International Civil Aviation Organization

AIR NAVIGATION SYSTEMS IMPLEMENTATION GROUP

Third Meeting (ANSIG/3)
(Cairo, Egypt, 2 – 4 July 2018)

Agenda Item 4.2.1: MID Region ASBU Implementation

STATUS OF IMPLEMENTATION OF B0-SURF AND B0-ACDM

(Presented by the Secretariat)

SUMMARY

This paper presents the status of implementation of B0-SURF and B0-ACDM in the MID Region and highlights recommended steps for the effective implementation of ACDM.

Action by the meeting is at paragraph 3.

REFERENCES

- MID Air Navigation Strategy (MID Doc 002)
- MIDANPIRG/16 Report

1. INTRODUCTION

1.1 PIA1 (*Airport Operations*) includes five (5) Modules in Block0 from which B0-SURF and B0-ACDM have considered priority 1 for implementation in the MID Region.

1.2 B0-SURF aims at enhancing safety and efficiency of surface operations through implementation of Advanced Surface Movement Guidance and Control System (A-SMGCS). A-SMGCS provides surveillance and alerting of movements of both aircraft and vehicles on the aerodrome thus improving runway/aerodrome safety and capacity.

1.3 B0-ACDM aims at Improved Airport Operation through Airport Collaborative Decision Making (ACDM). It is to be highlighted that ACDM implementation will enhance surface operations and safety by making airspace users, ATC and airport operators better aware of their respective situation and actions on a given flight.

2. DISCUSSION

B0-SURF IMPLEMENTATION STATUS

2.1 Performance Indicators/Supporting Metrics, Targets and status of the implementation of B0-SURF are detailed in **Appendices A** and **B**, respectively.

B0-ACDM IMPLEMENTATION STATUS

2.2 ACDM is a Concept, which aims at improving Air Traffic Flow and Capacity Management (ATFCM) at airports by reducing delays, improving the predictability of events and optimising the utilisation of resources.

2.3 Performance Indicators/Supporting Metrics, Targets and status of the implementation of B0-ACDM are detailed in **Appendices A** and **B**, respectively.

2.4 MIDANPIRG/16 meeting noted the outcome of the ICAO ACDM Seminar (Bahrain, 11-13 October 2015) that was organized in order to support the implementation of B0-ACDM in the MID Region and agreed to the following Conclusion:

CONCLUSION 16/6: ACTION PLAN FOR ACDM IMPLEMENTATION

That, in line with the MID Air Navigation Strategy, States concerned:

a) be urged to develop their ACDM implementation plan, with the support of ICAO MID Office, if required; and

b) *provide the ICAO MID Office with a copy of their plan before 1 November 2017.*

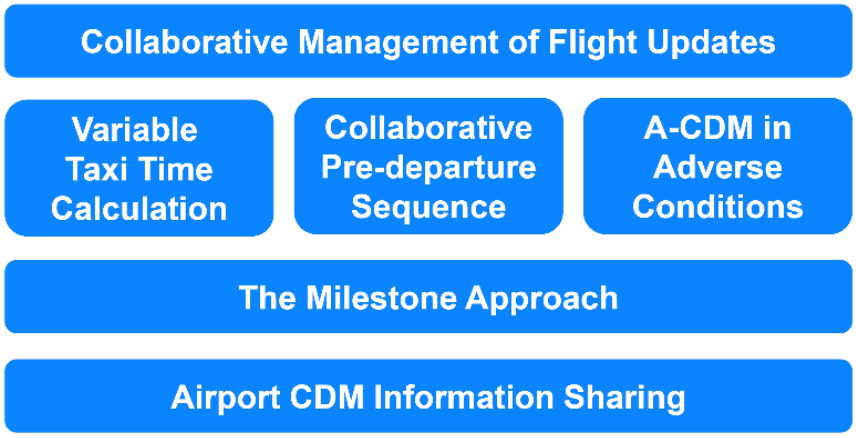
B0-ACDM Challenges

2.5 The meeting may wish to note that the following challenges related to ACDM implementation have been identified:

- Lack of knowledge and expertise (need for training);
- ACDM is a new culture of collaboration;
- Need of cooperation from all partners;
- Handling of commercially and security sensitive information;
- ACDM functions appropriate usage;
- Financial resources.

2.6 The full Airport Collaborative Decision Making (ACDM) implementation is a lengthy process involving all aviation stakeholders, which may take years to complete and become mature.

2.7 ACDM is a set of improved processes supported by the interconnection of various airport stakeholders information systems. It includes application designed to implement collaborative procedures that will allow the sharing of surface operations data among the different stakeholders at the airport. ACDM implementation elements have been defined as follow:



2.8 When ACDM is introduced as a project on an airport, the partners have to understand and discuss the impact and organisation of such a project. Moreover, they need to prepare their own organisations for the work ahead, including the cooperation with other partners.

2.9 The meeting may wish to encourage States/Aerodromes required to implement ACDM (Ref.: MID Region Air Navigation Strategy) to follow the recommended steps detailed in **Appendix C**.

ACDM Implementation (Prioritized Elements: Information Sharing and Milestones Approach)

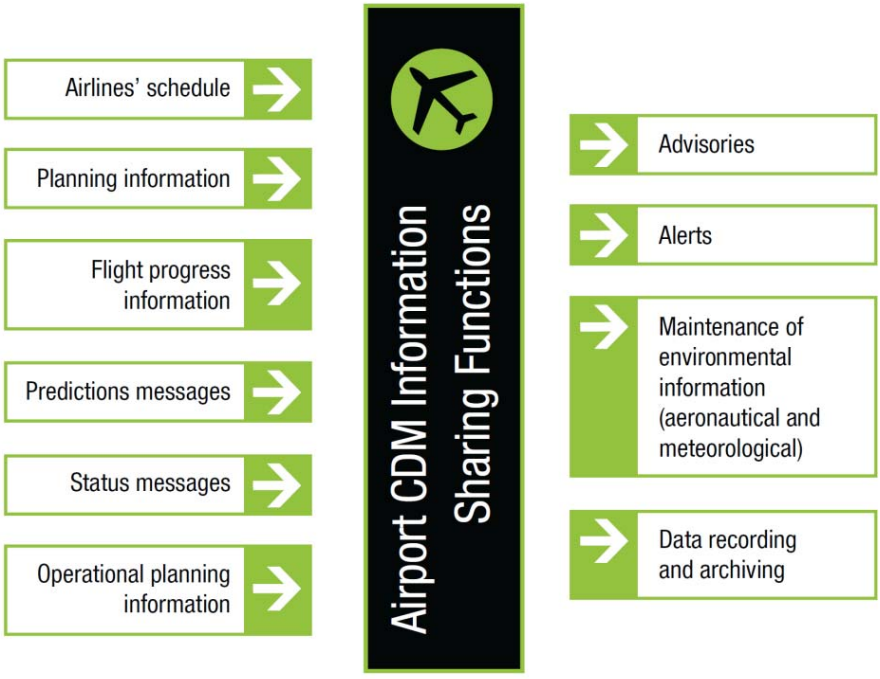
2.10 The following suggested implementation sequence of the ACDM elements could be followed for the implementation of ACDM:

1. **ACDM Information Sharing**
2. **Milestones Approach (ACDM Turn-round Process)**
3. Variable Taxi Time Calculation
4. Collaborative Management of Flight Updates
5. Collaborative Pre-Departure Sequence
6. ACDM in Adverse Conditions.

2.11 ACDM Information Sharing and ACDM Milestones Approach (Turn-round Process) are considered the main elements that should be considered high priority/fundamental elements during ACDM implementation process.

Information Sharing

2.12 Information Sharing is the first ACDM Element, which creates the foundation for all other functions. Therefore, it is essential to implement this element, in the first place. The relevance of ACDM Information is shown as follow:



2.13 ACDM Information Sharing platform ties the partners together in their aim to efficiently coordinate airport activities, and forms the foundation for other ACDM Concept Elements and supports local decision making for each of the partners and facilitates implementation of ACDM elements by:

- connecting ACDM Partners data processing systems;
- providing a single, common set of data describing the status and intentions of a flight; and
- serving as a platform for information sharing between partners.

Target Off-Block Time (TOBT)

2.14 The Target Off-Block Time (TOBT) is a key time that an Aircraft Operator or Ground Handler estimates that an aircraft will be ready, all doors closed, boarding bridge removed, push back vehicle available and ready to start up/push back immediately upon reception of clearance from the TWR.

2.15 With the implementation of Information Sharing, the TOBT prediction by the Aircraft Operator or Ground Handler becomes the second major step to implement, before all other elements.

Milestones Approach

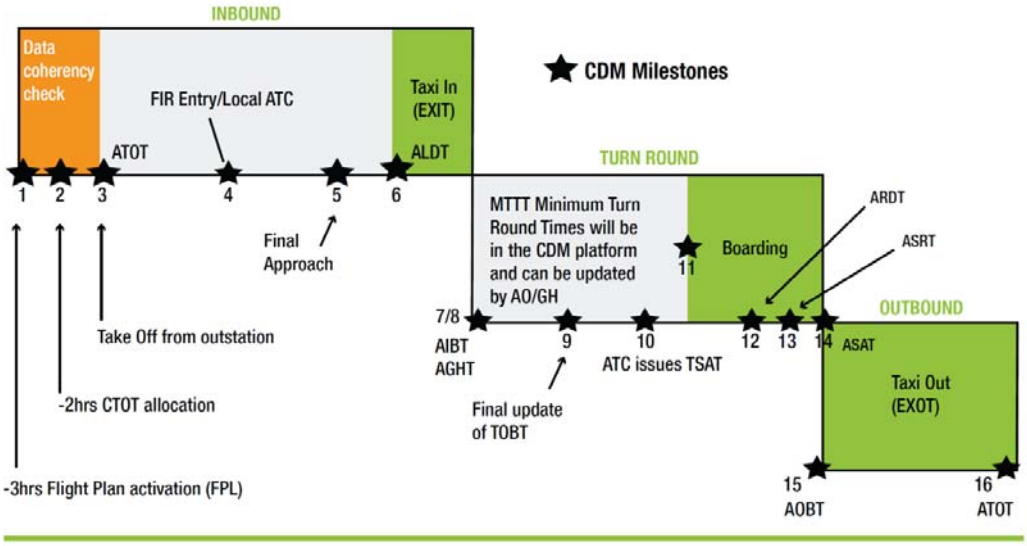
2.16 Where ACDM Information Sharing has been implemented, significant further improvements can be achieved by implementing the Milestone Approach for the turn-round process.

2.17 The Milestone aims to have an early and accurate prediction by the Aircraft Operator, in order for Air Traffic Control, Airport Operator, and Ground Handlers to anticipate for resources or traffic planning purposes. With prediction of TOBT in place, improved prediction of target take off times, start up times, and taxi time will become possible.

2.18 The progress of a flight is tracked in the ACDM Platform by a continuous sequence of different events, known as milestones, and rules for updating downstream information and the target accuracy of the estimates are defined. Different ACDM Partners can be responsible for different milestones, with the aim of integrating all of the milestones into a common seamless process for the flight.

2.19 The main objective of the Milestone Approach is to further improve the common situational awareness of all partners when the flight is inbound and in the turn-round flight phases. More specifically, the objectives are to:

- determine significant events in order to track the progress of flights and the distribution of these key events as Milestones;
- define information updates and triggers: new parameters, downstream estimates updates, alert messages, notifications, etc;
- specify data quality in terms of accuracy, timeliness, reliability, stability and predictability based on a moving time window;
- ensure linkage between arriving and departing flights;
- enable early decision making when there are disruptions to an event; and
- improve quality of information.



2.20 In connection with the above, the meeting is invited to review and update, as necessary, the Table at **Appendix D**, proposed for inclusion in the MID eANP Vol III for the monitoring of ACDM implementation (to replace the current B0-ACDM Table). Accordingly, the meeting is invited to agree to the following Draft Conclusions:

DRAFT CONCLUSION 3/XX: TABLE B0-ACDM 3-1

*That, the Table at **Appendix D** be included in the MID eANP Vol III (B0-ACDM) for the collection of data and monitoring of ACDM implementation.*

DRAFT CONCLUSION 3/XX: SURVEY ON ACDM IMPLEMENTATION

*That, a Survey on ACDM implementation be carried out for the population of the Table B0-ACDM 3-1 at **Appendix D**.*

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) review and update the status of implementation of B0-SURF and B0-ACDM at **Appendices A** and **B**, respectively;
b) encourage States/Aerodromes required to implement ACDM to follow the recommended steps detailed in **Appendix C**; and
c) endorse the Draft Conclusions at para. 2.20.

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".*

B0 – ACDM: Improved Airport Operations through Airport-CDM

Description and purpose

To implement collaborative applications that will allow the sharing of surface operations data among the different stakeholders on the airport. This will improve surface traffic management reducing delays on movement and manoeuvring areas and enhance safety, efficiency and situational awareness.

Main performance impact:

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

Applicability consideration:

Local for equipped/capable fleets and already established airport surface infrastructure.

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

APPENDIX B

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-ACDM

EXPLANATION OF THE TABLE

Column

1 Name of the State

2 Name of City/Aerodrome and Location Indicator

3 Status of implementation of Apron Management, where:
Y – Yes, implemented
N – No, not implemented

4 Status of implementation of ATM-Aerodrome coordination, where:
Y – Yes, implemented
N – No, not implemented

5 Terminal & runway capacity is declared, where:
Y – Yes, declared
N – No, not declared

6 Action plan — short description of the State's Action Plan with regard to the implementation of B0-ACDM.

7 Remarks

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	2018-2019	
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		
SAUDI ARABIA	RIYADH/King Khalid Intl (OERK)	N	N	N		
UAE	Abu Dhabi/Abu Dhabi Intl (OMAA)	Y	Y	Y	2017	Final Operational test Q4 2017 Full implementation Q1 2018
UAE	Dubai/Dubai Intl (OMDB)	Y	Y	Y	2017	
~~UAE~~	~~DUBAI/Al Maktoum Intl (OMDW)~~	~~N~~	~~N~~	~~N~~	~~No~~	~~No operational requirement~~
Total Percentage		**18%**	**18%**			

APPENDIX C

Recommended Steps for the effective implementation of ACDM

STEP:	EXPLANATION OF THE STEPS
1	ACDM Familiarization of All Partners: *Note 1- As Airport CDM includes a whole set of new procedures and processes, a training phase to understand these new features will be needed for all partners.*
2	Setting the Organization Structure *Note 2- Setting the Organization Structure at the airport level which to be responsible of the ACDM implementation and guide the project decision making process.*
3	Conduct ACDM GAP Analysis *Note 3- GAP Analysis related to ACDM Implementation with the involvement of all concerned partners may be conducted to achieve a clear vision of what is available and what is missing within the airport partners' technical infrastructure.*
4	Conduct Cost Benefit Analysis (CBA) *Note 4- Cost Benefit Analysis (CBA) may be conducted to contribute to a managerial decision on whether Airport CDM will be implemented at the airport.*
5	ACDM MoU Signature *Note 5- At airport level a Memorandum of Understanding (MoU) between the airport partners defines the ownership, the responsibilities, the rules for exchange and the confidentialities of data between the different parties. In particular, it specifies for each data in the Airport CDM Platform who is the owner, how it is managed and updated and who can read it and modify it. The rules for connections between systems to feed the Airport CDM Platform are also described in this MoU.* *Note 6- Since the Memorandum of Understanding sets the framework of the Airport CDM Project, it should be signed by all the airport partners as soon as they have decided to implement Airport CDM and they have agreed on the general objectives and responsibilities of each participant.* *Note 7- Note: Partners are defined as Aircraft Operators, Air Traffic Services, Airport operations Services, Ground Handlers, service providers and any other partners with a contribution to make to, and a benefit to derive from, Airport Collaborative Decision Making.*
6	Establishment of ACDM project plan *Note 8- ACDM project plan should include, mainly, Concepts Elements, Training, Technical Validation and Concept Validation.*
7	ACDM Elements Implementation *Note 9- **Information Sharing** is essential since it forms the foundation for all the other subsequent elements.* *Note 10- **The Milestones Approach (Turn- Round Process)** aims to achieve common situational awareness by tracking the progress of a flight from the initial planning to the take off.*

*Note 11- **Variable Taxi Time** is the key to predictability of accurate take-off in block times especially at complex airports.*

*Note 12- **Collaborative Management of Flight Updates** enhances the quality of arrival and departure information exchanges between the Network Operations and the CDM airports*

*Note 13- **Collaborative Pre-departure Sequence** establishes an off-block sequence taking into account operators preferences and operational constraints.*

*Note 14- **ACDM in Adverse Conditions** achieves collaborative management of a ACDM during periods of predicted or unpredicted reductions of capacity.*

8 Establish ACDM risks and mitigation Project

Note 15- ACDM risks and mitigation Project includes risks which are unique to Airport CDM and others which will be known from other projects within the Airport CDM context.

9 ACDM KPIs and performance measurement

Note 16- Objectives should be set and agreed by all partners, together with an agreed process to measure the achievement of the objectives (agreement on performance indicators). It is also vitally important that these agreements cover all the partners, collectively and individually.

APPENDIX D

Table B0-ACDM 3-1

EXPLANATION OF THE TABLE

Column:

1- Name of the State

2- Aerodrome and Location Indicator

3 & 4 Fundamental ACDM Elements

3-Information Sharing:
FI – Fully Implemented
PI – Partially Implemented
NI – Not Implemented

Note 1- Information Sharing is essential since it forms the foundation for all the other subsequent elements.

4-The Milestones Approach (Turn- Round Process)
FI – Fully Implemented
PI – Partially Implemented
NI – Not Implemented

Note 2- The Milestones Approach (Turn- Round Process) aims to achieve common situational awareness by tracking the progress of a flight from the initial planning to the take off.

5 – 8 Other ACDM Elements

5- Variable Taxi Time
FI – Fully Implemented
PI – Partially Implemented
NI – Not Implemented

Note 3- Variable Taxi Time is the key to predictability of accurate take-off in block times especially at complex airports.

6-Collaborative Management of Flight Updates
FI – Fully Implemented
PI – Partially Implemented
NI – Not Implemented

Note 4- Collaborative Management of Flight Updates enhances the quality of arrival and departure information exchanges between the Network Operations and the CDM airports.

7-Collaborative Pre-departure Sequence
FI – Fully Implemented
PI – Partially Implemented
NI – Not Implemented

Note 5- (Collaborative) Pre-departure Sequence establishes an off-block sequence taking into account operators preferences and operational constraints.

8-ACDM in Adverse Conditions

FI – Fully Implemented

PI – Partially Implemented

NI – Not Implemented

Note 6- ACDM in Adverse Conditions achieves collaborative management of a ACDM during periods of predicted or unpredicted reductions of capacity.

9- Action Plan — short description of the State's Action Plan with regard to ACDM Implementation, especially for items with a "PI" or "NI" status, including planned date(s) of full compliance, as appropriate.

10- Remarks — additional information, including detail of "PI" or "N", as appropriate.

APPENDIX D

Table B0-ACDM 3-1

State	Aerodrome Location Indicator	ACDM IMPLEMENTATIOM ELEMENTS							
		Fundamental ACDM Elements		Other ACDM Elements				Action Plan	Remarks
		Information Sharing	Milestones Approach	Variable Taxi Time	Collaborative Management of Flight Updates	Collaborative Pre-departure Sequence	ACDM in Adverse Conditions		
1	2	3	4	5	6	7	8	9	10
Bahrain	OBBI								
Egypt	HECA								
Iran	OIII								
Kuwait	OKBK								
Oman	OOMS								
Qatar	OTBD								
	OTHH								
Saudi Arabia	OEJN								
	OERK								
UAE	OMDB								
	OMAA								

- END -