



WORKING PAPER

ASSEMBLY — 41ST SESSION

TECHNICAL COMMISSION

Agenda Item 31: Aviation Safety and Air Navigation Standardization

**PROPOSAL FOR AMENDMENT TO ANNEX14-AERODROMES, VOL 1 AND DOC 9830
REQUIRED FOR A A-SMGCS LEVEL 5 IMPLEMENTATION**

(Presented by the Republic of Korea)

EXECUTIVE SUMMARY

The purpose of the paper is to propose amendments to Annex 14 – *Aerodromes*, Volume 1 and Doc 9830, *Manual of Advanced Surface Movement Guidance and Control Systems* required for A-SMGCS Level 5 implementation to improve the ground safety of aircraft & vehicles and the efficiency of airport operations for the recovery of aviation demand.

Action: The Assembly is invited to:

- a) note the information provided in this paper; and
- b) review and comment on the proposed amendments to Annex 14, Volume 1 and Doc 9830 in the Appendix.

<i>Strategic Objectives:</i>	This working paper relates to the Air Navigation Capacity and Efficiency Strategic Objectives.
<i>Financial implications:</i>	Not determined.
<i>References:</i>	Annex 14 – <i>Aerodromes</i> , Volume 1 — <i>Aerodrome Design and Operations</i> Doc 9830, <i>Manual of A-SMGCS</i> Doc 9750, <i>Global Air Navigation Plan</i> Doc 10020, <i>Manual on Electronic Flight Bags</i> Doc 10044, <i>Manual on the Aeronautical Mobile Airport Communications System</i>

1. INTRODUCTION

1.1 Aerodrome control service environments are being developed using various methods such as electronic strips, A-SMGCS or AMAN/DMAN to prevent incorrect access to runways or taxiways, while ground operation environments for pilots still rely on voice communication, lighting and signs.

1.2 To tackle this issue, the Republic of Korea introduced “Follow the greens”(‘20.4) after relentlessly developing A-SMGCS since the establishment of A-SMGCS Level 4(‘17.12) and achieved ground-breaking results reducing the occurrence of incorrect access to runways or taxiways by more than 70 per cent.

1.3 But there are still concerns regarding sunlight reflection, difficulty in securing visibility due to low visibility, deviation of routes and runway incursions.

1.4 In response, the Republic of Korea is implementing the A-SMGCS Level 5 project with Incheon International Airport Corporation to strengthen ground safety, increase airport capacity and reduce carbon emissions and aircraft fuel consumption for the post-pandemic era.

2. DISCUSSION

2.1 In order to implement A-SMGCS Level 5, on-board equipment in the cockpit is essential to provide pilots with real-time ground movement route information, surrounding aircraft movement status and airport safety nets such as warning of route deviation and runway incursion based on information generated by A-SMGCS.

2.2 After a test using airport operation vehicles and towed aircraft, A-SMGCS information will be transmitted to the actual operating aircraft through Portable Electronic Flight Bags in the cockpit for the test operation.

2.3 This is significant in that it symbolizes the transition from an analogue environment that relies on voice communication and lighting to a digital operating environment and that it is the first information sharing platform that is being established between the cockpit and air traffic control system.

2.4 One of the challenges Korea faced during the project is that Annex 14 or Doc 9830 only stipulates the need to link A-SMGCS with on-board equipment.

2.5 Airport operators, airlines and airport authorities are experiencing trial and error due to insufficient regulations on the types of on-board equipment available in the cockpit, data link methods that can be used to connect the equipment and A-SMGCS and safety assessments.

2.6 In particular due to the recent surge in cyber terrorism, there is a need to establish regulations on data link methods that reflect security and reliability reviews between the on-board equipment and A-SMGCS.

2.7 To address the above mentioned issues, the paper proposes revising Annex 14, Volume 1 and Doc 9830.



<A future oriented airport infrastructure>

APPENDIX

A. Annex 14 – Aerodromes, Vol 1, Attachment A. Guidance Material supplementary

New text to be inserted is highlighted with grey shading.

23. Aerodrome mapping data

23.3 Determination of aerodromes to be considered for collection aerodrome mapping data features

In order to determine which aerodromes may make use of applications requiring the collection of aerodrome mapping data features, the following aerodrome characteristics may be considered:

- safety risks at the aerodrome;
- visibility conditions;
- aerodrome layout;
- traffic density; and
- data link system between A-SMGCS and the portable Electronic Flight Bags.

The aeronautical mobile airport communications system (AeroMACS) is an ICAO standardized data link system for the safety and regularity of flight operations in the aerodrome (airport) environment.

Note.— Further guidance on aerodrome mapping data can be found in the Airport Services Manual, Part 8 — Airport Operational Service (Doc 9137), Electronic Flight Bags can be found in the Manual on Electronic Flight Bags (Doc 10020) and AeroMACS can be found in the Manual on the Aeronautical Mobile Airport Communications System (Doc 10044).

B. Doc 9830 – Manual of A-SMGCS

3.6.3.4 When an A-SMGCS is designed with one or more of its functionalities dependent on on-board equipment, the system should have the ability to safely handle aircraft with unserviceable equipment. The portable Electronic Flight Bags could be used as one of the on-board equipment.

a) In order to use portable Electronic Flight Bags, the safety risk assessment of the airport operators or air navigation service providers and approval from the appropriate authority should be required.

b) The safety risk assessment on interference to/from avionics should be conducted.

Note.— Refer to the Manual on the Aeronautical Mobile Airport Communications System (Doc 10044), Manual on Electronic Flight Bags (Doc 10020) and the Safety Management Manual (Doc 9859).