ASBU Modules
B0-SURF & B0-ACDM

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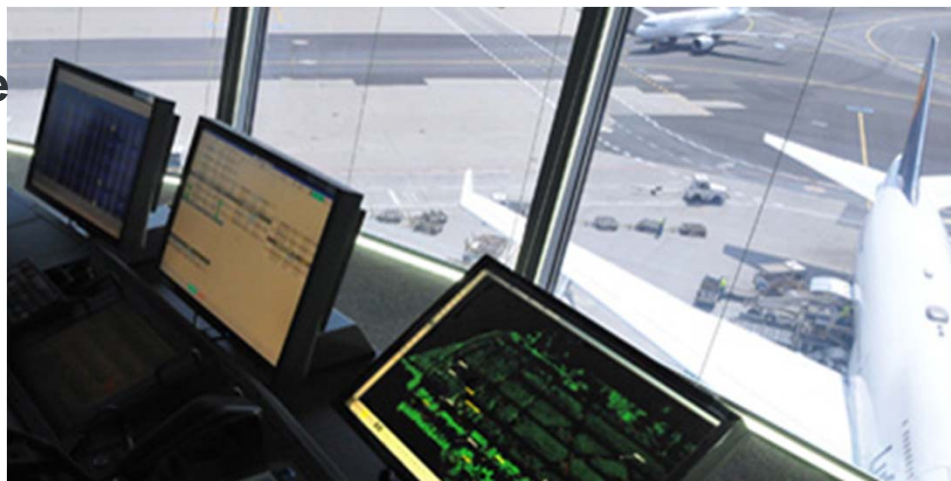*ICAP MID Regional Office*

Cairo, 24 November 2015

B0-SURF

Safety and Efficiency of Surface Operations

(A-SMGCS Level 1-2)
Airport surface surveillance

A-SMGCS

- The Advanced Surface Movement Guidance and Control Systems (A-SMGCS) is an expansion of the Surface Movement, Guidance and Control Systems (SMGCS).

- It aims to improve capacity and safety by making use of modern technologies and a higher level of integration between the various functionalities

Baseline

- Surface operations historically have been managed by use of visual scanning by both ANSP personnel and flight crew

- Enhanced surface situational awareness based upon use of an aerodrome surface movement primary radar system and display (SMR).

Fundamentals

- **Surveillance**
  - Enhances primary radar surface surveillance with the addition of at least one cooperative surface surveillance system.
  - Systems include Multilateration, Secondary Surveillance Radar Mode S, Automatic Dependent Surveillance – Broadcast (ADS-B)
    - Marginal improvement in routine management of taxi operations
    - More efficient sequencing of aircraft departures.

- **Alerting**
  - Alerting with flight identification information improves the ATC response to situations requiring resolution ex: runway incursion incidents and improved response times to unsafe surface situations
  - Levels of sophistication vary considerably

Necessary Procedures (Air & and Ground)

- Flight crew procedures specific to A-SMGCS are not beyond those associated with basic operation of aircraft transponder systems and settings of aircraft identification.
- Vehicle drivers must be in a position to effectively operate vehicle transponder systems.
- ATC is required to apply procedures specific to A-SMGCS

Necessary System Capability

- **Avionics**
  - Existing aircraft ADS-B and/or SSR transponder systems, including correct setting of aircraft identification.
- **Vehicles**
  - Vehicle cooperative transponder systems, type as a function of the local A-SMGCS installation. Industry solutions readily available
- **Ground systems**
  - A-SMGCS: The surface movement radar should be complemented by a cooperative surveillance means allowing to track aircraft and ground vehicles. A surveillance display including some alerting functionalities is required in the tower.
  - ADS B APT: cooperative surveillance infrastructure deployed on the aerodrome surface; installation of a tower traffic situational awareness display.

Training and Qualification Requirements

- Training in the operational standards and procedures are required for this module

- Likewise, the qualifications requirements are identified in the regulatory requirements which form an integral part to the implementation of this module.

Regulatory/Standardization needs and Approval Plan (Air & Ground)

- Standards approved for aerodrome Multilateration, ADS-B and safety logic systems exist for use in:
  - Europe
  - The United States
  - Other member States.

- Standards for SMR exist for use globally.

Benefits and Elements

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

- **Benefits: Access, Capacity, Efficiency, Environment and Safety**
- **Elements:**
  - **Visual aids, Wild life strike hazard reduction**
  (Not included in the Module)
  - **Multilateration, SSR Mode S, and ADS-B/transponder for both aircraft and vehicles**
  - **Alerting systems with flight identification information**
  To be reflected in ANRF

Implementation Challenges

- Financial constraints,

- Supporting systems in the airports,

- Training and lack of qualified personnel

MID Air Navigation Strategy

- Identified B0-SURF and B0-ACDM modules as the priority 1 ASBU Block 0 to be implemented in the MID Region:

Applicability in the MID Region

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

BO-SURF Implementation

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 Project is under Execution. Expected completion on Dec 2015	
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	Jeddah/King Abdulaziz Intl (OEJN)	N	N		
	Riyadh/King Khalid Intl (OERK)	N	N		
	Dammam/King Fahad Intl (OEDF)	N	N		
UAE	Abu Dhabi/Abu Dhabi Intl (OMAA)	Y	Y	Level 4 2017	
	Dubai/Dubai Intl (OMDB)	Y	Y	Level 4 2016	
	Dubai/Al Maktoum Intl (OMDW)	Y	N	Level 4 2018	
Percentage		46%	46%		

AFI Air Navigation System Implementation Plan

B0-SURF

- Category: Optional
- Priority 2 (Recommended Implementation by June 2018)
- Applicability area: To be determined

AFI Air Navigation System Implementation Plan
B0-SURF

Ground

– Indicator: Percentage of international aerodromes with SMR/ SSR Mode S/ ADS-B Multilateration for ground surface movement

– Supporting metric: Number of international aerodrome with SMR/ SSR Mode S/ ADS-B Multilateration for ground surface movement

Avionics

– Indicator: Percentage of surveillance system on board (SSR transponder, ADS B capacity)

– Supporting metric: Number of aircraft with surveillance system on board (SSR transponder, ADS B capacity)

Vehicles

– Indicator: Percentage of international aerodromes with a cooperative transponder systems on vehicles

– Supporting metric: Number of vehicle with surveillance system installed

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- Any Questions

A-CDM

- Airport Collaborative Decision Making (A-CDM) is being actively encouraged by ICAO and the sector organizations for airports (ACI), airlines (IATA) and ATC (CANSO)

Objectives

- Predictability
- On time performance

- Gate / Stand usage
- Taxiway Apron Congestion

Stakeholders

- Aerodrome Operator
- Airlines
- ATC
- Ground Handlers
- Others

Collaboration

Benefits

– <u>Airport</u> operators – ACDM improves the efficient use of stands/gates and increase airport capacity.

– <u>Aircraft</u> operators – ACDM will help them reduce surface movement costs due to lower fuel consumption as a result of reduced taxiing and runway end holding times, also reducing environmental impact.

– <u>Ground handling</u> service providers – ACDM will make data available more in advance, permit better planning of tasks, and improve, inter alia, awareness of aircraft status on the ground, thus reducing delays.

Benefits (cont.)

– <u>Air traffic service providers</u> – ACDM can improve flow control and increase airspace capacity.

– <u>Air traffic controllers</u> – ACDM can assist in the development of runway improvements and capacity planning.

– <u>Passengers</u> – Passengers will also obtain significant benefits since it will improve punctuality, increase customer satisfaction, reduce lost connections, and they will have better information and service when incidents occur.

Implementing Airport CDM under Adverse Conditions

ATC may take steps to mitigate:

- Planning of diversions to other airports
- Ground stopping departures at affected airports
- Avoiding airspace congestion in the region
- Planning and implementing traffic recovery measures

Adverse Conditions

Forecast Weather
- Sandstorm
- Snow

Applicability in the MID Region

B0 – ACDM: Improved Airport Operations through Airport-CDM			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
A-CDM	OBBI, HECA, OIII, OKBK, OOMS, OTBD, OTHH, OEJN, OERK, OMDB, OMAA, OMDW	Indicator: % of applicable international aerodromes having implemented improved airport operations through airport-CDM Supporting metric: Number of applicable international aerodromes having implemented improved airport operations through airport-CDM	40% by Dec. 2017

A-CDM in the MID Region

State	City/ Aerodrome Location Indicator	Apron Management	ATM-Aerodrome Coordination	Terminal & runway capacity declared	Action Plan	Remarks
1	2	3	4	5	6	7
BAHRAIN	Bahrain/Bahrain Intl (OBBI)	N	N	N	2018	
EGYPT	Cairo/Cairo Intl (HECA)	N	N	N		
IRAN	Tehran/Mehrabad Intl (OIII)	N	N	N		
KUWAIT	Kuwait/Kuwait Intl (OKBK)	N	N	N		
OMAN	Muscat/Muscat Intl (OOMS)	N	N	N		
QATAR	Doha/Doha Intl (OTBD)	N	N	N		
QATAR	Doha/Hamad Intl (OTHH)	N	N	N		
SAUDI ARABIA	Jeddah/King Abdulaziz Intl (OEJN)	N	N	N		
	Riyadh/King Khalid Intl (OERK)	N	N	N		
UAE	Abu Dhabi/Abu Dhabi Intl (OMAA)	N	N	N	2017	
	Dubai/Dubai Intl (OMDB)	N	N	N	2016	
	Dubai/Al Maktoum Intl (OMDW)	N	N	N	2017	
Percentage		0	0	0		

MID A-CDM Seminar

- The ICAO MID Regional Office organized a Seminar on A-CDM hosted by Bahrain from 11 to 13 October 2015 to :

a) provide the MID States and service providers with an introduction to the A-CDM and the need to implement ASBU module B0-ACDM;

b) provide an overview on implementation requirements and challenges; and

c) share experience/best practices techniques for A-CDM implementation.

Outcomes of the MID A-CDM Seminar

- MID States and stakeholders to consider the establishment of A-CDM Committee to foster the implementation of A-CDM at the airports identified by the MID Air Navigation Strategy and request assistance from ICAO MID Regional Office, if needed;
- Terminal congestion, particularly in adverse weather conditions, should be considered as part of the A-CDM;
- Roles and responsibilities of regulators, aerodromes, air operators, ground handling agents and ATC should be clearly defined for A-CDM implementation; and
- ICAO to consider the above elements in drafting the A-CDM manual

AFI Air Navigation System Implementation

B0-ACDM

– Category: Essential

– Priority 1 (Immediate Implementation by December 2015)

– Applicability area to be determined

AFI Air Navigation System Implementation

B0-ACDM

– Indicator: Percentage of international aerodromes with Airport-CDM

– Supporting metric: Number of international aerodromes with Airport-CDM