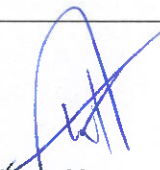

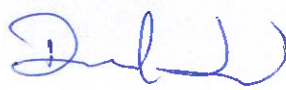


Business Continuity Manual

Business Continuity Plan: A3

Airfield Ground Lighting System

		Signature	Revision	Effective Date
Updated By	Assistant General Manager AD	 Albert Ho	30	Jul 2022
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A. System Description

1.0 Introduction

- 1.1 Airfield Ground Lighting (AGL) system provides navigation to pilot in the aerodrome during aircraft take off, approach for landing and taxing. The obligations of the Authority are maintaining our AGL to comply with International Civil Aviation Organization's (ICAO) Standard and to meet operational requirement of Civil Aviation Department (CAD) of HKSAR Government.
- 1.2 The Serviceability of AGL is divided into Category (Cat.) I, II and III respectively (please refer to ICAO Standard, Annex 14 for definition and operational requirement). Under Cat. I operation, the power supply of AGL system is provided by CLP Power main power as its main source and is backed up by localized diesel generators. While under Cat. II or III operation, the power configuration is reversed with generators as main power source and CLP Power as backup to meet the system transition time.
- 1.3 The major components of AGL system include Control and Monitoring System (CMS), power distribution network, vaults and its field circuits. This manual will cover the procedure during breakdown of those major components mentioned.

2.0 Control and Monitoring System (CMS)

- 2.1 The AGL CMS are used to facilitate the operators at Air-Traffic Control Tower (ATCX) to remote operate the on/off and intensity of airfield ground lights. Operation commands are pressed on the remote workstations and corresponding signals are sent through the Dedicated Network (DN) to the control systems at vaults.
- 2.2 The entire breakdown of CMS would cause affect the remote operation and monitoring capabilities via workstations at ATCX. The operation modes of all AGL facilities would remain at last state. Manual Control Backup System (MBCS) at ATCX can be utilized to remote operate airfield ground lights with certain operation limitations. Further, localized manual operation of hardware facilities at vaults would be required depending on the contingency operation requirement from controllers at ATCX.

3.0 Power Distribution Network

- 3.1 The main power source for AGL system at each vault is supplied by CLP Power via Airfield 11kV infrastructure power network. The AGL system is also locally backed-up by dual generators at each vault with 100% redundancy, that is, any one generator would be sufficient to cater for entire power supply demand at each vault.

4.0 Vaults

- 4.1 The main AGL facilities are installed in six separate vaults, two for North Runway, two for Centre Runway and two for South Runway. The power circuits, supplying power to airfield ground lights at field, are originating from these respective six vaults. The AGL power circuits of Runway Centre Lights and Runway Edge Lights are designed to be inter-leaved with supplied from two vaults to minimize the impact of runway operation in the event of failure of single vault.

B. Contingency Procedures for Airfield Ground Lighting System

1.0 Criteria for activating contingency plan

- 1.1 Whenever breakdown of following facilities of AGL system, this contingency plan would be activated.
- i. CMS;
 - ii. Power Distribution Network; or
 - iii. Vaults

2.0 Services and manpower involved

- 2.1 All works execution involving electrical installation shall be undertaken by appropriate Registered Electrical Worker (REW) according to procedures.
- 2.2 IAC-ACC, ATC Controllers of Civil Aviation Department (CAD), FRT members and AGL maintenance contractor will be involved.

3.0 Contingency Procedures for CMS breakdown

- 3.1 Check if irregularities below are detected in CMS, the procedures would be activated
- i. Continuous audio warning buzzer may be generated from the CMS workstation; or
 - ii. In the AGL CMS workstations, many AGL facilities / components are highlighted with yellow flashing indication or system malfunction or unresponsive to any remote operation.
- 3.2 Follow up procedures for reporting among relevant parties
- i. FRT and IAC-ACC shall be notified and report latest status.
 - ii. IAC-ACC shall notify CAD ATC controllers immediately if fault report is not initiated from them.

- 3.3 When the fault is reported, FRT shall respond and seek for the cause of the fault, and estimate the duration of recovery time.
 - 3.4 ATC controller would determine if Manual Back-up Control System (MBCS) is to be activated. Restricted operation mode of airfield ground lights could be maintained.
 - 3.5 FRT shall coordinate with ATC controller and IAC-ACC for the recovery program and execution of repair works
 - i. FRT shall organize the recovery program with maintenance contractor and coordinate with ATC controller for urgent maintenance window.
 - ii. FRT shall report to ATC Controller and IAC-ACC for periodic update on repair works and the updated recovery time.
 - iii. FRT shall notify ATC controller and IAC-ACC after the system is restored to normal operation.
- 4.0 Contingency Procedures for Power Distribution Network breakdown
- 4.1 Check if irregularities are detected according to Airfield SCADA or CMS, the procedures would be activated
 - i. Continuous audio warning buzzer may be generated from the CMS workstation or Airfield SCADA workstation.
 - ii. In the Airfield SCADA workstation, the switching stations in Airfield 11kV infrastructure network are highlighted with red flashing indication.
 - 4.2 Follow up procedure for reporting among relevant parties
 - i. FRT and IAC-ACC shall be notified and report latest status.
 - ii. IAC-ACC shall notify CAD ATC controllers immediately if fault report is not initiated from them.
 - 4.3 FRT shall check the affected electrical network on site to confirm the situation of supply source. CLP Power shall be contacted if power supply from CLP Power is found suspended.
 - 4.4 If the power supply is found healthy, FRT shall carry out AGL system check on site to ensure the power supply is maintained in vaults and subsequently to airfield ground lights in the field.
 - i. FRT shall report the updated situation to ATC controller and IAC-ACC.
 - ii. FRT shall carry out periodic checking on related power facilities on site until the remote monitoring system is recovered.

- 4.5 If the power supply is confirmed suspended on site, FRT shall check related operational status of AGL back-up generators and confirm the proper activation. The normal operation of any one generator would be sufficient to cater for entire power supply demand at each vault and the normal functionality of AGL system.
- i. FRT shall report to ATC controller on the status of AGL power system and coordinate with ATC controller on the operational status for AGL system.
 - ii. FRT shall organize the recovery program with maintenance contractor and coordinate with ATC controller and IAC-ACC for urgent maintenance window.
 - iii. FRT shall report to ATC Controller and IAC-ACC for periodic update on repair works and the updated recovery time.
 - iv. FRT shall notify ATC controller and IAC-ACC after the power system is restored.
 - v. FRT shall coordinate with ATC controller for the restoration of power supply of AGL system to normal main power supply.

5.0 Contingency Procedures for Vault breakdown

- 5.1 Check if irregularities below are detected in CMS, the procedures would be activated
- i. Continuous audio warning buzzer may be generated from the CMS workstation; or
 - ii. In the AGL CMS workstations, many AGL facilities / components associated with one or more vaults are highlighted with yellow flashing indication.
- 5.2 Follow up procedures for reporting among relevant parties
- i. FRT and IAC-ACC shall be notified and report latest status.
 - ii. IAC-ACC shall notify CAD ATC controllers immediately if fault report is not initiated from them.
- 5.3 When the fault is reported, FRT shall respond and seek for the cause of the fault, check on status at affected vault and estimate the duration of recovery time.
- 5.4 If the damage to the vault is significant and the recovery is not expected in foreseeable short time, FRT shall report to ATC controller and IAC-ACC. The ATC controller shall assess the operation capability of the affected runway and taxiway facilities and arrange the necessary operation contingency.

- 5.5 FRT shall coordinate with ATC controller and IAC-ACC for the recovery program and execution of repair works
- i. FRT shall organize the recovery program with maintenance contractor and coordinate with ATC controller for urgent maintenance window.
 - ii. FRT shall report to ATC Controller and IAC-ACC for periodic update on repair works and the updated recovery time.
 - iii. FRT shall notify ATC controller and IAC-ACC after the system is restored to normal operation.

6.0 Interface with other operational organizations during contingency

6.1 CAD - ATC

6.2 IAC - ACC

6.3 TSI - FRT

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