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EXTRAORDINARY

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PART I : SECTION (I) — GENERAL
Government Notifications

PUBLIC UTILITIES COMMISSION OF SRI LANKA

Direction issued under section 18 (9) (a) for Implementation of the recommendations of the report of the Public Hearing held in regard to the island wide power failure occurred in the Transmission Licensee's network (Ceylon Electricity Board) on 3rd December 2021.

THE Public Utilities Commission of Sri Lanka hereby gives a direction to the Transmission Licensee, Ceylon Electricity Board (CEB) operating under License No.EL/T/09-002 issued by it, to implement the following recommendations made in the report of the Public Hearing held in regard to the island wide power failure occurred in the Transmission Licensee's network (Ceylon Electricity Board) on 3rd December 2021 held on 3rd & 7th March 2022 at the BMICH

1. Unnecessary operation of protection functions and inadequate investigations

- (a) Review the earth fault protections settings of line protection relays, after assessing the sustaining zero sequence currents in 220kV transmission lines, and also with the recommendation of OEM (of line protection equipment), in order to avoid unnecessary tripping of transmission lines. The CEB's protection document namely "**Protection Setting Standard - Principles and Methods for Protection Settings**" to be amended accordingly.



- (b) Take necessary measures to list the records of operation of Busbar protection equipment in substation automation system log in Biyagama grid substation and other grid substations as required, facilitating easy identification of the operation of protection functions (eg: operation of End fault protection).
- (c) Investigate as to why the Fault locator function of the line protection relay (main 1) was not being able to identify the fault location of Kotmale-Biyagama Line-2, and correct any shortcomings (if any) in the implementation of aforesaid relay function. Further, assess the implementation of fault locating functionality of other 220kV line protection relays too (As this function is useful to quick determination of fault location and the associated rapid troubleshooting increase the availability of the line.)
- (d) In compliance with the Electricity (Transmission) Performance Standard regulations Nos.28, 29 and 30 of 2016 the Transmission Licensee (CEB) is required to immediately start calculating the performance indices for power system protection and submit to PUCSL on quarterly basis.
- (e) Transmission Licensee (CEB) is required to carry out comprehensive analysis of every power system faults and plant tripping, in order to improve the power system reliability and stability.

2. Investigation on earth fault and the faulty wiring

To investigate the possibility of deliberate human interventions in earth fault on Biyagama-Kotmale line-2 and suspected faulty wiring of busbar protection system (wiring to provide circuit breaker status to the busbar protection relay), it is recommended to perform formal investigation by the law enforcement authorities.

3. Familiarizing the station staff on protection systems

- (a) Familiarize the power station staff on protection systems and handover the operation and monitoring activities of protection systems to the power station staff or housing one staff from protection branch (at least at the critical power stations like Lakvijaya, Kothmale, Victoria, Kelanitissa, etc) as more coordinated and decentralized protection system operation is an essential requirement.
- (b) The relevant staff of the Grid Substation to be made aware on protection systems and relevant error types.

4. Adhering with standard written procedures for repairs and modifications.

It is evident that CEB has not maintained the system according to the prudent utility practices. Hence adherence and compliance are required with standard written procedures for repairs, replacements, maintenance, modifications, and rectifications for all works carried out by the CEB. All the diagrams should be validated by an authorized person. There should be an As-built drawing for all alterations. Drawings should be up to the standard, and need to be comprehensible to the technical staff. It will reduce the troubleshooting downtime and eliminate the dependence on specific people. Also, standard as-built drawings should be kept in all relevant locations.

5. Increasing the Transmission Line Redundancy

Kotmale Biyagama transmission line redundancy needs to be increased on a priority basis to avoid overloading the remaining lines during a trip off of one line.

6. Tripping of Lakvijaya Power Station

Further examine the exact reason for the Lakvijaya tripping. Review the protection schemes of the transmission lines connected to Lakvijaya Power Station taking into account the power plants protection settings, to ensure that the

transmission lines do not unnecessarily isolate or cause plant shut down at abnormal operating conditions that do not necessarily endanger equipment.

7. Delay in Restoration of Power

- (a) Further investigation is required on the delay occurred in restoring Colombo city power.
- (b) Improve the restoration manual with a review of the priority listing to incorporate critical loads like hospitals etc, and also considering the adverse effects from industrial / commercial loads having large starting currents.

By Order of the Commission,

JANAKA RATNAYAKE,
Chairman.

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