducing the required air temperature for transport

and drying. Further study and possible changes to the inlet air temperature controls are still being evaluated. No derates occurred during the January 14-21, 2024 cold weather as a result of these changes.

f. EOP-012-1 is not effective until 10/1/2024. LG&E\KU is making progress on meeting the compliance obligations of the new standard and intends to be fully compliant with EOP-012-1 by its effective date of 10/1/2024.

g. All units will be in compliance with NERC Reliability Standard EOP-012-1 prior to the 2024 winter season.

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Question No. 27

Responding Witness: Lonnie E. Bellar

Q-27. Refer to LG&E/KU's 2022-00402 Response to Staff's Post-Hearing Request, Item 13, Attachment 1. Provide a detailed explanation of the outcome of the "capacity and energy emergency resulting in a load shed event" exercise which was scheduled for November 14, 2023.

A-27. See the response to JI 1.12(c) for more information about updates to the manual load shed plan.

During the GridEx VII tabletop exercise on November 14 and 15, 2023, load shedding was simulated and discussed among the Transmission Operations and Distribution Operations groups. Additionally, both Distribution and Transmission teams executed the updated load shedding plan using a training simulator. The execution of the updated load shed plan during GridEx VII proved successful, and both groups derived key insights from the exercise, which are presently under review and being integrated into operational practices.

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Question No. 28

Responding Witness: Lonnie E. Bellar

Q-28. Refer to LG&E/KU's response to the Attorney General's Initial Request for Information in Case No. 2022-00402 (LG&E/KU's 2022-00402 Response to Attorney's First Request), Item 13, Attachment 1. Provide a definition of the term "derate" as used within the context of Attachment 1.

A-28. The use of the term "derate" is consistent with the NERC GADS definition stating that "a derate is a partial outage with an associated reduction in capacity; it exists when a unit can generate but not at 100 percent capacity." The capacity is based on the capability of the unit, not on dispatch requirements (load following at less than 100 percent of a unit's load is not a derate).[4]

[4] https://www.nerc.com/pa/RAPA/gads/Training/2022_Conventional_GADS_Training_Module_06_Derate_Event_Reporting.pdf, page 3.

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Question No. 29

Responding Witness: Lonnie E. Bellar / Charles R. Schram

Q-29. Refer to LG&E/KU's 2022-00402 Response to Attorney General's First Request, Item 13, Attachment 1. Define "Generation Alert" as it is used within the context of Attachment 1, and explain how it is implemented.

A-29. Generation Alert status is a form of conservative operations status declared by LG&E/KU Generation Dispatch, whereby generating plants are requested to avoid unnecessary risks with generating units during periods of high load and/or reduced capacity. During Generation Alert status, plant personnel postpone non-critical activities related to generating units that pose a risk of tripping the unit and can be delayed without consequence to the unit's operation. Generation Dispatch issues the notice for Alert status via a combination of text messages and emails to plant contacts, management personnel, and the BA.

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Question No. 30

Responding Witness: Lonnie E. Bellar / Charles R. Schram

Q-30. Refer to LG&E/KU's 2022-00402 Response to Attorney General's First Request, Item 13, Attachment 1. Provide a timeline (date and specific time) of any changes to generation dispatch, including going into alert status, during the period between December 22, 2022, and December 25, 2022

A-30. The data requested can be found on pages 3-6 of the referenced attachment for the time period beginning December 23, 2022. Generation Dispatch was in "Standard", not "Alert" status on December 22, 2022. "Alert" status began at 06:10 on December 23, 2022, not 05:10 as indicated in the referenced attachment. On December 22, 2022, the following additional changes took place to unit status affecting available capacity for dispatch:

12/22/2022 at 04:57 - Mill Creek 3 good for full load following 93 MW gross (87 MW net) derate during planned 3C mill maintenance from 12/21/2022 at 23:00.

12/22/2022 at 07:05 - Mill Creek 2 good for full load following 205 MW derate during planned deslag from 12/21/2022 at 22:00.

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Question No. 31

Responding Witness: Lonnie E. Bellar

Q-31. Refer to LG&E/KU's 2022-00402 Response to Attorney General's First Request, Item 13, Attachment 1. Provide a timeline (date and specific time) of all changes in Energy Emergency Alert status during the period between December 22, 2022, and December 25, 2022. Include in the response copies of all internal and public communications related to the EEA statuses and when the correspondence occurred.

A-31. See attachment being provided in a separate file. The date and times that the LG&E/KU BA requested the TVA RC to declare an Energy Emergency Alert (EEA) on behalf of the LG&E/KU BA during the period between December 22, 2022 and December 25, 2022 are listed below. After initiating each EEA on behalf of the LG&E/KU BA, the TVA RC notified Balancing Authorities and Transmission Operators in the TVA RC Area and neighboring Reliability Coordinators using the Reliability Coordinator Information System (RCIS).

- 12/23/2022 – 13:36
  - EEA 3
- 12/23/2022 – 14:52
  - EEA 2
- 12/23/2022 – 16:45
  - EEA 3
- 12/24/2022 – 00:53
  - EEA 2
- 12/24/2022 – 01:55
  - EEA 3
- 12/24/2022 – 12:22
  - EEA 2
- 12/24/2022 – 14:06
  - EEA 0

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Question No. 32

Responding Witness: Lonnie E. Bellar

Q-32. Refer to LG&E/KU's Response to Attorney General's First Request, Item 13, Attachment 1. Explain the source of the other 58 percent of gas delivered to customers on December 23, 2022.

A-32. The referenced statement pertains to LG&E's gas LDC. The source of the other 58 percent of gas delivered to customers on December 23, 2023, was gas received by LG&E from Texas Gas Transmission, LLC (50%) and Tennessee Gas Pipeline Company, LLC (8%). The gas received by LG&E from Texas Gas Transmission, LLC included gas purchased by LG&E from its gas suppliers and gas purchased by third-party suppliers on behalf of LG&E's Rate FT and Rider TS-2 gas transportation service customers. The gas received by LG&E from Tennessee Gas Pipeline Company, LLC was gas purchased by LG&E from its gas suppliers.

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Question No. 33

Responding Witness: Lonnie E. Bellar

Q-33. Refer to LG&E/KU's 2022-00402 Response to Attorney General's First Request, Item 13, Attachment 1, page 2. Provide a list naming the organizational titles of all personnel and departments which are responsible for making the decision to execute the capacity and energy emergency operating plan.

A-33. The Transmission Control Center is responsible for executing the Capacity and Energy Emergency Operating Plan. Within this group, the following positions have the authority to implement the plan:

- Manager of the Control Center
- Group Leader Electric System Coordination and Engineering
- Team Leader Transmission Electric System Coordination
- Lead Electric System Coordinators
- Electric System Coordinators (TOP/BA)

All positions mentioned above are part of the Transmission System Operations department, which performs the real time operating activities of the BA and TOP functions.

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Question No. 34

Responding Witness: Lonnie E. Bellar

Q-34. Refer to LG&E/KU's 2022-00402 Response to Attorney General's First Request, Item 13, Attachment 1, page 4. Explain in more detail what caused E.W. Brown Generating Station, Unit 3 to be derated by 62 MW, including specifically what caused the problems with the combustion process instrumentation.

A-34. Brown 3 has 6 Oxygen probes in the ductwork that are used to control the combustion process. Two of these probes began reading incorrectly on 12/23/22 early in the day. This caused combustion issues that led to excessive slagging and ash carryover into the baghouse along with load reduction and ultimately, a unit outage on 12/25/22 21:15 to clean out the gas path.

The post outage investigation identified the failure of the probes to be leaks on the sensing lines unrelated to weather that caused incorrect readings.

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Question No. 35

Responding Witness: Lonnie E. Bellar

Q-35. Refer to LG&E/KU's 2022-00402 Response to Attorney General's First Request, Item 13, Attachment 1, page 4. Provide any documentation provided by LG&E/KU to plant personnel regarding "avoid unnecessary risks with generating units" during a generation alert or any other communications regarding the Generation Alert status.

A-35. See the attachment to Question No. 24 entitled *Generation Dispatch – Generator Commitment, Coordination, and Communication Procedure*, section 3.3.19 *Daily Balance Risk Assessment Status*. No further documentation exists to denote each of the myriad non-critical activities that, in the experience of plant personnel, could be postponed to avoid unnecessary risks of tripping or derating a generating unit. Examples of non-critical activities that could be postponed include logic control changes, instrumentation calibrations, and preventive maintenance activities such as oil changes and inspections. The email communication of the Generation Alert status on December 23, 2022 is being provided as a separate file.

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Question No. 36

Responding Witness: Lonnie E. Bellar / Charles R. Schram

Q-36. Refer to LG&E/KU's 2022-00402 Response to Attorney General's First Request, Item 13, Attachment 1, page 3. Provide a detailed explanation of any interruption in energy deliveries from OVEC during the period of December 22, 2022, through December 25, 2022. Include in the response a timeline of the energy deliveries received from OVEC with the associated MW for each delivery.

A-36. The requested timeline of energy deliveries from OVEC is being attached as a separate file; see the "Purchases" worksheet. See also the response to AG 1-14.

Five OVEC five units (Clifty Creek 1, 3, and 6 and Kyger Creek 3 and 4) were offline on December 22, 2022, prior to the arrival of Winter Storm Elliott. The outage causes are listed below.

Clifty Creek 1	Planned outage - extended on 12/1/22 returned 1/9/23
Clifty Creek 3	Tube weld issue; header leak; returned 12/26/22
Clifty Creek 6	Tube leak; returned 12/24/22
Kyger Creek 3	Boiler plugged - sec. superheat; returned 12/25/22
Kyger Creek 4	Pump drain valve and tube repair; returned 12/25/22

On 12/24/22 at 06:00, PJM began curtailing the OVEC tagged imports into LGE/KU; the curtailments ended by 13:00. OVEC is within the PJM BA area and PJM inappropriately curtailed OVEC exports to LKE when they curtailed all exports under their emergency procedures. LKE contacted PJM and corrected their action to restore the schedule.

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Question No. 37

Responding Witness: Lonnie E. Bellar

Q-37. Refer to LG&E/KU's 2022-00402 Response to Attorney General's First Request, Item 13, Attachment 1. Provide a detailed timeline of the energy received from Tennessee Valley Authority (TVA) as part of the Contingency Sharing Group Agreement during the period of December 22, 2022, through December 25, 2022. Include in the response the associated MW of each delivery.

A-37. See the attachment to the response to Question No. 36.

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Question No. 38

Responding Witness: Lonnie E. Bellar / Charles R. Schram

Q-38. Provide all correspondence between LG&E/KU and TVA for the period between December 20, 2022, and December 26, 2022.

A-38. See attachments being provided in separate files. The LG&E/KU LSE had additional communications with TVA through its Contingency Reserve Sharing Portal and the TVA Outage Portal, but only the events in the Contingency Reserve Sharing Portal are archived and are being attached as a separate file.

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Question No. 39

Responding Witness: Lonnie E. Bellar / Charles R. Schram

Q-39. Provide copies of all agreements between LG&E/KU and TVA related to the Contingency Reserve Sharing Group.

A-39. The Contingency Reserve Sharing Group Agreement was provided in response to PSC PH-14 in Case No. 2022-00402, which has been incorporated into the record of this proceeding. Also see the response to Question No. 40 for the annual update of the Operating Protocols section of the agreement.

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Question No. 40

Responding Witness: Lonnie E. Bellar / Charles R. Schram

Q-40. State how often the Contingency Reserve Sharing Group agreement is updated or amended. Include as part of the response all current documentation related to the Contingency Reserve Sharing Group.

A-40. The contingency reserve calculation specified in the Contingency Reserve Sharing Group agreement's Operating Protocols is updated annually to reflect the updated load ratio share of each participant. See the Revision History on pages 5-6 and the updated calculation on page 21 of the attachment being provided in a separate file.

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Question No. 41

Responding Witness: Lonnie E. Bellar / Charles R. Schram

Q-41. State whether the agreement between LG&E/KU and TVA related to the Contingency Reserve Sharing Group was amended after the events of Winter Storm Elliott. If yes, provide all documents that were in effect at the time of Winter Storm Elliott and the current version of the agreement. Include as part of the answer a red-lined copy detailing all differences between the original agreements and the current agreements.

A-41. The Contingency Reserve Sharing Group functioned consistent with the agreement's provisions during Winter Storm Elliott, and hence there was no need for amendments. The only updates were related to the annual update of the Operating Protocols' contingency reserves noted in the response to Question No. 40. The Contingency Reserve Sharing Group is intended to temporarily assist participants in recovering their Area Control Error ("ACE") in accordance with NERC Reliability Standards (BAL-001, BAL-002, and BAL-003), typically in situations when a large generating unit trips offline unexpectedly. It is not intended to be a replacement source of power over longer periods of time when a participant experiences a capacity shortfall.

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Question No. 42

Responding Witness: Lonnie E. Bellar / Charles R. Schram

Q-42. Refer to LG&E/KU's 2022-00402 Response to Attorney General's First Request, Item 13, Attachment 1. Provide a detailed timeline of the energy received from PJM Interconnection, LLC during the period of December 22, 2022, through December 25, 2022. Include in the response the associated MW of the energy received.

A-42. See the "Purchases" worksheet in the attachment to the response to Question No. 36. No purchases from PJM occurred on either December 22, 2022 or December 25, 2022.

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Question No. 43

Responding Witness: Lonnie E. Bellar

Q-43. Refer to LG&E/KU's 2022-00402 Response to Attorney General's First Request, Item 13, Attachment 1. Provide a detailed list and corresponding maps of all customers in the LG&E/KU BA who were impacted by loadshedding during Winter Storm Elliott.

A-43. See attachments being provided in a separate files for a list and map for transmission level customers impacted by load shedding that are not represented in the distribution map and list. Certain information requested is confidential and proprietary and is being provided under seal pursuant to a petition for confidential protection.

See attachment PSC DR1 LGE KU Attach to Q43 - Att 3 Distribution Customers Impacted by Load shedding. For maps of distribution customers impacted by load shedding, see attachment to Question No. 52(c). Customers are served by the transformers in those maps, indicated by  (OH Transformer) and by  (UG Transformer).

Note that the Companies' outage management system captures the total customers impacted by an outage and reflects affected current customers as of the date the data is pulled. Thus, due to customer turnover since Winter Storm Elliott, the attached is not necessarily an exact depiction of affected customers.

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Question No. 44

Responding Witness: Lonnie E. Bellar

Q-44. Refer to LG&E/KU's 2022-00402 Response to Attorney General's First Request, Item 13, Attachment 1, page 4.

a. Provide a list identifying each of the units that experienced a forced outage or partial outage or derate during the ten days leading up to and during Winter Storm Elliott. Include in the response for each unit a detailed explanation of why the unit experienced a forced outage or derate, how long the unit experienced an outage or derate, and when the unit returned to normal operation.

b. Provide a list identifying each of the units that was not operating during the period leading up to and during Winter Storm Elliott due to a scheduled outage. Include in the response for each unit a detailed explanation of why the unit was scheduled to be out, how long the unit was scheduled to be out, when the unit was expected to return to normal operation, and when the unit returned to normal operation.

A-44.

a. See attachment being provided in a separate file. The file includes all dates requested, event listing by unit.

b. Dix Unit 1 (11 MW net) was on a planned outage extension until January 16, 2023. Its planned outage that began on November 14, 2022, was extended because the unit could not be commissioned to return to operation due to low lake levels.

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Question No. 45

Responding Witness: Lonnie E. Bellar

Q-45. Refer to LG&E/KU's 2022-00402 Response to Attorney General's First Request, Item 13, Attachment 1. State whether LG&E/KU's load curtailment ended prior to the resolution of Texas Gas Supply's pressure issues. If so, state the amount and type of resources, including both generation and outside purchases, that LG&E/KU relied on to end the curtailment.

A-45. LG&E/KU's load curtailment ended at 22:11 on December 23, 2022 as noted on page 6 of the referenced attachment. Load curtailment was no longer required due to falling load levels in the late evening hours.

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Question No. 46

Responding Witness: Charles R. Schram

Q-46. Refer to the NERC/FERC October 2023 Report, page 123. Explain whether and how LG&E/KU took into account resistive heating in their short-term load forecasts for December 22, 2022, through December 24, 2022.

A-46. Short-term load forecasts are performed at the system level and therefore inherently include the impacts of resistance heating. The short-term forecasting models consider the historical impacts of resistance heating on load during cold weather events.

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Question No. 47

Responding Witness: Charles R. Schram

Q-47. Explain whether LG&E/KU has regularly relied on external non-firm energy purchases to serve its load in the last ten years. Include in the response the dates of such purchases in the winter in the last ten years and the extent to which LG&E/KU relied on such purchases on each such date.

A-47. With the exception of Winter Storm Elliott, LG&E/KU has not regularly relied on external non-firm energy purchases to serve its load during the last ten years. The only other purchase of non-firm energy during the last ten years for reliability purposes was on the morning of January 7, 2014, to maintain required contingency reserves after TVA withdrew their reserves from the reserve sharing group. Additional non-firm purchases for three hours during the loss of the Mill Creek station on July 15, 2021, during a diver fatality were made out of an abundance of caution during a hot summer day, but were ultimately not required to meet customers' energy needs or contingency reserves. Excluding any non-discretionary energy purchases associated with serving load affected by load transfers between LG&E/KU and other utilities, all other purchases in the last ten years were for economic reasons when purchased energy was cheaper than energy from the Companies' generating units.

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Question No. 48

Responding Witness: Lonnie E. Bellar / Charles R. Schram

Q-48. Refer to LG&E/KU's Current Tariff, P.S.C. Electric No. 13, Original Sheet No. 50.

a. Provide how many customers voluntarily curtailed service pursuant to Curtailable Service Rider-1 on December 22, 2022, through December 25, 2022, identify the maximum demand savings from the Curtailable Service Rider-1 during that period in MW and when that maximum demand savings occurred, and identify the demand savings from the Curtailable Service Rider-1 during the period in which LG&E/KU were shedding load in as much detail as possible (e.g., the savings in each instance, minute, or hour to the lowest increment possible).

b. Provide the number of customers, if any, that failed to curtail their load when requested under Curtailable Service Rider-1 from December 22, 2022, through December 25, 2022, and which dates this occurred.

c. State the organizational titles of all personnel and departments that are responsible for making the decision to contact customers under the Curtailable Service Rider-1 for curtailment of service.

d. State the organizational titles of all personnel and departments that are responsible for communications with the customers participating in Curtailable Service Rider-1.

e. State the organizational titles of all personnel and departments that are responsible for communications with the customers participating in Curtailable Service Rider-1

A-48.

a. Both customers on Curtailable Service Rider-1 ("CSR-1") voluntarily curtailed during the relevant period. They physically curtailed their load on December 23, 2022 (including during the load shedding event), for a total kVA reduction of 1,546 kVA, and a total of 1,646 kVA on December 24,

2022. The Companies calculated each of these values by summing the customers' demand one hour prior to the start of the December 23, 2022, physical curtailment and then subtracting the sum of the customers' highest demand during each curtailment period. Note, both CSR-1 customers are Option A customers, meaning that each has a minimum firm demand to or below which it must curtail its load during a physical curtailment request.

b. There was no physical curtailment on December 22 or December 25, 2022, so no customers were out of compliance on those dates. On December 23 and 24, 2022, both CSR-1 customers were in compliance with their contracted physical curtailments.

c. LG&E/KU Generation Dispatch is responsible for making the decision to call for physical curtailment under the CSR-1 rider. This decision can be made by the positions of Supervisor Generation Dispatch, Manager Generation Dispatch and Trading, or Director Power Supply.

d. Notification to CSR-1 customers of upcoming physical curtailment is made by Generation Dispatch personnel at the request of the Supervisor Generation Dispatch, the Manager Generation Dispatch and Trading, or the Director Power Supply.

e. See the response to part (d).

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Question No. 49

Responding Witness: Lonnie E. Bellar / Charles R. Schram

Q-49. Refer to LG&E/KU's Current Tariff, P.S.C. Electric No. 13, Original Sheet No. 51.

a. Provide how many customers voluntarily curtailed service pursuant to Curtailable Service Rider-2 on December 22, 2022, through December 24, 2022, identify the maximum demand savings from the Curtailable Service Rider-2 during that period in MW and when that maximum demand savings occurred, and identify the demand savings from the Curtailable Service Rider-2 during the period in which LG&E/KU were shedding load in as much detail as possible (e.g., the savings in each instance, minute, or hour to the lowest increment possible).

b. Provide the number of customers, if any, that failed to curtail their load when requested under Curtailable Service Rider-2 and which dates this occurred.

c. State the organizational titles of all personnel and departments that are responsible for making the decision to contact customers under the Curtailable Service Rider-2 for curtailment of service.

d. State which departments and individuals are responsible for communications with the customers participating in Curtailable Service Rider-2.

e. Provide all internal procedures outlining the process for determining a curtailment is needed and how customers are notified of this decision.

A-49.

a. All eight customers on Curtailable Service Rider-2 ("CSR-2") voluntarily curtailed during the relevant period. They physically curtailed their load on December 23, 2022, (including during the load shedding event), for a total kVA reduction of 151,683.7 kVA, and a total of 153,066 kVA on December 24, 2022. The Companies calculated each of these values by summing the

customers' demand one hour prior to the start of the December 23, 2022 physical curtailment and then subtracting the sum of the customers' highest demand during each curtailment period. Note, all eight CSR-2 customers are Option A customers, meaning that each has a minimum firm demand to or below which it must curtail its load during a physical curtailment request.

b. There was no physical curtailment on December 22 or December 25, 2022, so no customers were out of compliance on those dates. On December 23, 2022, three CSR-2 customers were out of compliance on their contracted physical curtailment. On December 24, 2022, two CSR-2 customers were out of compliance on their contracted physical curtailment.

c. LG&E/KU Generation Dispatch is responsible for making the decision to call for physical curtailment under the CSR-2 rider. This decision can be made by the positions of Supervisor Generation Dispatch, Manager Generation Dispatch and Trading, or Director Power Supply.

d. Notification to CSR-2 customers of upcoming physical curtailment is made by Generation Dispatch personnel at the request of the Supervisor Generation Dispatch, the Manager Generation Dispatch and Trading, or the Director Power Supply.

e. No written internal procedures exist for determining when a physical curtailment under CSR-2 is needed. CSR-2 physical curtailment is considered to be a dispatchable supply-side option to meet load and reserve requirements that is available after all other available generating resources are committed. Calling a physical curtailment must also be consistent with all requirements contained in the CSR-2 tariff. Notification of physical curtailment under CSR-2 is made by phone.

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Question No. 50

Responding Witness: Lonnie E. Bellar

Q-50. Refer to LG&E/KU's Current Tariff P.S.C. No. 20, Original Sheet No. 107.

a. State whether any of the following were subject to involuntary curtailment between December 22, 2022, and December 25, 2022, and if so, include in the name, location, and type of each impacted entity or person.

(1) Hospitals and Treatment Facilities;

(2) Life Support Equipment;

(3) Police Stations and Government Detention Institutions;

(4) Fire Stations;

(5) Communication Services;

(6) Water and Sewage Services;

(7) Transportation Services;

(8) Defense-related Services; and

(9) Schools.

b. For each person or entity identified as being curtailed in response to part a of this question, provide a listing of all communications between LG&E/KU concerning the involuntary curtailments, provide the type of each communication, and identify the date and time of each communication.

A-50.

a. See attachment being provided in a separate file. Note that the Companies' outage management system captures the total customers impacted by an outage and reflects affected current customers as of the date

the data is pulled. Thus, due to customer turnover since Winter Storm Elliott, the attached is not necessarily an exact depiction of affected customers.

b. See the response to Question No. 63.

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Question No. 51

Responding Witness: Lonnie E. Bellar / Robert M. Conroy

Q-51. Refer to LG&E/KU's Current Tariff P.S.C. No. 20, Original Sheet No. 107. Explain what steps were taking to preserve system integrity and to prevent the collapse of LG&E/KU's electric system or interconnected electric network or to restore service following an outage.

A-51. The Companies first note that Original Sheet Nos. 107, 107.1, 107.2, and 107.3 in both Companies' tariffs describe the purpose and procedures the Companies follow to reduce "the consumption of electric energy . . . in the event of a capacity shortage." (Original Sheet 107). They establish the right of the Companies to "take whatever steps, with or without notice and without liability on the Company's part, that Company believes necessary, in whatever order consistent with good utility practices and not on an unduly discriminatory basis, to preserve system integrity and to prevent the collapse of the Company's electric system or interconnected electric network or to restore service following an outage." (Original Sheet 107). They also provide that "any Customer may be affected by rotating or unplanned outages and should install emergency generation equipment if continuity of service is essential." (Original Sheet 107.1). Finally, as to curtailment procedures, they identify "steps [that] *may* be taken, individually or in combination, in the order necessary *as time permits*." (Original Sheet 107.2)(emphasis added).

Having noted the above, LG&E/KU, in accordance with the Capacity and Energy Emergency Operating Plan, took into consideration the following actions before shedding load:

- Commit all generation resources available
- Maximize generation output
- Use interruptible load (contractually interruptible)
- Curtail all non-firm wholesale energy sales
- Request the RC to declare Energy Emergency Alerts
- Attempt to reduce load through public appeals
- Purchase all available firm and non-firm energy regardless of cost

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Question No. 52

Responding Witness: Lonnie E. Bellar

Q-52. Refer to LG&E/KU's Current Tariff, P.S.C. No. 20, Original Sheet No. 107.1.

a. Provide a list of residents affected by involuntary load curtailment on December 22, 2022, through December 25, 2022.

b. Provide a list of the companies designated as critical commercial and industrial uses affected by involuntary load curtailment on December 22, 2022, through December 25, 2022.

c. Provide a list and map of all circuits impacted by involuntary load curtailment on December 22, 2022, through December 25, 2022.

A-52.

a. See attachment being provided in a separate file. Note that the Companies' outage management system captures the total customers impacted by an outage and reflects affected current customers as of the date the data is pulled. Thus, due to customer turnover since Winter Storm Elliott, the attached is not necessarily an exact depiction of affected customers.

b. LG&E/ KU does not classify commercial and industrial customers as "critical" outside of the groupings listed by the PSC in Question No. 50. LG&E/KU classifies key commercial account and industrial account customers. See attachment being provided in a separate file for key account customers impacted by load shed

c. See attachments being provided in separate files. The information requested is confidential and proprietary and is being provided under seal pursuant to a petition for confidential protection.

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Question No. 53

Responding Witness: Lonnie E. Bellar

Q-53. Refer to LG&E/KU's Current Tariff, P.S.C. No. 20, Original Sheet No. 107.2. State whether the LG&E/KU's load exceeded internal generation, transmission, or distribution capacity between December 22, 2022, and December 25, 2022.

A-53. Yes.

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Question No. 54

Responding Witness: Lonnie E. Bellar / Charles R. Schram

Q-54. Refer to LG&E/KU's Current Tariff, P.S.C. No. 20, Original Sheet No. 107.2. Explain what internal efforts were made to secure emergency energy purchases relating to Winter Storm Elliot before or between December 22, 2022, and December 25, 2022.

A-54. See the response to SC 1-19(b) in Case No. 2022-00402 for the timing and volume of the successful energy purchases and the response to PSC 1-58(b)(1). In addition, when non-firm power from PJM was curtailed due to RTO conditions, the Companies' energy trading personnel unsuccessfully attempted to buy power from other counterparties through phone contacts and through bids entered in the SEEM system on December 23, 2023.

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Question No. 55

Responding Witness: Lonnie E. Bellar / Charles R. Schram

Q-55. Refer to LG&E/KU's Current Tariff, P.S.C. No. 20, Original Sheet No. 107.2. State which positions and departments are responsible for securing emergency energy purchases within LG&E/KU.

A-55. For the LG&E/KU LSE, the Companies' energy trading personnel, including the Supervisor of Trading, are responsible for securing energy purchases, including emergency energy purchases. Trading is part of Generation Dispatch and Trading within Power Supply.

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Question No. 56

Responding Witness: Lonnie E. Bellar / Robert M. Conroy

Q-56. Refer to LG&E/KU's Current Tariff, P.S.C. No. 20, Original Sheet No. 107.2. Provide the number of customers who had their own internal generation capacity between December 22, 2022, and December 25, 2022, and explain whether any of these customers were curtailed at any point during that time.

A-56. As to curtailment procedures, Original Sheet 107.2 identifies "steps [that] *may* be taken, individually or in combination, in the order necessary *as time permits*." (Original Sheet 107.2)(emphasis added). One of those steps that may be taken if time permits is to curtail customers having their own generation capacity.

On circuits impacted by curtailment, the Company is aware of 136 customers with distributed generation, of which only 21 have energy storage or backup generation capability. Note that the Company is not made aware of all customer generation capacity, specifically small gas or diesel backup generation capacity.

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Question No. 57

Responding Witness: Lonnie E. Bellar

Q-57. Refer to LG&E/KU's Current Tariff, P.S.C. No. 20, Original Sheet No. 107.2. State whether power output was maximized at LG&E/KU's generating units on December 23, 2022. If not, explain why.

A-57. Power output at LG&E/KU's generating units was maximized, net of outages and derates, to meet load on December 23, 2022.

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Question No. 58

Responding Witness: Lonnie E. Bellar

Q-58. Refer to LG&E/KU's Current Tariff, P.S.C. No. 20, Original Sheet No. 107.2. State whether power output was maximized at LG&E/KU's generating units on any other date between December 22, 2022, and December 25, 2022, or in preparation for the storm that would become Winter Storm Elliott. If not, explain why.

A-58. Power output at LG&E/KU's generating units was maximized, net of outages and derates, when required to meet load between December 22, 2022, and December 25, 2022.

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Question No. 59

Responding Witness: Lonnie E. Bellar / Robert M. Conroy

Q-59. Refer to LG&E/KU's Current Tariff, P.S.C. No. 20, Original Sheet No. 107.2. State whether LG&E/KU's use of generating units was reduced to a minimum on December 23, 2022.

A-59. P.S.C. No. 20, Original Sheet No. 107.2 identifies "steps [that] may be taken, individually or in combination, in the order necessary as time permits." One of those steps that may be taken if time permits is for the Companies to reduce the use of energy at their generating stations to a minimum. This was not exercised on December 23, 2022, and would have been de minimis if it were. Also, because the load shedding on December 23, 2022, occurred during evening hours of a holiday period, the Companies' use of energy in other facilities would already have been at lower than normal business day levels.

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Question No. 60

Responding Witness: Lonnie E. Bellar / Robert M. Conroy

Q-60. Refer to LG&E/KU's Current Tariff, P.S.C. No. 20, Original Sheet No. 107.2. State whether LG&E/KU's use of generating units was reduced to a minimum on any other date between December 22, 2022, and December 25, 2022.

A-60. P.S.C. No. 20, Original Sheet No. 107.2 identifies "steps [that] may be taken, individually or in combination, in the order necessary as time permits." One of those steps that may be taken if time permits is for the Companies to reduce the use of energy at their generating stations to a minimum. This was not exercised on December 22 and 25, 2022, and would have been de minimis if it were. Also, because December 25, 2022, was a holiday, the Companies' use of energy in other facilities would already have been at lower than normal business day levels.

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Question No. 61

Responding Witness: Lonnie E. Bellar / Robert M. Conroy

Q-61. Refer to LG&E/KU's Current Tariff, P.S.C. No. 20, Original Sheet No. 107.3. State whether LG&E/KU advised the Public Service Commission that they would begin involuntary curtailments on December 23, 2022.

A-61. As to curtailment procedures, Original Sheet 107.2 identifies "steps [that] *may* be taken, individually or in combination, in the order necessary *as time permits*." (Original Sheet 107.2)(emphasis added). One of those steps that may be taken if time permits is to advise the Commission "of the situation." (Original Sheet 107.3). The Companies advised the Commission via a Company representative supporting Kentucky Emergency Management of the involuntary curtailments shortly after they began on December 23, 2022. Additionally, on the morning of December 24, 2022, Mr. Bellar advised the Commission's Chairman of the situation in a phone conference.

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Question No. 62

Responding Witness: Lonnie E. Bellar

Q-62. Refer to LG&E/KU's Current Tariff, P.S.C. No. 20, Original Sheet No. 107.3. Provide any communications LG&E/KU made through news media to appeal for the voluntary curtailment of load between December 22, 2022, and December 25, 2022.

A-62. See attachments being provided in separate files and the response to Question No. 11. Attachment 1 is the LG&E and KU press release issued on Dec. 23, 2022.

Attachment 2 is the December 2022 media report, according to LexisNexis.

- LG&E and KU handled media requests that resulted in 249 stories in December 2022 specifically on the power outages from Winter Storm Elliott. The estimated reach of these stories (potential readers, listeners and viewers) was 109 million people (stories ran on outlets such as Yahoo News, which has national and global views).

- The media outlet that covered the greatest number of stories on the power outages and restoration effort was WDRB-TV, which ran 49 stories combined on air and online in response to the Winter Storm Elliot outages.

- LG&E and KU handled media requests from all major media outlets in Lexington and Louisville, as well as others from around our service territory.

- The leading media message in December 2022 was that LG&E and KU 'educates customers on saving energy'.
  - Reporting on severe weather just before Christmas dominated this message, with LG&E and KU implementing some brief service interruptions.
  - The message was accompanied by spokesperson explanations of why such measures were needed and advice on ways to reduce energy consumption.

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Question No. 63

Responding Witness: Lonnie E. Bellar

Q-63. Refer to LG&E/KU's Current Tariff, P.S.C. No. 20, Original Sheet No. 107.3. Provide any communications that occurred between LG&E/KU to its customers to appeal for the voluntary curtailment of load between December 22, 2022, and December 25, 2022.

A-63. See attachments being provided in separate files for images from the utilities website, outage map and social channels.

Dec. 23, 2022:

- 8:55 PM – Items posted to website included: **press release**, warning (red) card on home page with link to press release, warning (red) alert bar on the outages overlay and main menu (hamburger menu) overlay, with links to press release.

    - Home page card:
      LG&E and KU performing service interruptions; need customers' help
      Extreme cold and pressures on the regional grid are resulting in scattered power outages. We need your help in reducing energy consumption.
      Read more <link to press release>

    - Alert bar:
      Extreme cold and pressures on the regional grid are resulting in scattered power outages. We need your help in reducing energy consumption.
      Learn more <link to press release>

Dec. 24, 2022

- 8:58 AM – Updated warning card message and photo posted. Alert bar on outage and main menu overlays updated.

- Home page card title:
  Winter weather update
  We appreciate our customers' ongoing support. Customers' energy conservation efforts remain important.
  Get cold weather tips <link to energy efficiency tips page>

Dec. 25, 2022 - Jan. 6, 2023

- Home page card: Winter weather update card changed from warning (red) card to a blue (info) card still linking to energy efficiency tips page. Alert bars on overlay menus removed.
  - Home page card removed on or around Jan. 6, 2023.

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Question No. 64

Responding Witness: Lonnie E. Bellar

Q-64. Refer to LG&E/KU's Current Tariff, P.S.C. No. 20, Original Sheet No. 107.3. State whether customers were advised through the use of news media and personal contact that load interruption is imminent and explain how communication occurred.

A-64. LG&E and KU used a host of communications channels requesting customers reduce their energy consumption and notify them about the brief service interruptions. See the responses to Question Nos. 11, 62 and 63.

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Question No. 65

Responding Witness: Lonnie E. Bellar

Q-65. Refer to LG&E/KU's Current Tariff, P.S.C. No. 20, Original Sheet No. 107.3. State which department and positions are responsible for communications with the news media.

A-65. The LG&E and KU Communications and Corporate Responsibility department is responsible for communications with the news media. Specifically the following positions:

- Vice President-Communications and Corporate Responsibility
- Director, Media Relations
- Media Relations Manager

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Question No. 66

Responding Witness: Lonnie E. Bellar

Q-66. Refer to LG&E/KU's Current Tariff, P.S.C. No. 20, Original Sheet No. 107.3. Explain the procedures for determining the interruption of selected distribution circuits, including the order of circuits affected by involuntary load curtailment, and provide any documentation relating to these procedures.

A-66. The EOP-011-1 LG&E/KU Capacity and Energy Emergency Operating Plan describes the procedure and practices the LG&E/KU BA and TOP use during a load shed event. The version of this procedure in effect during Winter Storm Elliott is attached in response to Question No. 24. See attachment being provided in a separate file.

As part of the NERC EOP-011 Standard requirement R1, a tool was developed to allow for manual load shed. In 2022, the tool was reviewed in coordination with Gas Operations, Distribution Operations, and Transmission Operations groups within LG&E/KU.

This tool incorporates a predetermined list which identifies and prioritizes circuits for the purpose of load shed during a Capacity Energy Emergency. At a high level, the prioritized list was established as follows:

1. Transmission identified a list of radial circuits (including distribution transformers with high side breakers) with telemetered indication and control (excluding UFLS circuits)
2. Distribution reviewed the list and applied a criticality score to each radial transmission circuit based on the scoring criteria (see the table in the Transmission Load Shedding Standard document for more info on how criticality scores were determined)
    - Since multiple distribution circuits are fed from each radial transmission circuit, the criticality score for each transmission circuit was determined based on the sum total of criticality scores for each distribution circuit fed by that transmission circuit.

3. Based on the criticality scores provided by Distribution, Transmission then grouped the radial transmission circuits into blocks of approximately 50 MW

The objective of the list was to pre-define groups for potential load shedding, allowing operators to alternate or rotate outages more efficiently, thus distributing the impact of an emergency situation among customers (rotating outages).

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Question No. 67

Responding Witness: Lonnie E. Bellar

Q-67. Refer to LG&E/KU's Current Tariff, P.S.C. No. 20, Original Sheet No. 107.3. Provide a list of all positions in either LG&E/KU or the BA responsible for this determination of which areas are affected by involuntary load curtailment.

A-67. The positions responsible for determining which circuits are included in the load shed tool are:

- Group Leader Electric System Coordination Engineering
- Manager System Control Center
- Group Leader DCC Engineering
- Manager Distribution System Operations

The real-time decision to shed load using the load shed tool is at the discretion of the Electric System Coordinator on duty, in accordance with the Authority Letter supporting the NERC Reliability Standard TOP-005-1 R1.

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Question No. 68

Responding Witness: Lonnie E. Bellar

Q-68. Refer to LG&E/KU's Current Tariff, P.S.C. No. 20, Original Sheet No. 107.3. State whether, prior to Winter Storm Elliott, LG&E/KU had a predetermined list for which areas would be subjected to the opening of circuits and involuntary load curtailment and, if so, explain how this list was created.

A-68. Yes prior to Winter Storm Elliott, LG&E/KU had a predetermined list for which customers would be interrupted in case of a Capacity Energy Emergency. See the response to Question No. 66.

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Question No. 69

Responding Witness: Lonnie E. Bellar

Q-69. Refer to LG&E/KU's 2022-00402 Response to Attorney General's First Request, Item 13, Attachment 1, page 2, stating, "[t]he LG&E and KU Balancing Authority ("BA") had to shed load on 12/23 from 17:58 through 22:11 by as much as 317 MW."

a. Provide a list of circuits opened before or between December 22, 2022, and December 25, 2022, in preparation for or during Winter Storm Elliott.

b. Provide a list of all circuits that were curtailed between December 22, 2022, and December 25, 2022, and how long each circuit was offline.

c. Describe how LG&E/KU assessed the demand on each circuit when determining its involuntary load curtailment.

d. Provide a list stating in which LSE each opened circuit was located.

A-69.

a. No circuits were opened in preparation for or during Winter Storm Elliott other than the circuits opened for load shed purposes due to the Capacity Emergency.

b. See attachment being provided in a separate file. For load shedding purposes, the attachment shows the transmission circuits that were used during the load shed event on 2/23/2022, start time, end time, duration in minutes, and the number of customers impacted. The load shed event lasted from 5:59 pm to 10:11 pm and the average length of outage per customer was estimated to be 59 minutes. The varying restoration times were due to a number of factors including: the need to follow changes in Area Control Error (ACE), considerations for varying load amounts on individual circuits being restored, accounting for cold load pickup, and equipment issues that delayed or prevented restoration.

c. Real Time telemetry via the Energy Management System (EMS) was used to assess the demand on each circuit.

d. The LG&E/KU LSE was the only LSE impacted. The other three LSEs within the BAA did not experience a capacity issue and did not require load shed.

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Question No. 70

Responding Witness: Lonnie E. Bellar

Q-70. Provide how many traffic lights were impacted by LG&E/KU's involuntary energy curtailment and opening of circuits on December 23, 2022. Include in the answer a list of each traffic light location.

A-70. At least 122 traffic light locations were impacted by load shed on December 23, 2022. This does not include any unmetered traffic lights or any traffic lights included on other services under general service rate categories. See attachment being provided in a separate file.

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Question No. 71

Responding Witness: Lonnie E. Bellar

Q-71. Provide how many traffic lights were impacted by LG&E/KU's involuntary energy curtailment and opening of circuits on any other days between December 22, 2022, and December 25, 2022.

A-71. There was no energy curtailment between December 22, 2022, and December 25, 2022 other than on December 23, 2022. See the response to Question No. 70.

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Question No. 72

Responding Witness: Lonnie E. Bellar

Q-72. Explain what alternatives, if any, that LG&E/KU considered prior to ordering load shed of approximately 317 MW on December 23, 2022.

A-72. In accordance with the Capacity and Energy Emergency Operating Plan, LG&E/KU took into consideration the following actions before shedding load:

- Commit all generation resources available
- Maximize generation output
- Use interruptible load (contractually interruptible)
- Curtail all non-firm wholesale energy sales
- Request the RC to declare Energy Emergency Alerts
- Attempt to reduce load through public appeals
- Purchase all available firm and non-firm energy regardless of cost

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Question No. 73

Responding Witness: Lonnie E. Bellar

Q-73. Explain what risks LG&E/KU would have faced had it not ordered load shedding on December 23, 2022

A-73. LG&E/KU as the BA is obligated to take or direct such actions as are necessary to maintain load-resource balancing within the LG&E/KU BAA in accordance with the NERC Reliability Standards. If the LG&E/KU BA had refrained from shedding load, LG&E/KU BAA would have become a burden on the Interconnection, potentially contributing to adverse reliability conditions on the Bulk Electric System, including uncontrolled or unstudied conditions and cascading outages. To prevent such scenarios and uphold the reliability and system integrity of the grid, LG&E/KU BA was obligated to shed load to ensure it did not impose undue stress on the Eastern Interconnection. This proactive approach is essential for maintaining the stability and integrity of the overall electrical system.

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Question No. 74

Responding Witness: Lonnie E. Bellar

Q-74. Refer to the Commission's June 30, 2021, Order in Case No. 2020-00349.[5] Identify which open circuits, if any, included customers equipped with advanced metering infrastructure (AMI). Include in the answer the number of customers equipped with AMI in each open circuit.

A-74. See attachment being provided in a separate file.

[5] Case No. 2020-00349, *Electronic Application of Kentucky Utilities Company for an Adjustment of Its Electric Rates, a Certificate of Public Convenience and Necessity to Deploy Advanced Metering Infrastructure, Approval of Certain Regulatory and Accounting Treatments, and Establishment of a One-Year Surcredit* (Ky. PSC June 30, 2020) at 13.

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Question No. 75

Responding Witness: Lonnie E. Bellar

Q-75. Refer to the Commission's June 30, 2021, Order in Case No. 2020-00349. State whether LG&E/KU believe more widespread adoption of AMI would have reduced the required voltage headroom and prevented the need to open circuits.

A-75. AMI-enabled volt-var optimization (VVO) and conservation voltage reduction (CVR) functionality could have been used to reduce **electric** load**.** However, the magnitude of load curtailment required could not have been achieved by CVR. AMI would not have **prevented** load shed.

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Question No. 76

Responding Witness: Lonnie E. Bellar

Q-76. State whether LG&E/KU, or any of its representatives, sought permission to operate below the NERC reserve margin guidelines. Include in the answer any correspondence between LG&E/KU and NERC/FERC.

A-76. LG&E/KU did not seek permission to operate below the NERC reserve margin guidelines. NERC guidelines are not enforceable standards approved by FERC in accordance with section 215 of the Federal Power Act. There is no process available or requirement under the NERC Rules of Procedure to seek permission to deviate from the guidelines issued by NERC.

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Question No. 77

Responding Witness: Lonnie E. Bellar

Q-77. Provide a copy of all customer complaints received in connection with Winter Storm Elliott.

A-77. See attachment being provided in a separate file.

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Question No. 78

Responding Witness: Lonnie E. Bellar

Q-78. State whether any customer has filed any legal action against LG&E or KU as a result of the events of Winter Storm Elliott. If yes, provide the basis of the claim, the docket number and relevant court information.

A-78. To date, LG&E and KU are not aware of any legal action filed against the Companies as a result of the events of Winter Storm Elliott.

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Question No. 79

Responding Witness: Lonnie E. Bellar

Q-79. State whether LG&E/KU or their BA had any correspondence with other balancing authorities in the week leading up to, and during, Winter Storm Elliott. If yes, provide the name of the of BA and all correspondence between the entities.

A-79. See attachment being provided in a separate file. The LG&E/KU BA had correspondence with other BAs leading up to and during Winter Storm Elliott through RCIS notifications made by the TVA RC on behalf of the LG&E/KU BA. The date and times of these notifications are listed below.

- 12/20/2022 – 09:50
  - Cold Weather Alert
- 12/23/2022 – 06:10
  - Generation Alert
- 12/23/2022 – 13:36
  - EEA 3
- 12/23/2022 – 14:52
  - EEA 2
- 12/23/2022 – 16:45
  - EEA 3
- 12/24/2022 – 00:53
  - EEA 2
- 12/24/2022 – 01:55
  - EEA 3
- 12/24/2022 – 12:22
  - EEA 2
- 12/24/2022 – 14:06
  - EEA 0

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Question No. 80

Responding Witness: Lonnie E. Bellar / Charles R. Schram

Q-80. State whether LG&E/KU or their BA had any correspondence with other utilities in the week leading up to, and during, Winter Storm Elliott. If yes, provide the name of the utilities and all correspondence between the entities.

A-80. The Companies assume the scope of this request is limited to communications concerning the approach of Winter Storm Elliott and the storm itself (as opposed to any communications for unrelated reasons during the week prior to Winter Storm Elliott).

The LG&E/KU BA corresponded with each LSE within the LG&E/KU BA Area (LG&E/KU LSE, OMU, KMPA, and KYMEA) via email. The LG&E/KU BA also corresponded with the TVA RC leading up to and during Winter Storm Elliott and the TVA RC made notifications to other utilities on behalf of the LG&E/KU BA through the RCIS.

See attachment being provided in a separate file for correspondence with LSEs. Also, see the response to Question No. 79 for RCIS notifications.

Other than energy trading communications with entities that may have included utilities in efforts to buy power during Winter Storm Elliott being attached as a separate file, the LG&E/KU LSE's Power Supply group did not correspond with other utilities during this period.

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Question No. 81

Responding Witness: Lonnie E. Bellar

Q-81. Provide a circuit-by-circuit list of all substations that were damaged or otherwise failed to properly operate during Winter Storm Elliott. Include as part of the answer how long it took to repair the substations.

A-81. Paynes Mill Substation Transformer 1 differential relay operated on overload at 14:14 EST dropping circuits 0517, 0518, 0519 and 0520. Relay settings were adjusted and substation was restored at 1537 EST.

Brown Plant 728 to West Cliff 712 138kV Line and West Cliff T02 138/69kV Trans. Breaker 117-728 at Brown Plant tripped and remained open due. Substation Employees were dispatched to troubleshoot and repair (TS&R). This breaker was out of service for 2 hours, 36 minutes.

Delvinta to Lake Reba Tap 161 kV Line and West Irvine 161/69kV Transformer. Breakers 139-804, 162-804, and 193-608 tripped due to heavy winds in the area (gusts up to 49mph). Breaker 139-804 at Lake Reba Tap failed to reclose during this event. Substation Employees were dispatched to TS&R. This breaker was out of service for 10 hours, 25 minutes.

The following breakers failed to remotely close after being remotely opened while implementing rotational load shed between 5:59 pm and 10:11 pm on December 23, 2022:

- Hardesty 113-608
    - Could not close remotely after breaker was opened. Personnel dispatched to the substation to TS&R. The breaker was closed in 1 hour, 34 minutes.
- Oak Hill 191-608
    - Could not close remotely after breaker was opened. Personnel dispatched to the substation to TS&R and the breaker was closed in 2 hours, 14 minutes.

- Farmers 175-608
    - Could not close remotely after breaker was opened. Personnel dispatched to the substation to TS&R and the breaker was closed in 1 hour, 10 minutes.
- Lexington Plant 028-608
    - Could not close remotely after breaker was opened. Personnel dispatched to the substation to TS&R and the breaker was closed in 2 hours, 33 minutes.
- Richmond 069-624
    - Could not close remotely after breaker was opened. Personnel dispatched to the substation to TS&R and the breaker was closed 1 hour, 47 minutes.
- Lyndon South LS-138KV TR3
    - Could not close remotely after breaker was opened. Personnel dispatched to the substation to TS&R. Some customers were able to be restored from an alternate feed in 35 minutes until the breaker was closed in 1 hour, 13 minutes.
- Corydon 012-614
    - Could not close remotely after breaker was opened. Personnel dispatched to the substation to TS&R and the breaker was closed in 2 hours, 1 minute.

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Response to Commission Staff's First Request for Information
Dated January 26, 2024

Case No. 2023-00422

Question No. 82

Responding Witness: Lonnie E. Bellar

Q-82. Provide a circuit-by-circuit list of all transformers that were damaged or otherwise failed to properly operate during Winter Storm Elliott. Include as part of the answer how long it took to repair the transformers.

A-82. During Winter Storm Elliot, there were no Substation transformers that were damaged or otherwise failed to properly operate.

See attachment being provided in a separate file for distribution lines transformers that were replaced during Winter Storm Elliot. Certain information requested is confidential and proprietary and is being provided under seal pursuant to a petition for confidential protection.

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Case No. 2023-00422

Question No. 83

Responding Witness: Lonnie E. Bellar

Q-83. Provide a circuit-by-circuit list of all poles that were damaged or otherwise failed to properly operate during Winter Storm Elliott. Include as part of the answer how long it took to repair the poles.

A-83. Transmission lines did not experience any pole failures during Winter Storm Elliott.

There was one Distribution pole that failed and was replaced during Winter Storm Elliott on circuit 0304 and power was restored to the 9 customers interrupted in 61 minutes.

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Response to Commission Staff's First Request for Information
Dated January 26, 2024

Case No. 2023-00422

Question No. 84

Responding Witness: Lonnie E. Bellar

Q-84. For each pole damaged during Winter Storm Elliott, provide the date of installation and the most recent inspection performed on the pole prior to its damage.

A-84. Transmission lines did not experience any pole failures during Winter Storm Elliott

The distribution pole on circuit 0304 that failed during Winter Storm Elliott was inspected as part of the required bi-annual PSC inspections in March of 2021 and has since been inspected again in March of 2023.

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Case No. 2023-00422

Question No. 85

Responding Witness: Lonnie E. Bellar

Q-85. Provide a copy of any internal assessment report conducted by LG&E/KU addressing the preparation, impact, and response to Winter Storm Elliott.

A-85. From Case No. 2022-00402, see the following documents: PSC PH-13, Attachments 1 & 2; AG 1-13, Attachments 1 & 2, Joint Intervenors 1-27, Attachment 2. Note that AG 1-13 Attachment 1 has been updated and is attached to the response to AG 1-2 in this proceeding.

See attachment being provided in a separate file for a copy of the Emergency Preparedness Response Team After Action Review regarding aspects of Winter Storm Elliott operational response.

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Response to Commission Staff's First Request for Information
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Case No. 2023-00422

Question No. 86

Responding Witness: Counsel / Lonnie E. Bellar

Q-86. Provide all correspondence (email, internal memos, meeting notes, etc.) related to LG&E/KU's assessment of their preparation, impact, and response to Winter Storm Elliott.

A-86. Subject to and without waiver of objections on the grounds of privilege and/or work product doctrine, the Companies state that this request requires review of voluminous electronically stored information (ESI) consisting of thousands of documents and communications, that such documents are being reviewed electronically for responsiveness and privilege; and that responsive, non-privileged documents will be produced on a rolling basis.

The Companies, through counsel, object to this request to the extent it calls for production of documents or communications that are protected by the attorney-client privilege and/or the work product doctrine. Specifically, documents otherwise responsive to this request include communications with counsel for the purpose of seeking and receiving legal advice and may reveal the mental impressions of counsel or others acting at counsel's direction, or were created in anticipation of litigation or regulatory proceedings.

The Companies will supplement this response with a status report on the production by Friday, February 23, 2024. At the time of final production, the Companies will also produce a privilege log identifying all documents withheld on the basis of privilege or work product protection. No production of documents responsive to this request is intended as a waiver of attorney-client or work product privilege.

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Case No. 2023-00422

Question No. 87

Responding Witness: Lonnie E. Bellar / Stuart A. Wilson

Q-87. Provide a copy of any risk assessment LG&E/KU conducted as a result of Winter Storm Elliott.

A-87. See the response to Question No. 85 for internal assessment reports created by the Companies regarding Winter Storm Elliott. Regarding risk mitigation activities the Companies have undertaken, the primary focus of the Companies related to Winter Storm Elliott and generation has been on gas pressure on the Texas Gas Transmission pipeline. See the response to Question No. 19. In addition, the Companies have installed software upgrades on the Trimble County CTs. See the response Question No. 21. The Companies are also working with Texas Gas Transmission on a broader study to evaluate fuel oil, compression, and storage. See the response to Question No. 20. Finally, the Companies' weather history will include Winter Storm Elliott and they are evaluating how to reflect low gas pressure risk in future resource adequacy studies.

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Case No. 2023-00422

Question No. 88

Responding Witness: Charles R. Schram / Stuart A. Wilson

Q-88. Explain what efforts LG&E/KU has undertaken to update their forecast planning to prepare for future winter risk events.

A-88. The LG&E/KU LSE has not made recent changes to their short-term load forecast process due to experiencing cold temperatures in December 2022 and January 2024. These are data points that go into the forecasting models. In 2022, LG&E/KU began using the Enverus eLoad model. Similar to the EPRI ANNSTLF model, Enverus is a learning model that uses historical load and regional weather patterns to produce KU and LG&E load forecasts. The short-term forecasting process is further described in https://www.oasis.oati.com/woa/docs/LGEE/LGEEdocs/04-01-23_Short_Term_Load_Forecast_-_final.pdf. As part of the forecasting models operation, the weather and load data from Winter Storm Elliott is now part of the historical data that serves as an input for future forecasts during similar conditions.

The Companies understand that the accuracy of any short-term load forecast is subject to the accuracy of the weather forecast, particularly the temperature inputs. Therefore, the Companies will continue their practice of having all available capacity prepared to operate to meet customers' energy demands when extreme temperatures are forecast.

See the response to Question No. 87 for actions related to long-term resource planning.

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Response to Commission Staff's First Request for Information
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Case No. 2023-00422

Question No. 89

Responding Witness: Lonnie E. Bellar / Charles R. Schram

Q-89. Refer to LG&E/KU's 2022-00402 Response to Attorney General's First Request, Item 13, Attachment 1.

a. Provide a summary and timeline of the events in the LG&E/KU's BA during Winter Storm Uri like that provided in Attachment 1 to LG&E/KU's 2022-00402 Response to Attorney General's First Request, Item 13, for Winter Storm Elliott in 2022.

b. Identify any changes, if any, LG&E/KU made in response to the events of Winter Storm Uri. As part of the answer, include any updated checklists or training procedures that were implemented.

c. State whether LG&E/KU, as an LSE or in their role as BA, made any changes to its weather forecast model in response to Winter Storm Uri, and if so, provide a detailed list of all changes made.

A-89.

a. The LG&E/KU BA did not experience capacity or energy emergency issues or any significant events during Winter Storm Uri and did not create a similar timeline.

b. In response to Winter Storm Uri and the NERC Alert issued in 2021 on Cold Weather Preparations for Extreme Weather Events, the LG&E/KU TOP function performed a Winter Assessment prior to the start of the winter season to evaluate potential impacts to the transmission system caused by extreme winter weather and develop any necessary plans to address potential issues.

c. The LG&E/KU BA does not forecast weather and did not make changes to its weather forecast sources in response to Winter Storm Uri.

The LG&E/KU LSE does not forecast weather and did not make changes to its weather forecast sources in response to Winter Storm Uri. The impact of the storm was significant in Texas, but minimal for the LG&E/KU LSE, where load peaked at only 5,592 MW on February 17, 2021. During Uri, temperatures in Louisville reached a low of 10° F on both 2/16/2021 and 2/17/2021.[6]

[6] NOAA data from Louisville SDF.