PPL companies

Balancing Authority / Transmission Conservative Operations

Effective Date: February 28th, 2020

LG&E/KU Balancing Authority / Transmission Conservative Operations
Procedure Title **February 28, 2020**
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Required Approval Signatures

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Purpose

This document describes the process for issuing and suspending a LG&E/KU System Alert. The purpose of these alerts is to notify others of any anticipated or real-time conditions that could negatively impact the reliability of the Bulk Electric System (BES). Conditions or events that could warrant implementation of a System Alert may include, but are not limited to:

- Weather-related conditions such as severe thunderstorms, intense lightning storms, tornados, ice/snow accompanied with high winds, extreme temperatures, and/or flooding
- Natural disasters

This document also describes the process for LG&E/KU to implement Conservative Operations. The decision to implement Conservative Operations can be made by the Lead Electric System Coordinator or management team and will be based on any condition, combination of conditions, or threat(s) to the transmission system. Conditions or events that could warrant implementation of Conservative Operations may include, but are not limited to:

- Loss of multiple transmission facilities
- Loss of multiple generators or potential fuel delivery issues
- Loss of SCADA or EMS visibility
- Loss of Primary Control Center
- Forest or Brush Fires
- Environmental Alerts
- Geomagnetic Disturbances of a magnitude that may cause system disturbances
- Suspected or confirmed terrorist activity aimed at causing instability on the transmission system.

System Alerts

Extreme Temperatures

Extreme temperatures may result in high loads experienced on the LG&E/KU Transmission System. If these conditions are expected to persist for an extended period or there are concerns about Generation Capacity and Operating Reserve requirements, Severe Weather Alerts may be implemented.

Hot Weather

As extreme hot temperatures, along with high humidity, are forecasted for the service territory, a Hot Weather Alert may be issued by LG&E/KU. Transmission Operations utilizes Louisville and Lexington weather location and temperature to base this for the Transmission Service Territory:

1. Issuing
    a. Decide if a Hot Weather Alert is required (a forecasted extreme higher than normal temperature condition is expected and has the potential to impact the BES, typically temperatures above 95 degrees).
    b. If time permits, notify and discuss with management.
    c. Define boundaries of the Hot Weather Alert area based on extreme high temperature forecast data.
    d. Define the start and end times of Hot Weather Alert.
    e. Declare LG&E/KU Hot Weather Alert.
    f. Communicate declaration to TVA RC and to TransEmergency group email.
    g. Communicate with TVA RC to have alerts posted to RCIS.
    h. Provide reliability advised actions (if any) to Member Company System Operator to consider and/or implement.
    i. Record actions in the system operator log.

2. Action Items
    a. Provide updates to the TransEmergency group email on a regular basis as the weather system moves across the footprint.

b. Review system adequacy requirements (i.e. the amount of Operating Reserves versus Operating Reserve requirements).

c. Review all work on critical computer systems, such as EMS and ICCP maintenance and coordinating with IT to suspend work on critical telecommunication equipment.

d. Review maintenance, construction, and testing being performed on any transmission facilities and if appropriate, requesting deferral or cancellation of scheduled work. This includes non-essential planned maintenance, tree trimming, Remote Terminal Unit (RTU) work, protection and control testing, etc.

e. Review Transmission Operations staffing levels and evaluating the need to staff the Backup Control Center.

f. Notifying BAA LSE's and IPP's of the current Hot Weather Alert and provide start and end times.

g. Based on the risk to the BES review and if deemed applicable, notifying LSE's and IPP's within the BAA to initiate their Alert or Conservative Operations processes.

3. Terminate

a. Notify and discuss with management.

b. Decide if a Hot Weather Alert needs to be extended or if it can be terminated (based on updated high temperature forecast for the area that is affected by the Alert).

c. If termination is warranted, please continue:

d. Terminate Hot Weather Alert.

e. Communicate termination to TVA RC and to the TransEmergency email group.

f. Communicate with TVA RC to terminate RCIS alerts

g. Record actions in the system operator log.

Cold Weather

As extreme cold temperatures, along with associated wind chill factors, are forecasted for the service territory, Cold Weather Alert may be issued. Transmission Operations utilizes Louisville and Lexington weather location and temperature to base the decision to issue Severe Weather Alerts for the Transmission Service Territory:

1. Issuing

   a. Decide if a Cold Weather Alert is required (a forecasted extreme lower than normal temperature condition is expected and has the potential to impact the BES, typically temperatures below 20 degrees).

   b. If time permits, notify and discuss with management.

   c. Define boundaries of the Cold Weather Alert area based on extreme high temperature forecast data.

   d. Define the start and end times of Cold Weather Alert.

   e. Declare LG&E/KU Cold Weather Alert.

   f. Communicate declaration to TVA RC and to TransEmergency group email

   g. Communicate with TVA RC to have alerts posted to RCIS.

   h. Provide reliability advised actions (if any) to Member Company System Operator to consider and/or implement.

   i. Record actions in the system operator log.

2. Action Items

   a. Provide updates to the TransEmergency group email on a regular basis as the weather system moves across the footprint.

   b. Review system adequacy requirements (i.e. the amount of Operating Reserves versus Operating Reserve requirements).

   c. Review all work on critical computer systems, such as EMS and ICCP maintenance and coordinating with IT to suspend work on critical telecommunication equipment.

d. Review maintenance, construction, and testing being performed on any transmission facilities and if appropriate, requesting deferral or cancellation of scheduled work. This includes non-essential planned maintenance, tree trimming, Remote Terminal Unit (RTU) work, protection and control testing, etc.

e. Review Transmission Operations staffing levels and evaluating the need to staff the Backup Control Center.

f. Notifying BAA LSE's and IPP's of the current Cold Weather Alert and provide start and end times.

g. Based on the risk to the BES review and if deemed applicable, notifying LSE's and IPP's within the BAA to initiate their Alert or Conservative Operations processes.

3. Terminate

   a. Notify and discuss with management.

   b. Decide if a Cold Weather Alert needs to be extended or if it can be terminated (based on updated low temperature forecast for the area that is affected by the Alert).

   c. If termination is warranted, please continue:

   d. Terminate Cold Weather Alert.

   e. Communicate termination to TVA RC and to TransEmergency group email.

   f. Communicate with TVA RC to terminate alerts to RCIS

   g. Record actions in the system operator log.

Extreme Weather Conditions

In the event of other extreme weather conditions, outside of very high or very low temperatures. Extreme weather conditions may include severe thunderstorms with high winds and/or intense lightning storms, tornados, or ice/snow accompanied with high winds. Severe Weather Alerts will be issued when forecasted extreme weather conditions are projected and have the potential to impact the bulk electric system.

1. Issuing

   a. Decide if a Severe Weather Alert is required (forecasted extreme weather conditions are projected and have the potential to impact the BES).

   b. If time permits, notify and discuss with management.

   c. Define boundaries of the Severe Weather Alert area based on weather forecast data.

   d. Define the start and end times of Severe Weather Alert.

   e. Declare Severe Weather Alert and the nature of the Alert.

   f. Communicate declaration to TVA RC and to TransEmergency group email.

   g. Communicate with TVA RC to have alerts posted to RCIS.

   h. Provide reliability advised actions (if any) to Member Company System Operator to consider and/or implement.

   i. Record actions in the system operator log.

2. Action Items

   a. Provide updates to the TransEmergency group email on a regular basis as the weather system moves across the footprint.

   b. Review system adequacy requirements (i.e. the amount of Operating Reserves versus Operating Reserve requirements).

   c. Review all work on critical computer systems, such as EMS and ICCP maintenance and coordinating with IT to suspend work on critical telecommunication equipment.

   d. Review maintenance, construction, and testing being performed on any transmission facilities and if appropriate, requesting deferral or cancellation of scheduled work. This includes non-essential planned maintenance, tree trimming, Remote Terminal Unit (RTU) work, protection and control testing, etc.

   e. Review Transmission Operations staffing levels and evaluating the need to staff the Backup Control Center.

f. Notifying BAA LSE's and IPP's of the current Conservative Operations and provide start and end times.

g. Based on the risk to the BES review and if deemed applicable, notifying LSE's and IPP's within the BAA to initiate their Alert or Conservative Operations processes.

3. Terminate

a. Notify and discuss with management.

b. Decide if a Severe Weather Alert needs to be extended or if it can be terminated (based on updated weather forecast for the area that is affected by the Alert).

c. If termination is warranted, please continue:

d. Terminate Severe Weather Alert.

e. Communicate termination to TVA RC and to TransEmergency group email.

f. Communicate with TVA RC to terminate RCIS alerts.

g. Record actions in the system operator log.

Transmission Emergency Alert

Conditions or events that could lead to a Transmission Emergency Alert may include, but are not limited to anticipated or difficulty managing the transmission system below its System Operating Limits, issues resulting from one or more forced outages, etc.

1. Issuing

a. Decide if a Transmission Emergency Alert is warranted (a SOL is being exceeded and the transmission system cannot be brought back under the SOL and has the potential to impact the BES).

b. If time permits, notify management.

c. Declare Transmission Emergency Alert.

d. Communicate declaration to TVA RC and to TransEmergency group email.

e. Communicate with TVA RC to have alerts posted to RCIS.

f. Coordinate with TVA RC and develop actions to help mitigate the emergency.

g. Provide reliability advised actions (if any) to Member Company System Operator to consider and/or implement.

h. Record actions in the system operator log.

2. Action Items

a. Provide updates to the TransEmergency group email on a regular basis as the weather system moves across the footprint.

b. Review system adequacy requirements (i.e. the amount of Operating Reserves versus Operating Reserve requirements).

c. Review all work on critical computer systems, such as EMS and ICCP maintenance and coordinating with IT to suspend work on critical telecommunication equipment.

d. Review maintenance, construction, and testing being performed on any transmission facilities and if appropriate, requesting deferral or cancellation of scheduled work. This includes non-essential planned maintenance, tree trimming, Remote Terminal Unit (RTU) work, protection and control testing, etc.

e. Review Transmission Operations staffing levels and evaluating the need to staff the Backup Control Center.

f. Notifying BAA LSE's and IPP's of the current Conservative Operations and provide start and end times.

g. Based on the risk to the BES review and if deemed applicable, notifying LSE's and IPP's within the BAA to initiate their Alert or Conservative Operations processes.

3. Terminate

a. Notify and discuss with management.

b. Decide if a Transmission Emergency Alert needs to be extended or if it can be terminated (based on updated BES conditions for the area that is affected by the Alert).

c. If termination is warranted, please continue:

d. Terminate Transmission Emergency Alert.

e. Communicate termination to TVA RC and to TransEmergency group email.

f. Communicate with TVA RC to terminate RCIS alerts.

g. Record actions in the system operator log.

Conservative Operations Alert

In the event of an operations alert, a declaration of Conservative Operations may be required to protect the integrity of the BES. A Conservative Operations Alert may include but not limited to loss of communications, SCADA or EMS visibility, geomagnetic disturbances, environmental, brush fires, load shed event, and suspected or confirmed terrorist activity aimed at causing instability on the transmission system.

1. Issuing

   a. Decide if a COA is warranted.

   b. If time permits, notify and discuss with management.

   c. Define the boundaries for the area of COA.

   d. Define the start and end times of COA.

   e. Declare a COA.

   f. Communicate declaration to TVA RC and to TransEmergency group email

   g. Communicate with TVA RC to have alerts posted to RCIS.

   h. Provide reliability advised actions (if any) to Member Company System Operator to consider and/or implement.

   i. Record actions in the system operator log.

2. Action Items

   a. Provide updates to the TransEmergency group email on a regular basis as conditions change.

   b. Reviewing system adequacy requirements (i.e. the amount of Operating Reserves versus Operating Reserve requirements).

   c. Suspending all work on critical computer systems, such as EMS and ICCP maintenance and telecommunication equipment.

   d. Suspend maintenance, construction, and testing being performed on any generation or transmission facilities and if appropriate, requesting deferral or cancellation of scheduled work. This includes non-essential planned maintenance, tree trimming, Remote Terminal Unit (RTU) work, protection and control testing, etc.

   e. Reviewing Transmission Operations staffing levels and evaluating the need to staff the Backup Control Center.

   f. Reviewing transmission operations emergency plans for additional, staffing of substation.

   g. Notifying BAA LSE's and IPP's of the current Conservative Operations and provide start and end times.

   h. Based on the risk to the BES review and if deemed applicable, notifying LSE's and IPP's within the BAA to initiate their Alert or Conservative Operations processes.

3. Terminate

   a. Notify and discuss with management.

   b. Decide if a COA needs to be extended or if it can be terminated.

   c. If termination is warranted, please continue:

   d. Terminate COA.

   e. Communicate termination to TVA RC and to TransEmergency group email.

   f. Communicate with TVA RC to terminate RCIS alerts.

   g. Record actions in the system operator log.

Revision History

Revision Number	Date	Author	Sections Changed
Creation	May 20,2014	John Jackson	
1	May 12, 2015	John Jackson	Annual review, formatting changes
1.1	May 4, 2017	Tayce Lassiter	Annual review
2	June 30, 2018	Tayce Lassiter	Annual review, updated signatures
3	February 29, 2020	Omel Perchatsch	Addition of System Alerts and changes to COA