



LG&E/KU Capacity and Energy Emergency Operating Plan

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LG&E/KU Capacity and Energy Emergency Operating Plan

A Transmission Operations Document
Applicable to Balancing Authority (BA)

Supports Evidence for NERC Reliability Standards:

EOP-011-2	R2, R4
TOP-001-5	R2, R11
IRO-001-4	R2, R3

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LG&E/KU Capacity and Energy Emergency Operating Plan

Procedure Title

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Required Approval Signatures

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1 Purpose

The purpose of this document is to establish the Louisville Gas and Electric (“LG&E”) and Kentucky Utilities (“KU”) (collectively “LG&E/KU”) Balancing Authority (BA) Capacity and Energy Emergency Operating Plan to ensure that the LG&E/KU BA and the associated entities within its Balancing Authority Area are prepared for Capacity and Energy Emergencies.

2 Definitions

NERC defined terms are shown in italics

Balancing Authority

Balancing Authority Area

Bulk Electric System

Capacity Benefit Margin

Capacity Emergency

Conservative Operations – A LG&E/KU process that can be implemented to maintain the reliability of the Bulk Electric System in case of extreme weather, operational events, cyber events or other issues impacting the BES.

Distribution Control Center (DCC)

Demand

Direct Load Control (DLC) – A demand response program consisting of an electrical switch provided by and installed by the LG&E/KU LSE on a customer’s central air conditioning system, heat pump, electric water heater, and/or pool pump that periodically cycles the aforementioned equipment off for approximately 10-15 minutes

Disturbance

Electric System Coordinator (ESC) – The position within LG&E/KU that performs the Transmission Operator (TOP) and some Balancing Authority (BA) functions.

Emergency

Energy Emergency



Facility

Imbalance Event – An imbalance as defined in the Network Operating Agreement Attachment 1 located in Appendix 4 of this document.

Interruptible Load

Load

Load-Serving Entity (LSE)

Operating Instruction

Operating Plan

Operational Planning Analysis

Operating Reserve

Real-time

Remedial Action Scheme

Special Protection System

System

Transmission



3 Scope

The LG&E/KU BA has the responsibility for monitoring and coordinating system resource and Demand balance with Generator Operators and Load-Serving Entities (LSEs) within its Balancing Authority Area.

This Operating Plan outlines the LG&E/KU BA's plan for mitigating Capacity and Energy Emergencies.¹

Additionally, this Operating Plan describes an LSE's responsibility to respond to an Imbalance Event in such a manner that they meet obligations in accordance with Good Utility Practice and LG&E/KU's Network Operating Agreement (NOA).

4 LG&E/KU Electric System Coordinator Responsibility and Authority

This Operating Plan applies to the LG&E/KU BA. The LG&E/KU BA consists of NERC certified System Operators who are responsible for the Real-time reliable operations of the Bulk Electric System (BES). The BA has the authority and responsibility to activate the Operating Plan to address LSEs experiencing an Imbalance Event and to mitigate Capacity and Energy Emergencies.² They may execute the plan by implementing the steps within this Operating Plan, issuing Operating Instructions, and/or other actions as deemed necessary by the BA. The BA shall take or direct timely, appropriate, Real-time actions to alleviate Capacity and/or Energy Emergencies up to and including shedding of firm load.

Actions to mitigate an Emergency may be performed without obtaining approval from higher level management within LG&E/KU. If necessary, BAs have the authority to request additional staff to facilitate restoring the BES to normal conditions. The BA is expected to implement Real-time actions to ensure that the BES is operated in the most reliable manner possible while taking into consideration the safety of the general public and its customers.

Each Transmission Operator, Generator Operator, and Distribution Provider within the LG&E/KU BAA shall comply with each Operating Instruction issued by the Balancing Authority, unless such action cannot be physically implemented or it would violate safety, equipment, regulatory, or statutory requirements. The BA should be informed if the Transmission Operator, Generator Operator, or Distribution Provider is unable to comply with the Operating Instruction.

¹ EOP-011-2 R2

² EOP-011-2 R2.1



5 Reliability Coordinator

The Tennessee Valley Authority Reliability Coordinator (TVA RC) serves as LG&E/KU's Reliability Coordinator. The LG&E/KU BA shall comply with the RC's Operating Instructions. Unless compliance with the Operating Instructions cannot be physically implemented or unless such actions would violate safety, equipment, regulatory, or statutory requirements,³ Under these circumstances, the LG&E/KU BA shall immediately inform the RC of the inability to perform the Operating Instruction.⁴

5.1 Operating Plan Review

The LG&E/KU BA will annually submit this Operating Plan to mitigate operating Emergencies for Transmission Capacity and energy Emergencies to the RC for review. The RC will then notify the LG&E/KU BA on the results of its review. The LG&E/KU BA, if necessary, will address any reliability risks identified by the RC and resubmit this Operating Plan to the RC within a time period specified by the RC.⁵

6 LG&E/KU BA Overview

This Capacity and Energy Emergency Operating Plan is for reference and does not require a specific event to trigger. Steps listed shall be implemented as part of the continual operational processes to ensure resource to Demand balance within industry standards.

The LG&E/KU BA is a member of the TEE Contingency Reserve Sharing Group (TCRSG) with TVA. The LG&E/KU Generation Dispatch Group is responsible for requesting contingency reserve assistance, as needed.

The LG&E/KU Balancing Authority Area includes four LSEs: LG&E/KU LSE (LGEE), Kentucky Municipal Power Administration (KMPA), Owensboro Municipal Utilities (OMU), and Kentucky Municipal Energy Agency (KYMEA). LGEE is the provider of ancillary services including Schedule 5 (Operating Reserve – Spinning Reserve Service) and Schedule 6 (Operating Reserve – Supplemental Reserve Service) for the BA area.

³ IRO-001-4 R2

⁴ IRO-001-4 R3

⁵ EOP-011-2 R4



7 LSE Imbalance Event Response Plan

LSEs in the LG&E/KU Balancing Authority Area are responsible for maintaining generation and Load balance for their respective systems. These LSEs are monitored individually by the LG&E/KU BA. In the event an LSE experiences an Imbalance Event that is expected to last 15 minutes or more, the LSE will contact the BA without intentional delay to inform them of the cause and potential duration of the Imbalance Event. The LSE shall notify the BA of the plan to mitigate the Imbalance Event within 90 minutes. This notification shall be no later than 15 minutes after the commencement of the Imbalance Event. The LSE shall implement all necessary steps to mitigate the Imbalance Event as part of its mitigation plan. Appendix 4 to this Operating Plan, is the NOA's *Appendix A – Imbalance Events* which, describes mitigation activities an LSE may use to remedy an Imbalance Event. The LSE experiencing an Imbalance Event shall correct the event within 90 minutes of the start of the event.

The LG&E/KU BA shall monitor the imbalance of the LSE, while always evaluating the risk to the Balancing Authority Area. The LG&E/KU BA may direct the LSE to shed load if, despite pursuing mitigation activities described in this Operating Plan and the LG&E/KU NOA, the LSE remains unable to deliver power to its load due to a power supply shortage impacting the LSE. If at any time it appears that any of the situations below are applicable, the BA shall implement the plan outlined in Section 8 of this document:

the LSE's mitigation plan is inadequate

the LSE's Imbalance Event will not be mitigated within 90 minutes

the LSE's Imbalance Event creates a concern or issue for the operation of the Transmission System within limits or to Balancing Authority Area as a whole

8 LG&E/KU BA Capacity and Energy Emergency Operating Plan

The LG&E/KU BA is responsible for monitoring the entire LG&E/KU Balancing Authority Area in order to maintain generation-Load-interchange balance within the LG&E/KU Balancing Authority Area. The BA must also monitor the status of Remedial Action Schemes that impact generation or Load.⁶ The LG&E/KU BA will work in coordination with the LSEs regarding the LSE's effort to mitigate Imbalance Events, as long as the Imbalance Event does not jeopardize the reliability of the Balancing Authority Area or cause or contribute to a potential limit exceedance.

If an Imbalance Event inside the LG&E/KU Balancing Authority Area is not mitigated within 90 minutes, the LSE will provide a mitigation plan. If at any time it appears that any of the situations below are applicable, the BA shall implement the Operating Plan outlined below:

⁶ TOP-001-5 R11



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the LSE's mitigation plan is inadequate

the LSE's Imbalance Event will not be mitigated within 90 minutes

the LSE's Imbalance Event creates a concern or issue for the operation of the Transmission System within limits or to Balancing Authority Area as a whole

the BA will implement the proposed plan if it will maintain reliability for the entire Balancing Authority Area.

Operating Plan

The BA has authority over Generator Owners (GO), Generator Operators (GOP), and LSEs within its Balancing Authority Area. If the BA experiences a Capacity or Energy Emergency, the BA shall coordinate with these entities to mitigate potential risks to the Bulk Electric System. Contact information for each of these entities can be found in the LG&E/KU Communication Capability Document.

The BA retains the authority to determine which actions are appropriate and necessary to mitigate a Capacity or Energy Emergency. They may take actions including, but not limited to, those listed below based on system conditions and their judgement.⁷

Managing Generating Resources⁸

The BA shall coordinate with GOPs in the Balancing Authority Area to confirm generation capability and availability.⁹ If an entity has a unit that is unavailable, then the BA shall work with the entity to return the unit to service. If a unit has planned maintenance upcoming that will contribute to the Emergency, the BA shall work with the GOP to cancel the outage.

If a GOP has an issue with fuel supply or inventory levels required to run a unit, the BA will coordinate with that GOP to develop a plan to address those concerns.¹⁰ These plans will address the possibility of fuel switching capabilities¹¹ and/or environmental constraints.¹² The goal is to mitigate a Real-time or potential Capacity or Energy Emergency by adjusting generation availability and capability within the LG&E/KU Balancing Authority Area.

Public Appeals and Requests to Government Agencies for Energy Reduction¹³

⁷ EOP-011-2 R2.2

⁸ EOP-011-2 R2.2.3

⁹ EOP-011-2 R2.2.3.1

¹⁰ EOP-011-2 R2.2.3.2

¹¹ EOP-011-2 R2.2.3.3

¹² EOP-011-2 R2.2.3.4

¹³ EOP-011-2 R2.2.4; R2.2.5



The BA may direct LSEs within the Balancing Authority Area to issue public appeals or request government agencies to implement energy reduction programs. The BA shall contact the LSEs, by phone, to initiate the appeals and requests. Once the potential or Real-time Capacity and Energy Emergency is mitigated, any appeals and requests can be terminated. The BA will notify the LSEs of the termination by phone.

Reduction of Internal Energy Use¹⁴

The BA will notify LSEs in the Balancing Authority Area of the need to reduce internal energy use to help mitigate a Capacity or Energy Emergency. This notification will consist of a phone call from the BA to the LSEs directly. The BA will call at the start and conclusion of the energy reduction period.

Use of Interruptible Load, Curtailable Load and Direct Load Control¹⁵

LGEE has contractual load that is interruptible, curtailable, and/or in a Direct Load Control program. In the event of a Capacity or Energy Emergency, Generation Dispatch may use these programs within the tariff parameters.

Manual Load Shed¹⁶

In the event of a Capacity or Energy Emergency that risks the reliability of the Bulk Electric System, the ESC will immediately issue an Operating Instruction to DCC to shed load. See full load shed plan in Appendix 3. If the ESC cannot contact DCC or if DCC is unable to execute the load shed plan, the ESC will shed load at the transmission level.

The LG&E/KU BA has the capability to shed load within the LG&E/KU Balancing Area via the EMS. Load shed tools, within the EMS have been developed to minimize overlap between manual load shed circuits and under frequency load shed equipped circuits, and minimize overlap between manual load shed circuits and circuits that serve designated critical loads. These screens enable the ESC to manually shed load within a timeframe adequate for mitigating Emergencies.

If an event occurs where load shed can be coordinated among all LSEs in the LG&E/KU Balancing Authority Area, the BA will contact each applicable LSE and issue an Operating Instruction to shed load.

The BA may take actions listed above to prepare for and mitigate Emergencies within the LG&E/KU Balancing Authority Area. The BA will consider potential reliability impacts from extreme weather events and cold weather conditions when determining actions required to prepare for and mitigate Emergencies¹⁷ If extreme weather is forecasted within the LG&E/KU

¹⁴ EOP-011-2 R2.2.6

¹⁵ EOP-011-2 R2.2.7

¹⁶ EOP-011-2 R2.2.8

¹⁷ EOP-011-2 R2.2.9.1 & R2.2.9.2



BAA, the BA will work with the necessary personnel, including but not limited to Generation Dispatch and other LSEs, to determine potential reliability impacts as necessary. Extreme weather events may include cold weather conditions,¹⁸ extreme temperatures resulting in peak loads, abnormally high seasonal loads and severe weather that may impact energy production or deliverability. When evaluating potential reliability impacts from these conditions, the BA will determine if additional actions are required. Potential actions that may be taken include, but are not limited to:

- Carrying additional Operating Reserves
- Postponing planned generation outages
- Bringing on additional generation prior to weather event

The BA may take actions with only localized application to address LSEs that may be energy deficient. The BA is not required to apply responsive actions to the whole BA Area if such action would not mitigate the deficiency or be appropriate.

Requesting an Energy Emergency Alert

As the BA identifies a potential Capacity or Energy Emergency situation, the BA will notify the RC as soon as possible of the LG&E/KU BA's current and projected conditions. This may include, but is not limited to:¹⁹

- Current and next hour Net Schedule Interchange
- Current generation capacity online within the Balancing Authority Area
- Real-time Balancing Authority Area load
- Next hour Balancing Authority Area load forecast

The BA and RC shall discuss the declaration of an Energy Emergency Alert per EOP-011-2 Attachment 1 (attached to this document) and for purposes of triggering the availability of Capacity Benefit Margin (CBM). If the Emergency is anticipated, the BA shall **request** the RC declare an EEA 1. If the Emergency is Real-time and the BA and member LSEs are implementing load management procedures, then the BA shall **request** the RC declare an EEA 2 or EEA 3²⁰. EEA notifications will be communicated to DCC management through TCC management and ESC's (Appendix 3). **If the Emergency is a Real-time Energy Emergency, the BA shall take immediate steps (up to and including firm load shedding) to reduce risk to the Bulk Electric System.**

EEA 1

If the LG&E/KU BA is experiencing conditions where all available generation resources are committed to meet firm Load, firm transactions, and reserve commitments, and there is concern

¹⁸ EOP-011-2 R2.2.9.1 and R2.2.9.2

¹⁹ EOP-011-2 R2.2.1

²⁰ EEA 3 shall only be requested if the BA is not maintaining minimum Contingency Reserve requirement and/or firm load is being shed to maintain ACE.



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about sustaining required Contingency Reserves, the BA shall **request** an EEA 1 be issued by the RC for the BA. In addition, the BA shall either curtail or work with Balancing Authority Area LSEs to adjust non-firm wholesale energy sales to zero. An EEA 1 may also be requested for LSE's within the LG&E/KU BA if the LSE is energy deficient and the BA determines that the LSE's mitigation plan may not be adequate to resolve the energy deficiency within 90 minutes.

EEA 2

If it is decided the LG&E/KU BA is no longer able to provide its expected energy requirements and is an energy deficient Balancing Authority, it shall take steps detailed above in the Operating Plan to mitigate Emergencies and **request** the RC issue an EEA 2. An EEA 2 may also be requested for LSE's within the LG&E/KU BA if the LSE is energy deficient and has not mitigated the energy deficiency within 90 minutes. As with an EEA 1, the BA shall either curtail or work with Balancing Authority Area LSEs to adjust non-firm wholesale energy sales to zero. The LSE's are able to access CBM after declaring an EEA2. Once an EEA 2 is issued, the BA shall notify neighboring BA's and DCC. The neighboring BAs are:

- Tennessee Valley Authority (TVA)
- Midcontinent ISO (MISO)
- PJM

Additionally, the BA shall communicate at least once an hour with the RC the about the current status of the LG&E/KU Balancing Authority Area and mitigation steps in place.

EEA 3

The energy deficient Balancing Authority is unable to meet minimum Contingency Reserve requirements (MW amount for CRSB).

Prior to requesting the RC to initiate an EEA 3, the BA will coordinate with Generation Dispatch and all GOPs in the Balancing Authority Area to bring on all available generation capacity and initiate Direct Load Control, within tariff parameters.²¹ For generation, this includes but is not limited to:

- All LG&E/KU Coal, Gas, and Hydro Units
- KMPA Gas Combustion Turbines
- KYMEA Paris Scott Diesel Units

If, after all available generation has been brought online and load has been reduced (as appropriate utilizing public appeals, voltage reductions, and curtailing interruptible loads and schedules, within tariff parameters) the LG&E/KU BA is still deficient and unable to maintain

²¹ The LG&E is currently the only LSE in the LG&E/KU Balancing Authority Area with agreements for Direct Load Control.



minimum Contingency Reserves, the BA shall request the RC issue an EEA 3. In an EEA 3, the BA shall continue to implement necessary steps identified in the Operating Plan above.

If an LSE Imbalance Event is causing or contributing to a Transmission operating limit exceedance, the LG&E/KU BA may also request an EEA 3 prior to the shedding of the LSE's load.

9 Revision History

Rev No:	Change:	Revised By:	Review Date:	Effective Date:
0	Document creation for applicable requirements from NERC standards EOP-011-1, TOP-001-3, and IRO-001-4 effective 4/1/2017, Replaced prepared by from Dan Hawk to Mike Pendleton	M. Pendleton	1/1/2017	4/1/2017
1	Alphabetically rearranged section 2. Replaced Benham with KYMEA in section 6 and removed related footnote. Added language in section 7 to allow for implementation of the Operating Plan in section 8, if necessary, for LSE Imbalance Events. Added language in Section 8 for requesting EEAs on behalf of energy deficient LSEs within the Balancing Authority Area	M. Pendleton	12/1/2017	1/31/2018
2	Changed TOP-001-3 to TOP-001-4. Deleted the mention of IPPs on the LG&E/KU system.	T. Lassiter	1/16/2019	1/31/2019
3	Annually reviewed entire document. Added Evidence Spreadsheet Review to Controls Checklist.	R. Wolf	1/17/2020	1/31/2020



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Rev No:	Change:	Revised By:	Review Date:	Effective Date:
	Replaced Tayce Lassiter with Rob Wolf and replaced Tom Jessee with Beth McFarland on signature page. Replaced Regulated Generation Dispatch and RGD with Generation Dispatch.			
4	Removed Bluegrass Unit 3 Gas Turbine as available to mitigate EEA-3 conditions due to pseudo-tie	R. Wolf	2/7/2020	2/14/2020
5	Removed OMU Elmer Smith Coal Units as available to mitigate EEA-3 conditions due to retirement. Updated EEI to GridLiance Heartland (GLH)	R. Wolf	5/27/2020	6/1/2020
6	Annually reviewed entire document.	R. Wolf	4/23/2021	6/1/2021
7	Annually reviewed entire document. Added "Imbalance Event Flowchart" to Appendix 5, move Control Checklist to Appendix 6. Updated KYMEA contacts in Appendix. Minor revisions throughout.	R. Wolf		4/1/2022
8	Annually Reviewed the entire document, reworded sections throughout. Updated Signatures. Updated document to comply with new revision of EOP-011. Updated all standards references to EOP-011-2 and TOP-001-5.	T. Lassiter	3/8/2023	4/1/2023
9	Added the manual load shed plan in appendix 3 updated the wording in the manual load shed section to better explain how we comply with the new EOP-011-2 R2.2.9.1 requirement.	T. Lassiter	9/29/2023	10/31/2023



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Appendix 1: EOP-011-2 Energy Emergency Alerts

Introduction

This Attachment provides the process and descriptions of the levels used by the Reliability Coordinator in which it communicates the condition of a Balancing Authority which is experiencing an Energy Emergency.

A. General Responsibilities

1. **Initiation by Reliability Coordinator.** An Energy Emergency Alert (EEA) may be initiated only by a Reliability Coordinator at 1) the Reliability Coordinator's own request, or 2) upon the request of an energy deficient Balancing Authority.
2. **Notification.** A Reliability Coordinator who declares an EEA shall notify all Balancing Authorities and Transmission Operators in its Reliability Coordinator Area. The Reliability Coordinator shall also notify all neighboring Reliability Coordinators.

B. EEA Levels

Introduction

To ensure that all Reliability Coordinators clearly understand potential and actual Energy Emergencies in the Interconnection, NERC has established three levels of EEAs. The Reliability Coordinators will use these terms when communicating Energy Emergencies to each other. An EEA is an Emergency procedure, not a daily operating practice, and is not intended as an alternative to compliance with NERC Reliability Standards.

The Reliability Coordinator may declare whatever alert level is necessary, and need not proceed through the alerts sequentially.

1. EEA 1 — All available generation resources in use.

Circumstances:

- The Balancing Authority is experiencing conditions where all available generation resources are committed to meet firm Load, firm transactions, and reserve commitments, and is concerned about sustaining its required Contingency Reserves.
- Non-firm wholesale energy sales (other than those that are recallable to meet reserve requirements) have been curtailed.

2. EEA 2 — Load management procedures in effect.

Circumstances:

- The Balancing Authority is no longer able to provide its expected energy requirements and is an energy deficient Balancing Authority.
- An energy deficient Balancing Authority has implemented its Operating Plan(s) to mitigate Emergencies.



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- An energy deficient Balancing Authority is still able to maintain minimum Contingency Reserve requirements.

During EEA 2, Reliability Coordinators and energy deficient Balancing Authorities have the following responsibilities:

- 2.1 Notifying other Balancing Authorities and market participants.** The energy deficient Balancing Authority shall communicate its needs to other Balancing Authorities and market participants. Upon request from the energy deficient Balancing Authority, the respective Reliability Coordinator shall post the declaration of the alert level, along with the name of the energy deficient Balancing Authority on the RCIS website.
 - 2.2 Declaration period.** The energy deficient Balancing Authority shall update its Reliability Coordinator of the situation at a minimum of every hour until the EEA 2 is terminated. The Reliability Coordinator shall update the energy deficiency information posted on the RCIS website as changes occur and pass this information on to the neighboring Reliability Coordinators, Balancing Authorities and Transmission Operators.
 - 2.3 Sharing information on resource availability.** Other Reliability Coordinators of Balancing Authorities with available resources shall coordinate, as appropriate, with the Reliability Coordinator that has an energy deficient Balancing Authority.
 - 2.4 Evaluating and mitigating Transmission limitations.** The Reliability Coordinator shall review Transmission outages and work with the Transmission Operator(s) to see if it's possible to return to service any Transmission Elements that may relieve the loading on System Operating Limits (SOLs) or Interconnection Reliability Operating Limits (IROLs).
 - 2.5 Requesting Balancing Authority actions.** Before requesting an EEA 3, the energy deficient Balancing Authority must make use of all available resources; this includes, but is not limited to:
 - 2.5.1 All available generation units are on line.** All generation capable of being on line in the time frame of the Emergency is on line.
 - 2.5.2 Demand-Side Management.** Activate Demand-Side Management within provisions of any applicable agreements.
- 3. EEA 3 — Firm Load interruption is imminent or in progress.**

Circumstances:

- The energy deficient Balancing Authority is unable to meet minimum Contingency Reserve requirements.

During EEA 3, Reliability Coordinators and Balancing Authorities have the following responsibilities:

- 3.1 Continue actions from EEA 2.** The Reliability Coordinators and the energy deficient Balancing Authority shall continue to take all actions initiated during EEA 2.



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3.2 Declaration Period. The energy deficient Balancing Authority shall update its Reliability Coordinator of the situation at a minimum of every hour until the EEA 3 is terminated. The Reliability Coordinator shall update the energy deficiency information posted on the RCIS website as changes occur and pass this information on to the neighboring Reliability Coordinators, Balancing Authorities, and Transmission Operators.

3.3 Reevaluating and revising SOLs and IROLs. The Reliability Coordinator shall evaluate the risks of revising SOLs and IROLs for the possibility of delivery of energy to the energy deficient Balancing Authority. Reevaluation of SOLs and IROLs shall be coordinated with other Reliability Coordinators and only with the agreement of the Transmission Operator whose Transmission Owner (TO) equipment would be affected. SOLs and IROLs shall only be revised as long as an EEA 3 condition exists, or as allowed by the Transmission Owner whose equipment is at risk. The following are minimum requirements that must be met before SOLs or IROLs are revised:

3.3.1 Energy deficient Balancing Authority obligations. The energy deficient Balancing Authority, upon notification from its Reliability Coordinator of the situation, it will immediately take whatever actions are necessary to mitigate any undue risk to the Interconnection. These actions may include Load shedding.

3.4 Returning to pre-Emergency conditions. Whenever energy is made available to an energy deficient Balancing Authority such that the Systems can be returned to its pre-Emergency SOLs or IROLs condition, the energy deficient Balancing Authority shall request the Reliability Coordinator to downgrade the alert level.

3.4.1 Notification of other parties. Upon notification from the energy deficient Balancing Authority that an alert has been downgraded, the Reliability Coordinator shall notify the neighboring Reliability Coordinators (via the RCIS), Balancing Authorities and Transmission Operators that its Systems can be returned to its normal limits.

Alert 0 - Termination. When the energy deficient Balancing Authority is able to meet its Load and Operating Reserve requirements, it shall request its Reliability Coordinator to terminate the EEA.

0.1 Notification. The Reliability Coordinator shall notify all other Reliability Coordinators via the RCIS of the termination. The Reliability Coordinator shall also notify the neighboring Balancing Authorities and Transmission Operators.



Appendix 2: Capacity and Energy Emergency Event Checklist

The purpose of this checklist is to be used in the event of an anticipated or actual Capacity or Energy Emergency. The individual completing this checklist should follow it as written, unless there is immediate risk to Bulk Electric System. In the event that the BA determines not to implement any “Action Steps” below on the grounds that such action is inappropriate or ineffective to alleviate the condition under existing operating conditions, the individual completing the checklist shall note that fact and the reason in the margins of the checklist or in some other attachment hereto.

EEA 1		
Action Steps		Complete
Confirm that the BA has:		
	Curtailed all non-firm wholesale energy sales	
If above steps have been taken, and there is still concern about the BA meeting firm commitments, the LG&E/KU Balancing Authority will:		
	Request TVA Reliability Coordinator to declare an EEA1 and to post the event on the RCIS	
	For an event initiated by the LG&E/KU LSE, the LG&E/KU BA will notify neighboring BAs and DCC of the EEA. These include:	
	• MISO	
	• PJM	
	• TVA	
	Notify the TCRSG Admin of the EEA once issued (through Generation Dispatch).	
Initials:		



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EEA 2	
Action Steps	Complete
In addition to applicable items from the EEA1 checklist, confirm that the BA has:	
Loaded all available generating capacity.	
Maximized generating output and availability.	
Optimized fuel supply.	
Reduced load (as appropriate) utilizing public appeals, voltage reductions, and curtailing interruptible loads and schedules (within tariff parameters).	
Deployed operating reserves to meet demand.	
If above steps have been taken and the BA is unable to meet its expected energy requirements and is an energy deficient BA, the LG&E/KU BA will:	
Request TVA Reliability Coordinator to declare an EEA2 and to post the event on the RCIS	
For an event initiated by the LG&E/KU LSE, the LG&E/KU BA will notify neighboring BAs and DCC of the EEA. These include:	
<ul style="list-style-type: none"> • MISO 	
<ul style="list-style-type: none"> • PJM 	
<ul style="list-style-type: none"> • TVA 	
Notify the TCRSG Admin of the EEA once issued (through Generation Dispatch).	
Update the TVA RC hourly during the EEA declaration period. <ul style="list-style-type: none"> • Current and next hour Net Schedule Interchange • Current generation capacity online within the Balancing Authority Area • Real-time Balancing Authority Area load • Next hour Balancing Authority Area load forecast 	
Initials:	



PPL companies

LG&E/KU Capacity and Energy Emergency Operating Plan

Revision: 9

Effective Date: 10/31/2023

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EEA 3²²	
Action Steps	Complete
In addition to applicable items from the EEA1 and EEA2 checklist, confirm that the BA has:	
Brought on-line all available generation (regardless of cost)	
Purchased all available firm and non-firm energy (regardless of cost)	
Interrupted all contractually interruptible loads as appropriate (within tariff parameters)	
Utilized all Contingency Reserves to meet firm load commitments and the CRSG contingency reserve assistance has been initiated within contractual parameters.	
If above steps have been taken, and the BA is unable to maintain minimum Contingency Reserves and meet firm demand, the LG&E/KU BA will:	
Request TVA Reliability Coordinator to declare an EEA3 and to post the event on the RCIS. Notify DCC of the EEA3.	
Notify DCC and request firm load be manually shed to restore the system to balance.	
Notify neighboring BAs of the EEA. These include:	
<ul style="list-style-type: none"> • MISO 	
<ul style="list-style-type: none"> • PJM 	
<ul style="list-style-type: none"> • TVA 	
Notify the TCRSG Admin of the EEA once issued (through Generation Dispatch).	
Update the TVA RC hourly during the EEA declaration period. <ul style="list-style-type: none"> • Current and next hour Net Schedule Interchange • Current generation capacity online within the Balancing Authority Area • Real-time Balancing Authority Area load • Next hour Balancing Authority Area load forecast 	
Notify Group Leader – Electric System Coordination of the event and associated NERC/DOE Reporting requirements.	
Initials:	

²² For an EEA3 where load shedding is required to restore balance to the footprint, it is understood action may need to be taken quickly to lessen the burden on the Interconnection and the checklist may not be explicitly followed.



Appendix 3: Capacity Emergency Load Shed Procedure (DCC)

Title:	Company Capacity Emergency Load Shed		
Purpose:	The purpose of the procedure is to establish a standard process for Load Shed in a Capacity Energy Emergency		
Frequency		Timing:	
Process Steps:			
<p>Step 1: LG&E/KU Balancing Authority (BA) moves into Energy Emergency Alert (EEA)</p> <ul style="list-style-type: none"> a) TCC management notifies DCC management team of alert <ul style="list-style-type: none"> i. If EEA alert level changes – TCC notifies DCC management team b) DCC management discusses alert with operators (shift lead) c) EDO and ETO upper management is notified of the situation <p>*Note: Step 1 is not required to execute Step 2 and may happen during or after Step 2</p> <p>Step 2: TCC Operator contacts DCC Operator to inform load shed is required</p> <ul style="list-style-type: none"> a) TCC contacts DCC b) TCC Operator provides DCC Operator required MW/MVA to shed c) TCC provides deadline for DCC to complete Load Shed actions <ul style="list-style-type: none"> i. If DCC can't meet the timeline provided, TCC will shed load at the transmission level d) Keep phone line open between TCC and DCC operators e) DSO peer contacts DCC management <ul style="list-style-type: none"> i. DCC management informs outlook distribution group ("update group name") f) DSO peer to delegate event management during load shed event g) DSO peer disables FLISR system wide <p>Step 3: DSO sheds required MW/MVA using Load shed tabular in DSCADA</p> <ul style="list-style-type: none"> a) Start with "Critical Block 1" and calculate number of "Critical Blocks" required using "Total MW/MVA" for each Block b) Continue to open the next "Critical Block" until required MW/MVA has been shed with coordination between TCC and DCC <p>*Note: <u>ALL</u> restoration of DCC outage events not related to load shed will be halted during the load shed event</p> <p>Step 4: TCC management opens line of communication with appropriate personnel including DCC management</p>			



Step 5: If duration is such that rotating outages is deemed appropriate, DSO sheds next “Critical Block” to accommodate rotating outages

- a) DCC operator coordinates with TCC to open next “Critical Block”

Note: This step (Step 5) sheds 1 additional “Critical Block” above required MW/MVA

Step 6: DSO restores “Critical Blocks” as situation allows

- a) For the last “Critical Block” shed to accommodate rotating blackouts view the “Max Current Hour” MW total for the block
 - i. TCC Load shed minimum MW/MVA requirement must be maintained during rolling outages and restorations
- b) Restore critical block in first shed first restored method in coordination with TCC
- c) If breaker does not successfully close remotely, DSO peer to dispatch crew to close locally

Step 7: Repeat steps 5 through 6 until Load Shed event is complete

Step 8: Run report to determine existing PDO events prior to load shed

*****IF ANY ISSUES ARISE DURING Execution OF THIS PROCEDURE CONTACT DCC SUPERVISION BEFORE PROCEEDING*****

Revision #:	1.0		
Revision Notes:	New		
Created by:	Matt Mccoy	Approved by:	
Approved Date:		Effective Date:	

Appendix 4: Network Operating Agreement Attachment 1

Appendix A – Imbalance Events

I. Application

This Appendix A states the actions to be taken when a Network Customer experiences a real-time imbalance of +/- five percent of the Network Customer’s Annual Peak Load or five megawatts (whichever is greater) (“Imbalance Event”). Annual Peak Load” is defined as the Network



Customer's hour of peak load during the previous calendar year, rounded up to the next full MW. Transmission Owner shall provide the Annual Peak Load to each customer at or prior to the beginning of each calendar year, subject to modification if the customer modifies its delivery points during the course of a calendar year. An Imbalance Event that occurs when load exceeds actual supply, or generation is deficient to scheduled supply, is a negative Imbalance Event ("Negative Imbalance Event"). An Imbalance Event that occurs when actual delivery of energy exceeds load, or generation is in excess of scheduled supply, is a positive Imbalance Event ("Positive Imbalance Event").

All Imbalance Events must end within ninety (90) minutes of commencement of the Imbalance Event.

II. Notifications

If the Network Customer anticipates an Imbalance Event that will last for fifteen (15) minutes or longer, the Network Customer shall notify the BA promptly, informing the BA of the cause and potential duration of such Imbalance Event.

No later than fifteen (15) minutes after the commencement of an Imbalance Event, the Network Customer shall promptly notify the BA of the plan to mitigate such Imbalance Event within ninety (90) minutes of commencement.

In the event that the Network Customer anticipates that it will experience an Imbalance Event due to normal operating conditions (for example, regular morning and evening ramps) in a given day, a single notification in the morning of the same day will satisfy this notification requirement unless conditions change from the anticipated conditions communicated to Transmission Owner, in which case, additional notifications may be required.

III. Mitigation procedures for a Negative Imbalance Event

For all Negative Imbalance Events that occur prior to April 1, 2017, the Network Customer shall follow the procedures in Attachment 1-EOP-002 to NERC Reliability Standard EOP-002-3.1 applicable to Load Serving Entities. Beginning April 1, 2017, the following procedures shall apply to Negative Imbalance Events that last at least fifteen (15) minutes:

A. Imbalance Level A

If the Network Customer experiences a Negative Imbalance Event, then after fifteen (15) consecutive minutes of the commencement of the Negative Imbalance Event the Network Customer shall curtail all non-firm wholesale energy sales (other than those that are recallable only to meet reserve requirements).

B. Imbalance Level B

If after the Network Customer curtails all non-firm wholesale energy sales the Negative Imbalance Event is still continuing, then in addition to curtailing non-firm wholesale energy sales (as detailed



under Imbalance Level A), the Network Customer shall implement mitigation procedures which may include, but are not limited to:

- Managing its generation resource(s) to increase capability;
- Public appeals for voluntary load reduction;
- Requests to government agencies to implement their programs to achieve necessary energy reductions;
- Reduction of internal utility energy use;
- Use of interruptible load, curtailable load and demand response;
- Voltage reduction;
- Purchasing energy from third parties, regardless of the cost; and
- Making a request (through the BA) to the Reliability Coordinator to declare an Energy Emergency for purposes of triggering the availability of Capacity Benefit Margin (CBM).

The Network Customer shall take any and all mitigation actions necessary to ensure that a Negative Imbalance Event ends within ninety (90) minutes of the commencement of such Imbalance Event.

IV. Mitigation procedures for a Positive Imbalance Event

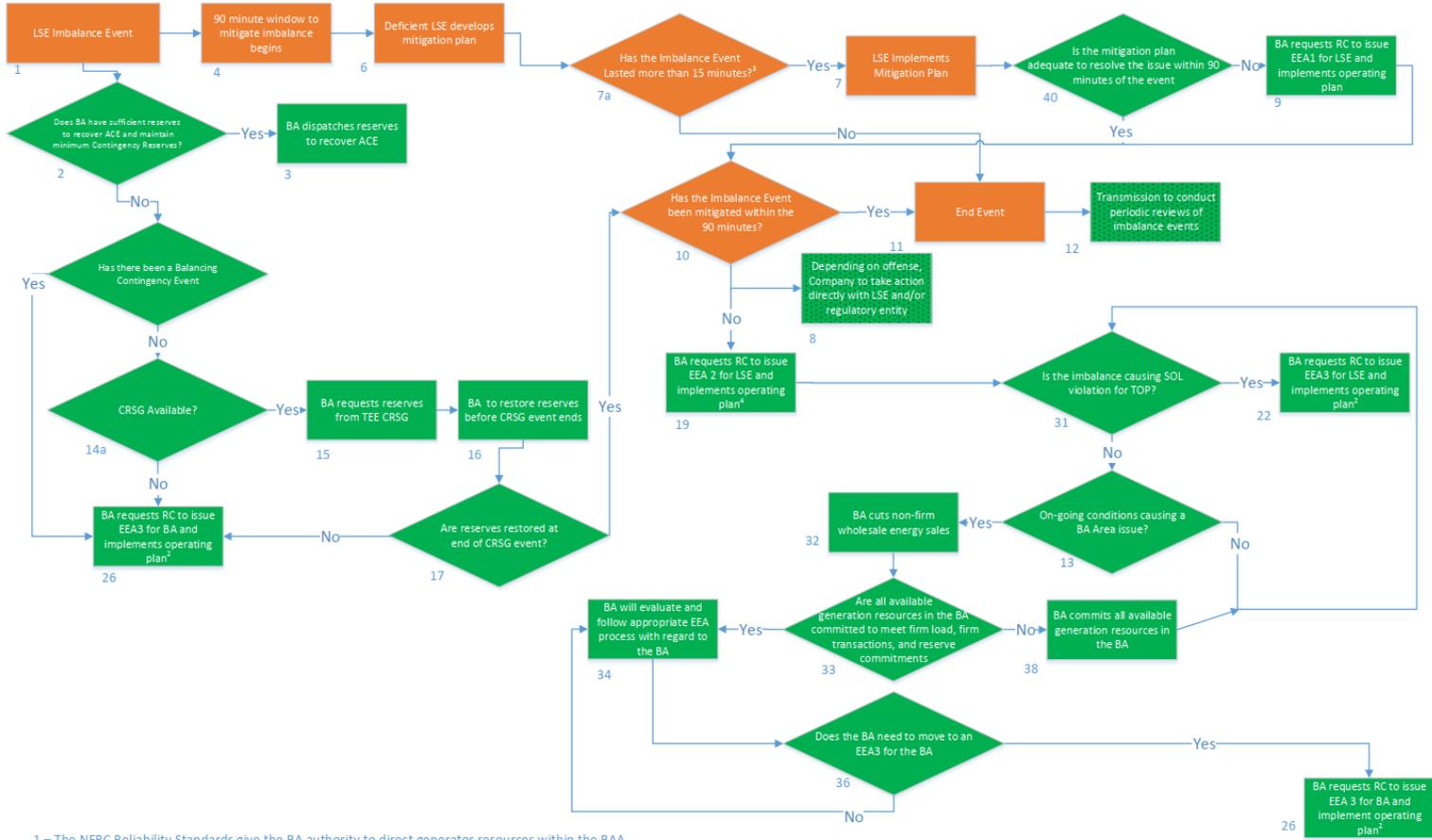
For Positive Imbalance Events, within fifteen (15) minutes of the commencement of such Positive Imbalance Event the Network Customer shall take steps to balance energy and load, including, but not limited to the following options:

- Reduce generation to minimum levels which may include the usage of stabilization fuel;
- Sell surplus generation at a loss; and/or
- Shut down or cycle generating units.

The Network Customer shall take any and all mitigation actions necessary to ensure that a Positive Imbalance Event ends within ninety (90) minutes of the commencement of such Imbalance Event.



Appendix 5: Imbalance Event Flowchart



1 – The NERC Reliability Standards give the BA authority to direct generator resources within the BAA.
 2 – In the event load cannot be shed by an LSE quick enough to mitigate a potential reliability situation, the LGEE BA/TOP will immediately shed load at their discretion to prevent impact to the Interconnection.
 3 – For an imbalance lasting greater than 15 minutes, LSE must have plan to mitigate issue and curtail all non-firm wholesale energy sales. If this does not resolve the issue, then implement mitigation procedure
 4 – EEA2 steps as appropriate: Cut all non-firm OSS, bring on all available generation¹, minimize utility usage, issue public appeals, purchase power regardless of cost, DSM, curtailable contracts.

ATTORNEY – CLIENT PRIVILEGED; CONFIDENTIAL; WORK PRODUCT



Appendix 6: Capacity and Energy Emergency Operating Plan Controls Checklist

This section is intended to be used each time the document is revised to ensure compliance with all requirements. Once the checklist is complete, forward a copy of the completed checklist to the Compliance Department.

Plan Coordination	
Action Steps	Date as completed
Post a copy of the new plan to:	
TVA CTR Portal website (http://ctr.tva.com)	11/9/2023
SERC EPC website (https://www.serc1.org)	11/9/2023
Send a copy of the signed Operating Plan to:	
Bluegrass Generation/East Kentucky Power Coop (EKPC)	11/9/2023
Owensboro Municipal Utilities (OMU)	11/9/2023
Tennessee Valley Authority (TVA) – RC	11/9/2023
Kentucky Municipal Power Agency (KMPA)	11/9/2023
Kentucky Municipal Energy Agency (KYMEA)	11/9/2023
Manager, Generation Compliance (LGE/KU)	11/9/2023
Manager, Market Compliance (LGE/KU)	11/9/2023
Manager, System Control Center (LGE/KU)	11/9/2023

Document Reviews	
Action Steps	Date as completed
Entire document was reviewed at least annually (Jan. 1 thru Dec. 31). ²³	3/8/2023
Entire document submitted and reviewed by the Tennessee Valley Authority Reliability Coordinator (TVA RC). ²⁴	10/26/2023
If applicable, addressed any reliability risks identified by the Tennessee Valley Authority Reliability Coordinator (TVA RC) as part of its review and resubmitted entire document to the TVA RC within the time period specified by the TVA RC. ²⁵	N/a

²³ EOP-011-2 R2

²⁴ EOP-011-2 R2

²⁵ EOP-011-2 R4



Update Copies of the Plan Available to System Operators	
Action Steps	Date as completed
Post a copy of the new plan to:	
TransOps network drive (\\lgenergy.int\shares\group2\transops\documentation\Emergency Operating Procedures)	11/6/2023
Simpsonville Control Center "EOP Procedures" thumb drive	11/10/2023
Dix Dam control Center "EOP Procedures" thumb drive	11/14/2023
Transmission Compliance Documents Intranet	11/9/2023
Transmission Control Center SharePoint Site	11/9/2023
Update hard copies of the plan in:	
Simpsonville Control Center EOP Binder	11/10/2023
Dix Dam Control Center EOP Binder	11/14/2023

Date Submitted: 11/14/2023

Signature: *Tayce Lassiter*

Printed Name: Tayce Lassiter