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-011-1	R2, R4
TOP-001-4	R2, R11
IRO-001-4	R2, R3

Effective Date – April 1, 2022

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PPL companies

LG&E/KU Capacity and Energy Emergency Operating Plan

Procedure Title

4/1/2022

Effective Date

Required Approval Signatures

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1 Purpose

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 operate the Transmission system in a conservative manner to maintain the reliability of the Bulk Electric System.

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 Electric System Coordinator (ESC) working the BA desk. LG&E/KU BA ESCs are NERC certified System Operators and are responsible for the Real-time reliable operations of the Bulk Electric System (BES). The BA ESC has the authority and responsibility to activate the Operating Plan in order to address LSEs experiencing an Imbalance Event. Additionally, the BA ESC has the authority and responsibility to activate the Operating Plan in order to mitigate Capacity and Energy Emergencies[2] by implementing the steps within this Operating Plan, issuing Operating Instructions, and/or other actions as deemed necessary by the BA ESC.[3] The BA ESC shall also take or direct, timely, and appropriate Real-time actions during normal and Emergency conditions to alleviate Capacity and/or Energy Emergencies up to and including shedding of firm load. Mitigating actions may be performed without obtaining approval from higher level management within LG&E/KU. The BA ESC has the authority to request additional staff during an Emergency, if necessary. The BA ESC has the authority to implement Real-time actions to ensure that the BES is operated in the most reliable manner as possible and with consideration for the safety of the general public and its customers.

All LG&E/KU personnel involved with the operations of the system (including but not limited to: field service personnel, substation maintenance personnel, generation production, and energy marketing personnel) and LSEs within the LG&E/KU Balancing Authority Area are subject to the authority of the LG&E/KU BA ESC. All decisions relating to the safe and reliable operation of the BES are the responsibility of the BA ESC and shall be deemed as final unless such actions would violate safety, equipment, regulatory or statutory requirements, under these circumstances the BA ESC shall be informed of such without intentional delay.

[1] EOP-011-1 R2
[2] EOP-011-1 R2.1
[3] TOP-001-4 R2

5 Reliability Coordinator

The Tennessee Valley Authority Reliability Coordinator (TVA RC) serves as LG&E/KU's Reliability Coordinator (RC). The LG&E/KU BA ESC 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.[4] Under these circumstances, the LG&E/KU BA ESC shall immediately inform the RC of the inability to perform the Operating Instruction.[5]

5.1 Operating Plan Review

The LG&E/KU BA will annually submit this Operating Plan to the RC for 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.[6]

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. As necessary to maintain the reliability of the BES, LG&E/KU will render all available Emergency assistance to others as requested in accordance with the Energy Emergency Alert process, providing that the requesting entity has implemented its comparable Emergency procedures, unless such actions would violate safety, equipment, or regulatory or statutory requirements.

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, Kentucky Municipal Power Administration (KMPA), Owensboro Municipal Utilities (OMU), and Kentucky Municipal Energy Agency (KYMEA). Pertinent to this Operating Plan, the LG&E/KU LSE is the provider of ancillary services including Schedule 5 (Operating Reserve – Spinning Reserve Service) and Schedule 6 (Operating Reserve – Supplemental Reserve Service).

7 LSE Imbalance Event Response Plan

[4] IRO-001-4 R2
[5] IRO-001-4 R3
[6] EOP-011-1 R4

LSEs in the LG&E/KU Balancing Authority Area are responsible for maintaining generation/Load balance for their respective systems. These LSEs are monitored individually by the LG&E/KU BA ESC. In the event an LSE experiences an Imbalance Event that is expected to last 15 minutes or more, the LSE will contact the BA ESC without intentional delay to inform them of the cause and potential duration of the Imbalance Event; no later than 15 minutes after the commencement of the Imbalance Event, the LSE shall notify the BA ESC of the plan to mitigate the Imbalance Event within 90 minutes. 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 ESC shall monitor the imbalance of the LSE, while always evaluating the risk to the Balancing Authority Area. The LG&E/KU BA ESC 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 affecting the LSE. If at any time it appears that the LSE's mitigation plan is inadequate, the LSE's Imbalance Event will not be mitigated within 90 minutes, or 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 ESC shall implement the plan outlined in Section 8 of this document.

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, including the status of Special Protection Systems (Remedial Action Schemes) that impact generation or Load, in order to maintain generation-Load-interchange balance within the LG&E/KU Balancing Authority Area.[7] The LG&E/KU BA will work in coordination with the LSE's with regard to 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, however, an Imbalance Event inside the LG&E/KU Balancing Authority Area is not mitigated within 90 minutes, the LSE provides a mitigation plan that the BA ESC determines may be inadequate to mitigate the imbalance within 90 minutes, or the Imbalance Event creates a Real-time or anticipated capacity or energy deficiency for the entire Balancing Authority Area or an actual or potential Transmission limit exceedance, the BA ESC will implement this plan to maintain reliability for the entire Balancing Authority Area.

<u>Operating Plan</u>
The BA ESC 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 ESC shall coordinate with these entities to mitigate a potential risk to the Bulk Electric

[7] TOP-001-4 R11

System. Contact information for each of these entities can be found in Appendix 3 of this document. The following are actions the BA ESC may take to correct or avoid a Capacity and/or Energy Emergency.[8] The BA ESC retains authority and discretion to determine which actions are appropriate and necessary to mitigate a Capacity or Energy Emergency and may take some or all of the actions in the list below (as well as actions not listed) based on system conditions and the BA ESC's judgement and experience.

Managing Generating Resources[9]

The BA ESC shall coordinate with GOPs in the Balancing Authority Area to confirm generation capability and availability.[10] If an entity has a unit on outage that can be returned or planned maintenance upcoming that will contribute to the Emergency, the BA ESC shall work with the entity to cancel the outage and return the unit to service (if available). If a GOP has an issue with fuel supply or inventory levels required to run a unit, the BA ESC will coordinate with that GOP to develop a plan to address fuel supply and inventory concerns.[11] Such plan will address the possibility of fuel switching capabilities[12] and/or environmental constraints.[13] The goal is to mitigate a real or potential Capacity or Energy Emergency by maximizing generation availability and capability within the LG&E/KU Balancing Authority Area.

Public Appeals and Requests to Government Agencies for Energy Reduction[14]

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

Reduction of Internal Energy Use[15]

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

Use of Interruptible Load, Curtailable Load and Direct Load Control[16]

The LG&E/KU LSE has notified the BA of contractual load that is interruptible, curtailable, and/or on Direct Load Control. In the event of a Capacity and/or Energy

[8] EOP-011-1 R2.2
[9] EOP-011-1 R2.2.3
[10] EOP-011-1 R2.2.3.1
[11] EOP-011-1 R2.2.3.2
[12] EOP-011-1 R2.2.3.3
[13] EOP-011-1 R2.2.3.4
[14] EOP-011-1 R2.2.4; R2.2.5
[15] EOP-011-1 R2.2.6
[16] EOP-011-1 R2.2.7

Emergency, the BA ESC may contact the LG&E/KU LSE and request the use of such programs within the tariff parameters.

Currently, no other LSEs have an established load curtailment plan.

Manual Load Shed[17]

The LG&E/KU BA ESC has the capability to shed LG&E/KU LSE load via its Energy Management System (EMS). Tools within the EMS have been developed to minimize overlap in manual load shed points and UFLS equipped circuits, as well as making manual load shed capable within a timeframe adequate for mitigating Emergencies. In the event of an Emergency that risks the reliability of the Bulk Electric System, the BA ESC shall immediately shed load or issue an Operating Instruction for the shedding of load.

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

The BA ESC may take actions listed above to prepare for and mitigate Emergencies within the LG&E/KU Balancing Authority Area. The BA ESC will give consideration to extreme weather events impacting the Balancing Authority Area.[18] Extreme weather events may include extreme temperatures resulting in peak loads or abnormally high seasonal loads and severe weather that may affect energy production or deliverability. Consideration for such events may include, but is not limited to: carrying additional Operating Reserves, postponing planned generation outages, and bringing on additional generation prior to weather event. The BA ESC may take actions with only localized application or targeted to address LSEs that may be energy deficient and is not required to apply responsive actions to the BA Area as a whole if such BA Area-wide action would not mitigate the deficiency or otherwise be appropriate.

<u>Requesting an Energy Emergency Alert</u>

As the BA ESC identifies a potential Capacity and/or Energy Emergency situation, the BA ESC 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

In discussion with the RC, the BA ESC and RC shall discuss the declaration of an Energy Emergency Alert per EOP-011-1 Appendix 1 (attached to this document) and for purposes of triggering the availability of Capacity Benefit Margin (CBM). If the Emergency is anticipated,

[17] EOP-011-1 R2.2.8
[18] EOP-011-1 R2.2.9
[19] EOP-011-1 R2.2.1

the BA ESC 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 ESC shall request the RC declare an EEA 2 or EEA 3[20]. **If the Emergency is a Real-time Energy Emergency, the BA ESC 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 about sustaining required Contingency Reserves, the BA ESC shall request an EEA 1 be issued by the RC for the BA. In addition, the BA ESC 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 if an LSE within the LG&E/KU BA is energy deficient and the BA ESC 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 if an LSE within the LG&E/KU BA is energy deficient and has not mitigated the energy deficiency within 90 minutes. As with an EEA 1, the BA ESC shall either curtail or work with Balancing Authority Area LSEs to adjust non-firm wholesale energy sales to zero. Once issued, the BA ESC shall notify neighboring BAs (contact information is in Appendix 3). The neighboring BAs are:

- Tennessee Valley Authority (TVA)
- Midcontinent ISO (MISO)
- PJM
- GridLiance Heartland (GLH)
- OVEC

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

EEA 3
Prior to requesting the RC to initiate an EEA 3, the BA ESC will coordinate with 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:

[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.

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

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

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 minimum Contingency Reserves, the BA ESC shall request the RC issue an EEA 3. In an EEA 3, the BA ESC shall continue to implement necessary steps identified in the Operating Plan in Section 8.

In the event that 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

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

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Appendix 1: EOP-011-1 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.

- 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.

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 ESC 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 ESC will notify neighboring BAs of the EEA. These include:	
	• MISO	
	• PJM	
	• TVA	
	• GridLiance Heartland (GLH)	
	• OVEC	
	Notify the TCRSG Admin of the EEA once issued (through Generation Dispatch).	
	Update the TVA RC hourly during the EEA declaration period.	
	Initials:	

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 ESC 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 ESC will notify neighboring BAs of the EEA. These include:	
	• MISO	
	• PJM	
	• TVA	
	• GridLiance Heartland (GLH)	
	• OVEC	
	Notify the TCRSG Admin of the EEA once issued (through Generation Dispatch).	
	Update the TVA RC hourly during the EEA declaration period.	
	Initials:	

EEA 3[22]		
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 ESC will:		
	Request TVA Reliability Coordinator to declare an EEA3 and to post the event on the RCIS.	
	Notify the appropriate Transmission Operator and request firm load be manually shed to restore the system to balance.	
	Notify neighboring BAs of the EEA. These include:	
	• MISO	
	• PJM	
	• TVA	
	• GridLiance Heartland (GLH)	
	• OVEC	
	Notify the TCRSG Admin of the EEA once issued (through Generation Dispatch).	
	Update the TVA RC hourly during the EEA declaration period.	
	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: Contact List (From COM-001)

Entities Relative to the LG&E/KU Balancing Authority

	E-mail	Phone (Primary CC)	Cellular Phone	Satellite Phone (Primary CC)
LG&E/KU Adjacent Balancing Authorities				
MISO	[redacted]	[redacted]	[redacted]	[redacted]
PJM (BA for EKPC)	[redacted]	[redacted]	[redacted]	[redacted]
GridLiance Heartland (GLH)	[redacted]	[redacted]	[redacted]	[redacted]
Ohio Valley Electric Corporation (OVEC)	[redacted]	[redacted]	[redacted]	[redacted]
Tennessee Valley Authority (TVA)	[redacted]	[redacted]	[redacted]	[redacted]
LSE's Within The LG&E/KU Balancing Authority Area				
Owensboro Municipal Utilities (OMU)	[redacted]	[redacted]	[redacted]	[redacted]
LG&E/KU	[redacted]	[redacted]	[redacted]	[redacted]
AMP (Marketer for KMPA)	[redacted]	[redacted]	[redacted]	N/A
ACES (Marketer for KYMEA)	[redacted]	[redacted]	[redacted]	N/A

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.

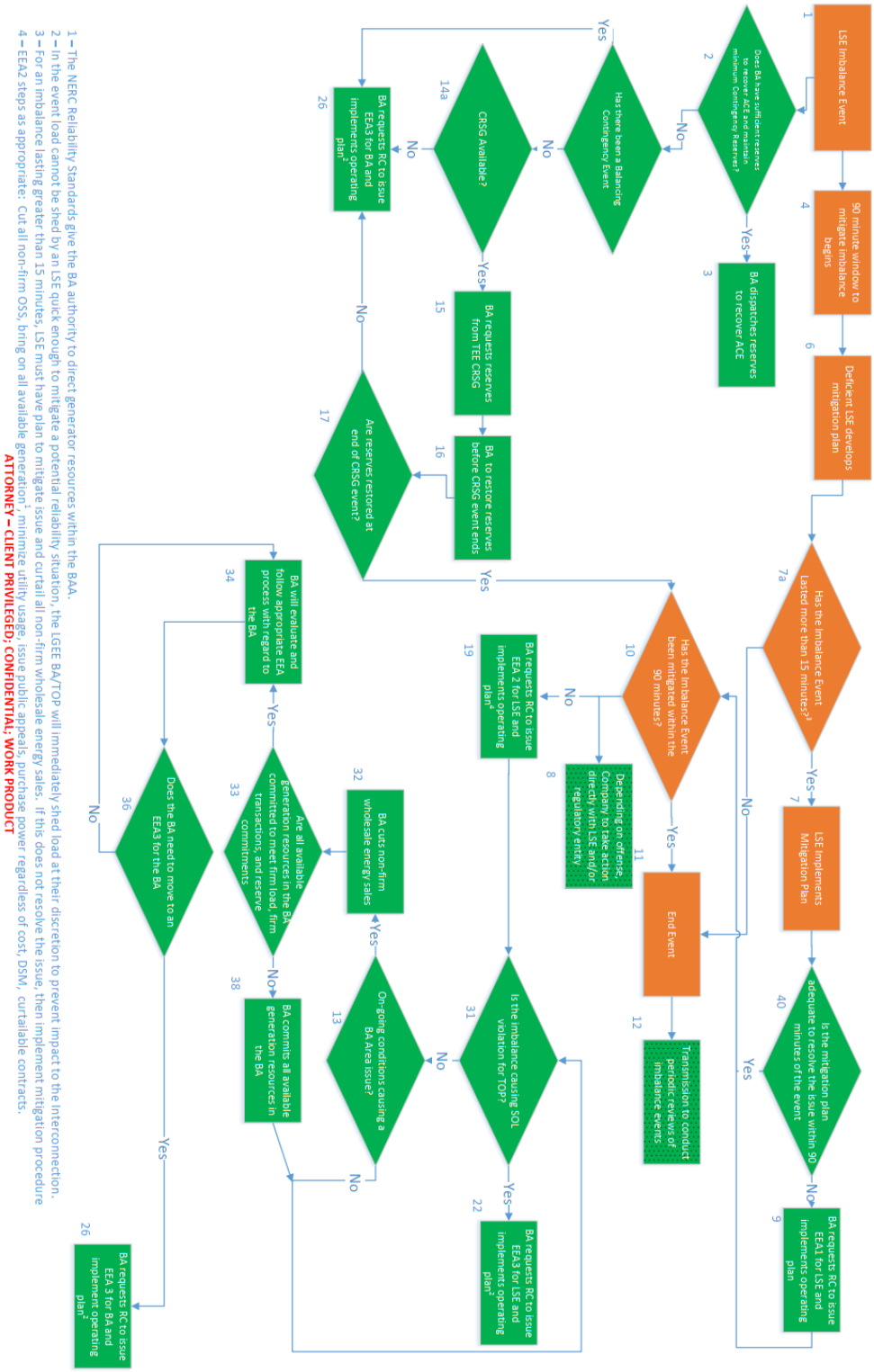
IV. Mitigation procedures for a Positive Imbalance Event

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 generation[1], 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 and the Trans_ops_compliance e-mail [redacted]

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

Document Reviews	
Action Steps	**Date as completed**
Entire document was reviewed at least annually (Jan. 1 thru Dec. 31).[23]	
Entire document submitted and reviewed by the Tennessee Valley Authority Reliability Coordinator (TVA RC).[24]	
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]	
Review Evidence Spreadsheet	

[23] EOP-011-1 R2
[24] EOP-011-1 R2
[25] EOP-011-1 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)	
	Simpsonville Control Center "EOP Procedures" thumb drive	
	Dix Dam control Center "EOP Procedures" thumb drive	
	Transmission Compliance Documents Intranet	
	Transmission Control Center SharePoint Site	
Update hard copies of the plan in:		
	Simpsonville Control Center EOP Binder	
	Dix Dam Control Center EOP Binder	

Date Submitted:_____

Signature:_____

Printed Name:_____