International Civil Aviation Organization

Runway and Ground Safety Working Group

Fourth Meeting (RGS WG/4)
(Cairo, Egypt, 05-07 November 2017)

Agenda Item 4: **Coordination between RASG-MID and MIDANPIRG in the area of Aerodromes**

SAFETY AND EFFICIENCY ISSUES ASSOCIATED WITH
ASBU MODULE B0-A-SURF

(Presented by the Secretariat)

SUMMARY
This paper presents the status of implementation of the B0-SURF elements in the MID Region and the associated performance monitoring. It seeks ways and means to expedite the implementation in order to meet the agreed performance targets. Action by the meeting is at paragraph 3.

REFERENCES
- ANSIG/2 Report - MID Air Navigation Strategy (MID Doc 002) - MID e-ANP Volume III - MIDANPIRG/16 Report

1. INTRODUCTION

1.1   The MID Region Air Navigation Strategy was agreed by the Fourth meeting of the MIDANPIRG Steering Group (MSG/4, Cairo, Egypt, 24-26 November 2014) and further endorsed by the MIDANPIRG/15 as MID Doc. 002 to be the framework identifying the regional air navigation priorities, performance indicators and targets. The Strategy includes Tables for all twelve priorities 1 ASBU Modules along with their associated elements, applicability, performance Indicators, supporting Metrics and performance Targets.

1.2   B0-SURF: Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2) is a priority one ASBU module in the MID Air Navigation Strategy.

2. DISCUSSION

2.1   The Advanced Surface Movement Guidance and Control Systems (A-SMGCS) is an expansion of the Surface Movement, Guidance and Control Systems (SMGCS) to improve capacity and safety by making use of modern technologies and a higher level of integration between the various functionalities

2.2   A-SMGCS: improves access to portions of the manoeuvring area obscured from view of the control tower for vehicles and aircraft. Basic A-SMGCS provides surveillance and alerting of movements of both aircraft and vehicles on the aerodrome thus improving runway/aerodrome safety and capacity.

Implementation and Monitoring

2.3   A-SMGCS Levels 1-2 related to B0-SURF are to be implemented by a number of agreed international airports as included in the MID Region Air Navigation Strategy. Name of the applicable airports and implementation Performance Indicators/Supporting Metrics and Targets are included in Volume III of the MID e-ANP as at **Appendix A**.

2.4   The agreed B0-SURF main implementation elements are: Level 1 and Level 2 where:

- Level 1: provides improved surveillance and procedures covering the maneuvering area for ground vehicles and movement area for aircraft. The procedures concern identification and issuance of ATC instructions and clearances. The controllers are given traffic position and identify information which is an important step forward from the traditional Surface Movement Radar (SMR) image.

- Level 2: consists of the improvement of Level 1 existing functions and the introduction of the Control and Guidance functions. Several improvements need to be implemented, as surveillance data will be used by the runway safety net, the surveillance infrastructure will not be the same. In comparison to Level 1, the traffic information (position, identity) will be completed with other parameters like speed vector, and the performance will be enhanced, i.e. the position accuracy will be better. In addition, the automated control system shall be robust to failures of other ATC systems (Flight Data Processing System, etc.), or other A-SMGCS elements.

2.5   Details on the definition of A-SMGCS implementation levels and an implementation road map are provided in Eurocontrol document titled "Definition of A-SMGCS Implementation Levels" which is available at:
https://www.eurocontrol.int/articles/advanced-surface-movement-guidance-and-control-systems-smgcs .

2.6   Information on the B0-SURF implementation needs to be reported by the States to the ANSIG for necessary monitoring and update.

2.7   Implementation challenges include financial constraints, unavailability of supporting systems in the airports, training needs, and lack of qualified human resources.

2.8   Based on a survey carried out in September 2014, the ICAO MID Regional Office received information related to States' plans for A-SMGCS implementation. It was reported that the following airports have already implemented A-SMGCS Level 1-2: OMDB, OMAA, OMDW, OTBD, OTHH, and HECA.

2.9   For the purpose of performance monitoring and reporting, four (4) elements have been included in the MID Region Air Navigation Strategy: *Non-cooperative Surveillance Sensors (NCSS), Cooperative Surveillance Sensor (CSS), Data Fusion (FS), and Alert,* as Performance Indicators/Supporting Metrics, Targets and status of the implementation.

2.10   Detailed information on the monitoring of B0-SURF is included in Volume III of the MID e-ANP, including necessary supporting enablers (i.e. tables, databases, etc.), in order to be used as planning tools for the measurement of the air navigation systems performance. Concerned MID e-ANP Tables related to the status of implementation of the different B0-SURF elements are at **Appendix B**.

3.   **ACTION BY THE MEETING**

3.1   The meeting is invited to urge States to:

 a) review and update the status of implementation of the different B0-SURF elements;

 b) identify the difficulties faced in the implementation of B0-SURF elements; and

 c) recommend measures to expedite the implementation process and meet the agreed performance targets.

APPENDIX A

B0-SURF: Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)

Description and purpose

Basic A-SMGCS provides surveillance and alerting of movements of both aircraft and vehicles on the aerodrome thus improving runway/aerodrome safety. ADS-B information is used when available (ADS-B APT).

Main performance impact:

KPA- 01 – Access and Equity	KPA-02 – Capacity	KPA-04 – Efficiency	KPA-05 – Environment	KPA-10 – Safety
Y	Y	Y	Y	Y

Applicability consideration:

A-SMGCS is applicable to any aerodrome and all classes of aircraft/vehicles. Implementation is to be based on requirements stemming from individual aerodrome operational and cost-benefit assessments. ADS-B APT, when applied is an element of A-SMGCS, is designed to be applied at aerodromes with medium traffic complexity, having up to two active runways at a time and the runway width of minimum 45 m.

B0-SURF: Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)			
Elements	*Applicability*	**Performance Indicators/Supporting Metrics**	**Targets**
A-SMGCS Level 1*	OBBI, HECA, OIII, OKBK, OOMS, OTBD, OTHH, OEDF, OEJN, OERK, OMDB, OMAA, OMDW	Indicator: % of applicable international aerodromes having implemented A-SMGCS Level 1 Supporting Metric: Number of applicable international aerodromes having implemented A-SMGCS Level 1	70% by Dec. 2017
A-SMGCS Level 2*	OBBI, HECA, OIII, OKBK, OOMS, OTBD, OTHH, OEJN, OERK, OMDB, OMAA, OMDW	Indicator: % of applicable international aerodromes having implemented A-SMGCS Level 2 Supporting Metric: Number of applicable international aerodromes having implemented A-SMGCS Level 2	50% by Dec. 2017

Reference: Eurocontrol Document – "Definition of A-SMGCS Implementation Levels, Edition 1.2, 2010".

TABLE B0-SURF (A-SMGCS Level 1-2)

EXPLANATION OF THE TABLE

Column

1   Name of the State

2   Name of City/Aerodrome and Location Indicator where A-SMGCS is required

3   Status of implementation of A-SMGCS Level 1, where:
           Y – Yes, implemented
           N – No, not implemented

4   Status of implementation of A-SMGCS Level 2, where:
           Y – Yes, implemented
           N – No, not implemented

5   Action plan — short description of the State's Action Plan with regard to the implementation of A-SMGCS Level 1-2, especially for items with "N".

6   Remarks - additional information (e.g. case of difference between level 1 and level 2 applicability)

State	City/ Aerodrome Location Indicator	Level 1	Level 2	Action Plan	Remarks
1	*2*	*3*	*4*	*5*	*6*
BAHRAIN	Bahrain/Bahrain Intl (OBBI)	N	N	A-SMGCS Level 1, 2 Projects is under execution phase. Expected completion on Dec 2018	
EGYPT	Cairo/Cairo Intl (HECA)	Y	Y		
IRAN	Tehran/Mehrabad Intl (OIII)	N	N		
KUWAIT	Kuwait/Kuwait Intl (OKBK)	N	N		
OMAN	Muscat/Muscat Intl (OOMS)	N	N		
QATAR	Doha/Doha Intl (OTBD)	Y	Y		
QATAR	Doha/Hamad Intl (OTHH)	Y	Y		
SAUDI ARABIA	Dammam/King Fahad Intl (OEJN)	N	N		
SAUDI ARABIA	JEDDAH/King Abdulaziz Intl (OEJN)	N	N		
SAUDI ARABIA	RIYADH/King Khalid Intl (OERK)	N	N		
UAE	Abu Dhabi/Abu Dhabi Intl (OMAA)	Y	Y	Level 4 -2017	
UAE	Dubai/Dubai Intl (OMDB)	Y	Y	Level 4 – 2016 (implemented)	
UAE	DUBAI/Al Maktoum Intl (OMDW)	Y	Y	Level 4 - 2018	
Total Percentage		46%	46%		

Table B0-SURF Implementation

EXPLANATION OF THE TABLE

Column:

1   Name of the State.

2   Name of City/Aerodrome and Location Indicator

3   **Non-cooperative Surveillance Sensors (NCSS):** e.g. Surface Movement Radar (SMR). This is required for Level 1 and Level 2.
Implementation status of (NCSS) is indicated by:
         Y – Yes, implemented
         N – No, not implemented

4   **Cooperative Surveillance Sensor (CSS)**: e.g.; Multilateration and ADS-B. This is required for Level 1 and Level 2.
Implementation status of (CSS) is indicated by:
         Y – Yes, implemented
         N – No, not implemented

5   **Data Fusion (FS)**: The process of combining surveillance information from two or more sensor systems or sources. This is required for Level 1 and Level 2.
Implementation status of (FS) is indicated by:
         Y – Yes, implemented
         N – No, not implemented

6   **Alert**: Conflict/infringement detection. This is required for Level 2
Implementation status of Alert is indicated by:
         Y – Yes, implemented
         N – No, not implemented

7   Action Plan: short description of the State's Action Plan with regard to the implementation of A-SMGCS.

8   Remarks — additional information (e.g. case of difference between level 1 and level 2 applicability)

TABLE B0-SURF
Monitoring of A-SMGCS Elements Implementation

State	City/Aerodrome Location Indicator	NCSS	CSS	DF	Alert	Action Plan	Remarks
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
BAHRAIN	Bahrain/Bahrain (OBBI)						
EGYPT	Cairo/Cairo Intl (HECA)						
IRAN,	Tehran/Mehrabad (OIII)						
KUWAIT	Kuwait/Kuwait Intl (OKBK)						
OMAN	Muscat/Muscat Intl (OOMS)						
QATAR	Doha/Doha Intl (OTBD)						
QATAR	Doha/Hamad Intl (OTHH)						
SAUDI ARABIA	JEDDAH/King Abdulaziz Intl (OEJN)						
SAUDI ARABIA	RIYADH/King Khalid Intl (OERK)						
UAE	Abu Dhabi/Abu Dhabi (OMAA)						
UAE	Dubai/Dubai Intl (OMDB)						
UAE	DUBAI/Al Maktoum (OMDW)						

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