ICAO

**Twenty-Third Meeting of the AFI Planning and Implementation Regional Group
(APIRG/23)
(Virtual 24 – 26 November 2020)**

Agenda Item 4:   Other Air Navigation Issues

4.1 Initiatives by States & Industry and other air navigation issues

Implementation of Multilateration (MLAT) to Facilitate Gate to Gate Surveillance

(Presented by Kenya)

SUMMARY
This working paper presents progress made by KCAA in the implementation of ASBU Module BO-75 (Safety and Efficiency of Surface Operations) under the Performance Improvement Area (Airport Operations).   To achieve the above, KCAA is in the process of implementing MLAT at some of the manned aerodromes that have not been facilitated with Surface Movement Radar (SMR). The solution is in consistency with ICAO Aviation System Block Upgrade (ASBU) adopted by KCAA in the 2015-2030 Strategic Plan.   **Action by the Meeting is outlined under item 3 of this paper**

REFRENCE(S):	1. ICAO – Concept on use of MLAT 2. ICAO Doc 10056 3. ICAO guidance material on to use MLAT and ADS-B to support ATS implementation (Cir 326) 4. ICAO Doc 4444 PANS-ATM 5. Factory Training Manuals
Related Strategic Objectives	1. Enhance global civil aviation safety 2. Increase the capacity and improve the efficiency of the global civil aviation system 3. Minimize the adverse environmental effects of civil aviation activities

1   INTRODUCTION

1.1   KCAA has embarked on implementation of MLAT system that is expected to operate independently for detections of aircraft/vehicles and vehicles on the maneuvering area (runway, Taxiways and Apron) at the following airports;

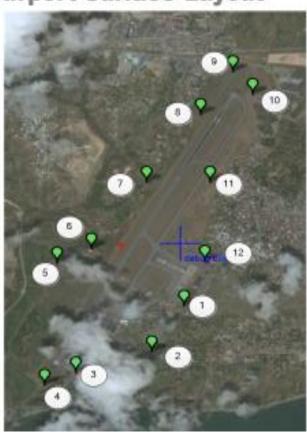- Moi International Airport (MIA) - Mombasa
- Wilson

- Kisumu
- Malindi

1.2   The system is expected to enhance provision of ATM in a variety of applications, from "radar-like" air traffic control purpose to enhanced situational awareness of surface movements by aerodrome controllers. It offers most advantages in situations where other surveillance systems (e.g. SMR) are not available.

2.   DISCUSSION

2.1.   Although MLAT can be combined with other surveillance systems in Kenya the system will be used independently.

2.2   MLAT will be applicable in the following areas; Airport surface surveillance applications for ground and aerodrome control including aircraft derived data for ground-based ATM tools, situational awareness including tagging obstacles, airport low visibility operations, multiple runway monitoring.

2.3   It will also support ground conflict detection by providing frequent updates of aircraft and vehicle positions and enable monitoring of aircraft and vehicles and provide protection against runway incursions, monitor taxiing operations in low visibility operations minima conditions.

2.4   The system has capability of on-line data recording and playback, including surveillance data, flight data, surface management data, operator's action information.

2.5   Applicable safety nets include conflict alert, special code alert, duplicate code alert, taxiway deviation alert, intrusion alert, visual and audio alert, amongst others.

2.6   Once operationalized, will increase ATS situational awareness of aircraft and vehicles on the ground allowing safe management of ground movements by providing full surveillance coverage of runways, taxiways and apron areas at MIA, Wilson, Kisumu and Malindi Airports.

2.7   To utilize the service, aircraft must be equipped with transponders and have them on prior to taxi/ pushback before departure and on arrival before switching off the engine(s). Vehicles must have their transponder on at all times while on the maneuvering area and apron. Interrogation is on 1030MHZ while reply is on 1090MHZ.

2.8   Aerodrome control will use MLAT to maximize utilization of RWYs and confirm that traffic is following instructions to and from the RWYs. Final approach monitoring will facilitate more precision to determine whether an aircraft is positioned to land on the correct runway and automatically generate an alert of such a situation.

2.9   The display will include position indications and map information required to provide ATS surveillance services including information on the identity of aircraft/vehicles. It will also provide continuous updated presentation of surveillance information including position indications.

2.10   MLAT provides operational improvements by addressing some of the limitations of traditional radar surveillance system, reduce controller workload and provide benefits in the areas of safety, capacity, efficiency and environmental impact, thus contributing to the overall ANS objectives.

2.11   In future, cost savings will also be achieved from the implementation of an MLAT and ADS-B based surveillance system rather than the life cycle expenses associated with installing, maintaining, and extending existing radar-based surveillance systems.

2.12   To ensure safety in the use MLAT within Kenya, the following procedure shall be adopted by controllers;
- Use the MLAT surveillance information for situation awareness ONLY.
- CONFIRM with the pilot/vehicle operator if identity provided by the MLAT system is inconsistent with the strip.
- Request pilot/vehicle operator to CHANGE the SSR code in event of detection of duplicated identity.
- DATCO shall REPORT all failures pertaining to MLAT display & erroneous data information.
- DATCO shall ensure CORRECT MAP display at all times (including aircraft stands).

2.13   Antennae location at Moi International Airport – Mombasa

Airport Surface Layout

Position of Antennae in relation to the airport surface

GS1	ATC Tower	RS	Building
GS2	VHF	RSRTS	Building
GS3	Power station	RS	Building
GS4	LOCALIZER	RS	Building
GS5	FIELD1	RS	Building
GS6	Radar Station	RSIS	Field
GS7	FIELD2	RS	Field
GS8	DME	RS	Building
GS9	FIELD3	RS	Building
GS10	Weather Station	RS	Field
GS11	FIELD4	RS	Building
GS12	Water Tower	RS	Building

3 ACTION BY THE MEETING

3.1   The meeting is invited to:

a) Take note of the progress made by Kenya in the implementation of MLAT system to provide Gate to Gate surveillance.

b) Urge States that have not deployed SMRs at manned airports consider deployment of MLAT as a low cost solution that will facilitate Gate to Gate surveillance so to enable seamless surveillance in AFI.

END