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After Action Review

Event: Winter Storm Elliott	**Event Date:** Dec 23, 2022

The event from a generation and balancing authority perspective was summarized by Mike Drake on the SharePoint site Winter Storm Elliott LKE Event Summary 12-23-22.docx (lgeenergy.int).

Damages to LG&E and KU Transmission facilities included:

- None

Operations and Outages:

- Actual out: 12/23/2022 01:09:45 Actual In: 12/23/2022 01:09:46. Line/Equipment: Delvinta to Lake Reba Tap 161kV line and West Irvine 161/69 Transformer. Weather: 38 degrees, 31 mph winds (W), 49 mph gusts, Conditions- Light Rain. Customer Impact: None
- Actual out: 12/23/2022 01:14:35 Actual In: 12/23/2022 11:40:00. Line/Equipment: Delvinta to Lake Reba Tap 161kV line and West Irvine 161/69 Transformer. Weather: 38 degrees, 31 mph winds (W), 49 mph gusts, Conditions- Light Rain. Split section between Delvinta 139 to West Irvine 193 everything checked ok. Then tested to Lake Reba Tap 162 and everything held. Transmission Lines was going to send crews out but Line tested good. Substation crews Checked Lake Reba Tap 804 for low Air pressure/ Breaker Air system froze up and maintenance resolved issue. Customer Impact: None.
- Actual out: 12/23/2022 07:39:17 Actual In: 12/23/2022 10:16:00 2h 36m 43s. Line/Equipment: Brown Plant 728 to West Cliff 712 138 kV LINE and West Cliff T02 138/69 KV Trans. Weather: -6 degrees, 20 mph winds (WSW) , 29 mph gusts, Conditions- Foggy. Cause: Gas Pressure switch froze. Customer Impact: None.
- Actual out: 12/23/2022 14:14:57 Actual In: 12/23/2022 15:37:00 1h 22m 3s. Line/Equipment: Paynes Mill to Tyrone 69kV line, Paynes Mill to Pisgah 69kV line. Weather: -1 degrees, 17 mph winds (W) , 30 mph gusts, Conditions- Light Snow. Cause: Over Current settings set wrong on the low side. Customer Impact: Paynes Mill 1298, 1 hr 32 min.

Safety:

- Transmission did not have any close calls or near misses.

Summary Recommendations:

This section is considered an Executive level list of recommendations based on the information provided below. This information is consolidated into one master document and then the team agrees on the Summary Recommendations.

What went well (Provide a list of activities that went well during the restoration process):

1. No safety concerns or near misses were identified.
2. Coordination and teamwork between TCC, Generation Dispatch, DCC, and field personnel
3. Coordination with LSEs (OMU, KMPA, and KYMEA)
4. Coordination with Reliability Coordinator (RC-TVA)
5. ESCs were well prepared and able to successfully implement established operating plans to address system emergencies throughout the event
6. ESCs and Engineers worked well together to manage multiple N-1 issues occurring simultaneously
7. NERC Reporting (Initial report 1 hour and final report 72 hours later).
8. No staffing issues; management, additional ESCs and support staff present in the control center during the event and engineers provided additional support remotely.
9. Load shed tool provided energy relief needed
10. Load shed implementation was well coordinated and communicated among GD and TOP/BA allowing for ACE to remain around zero (not dragging on the grid)
11. _____

What did NOT go well (Identify problem areas that occurred without any specific recommendations on improvement):

1. Communication with Key Accounts
2. Public appeal occurred after the load shed rollouts began
3. TCC did not have an understanding prior to shedding load that DCC was going to open Distribution feeder breakers after Transmission breakers were opened.
4. Ability to purchase power in an emergency situation. MISO said we could not buy from them since we did not have a BA/BA agreement. (Will followup with Policy and Tariffs).
5. _____

Comments/Suggestions to Improve (Identify what can be done to improve things that did or did not go well based on the comments above):

1. Conduct a full review of the LG&E/KU Transmission Load Shedding Standard program / process, including ownership. Owner: Steinmetz
2. Review and update as necessary the LG&E/Capacity and Energy Emergency Operating Plan. Owner: Jackson
3. Consider a defined LG&E/KU Power Conservation Alert Process/Program. Owner: McFarland
4. Develop and Execute the necessary Corp Awareness Training for any New or Updated Transmission Operating Plans/Programs. Owner: Steinmetz
5. Incorporate any New or Updated Operating Plans/Programs (Transmission & Other) into the 2023 Grid Ex where they will be exercised. Owner: Steinmetz
6. Address all follow-up items that may result from the Distribution After Action Review, creating subteams as needed. Owner: Steinmetz/Jackson/Meacham

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7. Work on BA/BA agreements with MISO on being able to purchase emergency power. (Owner: Jackson/Ramos)
8. Routine Compliance Review of the Event. Owner: Hall/Colvin
9. _____

Name: Keith Steinmetz Role: Transmission Section chief Date: 1/9/2023

Please return Completed form(s) to Dan Hawk, via email at Daniel.hawk@lge-ku.com , or via house-mail (BOC I). Submitted forms will be reviewed by the Emergency Preparedness and Response Team for to identify and act on improvement opportunities.