INTERNATIONAL CIVIL AVIATION ORGANIZATION

THE MIDDLE EAST AIR NAVIGATION PLANNING AND IMPLEMENTATION REGIONAL GROUP (MIDANPIRG)

REPORT OF THE SIXTH MEETING OF CNS SUB-GROUP

(Tehran, Iran, 9 – 11 September 2014)

The views expressed in this Report should be taken as those of the MIDANPIRG CNS Sub-Group and not of the Organization. This Report will, however, be submitted to the MIDANPIRG and any formal action taken will be published in due course as a Supplement to the Report.

Approved by the Meeting
and published by authority of the Secretary General

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PART I – HISTORY OF THE MEETING

1. PLACE AND DURATION

1.1 The Sixth meeting of the MIDANPIRG Communication, Navigation and Surveillance Sub-Group (CNS SG/6) was hosted by Tehran, Islamic Republic of Iran at Hotel Parsian Azadi in Tehran, Iran from 9 to 11 September 2014.

2. OPENING

2.1 Dr. Alireza Jahangirian, Vice Minister of Roads and Urban Development and President of Civil Aviation Organization (CAO) of Iran opened the meeting. He welcomed all the participants to Iran and the City of Tehran in his opening. He emphasized on the harmonization of the CNS infrastructure in the Region and with other Regions in order to have interoperability between the systems. Dr. Jahangirian also highlighted the difficulties that the Islamic Republic of Iran is facing for procuring/maintaining the necessary infrastructure/equipment, due to the sanctions. He said that CNS system is the back bone of the air navigation and air traffic management systems and the efficient and trustable functions of these systems is vital to increase the safety and efficacy of air navigation network. Dr. Jahangirian highlighted that the cooperation among States has the fundamental role in air traffic management and underlined that the most important capital in CNS is then availability of knowledgeable and skillful human resources.

Dr. Jahangirian indicated that the traffic in Tehran FIR doubled lately due to the avoidance of Baghdad FIR by some airlines, which put a lot of pressure on Iran to accommodate this sudden growth. Finally, he wished the meeting all the success in its deliberations.

2.2 Mr. Mohamed Smaoui, ICAO Deputy Regional Director, Middle East Office, also addressed the meeting in the opening thanking Iran for hosting the meeting and for the warm welcome and excellent hospitality extended to the ICAO team and all the participants. Mr. Smaoui emphasized the need to address the CNS issues from a Regional perspective and indicated that the CNS infrastructure needs to be implemented based on operational requirements that bring operational benefits. He highlighted the important topics to be addressed by the meeting. Finally, Mr. Smaoui wished the meeting all the success.

3. ATTENDANCE

3.1 The meeting was attended by a total of thirty four (34) participants, from five (5) States (Bahrain, Iran, Kuwait, Oman and United Arab Emirates) and two (2) Organizations (IATA and SITA). The list of participants is at the **Attachment A**.

4. OFFICERS AND SECRETARIAT

4.1 The meeting was chaired by Mr. Ali Humaid Al-Adawi Standards Officer in Public Authority for Civil Aviation in Sultanate of Oman, who also thanked Iran for hosting the CNS SG/6 meeting in Tehran. He highlighted the importance to be on time for discussing the papers, because the number of working and information paper exceeded forty (40).

4.2 Mr. Raza Gulam RO/CNS was the Secretary of the meeting supported by Mr. Mohamed Smaoui, Deputy Regional Director.

5. LANGUAGE

5.1 The discussions were conducted in English. Documentation was issued in English.

6. AGENDA

6.1 The following Agenda was adopted:

Agenda Item 1: Adoption of the Provisional Agenda

Agenda Item 2: Follow-up on MIDANPIRG/14 Conclusions and Decisions relevant to CNS

Agenda Item 3: Global and Regional Developments related to CNS

Agenda Item 4: Developments related to MID-AMC

Agenda Item 5: Performance Framework for CNS implementation in the MID Region

Agenda Item 6: Review of Air Navigation Deficiencies in the CNS Field

Agenda Item 7: Future Work Programme

Agenda Item 8: Any other business

7. CONCLUSIONS AND DECISIONS - DEFINITIONS

7.1 All MIDANPIRG Sub-Groups and Task Forces record their actions in the form of Conclusions and Decisions with the following significance:

a) **Conclusions** deal with the matters which, in accordance with the Group's terms of reference, merit directly the attention of States on which further action will be initiated by ICAO in accordance with established procedures; and

b) **Decisions** deal with matters of concern only to the MIDANPIRG and its contributory bodies.

8. LIST OF DRAFT CONCLUSIONS AND DRAFT DECISIONS

DRAFT CONCLUSION 6/1: LAUNCHING OF THE MID-AMC SERVICE

DRAFT CONCLUSION 6/2: MID IP NETWORK ACTION GROUP

DRAFT CONCLUSION 6/3:	*AFTN/CIDIN AFS CONNECTIVITY AND AMHS IMPLEMENTATION*
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PART II: REPORT ON AGENDA ITEMS

REPORT ON AGENDA ITEM 1: ADOPTION OF THE PROVISIONAL AGENDA

1.1 The meeting reviewed and adopted the Provisional Agenda as at Para 6 of the History of the Meeting.

REPORT ON AGENDA ITEM 2: FOLLOW-UP ON MIDANPIRG/14 CONCLUSIONS AND DECISIONS RELEVANT TO CNS SG

2.1 The meeting noted the status of the MIDANPIRG/14 Conclusions and Decisions related to the CNS field and the follow-up actions taken by States, the Secretariat and other parties concerned as at **Appendix 2A**. The meeting agreed to review the Conclusions and Decisions, which are still current, under the associated Agenda Items with a view to propose to MIDANPIRG/15 appropriate follow-up action.

2.2 Concerning Conclusion 14/4, the meeting noted that based on a request by Iran, the ICAO MID Regional Office conducted a two day National Performance Framework Workshop in Tehran, to provide necessary assistance for the development/update of their National Air Navigation Performance Framework. The Workshop was also supported by IATA. Iran indicated that the outcome of the Workshop was very beneficial to them. Accordingly, it was highlighted that this was a good experience which should be recommended to other States.

2.3 Based on the above, the meeting reiterated MIDANPIRG Conclusion 14/4 and encouraged States requiring assistance to send their request to the ICAO MID Regional Office.

REPORT ON AGENDA ITEM 3: GLOBAL AND REGIONAL DEVELOPMENTS RELATED TO CNS

3.1 The meeting recalled that the Fourth Edition of Global Air Navigation Plan (GANP) was endorsed by the ICAO 38th Assembly held in Montreal, Canada, from 24 September to 4 October 2013. It was highlighted that the 38th Assembly called upon States, Planning and Implementation Regional Groups (PIRGs), and the aviation industry to:

- utilize the guidance provided in the GANP for planning and implementation activities which establish priorities, targets and indicators consistent with globally-harmonized objectives, taking into account operational needs; and

- provide timely information to ICAO, and to each other, regarding the implementation status of the GANP, including the lessons learned from the implementation of its provisions.

3.2 The 38th Assembly urged also States:

- to take into consideration the GANP guidelines as an efficient operational measure for environmental protection; and

- that are developing new generation plans for their own air navigation modernization to coordinate with ICAO and align their plans so as to ensure global compatibility and harmonization.

3.3 The meeting noted that the Regional Performance Dashboards have been launched on the ICAO website. These Dashboards aim to provide a glance of both Safety and Air Navigation Capacity and Efficiency Strategic Objectives, using a set of indicators and targets based on the regional implementation of the Global Aviation Safety Plan (GASP) and the Global Air Navigation Plan (GANP). It was highlighted that the purpose of these Dashboards is to show targeted performance at the regional level and, initially, contain graphics and maps with a planned expansion to include the Aviation System Block upgrades (ASBU) Block 0 Modules.

3.4 The meeting reviewed the Metrics and Indicators included in the Air Navigation Dashboard (V 1.0). It was highlighted that the Dashboard are evolving to include additional information related in particular to Continuous Descent and Climb Operations (CCO/CDO) and Fuel Savings/CO2 Emissions Reduction. Furthermore, it was noted that the Dashboards will be updated regularly to reflect the actual implementation status.

3.5 The meeting was apprised of Amendment 89 to Annex 10 which will become applicable on 13 November 2014. The amendment addressed number of issues associated with technical requirements for Global Navigation Satellite Systems (GNSS) in Volume I. Volume II addresses issues relating to Automatic Dependent Surveillance – Broadcast (ADS-B), Controller-Pilot Data Link Communications (CPDLC) and In-Trail Procedure (ITP) to facilitate En-route climb and descent in oceanic and remote continental airspace where the lack of ATS surveillance coverage is a limiting factor. The meeting highlighted that the States need to be active in proving their comments on any amendment through EFOD according to the standard procedures.

3.6 The meeting was further apprised of the proposals developed by the Navigation Systems Panel (NSP) to amend the SARPs in Annex 10, Volume I, and the publication of Cir. 326, "*Assessment of ADS-B and Multilateration Surveillance to Support Air Traffic Services and Guidelines for Implementation".*

3.7 The meeting was apprised of the progress achieved in the development of the new Regional Air Navigation Plan Template and the Action Plan for the development of the eANP.

3.8 The meeting noted that the ANP data related to the air navigation facilities and services is classified as: stable, dynamic or flexible. In this regard, it was agreed that the new ANP should be composed of three volumes:

a) Volume I should contain stable plan elements whose amendment necessitated approval by the Council and these elements be related to:

- assignment of responsibilities;
- mandatory requirements subject to regional agreement; and/or
- additional requirements specific to the Region which are not covered in SARPs.

Note: The following is a non-exhaustive list of such elements:

Flight Information Regions (FIR) Boundaries (Table and Charts); Search and Rescue Regions (SRR) Boundaries (Table and Charts); Volcanic Ash Advisory Centres (VAAC); Tropical Cyclone Advisory Centres (TCAC); Volcano Observatories (VO).

b) Volume II should contain dynamic plan elements whose amendment did not necessitate approval by the Council and these elements be related to:

- assignment of responsibilities;
- mandatory requirements subject to regional agreement; and/or
- additional requirements specific to the region which are not covered in SARPs.

Note: The following is a non-exhaustive list of such elements:

Major traffic flows; ATS route network; Meteorological Watch Offices (MWO); Secondary Surveillance Radar (SSR) codes; Five-letter name-codes; VOLMET Broadcasts.

c) Volume III should contain dynamic/flexible plan elements providing implementation planning guidance for air navigation systems and their modernization taking into consideration emerging programmes such as the ICAO Aviation System Block Upgrades (ASBUs) and associated technology roadmaps described in the *Global Air Navigation Plan* (GANP) (Doc 9750). The ANP Volume III would also include appropriate additional guidance, particularly with regard to implementation, to complement the material contained in the ANP Volumes I and II. The amendment of these elements does not require approval by the Council.

3.9 The meeting noted that the Air Navigation Commission reviewed on 14 May 2014 (196th session) the Draft Report to Council with the new eANP template and amendment procedures and the action plan for its electronic availability. Furthermore, The Council approved the new eANP template (Volumes I, II and III) and corresponding procedure for amendment with some changes to those applicable to Volume I, on 18 June 2014.

REPORT ON AGENDA ITEM 4: DEVELOPMENTS RELATED TO MID-AMC

4.1 The meeting noted that the first meeting of the MID-ATS Message Management Center Steering Group (MID-AMC STG/1) was held via teleconferencing on 18 June 2014. The meeting was attended by (5) States (Egypt, Iran, Jordan, Lebanon and UAE), the MID-AMC Team and Mr. Raza Gulam, Regional Officer CNS.

4.2 The meeting shared the concern of the MID-AMC STG/1 on the low level of participants and the low level of replies to the State Letter AN 7/5.1-14/084 dated 14 April 2014, related to the survey and assignment of members for the MID-AMC STG as at **Appendix 4A**. Accordingly, the meeting urged all States to send their MID-AMC STG members names and contact details to the ICAO MID Regional Office before **30 September 2014**. The meeting also agreed that the MID-AMC STG/2 should be held as a face-to-face meeting.

4.3 The meeting reviewed and updated the status of implementation of the AMHS in the MID Region, as follows:

	Bahrain- OB	Egypt-HE	Iran-OI	Iraq-OR	Jordan-OJ	Kuwait- OK	Lebanon-OL	Libya-HL	Oman-OO	Qatar-OT	Saudi Arabia-OE	Sudan-HS	Syria-OS	UAE- OM	Yemen-OY
AMHS Capability	A	AI	CS	CS	AI	A	A	A	AI	AI	AI	A	NI	AI	NI
Interconnection	NO	O	NO	NO	O	NO	NO	NO	O	O	O	NO	NI	O	NI

Legend:

A Available	**I** Implemented	**CS** Contract Signed	**NI** No Information	**NO** Not Operational	**O** Operational

4.4 The meeting appreciated the work done by the MID-AMC and noted that the main reason for not announcing the official full operation/launch of the MID-AMC was the lack of training for the key users. This was based on the results of the survey conducted and the outcome of the MID-AMC STG/1 meeting. Accordingly, after discussion of the training requirements, the meeting agreed that training needs to be conducted as soon as possible and in any case before February 2015.

4.5 The meeting received with appreciation an offer from IATA to host the training in their premises in Amman, Jordan and agreed that the MID-AMC should coordinate with them on the possible dates for the conduct of the training. The exact dates and other details will be communicated by the ICAO MID Regional Office to all MID States through the official Invitation Letter.

4.6 Based on all the above and considering the MIDANPIRG/14 Decision related to the operation date of the MID-AMC (GO/NO GO Decision), the meeting agreed to the following Draft Conclusion:

DRAFT CONCLUSION 6/1: LAUNCHING OF THE MID-AMC SERVICE

That,

*a) States, that have not yet done so, be urged to assign their MID-AMC STG members and alternates before **1 November 2014**; and*

b) the first AIRAC date following the training of the MID States key users be officially declared as the date of operation of the MID-AMC.

REPORT ON AGENDA ITEM 5: PERFORMANCE FRAMEWORK FOR CNS IMPLEMENTATION IN THE MID REGION

MID IP Network

5.1 The meeting recognized the necessity for a Regional Telecommunication Network for all Aeronautical Fixed Services (AFTN, AMHS, AIDC/OLDI, surveillance data sharing, etc.). Furthermore, the meeting recalled that MIDANPRG/14 meeting reiterated that the MID ATN implementation and MID IP Network should take place on the basis of regionally agreed requirements, taking into consideration, the System Wide Information Management (SWIM) concept and any other new developments.

5.2 The meeting recalled that the Current Point-to-Point circuit arrangement between States to support the Aeronautical Fixed Service (AFS) enhancement has the following issues:

- Half circuit arrangement between States is increasingly difficult to order and time consuming.
- Circuit upgrade between States is also impacted due to variable pricing and bandwidth availability of the half circuit at each State.
- Dynamic routing is not supported due to limited bandwidth and no central administration of the network.
- Incompatible network protocol does not support Extended Service as specified in ICAO Doc. 9880 and IPv6 addressing as specified in ICAO Doc. 9896.
- New future Information Management as recommended by ICAO 12th Air Navigation Conference, such as System Wide Information Management (SWIM), is not supported.
- Network security measures cannot be implemented, which lead many States to implement their own security measures and policy, adding to the overall cost.
- Different budget cycles and priorities between States make the synchronization of upgrades difficult and in turn limit the seamless distribution of Aeronautical Fixed Service (AFS) data.

5.3 The meeting noted that the European Region has implemented the Pan-European Network Service (PENS) and the North American Region has FAA Telecommunication Infrastructure (FTI) to support Canada and USA to distribute AFS data. Similarly, the ICAO South American Region has REDDIG and the Caribbean Region has MEVA. The APAC Region is planning for the implementation of a Common Regional Virtual Private Network (CRV).

5.4 The meeting recalled that, in the MID Region there was a proposal emanating from the IPS WG/2 in October 2009 to implement the Middle East Network Services (MENS), however, this was not pursued since the proposal was considered not mature at that time. In this respect, it was highlighted that MIDANPIRG/14 agreed that an IP Network should be established on the basis of regionally agreed requirements, taking into consideration, the System Wide Information Management (SWIM) concept and any other new developments.

5.5 The meeting recognized that the MID IP Network establishment should consider the following:

- reduce telecommunication cost;
- enhance information security;
- support new enhancements;
- provide a dynamic network;
- minimize coordination for network management and enhancement; and
- respond to Air Traffic requirements in a timely manner.

5.6 It is to be noted that the Network will be Private Network and not public internet. Any user of the Network can be connected to another user, as configured through the Network Administrator. The establishment of Virtual Private Network (VPN) is to be based on Multi-Protocol Label Switching (MPLS).

5.7 Based on all the above, the meeting agreed that a MID IP Network needs to be established to cope with the current and future requirements. In this respect, the meeting considered the following two options:

a) Private Network MENS i.e. similar to the European Network (PENS); or
b) join the APAC CRV Network.

5.8 The meeting agreed that the establishment of a MID IP Network could be a candidate project that is to be submitted to the MAEP Board for consideration. A Working Paper should be developed by the Secretariat with the support of Bahrain, Iran, Jordan, Kuwait, Oman and UAE for the submission to the MAEP Board/2 meeting planned to be held in Dubai, UAE, 20-22 January 2015. Accordingly, the meeting agreed to the following Draft Conclusion:

DRAFT CONCLUSION 6/2: MID IP NETWORK ACTION GROUP

That, Bahrain, Iran, Jordan, Kuwait, Oman and UAE be invited to assign IP Network Experts to assist the Secretariat in the development of necessary documentation related to the establishment of a MID-IP Network, for consideration by the MAEP Board.

5.9 The meeting reviewed and updated the IP Network surveys results and the proposal for an IP address plan that were presented to MIDANPIRG/14 as at **Appendices 5A** and **5B**.

MID Aeronautical Fixed Services

5.10 SITA provided the meeting with the status of progress and schedules related to the deployment of the gateway and connectivity to AMHS. In addition, SITA reported that the AMHS-Type X gateway specification was completed and its development is near completion.

5.11 The meeting noted that the AMHS/SITA Type X Interconnection Architecture Document has been endorsed by the APAC and EUR Regions. Accordingly, the meeting reviewed the Document and supported the same Architecture. In this respect, the meeting requested SITA to provide the MID-AMC with the following:

- the list of SITA Users in the MID Region (Including their AFTN address/SITA address); and

- the list of SITA AFTN connections in the MID Region that should migrate to AMHS connection.

5.12 The meeting tasked the MID-AMC STG with the following:

- discuss in detail the target topology with SITA AMHS and identify the involved COM Centres that have SITA connection;

- coordinate the change in the AFTN/AMHS routing tables; and

- create a plan to migrate to the AMHS/SITA gateway.

5.13 The meeting was apprised of the Eighteenth Meeting of the EANPG Aeronautical Fixed Service Group (AFSG/18) outcome. It was noted that the AFSG/18 discouraged AFTN and CIDIN connections, also the AFSG/18 recommended that the current AFTN and CIDIN based connections be gradually phased out. Furthermore, the meeting was also updated on State Letter 14-0394.TEC (FIC/HOI) indicating that EUR is going to make a major routing change in the whole Europe from CIDIN to AMHS as many operational AMHS LINKS have been established recently.

5.14 The meeting noted that such a big scale change scheduled for 18 September 2014 needs good preparation and coordination. The MID Region has the connection entry/exit points through Athens and Nicosia and this will not be affected. However, the meeting urged States that have exit/entry points with EUR to monitor abnormalities during the change and coordinate closely with the MID-AMC team, which is following this major routing change within EUR. It was also recommended to keep the EUR-AMC team aware of any abnormalities.

5.15 With all the developments in the AFS, the meeting urged States to expedite their AMHS implementation. Furthermore, the meeting discouraged the implementation of AFTN and CIDIN Circuits specially at International level and agreed that the replacement of the AFTN or CIDIN connections between States by AMHS links shall be based on ICAO Standards and Guidance Material (ICAO Doc 9880 and the ICAO EUR Docs 020 and 021). Accordingly, the meeting agreed to the following Draft Conclusion:

DRAFT CONCLUSION 6/3: AFTN/CIDIN AFS CONNECTIVITY AND AMHS IMPLEMENTATION

That,

a) *the establishment of new AFTN and CIDIN connections at the International level be discouraged;*

b) *the current connections based on AFTN or CIDIN standards be gradually phased out; and*

c) *States be urged to expedite their AMHS implementation.*

5.16 The meeting was informed that the MET SG/5 meeting (Jeddah, Saudi Arabia, 2-4 September 2014) reviewed the Aeronautical Fixed Service (AFS) communication requirements for the exchange of OPMET information between the MID and EUR Regions. It was highlighted that the current AFTN/CIDIN communication paths from Jeddah (planned primary ROC) and Bahrain (planned backup ROC) to Vienna support the OPMET exchange in Traditional Alphanumeric Code (TAC) format.

5.17 Considering that the exchange of OPMET data in digital form for METAR/SPECI, TAF and SIGMET will be recommended in 2016 and required in 2019, the meeting supported the MET SG/5 meeting proposal related to the implementation of AMHS communication paths between Jeddah-Vienna and Bahrain-Vienna. Accordingly, the meeting tasked the MID-AMC STG and the MID AMC to start coordination with the EUR AFSG to determine appropriate timeframe, sufficient Bandwidth and necessary Routing change. Accordingly, the meeting agreed to the following Draft Conclusion.

DRAFT CONCLUSION 6/4: AMHS ROUTING FROM MID TO EUR REGIONS

That, the MID-AMC develop a plan to implement AMHS communication paths between Jeddah-Vienna, and Bahrain-Vienna before 31 March 2015, to enable the exchange of OPMET data in digital form between the MID and EUR Regions.

AIDC/OLDI

5.18 The meeting was apprised of the outcome of the AIDC/OLDI Seminar, Cairo, Egypt 3-5 March 2014. The Summary of Discussions of the Seminar is at **Appendix 5C**.

5.19 The meeting urged States that have not yet done so, to provide their AIDC/OLDI Focal Points to the ICAO MID Regional Office, by **30 October 2014**, in order to coordinate with them the issues related to AIDC/OLDI implementation.

5.20 The meeting reviewed the AIDC/OLDI implementation Strategy at **Appendix 5D** that was developed by the Secretariat with the support of UAE. The meeting noted that as a follow-up to the outcome of the ATM SG/1 meeting (Cairo, Egypt, 9-12 June 2014), the Secretariat, in coordination with UAE, developed a consolidated version of the LoA Template, based on the draft Template endorsed by the ATM SG/1 meeting, which includes an Appendix related to AIDC/OLDI Bilateral Agreement.

5.21 The meeting reviewed two Draft Bilateral Agreement Template proposed by Oman related to AIDC and OLDI, respectively.

5.22 Based on the above, the meeting requested the Secretariat to consolidate a final version of the AIDC/OLDI Bilateral Agreement Template to be appended to the LoA Template, which will be presented to the MSG/4 meeting for endorsement.

5.23 The meeting encouraged States to provide the ICAO MID Regional Office with their updates/progress reports on AIDC/OLDI implementation by **30 October 2014**.

Call sign Confusion

5.24 The meeting recalled that the ICAO PANS-ATM Doc 4444 stipulates that aircraft identification in Item 7 of the FPL should not exceed 7 alphanumeric characters, without hyphens or symbols.

5.25 It was highlighted that, in order to reduce the level of operational call sign confusion events, and therefore improve levels of safety, several Airline operators have changed their philosophy of only using a numeric (commercial) call-sign (e.g. UAE503) to that of applying an ‘alpha-numeric’ call-sign (e.g. UAE59CG). This is now common practice in the European Region.

5.26 The meeting noted that UAE has worked on various activities to address the call sign confusion issue, in particular the implementation of software designed to automatically assign alternative callsign to track label in case of identification of call sign similarity. The meeting appreciated UAE offer to share the experience on their solution with other States.

5.27 The meeting recognized that many mitigation measures could be investigated to eliminate the risks associated with the call sign confusions and agreed accordingly to the following Draft Conclusion:

DRAFT CONCLUSION 6/5: CALL SIGN CONFUSION

That,

a) a survey related to the acceptance/processing of the alphanumeric callsigns (as filed in the flight plans) be conducted;

b) States that have not yet done so be invited to take necessary measures to comply with ICAO Doc 4444 provisions related to the acceptance of the alphanumeric call signs (as filed in the flight plans); and

c) States be invited to inform the ICAO MID Regional Office of the preferred option for the mitigation of the risks associated with the callsign confusion.

GNSS Implementation in the MID Region

5.28 The meeting recalled that the recommendations concerning GNSS adopted by the AN-Conf/12 were included in the Strategy for GNSS implementation in the MID Region, which was endorsed by MIDANPIRG/14. Furthermore, since GNSS is mainly used to support PBN implementation, the Strategy for the GNSS implementation in MID Region was integrated within the new MID Region PBN implementation plan.

5.29 In order to foster PBN and GNSS implementation the meeting reemphasized on the importance of thorough follow-up on GNSS developments and encouraged States to conduct Workshop/Seminars to share experiences related to PBN and GNSS including different augmentation systems.

5.30 The meeting urged States to provide the ICAO MID Regional Office with their GNSS implementation plans as part of their PBN implementation plan also to provide their observations of the effects of ionosphere on GNSS signal in their States, in order that mitigation measures could be proposed and actions taken accordingly.

5.31 The meeting recognized that the introduction of GNSS multi-constellation, multi-frequency will entail number of new technical and regulatory challenges beyond those already associated with current GNSS implementation.

5.32 The meeting noted that IATA does not support the Satellite Based Augmentation Systems (SBAS) as the onboard avionic and that the Aircraft Based Augmentation System (ABAS) used today, already achieve the accuracy provided by SBAS.

5.33 The meeting supported the proposal emanating from the PBN SG/1 meeting (Cairo, Egypt, 1-3 April 2014) that the ICAO MID Regional Office organize jointly with ACAC a Seminar in April 2015, covering subjects such as: the GNSS augmentation systems (ABAS, GBAS and SBAS), the

GNSS constellations, the monitoring of the GNSS signals, updates from other Regions, etc. The Seminar should also identify the augmentation systems that are most suitable for the MID Region. The meeting invited States and IATA to participate actively in the Seminar and supported the PBN SG/1 Draft Conclusion 1/5:

DRAFT CONCLUSION 1/5: GNSS SEMINAR

That, the ICAO MID Regional Office organize, Seminar on GNSS covering the augmentation systems (ABAS, GBAS and SBAS), and Multi-constellations during 2015.

5.34 The meeting received information on the implementation status of GNSS constellations and augmentations systems.

5.35 The meeting recognized that frequency interference-free operation of GNSS is essential, and that the frequency band 1 559 - 1 610 MHz, is used for elements of GNSS and recalled that the International Telecommunication Union (ITU) process, allows under footnotes No. 5.362B and 5.362C the operation of fixed service in some States on a secondary basis until 1 January 2015.

5.36 The meeting noted that the following States (Iraq, Jordan, Qatar, Saudi Arabia, Sudan, Syria and Yemen) still have their names in the footnotes 5.362B and/or 5.362C. In this regard, the meeting recalled MIDANPIRG/13 Conclusion 13/44: Protection of GNSS Signal, urging the concerned States to delete their name from these footnotes.

5.37 The meeting urged the concerned States to coordinate and take necessary actions with their National Radio Frequency Spectrum Regulatory Authorities (in some States it is called Telecom Regulatory Authority "TRA") in order to delete their names from the footnotes 5.362B and/or 5.362C at WRC-15.

5.38 The meeting noted that one of the ACAC Priorities/Projects is the GNSS implementation in the Region in collaboration with the European Commission based on the SBAS Implementation in the Regions of ACAC and ASECNA (SIRAJ) Project (EGNOS extension).

5.39 The meeting recalled that Egypt has adopted an initiative to establish a Regional Aeronautical Mobile Satellite (Route) System to provide Aeronautical Safety Communication, Navigation and Surveillance/Air Traffic Management Services over Africa and Middle East Regions; the initiative is called "NAVISAT". It was noted with concern that Egypt was supposed to organize a NAVISAT Seminar, as agreed by MIDANPIRG/14 meeting, and presents its recommendations to the PBN Sub Group; but the Seminar was not organized.

5.40 The meeting noted that EUROMED GNSS II/MEDUSA project (Global Navigation by Satellite Systems EGNOS/GALILEO) held Egypt National Workshop, in Cairo, Egypt on 12 March 2014.

5.41 The meeting was informed that EUR FMG carried out a review of potential sources of non-intentional *GNSS Radio Frequency Interference (*RFI) that may affect GNSS frequencies. It was noted that future GNSS multi-constellation/dual-frequency receivers are expected to provide significant mitigation against GNSS vulnerability. However, it will not provide a full mitigation and it is important to assess and address all vulnerabilities to threats that may impact safety of GNSS-based operations.

5.42 In view of the above, the FMG conducted a review of existing and new material on GNSS vulnerabilities. As a result, some guidance material was collated as at **Appendix 5E,** that would provide guidance to States when establishing and enforcing their regulatory provisions on the use of GNSS, in particular regulating the use of pseudolites and GNSS repeaters that may have potential safety impact on GNSS. In addition, GNSS jammers and spoofers are seen as significant threats to GNSS.

5.43 Based on the above, the meeting agreed to utilize the guidance material in **Appendix 5E** to mitigate potential GNSS radio frequency interference through appropriate legislation/regulation, and agreed to the following Draft Conclusion:

DRAFT CONCLUSION 6/6: GNSS RADIO FREQUENCY INTERFERENCE ISSUES

*That, States be invited to use the guidance at **Appendix 5E** for the development/amendment of their regulatory provisions related to the use of GNSS in particular those related to pseudolites and GNSS repeaters.*

Draft MID Air Navigation Strategy Parts Related to CNS

5.44 The meeting reviewed and updated the Draft MID Air Navigation Strategy Parts related to CNS, in particular the Aviation System Block Upgrades (ASBU) Block 0 Modules, FICE, TBO and ACAS Monitoring Tables as at **Appendix 5F.**

5.45 In accordance with the ICAO MID Regional Office State Letter Ref.: AN 1/7–14/123 dated 5 May 2014, the meeting urged States to implement the provisions of MIDANPIRG/14 Conclusions 14/4 and 14/6 and:

a) take all necessary measures to develop/update their National Air Navigation Performance Framework and provide the ICAO MID Regional Office a copy, preferably not later than **30 October 2014;** and

b) provide the relevant data to the ICAO MID Regional Office on annual basis.

5.46 The meeting noted that the MID Air Navigation Strategy will be further reviewed, updated and finalized by the MSG/4 meeting for endorsement on behalf of MIDANPIRG.

MID eANP Parts related to CNS

5.47 The meeting recalled that MIDANPIRG/14, through Decision 14/24, agreed that the development of the MID eANP based on the Council-approved ANP Template, be included in the work programme of the different MIDANPIRG subsidiary bodies and the relevant Parts of the MID eANP be presented, as soon as available, to MSG/4 and/or MIDANPIRG/15 for endorsement.

5.48 Based on the above, the meeting reviewed and updated the MID eANP parts related to CNS as at **Appendix 5G** and agreed that States provide their comments and inputs for the population of the different CNS Tables to the ICAO MID Regional Office by **15 October 2014**, for further review by the MSG/4 and ANP WG/2 meetings.

5.49 Based on the above, the meeting agreed to the following Draft Conclusion:

DRAFT CONCLUSION 6/7: MID eANP PARTS RELATED TO CNS

*That, States be urged to provide the ICAO MID Regional Office with their inputs and comments for the population of the different CNS Tables by **15 October 2014**, for the presentation of a consolidated version of the MID eANP Parts related to CNS to the MSG/4 and ANP WG/2 meetings.*

ICAO Position for WRC-15

5.50 The meeting noted that the ITU WRC-15 meeting is scheduled to be held in Geneva at the end of 2015. All WRC meetings are preceded by a Conference Pre Meeting (CPM) and for the WRC 15 meeting the CPM was held in Geneva the Fourth Quarter of 2014. CPM will represent the best information on technical, operational and regulatory/procedural issues relevant to the WRC.

5.51 The meeting also received a summary of the items that have effect on the ICAO position to WRC-15, including the appropriate aeronautical allocations to support Wireless Avionics Intra-Communications (WAIC).

5.52 The meeting noted that the ICAO Position was sent to States and concerned Organization as Attachment B to State letter E 3/5.15-13/57. The ICAO Position addresses all radio regulatory aspects on aeronautical matters on the agenda for the WRC-15.

5.53 The meeting recalled the poor participation and support to ICAO Position at WRC-12 by the MID States. Accordingly, the DGCA-MID/2 meeting urged States to ensure continuous coordination with their Radio Frequency Spectrum Regulatory Authorities (telecommunications authorities) and the regional groupings such as the Arab Spectrum Management Group (ASMG) for the support of the ICAO position at WRC and its preparatory meetings.

5.54 Based on all the above, the MIDANPIRG/14 meeting agreed that ICAO MID Regional Office issue State Letter highlighting the importance to bring the subject to the ministerial level, in order that States Radio Frequency Spectrum Regulatory Authorities (Telecommunications Authorities) defend the ICAO Position at various national/regional platforms where spectrum allocation issues are discussed. Accordingly, the ICAO MID Regional Office issued State Letter AN 7/30.15.1 – 14/208 on 03 August 2014.

5.55 The meeting urged States to work closely with their States Radio Frequency Spectrum Regulatory Authorities (Telecommunication Authorities) to ensure that ICAO Position is suitably reflected in the national position of the State and in the regional position; and to support ICAO Position during WRC-15 meeting.

5.56 The meeting reiterated the importance that the Civil Aviation Authorities coordinate with their respective Frequency Regulatory Authorities and attend the regional preparatory meetings and the WRC-15 to ensure that the approved ICAO Position is supported.

5.57 In view of the foregoing, the meeting agreed to following Draft Conclusion:

DRAFT CONCLUSION 6/8: SUPPORT ICAO POSITION TO WRC-15

That, States be urged to:

a) support the ICAO Position to the WRC-15;

b) make necessary arrangements for the designated Civil Aviation Personnel to participate actively in the preparatory work for WRC-15 at the national level; and

c) *attend the preparatory regional spectrum management groups meetings and WRC-15 to support and protect aviation interests.*

5.58 The meeting noted that ICAO organizes Regional Spectrum Workshops to engage and empower States to support ICAO Position. It was further noted that the ICAO MID Regional Office with support from ICAO HQ will organize a MID Region's "Aeronautical Frequency Spectrum Workshop - WRC-15 preparation in Cairo, 17- 18 February 2015, and back to back there will be also the ACP WG-F/32 meeting from 19 to 25 February 2015, where MID States will also be invited to attend along with their Telecommunication Regulatory Authorities (TRAs) in order to gain in-depth knowledge on frequency spectrum issues and related matters, and seek the necessary support to the ICAO Position.

Harmful Frequency Interference

5.59 The meeting noted that usually harmful interference occurs in near border of countries from adjacent aeronautical station or other radio services such as FM broadcast stations, military systems, etc.

5.60 Considering that the elimination of the harmful interference requires coordination among States, the meeting agreed that States assign focal points for frequency matters.

5.61 The meeting noted that ICAO developed a program for managing, assessing compatibility and presenting frequency assignments called Frequency Finder.

5.62 Based on the above, the meeting agreed to the following Draft Conclusion:

DRAFT CONCLUSION 6/9: ASSIGNMENT OF FREQUENCY MANAGEMENT FOCAL POINTS

That,

a) *States be urged to assign focal points for frequency matters and provide their contact details to the ICAO MID Regional Office before **30 October 2014**; and*

b) *ICAO organize a Workshop to train States on the new frequency finder program during 2015.*

Use of Flight Plan "Converters" to Process the ICAO New FPL

5.63 The meeting recalled MIDANPIRG/14 meeting Conclusion 14/25, and ICAO MID Regional Office State Letter Ref.: AN 6/2B –14/122 dated 4 May 2014 requesting concerned States to take necessary measures to upgrade their systems and provide the ICAO MID Regional Office with an update on the action(s) undertaken not later than 30 June 2014. In this respected the meeting noted with concern that the following States (Egypt, Iran, Iraq, Libya, Saudi Arabia, Syria and Yemen) are still using converters.

5.64 The meeting noted that Oman upgraded their system on 26 June 2014 to accept the new flight plan. The meeting also noted Iran concerns on the procurement of the necessary equipment to upgrade their system due to the sanctions.

5.65 The meeting agreed that the ICAO MID Regional Office send reminder letter to concerned States and request them to send their action plan for upgrading the system. Accordingly, the meeting agreed to the following Draft Conclusion:

DRAFT CONCLUSION 6/10: ACTION PLANS FOR INFPL SYSTEM UPGRADE

That, concerned States be urged to provide the ICAO MID Regional Office with their action plan for the upgrade of their systems to ensure full handling of the ICAO New Flight Plan format ***before 30 November 2014.***

Integrated Flight Plan Processing System (IFPS)

5.66 The meeting noted that Bahrain introduced an IFPS System for the Bahrain FIR/UIR in 2013, which is the entry system for all Bahrain FIR/UIR FPLs in order to:

- improve the quality of FPL before distributing them to ACC, TWR, and ARO;
- prevent double distribution to ACC, TWR and ARO;
- reject FPLs in case of major errors; and
- send Rejection Messages (RJE) or Acknowledge Messages (ACK) to the originator of the FPL according to the system configuration based on individual configurations for each FPL originator; and

5.67 It was highlighted that the implemented functions of the Bahrain FIR/UIR IFPS are of general nature and could support the needs of other FIRs/UIRs as well as regional or sub-regional needs in the ICAO MID Region, as the system is expandable.

5.68 The meeting agreed that the IFPS initiative should be revived. However, it was highlighted that in order to reach a decision regarding the operational requirements, the inputs from the ATM experts in the Region are needed. Furthermore, the CNS SG should address the system from the technical point of view, in terms of infrastructure, equipment, cost, human resources, etc.

5.69 The meeting agreed that the IFPS could be a good candidate for a working package under the MAEP framework. Accordingly, the meeting encouraged States to provide the Flight Plan Data/Difficulties to Bahrain in order to carry out further studies for the Region.

5.70 The meeting requested Bahrain to present a Working Paper to the MAEP Board/2 meeting on the subject and agreed to the following Draft Conclusion:

DRAFT CONCLUSION 6/11: REGIONAL IFPS STUDY

That, States be urged to provide the Flight Plan Data/Difficulties to the ICAO MID Regional Office ***before 31 December 2014,*** *in order for Bahrain to carry out further studies for the Region.*

MID Region Surveillance

5.71 The meeting noted that MIDANPIRG/14 was apprised of a recent incident where an IC Code conflict was observed. Accordingly, the meeting emphasized that when programming Mode S Interrogators, Mode S Operators have to comply with the allocated IC provided in the latest issued IC allocation; and develop an IC and coverage map programming procedures, taking their own specificities into account.

5.72 The meeting further noted that MIDANPIRG/14 meeting encouraged Mode S Radar Operators States to include the necessary verification in their local programming procedures; and tasked the CNS SG to include the verification procedure in the MID Region process for Mode S IC codes allocation. Therefore, the Secretariat in coordination with EUROCONTROL updated the MID Region process for Mode S IC codes allocation as at **Appendix 5H** which was reviewed by the meeting. Accordingly, the meeting agreed to the following Draft Conclusion:

DRAFT CONCLUSION 6/12: MID REGION PROCESS FOR MODE S IC CODES ALLOCATION

That, the MID Region process for Mode S IC codes allocation at ***Appendix 5J*** *be adopted.*

5.73 The meeting noted that by using the MICA application it is possible to extract the allocation and request for mode S IC codes for their own radars, provided that they are registered and can access the MICA application at:

https://extranet.eurocontrol.int/http://webprisme.cfmu.eurocontrol.int/mica/Index.action.

5.74 Based on the above, MIDANPIRG/14 meeting urged States to assign focal points to use the MICA application; and request training on the application, as deemed necessary. In this respect, the ICAO MID Regional Office sent State Letter AN 7/27-14/116 dated 27 April 2014. Replies were received from five (5) States (Bahrain, Egypt, Qatar, Sudan and UAE). The focal point list was reviewed and further updated by the meeting as at **Appendix 5I**.

5.75 The meeting noted that MIDANPIRG/14 meeting agreed to Conclusion 14/27 adopting the MID Surveillance Strategy at **Appendix 5J**. Accordingly, the meeting urged States to share surveillance data to enhance safety, increase efficiency and achieve seamless surveillance.

5.76 The meeting noted that the ADS-B is one of the technologies included in the GANP which supports many ASBU Modules in particular SURF, ASUR, SNET, ASEP, OPFL.

5.77 Based on the above, the meeting encouraged States to implement ADS-B out. The meeting reviewed the Draft template at **Appendix 5K** to be used for the monitoring of the ADS-B out implementation and agreed that States and users provide their comments on the template to the ICAO MID Regional Office for the consolidation of a final version which may be included in volume III of the MID eANP.

REPORT ON AGENDA ITEM 6: REVIEW OF AIR NAVIGATION DEFICIENCIES IN THE CNS FIELD

6.1 The meeting recalled that MIDANPIRG/14 re-iterated that the identification and reporting of Air Navigation Deficiencies by User-Organizations contribute significantly to the enhancement of air navigation safety in the MID Region. Nevertheless, the meeting noted with concern that the use of the MID Air Navigation Deficiency Database (MANDD) is far below expectation. Accordingly, the meeting urged States and authorized Users to use the MANDD for the submission of requests for addition, update, and elimination of Air Navigation Deficiencies.

6.2 The meeting recalled that MIDANPIRG/14 recognized the need for a formal procedure to be used for the elimination of deficiencies from the MANDD and accordingly agreed to the following Conclusion to replace and supersede MIDANPIRG/13 Conclusion 13/63:

CONCLUSION 14/32: ELIMINATION OF AIR NAVIGATION DEFICIENCIES IN THE MID REGION

That, States be urged to:

a) use the MID Air Navigation Deficiency Database (MANDD) for the submission of requests for addition, update, and elimination of Air Navigation Deficiencies; and

b) submit a Formal Letter to the ICAO MID Regional Office containing the evidence(s) that mitigation measures have been implemented for the elimination of deficiency(ies) when requesting the elimination of deficiency(ies) from the MANDD.

6.3 The meeting recalled that MIDANPIRG/14 recognized the need to review the methodology used for the prioritization of the air navigation deficiencies emphasizing that the deficiencies priority "U" have a **direct** impact on safety and require **immediate** corrective measures. Accordingly, the meeting agreed that all the priority "U" deficiencies in the CNS field to be changed to priority "A"

6.4 The meeting emphasized that the States should develop a Corrective Action Plan (CAP) for each air navigation deficiency and noted that the majority of the CAPs were not specifying a set of clear actions from States with specific timelines for the elimination of the deficiencies. Accordingly, the meeting agreed that the ICAO MID Regional Office delete all the current information reflected in the CAP column and urged States to use the MANDD to propose specific CAP for each deficiency.

6.5 The meeting agreed that the deficiencies related to old AFTN connections be deleted from MANDD, pending the approval of the amendment to the MID ANP which will propose the removal of these connections.

6.6 Based on the above, the meeting reviewed and updated the list of deficiencies in the CNS field as at **Appendix 6A**. The meeting urged States to take necessary actions to implement the provisions of the MIDANPIRG/14 Conclusion 14/32.

6.7 The meeting noted Kuwait concern regarding the non-availability of the circuit between Kuwait and Damascus for long periods.

REPORT ON AGENDA ITEM 7: FUTURE WORK PROGRAMME

7.1. The meeting reviewed the Terms of Reference (TOR) of the CNS Sub-Group as at **Appendix 7A** and agreed that they are still valid and current.

7.2. Taking into consideration, the planned ICAO MID Regional upcoming events which are of relevance to the activity of the CNS Sub-Group, in particular the MSG/4, ANSIG/1 and MIDANPIRG/15, the meeting agreed that the CNS SG/7 meeting be held during the first half of 2016. The venue will be Cairo, unless a State is willing to host the meeting.

REPORT ON AGENDA ITEM 8: ANY OTHER BUSINESS

8.1. UAE made reference to State Letter Ref: AN/2/48-14/53 of 25 August 2014 regarding a proposal for amendment to the PANS-TRG (Doc 9868) which includes new provision related to the training of the Air Traffic Safety Electronic Personnel (ATSEPs). UAE inquired if this terminology was used in any of the MID States. In this regard, the meeting agreed that UAE submit a working paper to the next CNS SG meeting on the training of the CNS Technicians and Engineers (ATSEPs).

8.2. The meeting received with appreciation the information provided by Iran regarding the flight check of radio navigation aids. It was noted in particular that an Action Group has been established within the Civil Aviation Organization of Iran. The Group carried out a safety assessment process to identify the risk of operation of the radio navigation systems whose flight check period was going to expire. This triggered a discussion on the guidance material contained in ICAO Doc 8071 and the necessity of its amendment. In this regard, it was underlined that the information contained in Doc 8071 is for guidance only and it's not mandatory; it is the responsibility of States to include the necessary requirements related to the flight check of radio navigation aids in their National Regulations.

APPENDICES

APPENDIX 2A

FOLLOW-UP ACTION PLAN ON MIDANPIRG/14 CONCLUSIONS AND DECISIONS

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
DECISION 14/2: UPDATED OF THE MIDANPIRG PROCEDURAL HANDBOOK That, the Seventh Edition of the MIDANPIRG Procedural Handbook be endorsed as at **Appendix 4.1B** to the Report on Agenda Item 4.1.	Update the MIDANPIRG Procedural Handbook and post it on the web	ICAO	Seventh edition of the Procedural Handbook	Feb. 2014	Completed
CONCLUSION 14/4: ASSISTANCE FOR THE DEVELOPMENT/UPDATE OF THE NATIONAL AIR NAVIGATION PERFORMANCE FRAMEWORK That, ICAO, in coordination with concerned States and Stakeholders (IATA, CANSO, ACI, etc): a) develop a plan for joint missions to identified States to support the development/update of the National Air Navigation Performance Framework in an effective and timely manner; and b) agree on the priorities and plans of action to be reflected in the National Air Navigation Performance Framework to improve the efficiency of air navigation at national and regional level, in accordance with the MID Air Navigation Strategy.	Implement the Conclusion	ICAO States	State Letter Missions to States/ development of National Performance Framework	Feb. 2014 Dec. 2014	Actioned SL AN 1/7-14/124 dated 6 May 2014 Iran requested WS which was conducted 7-8 Sep2014
CONCLUSION 14/5: MID REGION AIR NAVIGATION PRIORITIES That, a) the ASBU Block 0 Modules prioritization Table at **Appendices 4.1E** to the Report on Agenda Item 4.1 be endorsed as the initial version of the MID ASBU Implementation Plan; and b) the ASBU Block 0 Modules prioritization Table be reviewed on regular basis and be extended to cover Block 1 Modules, as appropriate.	Regular Review	MIDANPIRG/14 MIDANPIRG Subsidiary bodies	ASBU prioritization Table	Dec. 2013 Sep. 2014	Ongoing

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
CONCLUSION 14/6: DRAFT MID REGION AIR NAVIGATION STRATEGY That, a) the Draft MID Region Air Navigation Strategy at **Appendix 4.1F** to the Report on Agenda Item 4.1 be: i. endorsed as the initial version of the MID Region Air Navigation Strategy; and ii. further reviewed and completed by the different MIDANPIRG subsidiary bodies b) MID States be urged to: i. develop their National Air Navigation Performance Framework, ensuring the alignment with and support to the MID Region Air Navigation Strategy; ii. incorporate the agreed MID Region Performance Metrics into their National reporting and monitoring mechanisms; and iii. provide the ICAO MID Regional Office, on annual basis, with relevant data necessary for regional air navigation planning and monitoring.	Implement the Strategy	MIDANPIRG/14 MIDANPIRG Subsidiary bodies ICAO States States	Initial version of the Strategy Review and Update Strategy State Letter National Performance Framework Feedback	Dec. 2013 Sep. 2014 Feb. 2014 May 2014 Dec. 2014	Actioned SL AN 1/7-14/123 dated 6 May 2014
DECISION 14/21: ESTABLISHMENT OF MID-AMC STEERING GROUP That, a) a MID-AMC Steering Group is established with TOR as at **Appendix 4.5A** to the Report on Agenda Item 4.5; and b) States appoint a Member and Alternate for the MID-AMC Steering Group.	Implement the work programme of the MID-AMC STG	MIDANPIRG/14	MID-AMC STG established	Dec. 2013	Actioned SL AN 7/5.1-14/084 dated 16 April 2014 Jordan, Lebanon, Saudi Arabia and Sudan assigned members

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
CONCLUSION 14/22: MID-AMC OPERATION That, a) States be urged to: i. provide their AFTN/AMHS/CIDIN Routing tables to MID-AMC by 30 March 2014; ii. register users to MID-AMC according to the accreditation procedure defined at **Appendix 4.5B** to the report on Agenda Item 4.5; iii. complete testing of all MID-AMC functions by 30 June 2014; and b) the operation date of the MID-AMC be determined by the MID-AMC Steering Group.	Implement the Conclusion	ICAO States States MID-AMC STG	State Letter Routing Tables Testing/ feedback Operation date	Jan. 2014 Mar. 2014 Jun. 2014 Jun. 2014	Actioned SL AN 7/5.1-14/084 dated 16 April 2014
CONCLUSION 14/23: MID AIDC/OLDI IMPLEMENTATION SEMINAR That States, a) support ICAO in organising a Seminar on implementation of AIDC/OLDI; b) participate actively in the Seminar; and c) with the support of ICAO develop the MID AIDC/OLDI Implementation Plan.	Convene the Seminar	ICAO	Seminar	Mar. 2014	Completed

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
DECISION 14/24: DEVELOPMENT AND ENDORSEMENT OF THE MID eANP That, in support to the ICAO efforts to align the regional Air Navigation Plans (ANP) with the Fourth Edition of the Global Air Navigation Plan (GANP) (Doc 9750): a) the development of the MID eANP based on the Council-approved ANP Template, be included in the work programme of the different MIDANPIRG subsidiary bodies; and b) the relevant Parts of the MID eANP be presented, as soon as available, to MSG/4 and/or MIDANPIRG/15 for endorsement.	Implement the Conclusion	 MIDANPIRG subsidiary bodies MSG/4 and MIDANPIRG/15	 MID eANP Parts	 TBD Sep 2014 May 2015	Ongoing
CONCLUSION 14/25: INFPL POST IMPLEMENTATION-SYSTEM UPGRADES That, concerned States be urged to upgrade their systems to ensure the full handling of the ICAO New Flight Plan format before **30 June 2015**.	Implement the Conclusion	ICAO States	State Letter Feedback	Jan. 2014 Jun. 2015	Actioned SL AN 6/2B-14/122 dated 4 May 2014
CONCLUSION 14/26: MID REGION GNSS IMPLEMENTATION STRATEGY That, the MID Region GNSS implementation Strategy be updated as at **Appendix 4.6x** to the Report on Agenda Item 4.6.	Implement the Strategy	MIDANPIRG/14	Updated Strategy	Dec. 2013	Completed

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
CONCLUSION 14/27: MID SURVEILLANCE STRATEGY That, the MID Surveillance Strategy be adopted as at **Appendix 4.6B** to the Report on Agenda Item 4.6.	Implement the Strategy	MIDANPIRG/14	Updated Strategy	Dec. 2013	Completed
CONCLUSION 14/28: MID REGIONAL PBN IMPLEMENTATION STRATEGY AND PLAN That, the MID Regional PBN Implementation Strategy and Plan be updated as at **Appendix 4.6C** to the Report on Agenda Item 4.6.	Implement the Strategy	MIDANPIRG/14	Updated Strategy	Dec. 2013	Completed
CONCLUSION 14/32: ELIMINATION OF AIR NAVIGATION DEFICIENCIES IN THE MID REGION That, States be urged to: a) use the MID Air Navigation Deficiency Database (MANDD) for the submission of requests for addition, update, and elimination of Air Navigation Deficiencies; and b) submit a Formal Letter to the ICAO MID Regional Office containing the evidence(s) that mitigation measures have been implemented for the elimination of deficiency(ies) when requesting the elimination of deficiency(ies) from the MANDD.	Implement the Conclusion	ICAO States	State Letter CAP and necessary updates/ evidences	Mar. 2014 When necessary	Actioned SL 2/2-14/109 dated 17 Apr. 2014

APPENDIX 4A

MID AMC FOCAL POINTS

State	Name	Tel.	Mobile	Email
Bahrain	Mohamed Ali Saleh	+973 17 321 187	+973 3962 2202	masaleh@caa.gov.bh
Egypt	Essam helmy Mohamed Hassanin Ahmed Farghaly (ALT)	+20222657946 +20222678999	+2010022505	Essamhelmi07@hotmail.com ahmed-farghaly222@yahoo.com
Iran	Ali Akbar Salehi Valojerdi Alireza Mahdavisefat	+9821 6604 6645		akbarsalehi@gmail.com
Iraq				
Jordan	Ms. Mona Ribhi Al-Naddaf Ms. Majdolin Mahamood Al-Trad	+9626 489 1473	+96279 987 6710	aftn_ais@carc.gov.jo
Kuwait				
Lebanon	Mr. Rabee El Harakeh	+9611 628 150	+9613 719 944	rabeeharakeh@beirutairport.gov.lb
Libya				
Oman				
Qatar				
Saudi Arabia	Mr. Ibrahim Basheikh	+966 671 7717 ex1119		I_basheikh@hotmail.com
Sudan	Mr. Abdulmonem Elsheikh Ahmed ANS Director	+249183 770534	+2499 14101300	Aelsheikh78@gmail.com Abdulmonem_caa@yahoo.co.uk
Syria				
UAE	Mr. Hamad Al Belushi	+9712 599 6633	+97150 616 4350	hbelushi@szc.gcaa.ae
Yemen				

APPENDIX 5A

State Bahrain (Manama)

State	Speed	ISP	IP Address	Net Mask	Router Type	Data end user interface	Applications in use
Riyadh	64k	Batelco	10.61.11.12	255.255.255.252	Motorola Vangurd 6435	FXO/FXS	Voice
Dammam	64k	Batelco	10.61.11.44	255.255.255.252	Motorola Vangurd 6435	FXO/FXS	Voice
Tehran	64k	Batelco	172.16.10.2	255.255.255.0	Cisco2800	Serial	AFTN
						FXO/FXS	Voice
Kuwait	128k	Batelco	10.61.11.8	255.255.255.252	Motorola Vangurd 6435	Serial	AFTN-Radar
						FXO/FXS	Voice
Jeddah	64k	Batelco	10.61.11.48	255.255.255.252	Motorola Vangurd 6435	Serial	CIDIN
						FXO/FXS	Voice
Doha-1	64k	Batelco	10.61.11.32	255.255.255.252	Motorola Vangurd 6455	Serial	Radar
						FXO/FXS	Voice
Doha-2	64k	Batelco	10.61.11.56	255.255.255.252	Motorola Vangurd 6455	Serial	AFTN
						FXO/FXS	Voice
AbuDhabi-1	64k	Batelco	10.61.11.12	255.255.255.252	Motorola Vangurd 6435	Serial	Radar
						FXO/FXS	Voice
AbuDhabi-2	64k	Batelco	10.61.11.16	255.255.255.252	Motorola Vangurd 6435	Serial	CIDIN
						FXO/FXS	Voice

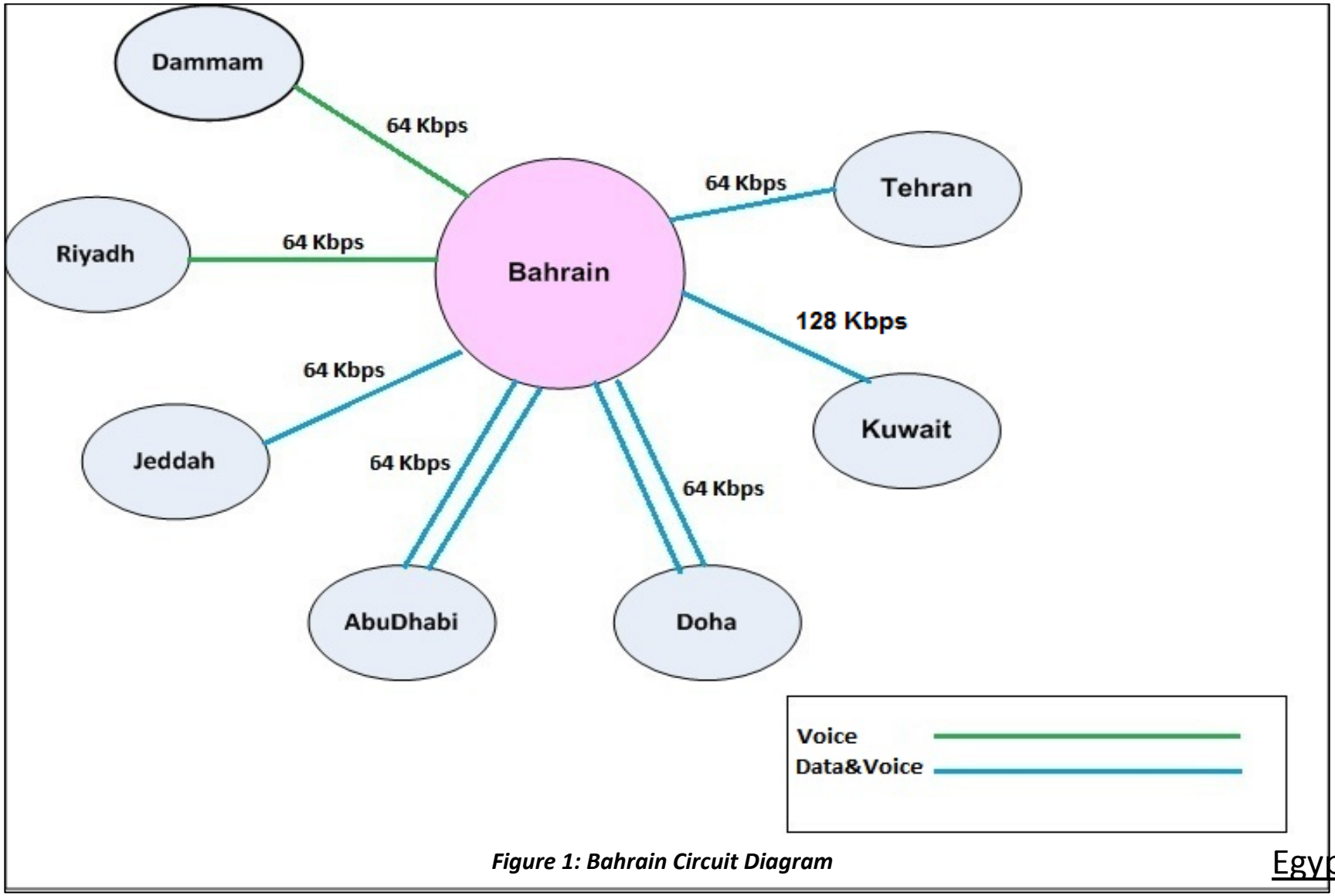


Figure 1: Bahrain Circuit Diagram

State Egypt (Cairo)

State	Speed	ISP	IP Address	Net Mask	Router Type	Data end user interface	Applications in use
Amman	64k	Telecom Egypt (ATM)	10.10.10.2 192.168.12.7	255.255.255.0 255.255.255.0	Motorola Vangurd 6800	IP	AMHS
						FXO/FXS	Voice
Jeddah1	64k	Telecom Egypt (ATM)	192.168.80.2	255.255.255.0	Cisco2800	FXO/FXS	Voice
						IP	OLDI, Radar
Jeddah2	128k	Telecom Egypt (ATM)	10.10.10.1	255.255.255.0	Motorola Vangurd 6455	IP	AMHS
						FXO/FXS	Voice
Riyadh	64k	Telecom Egypt (ATM)	192.168.80.2	255.255.255.0	Cisco2800	FXO/FXS	Voice
Tripoli	64k	Telecom Egypt (ATM)	10.10.10.1	255.255.255.0	Cisco1700	Serial	AFTN

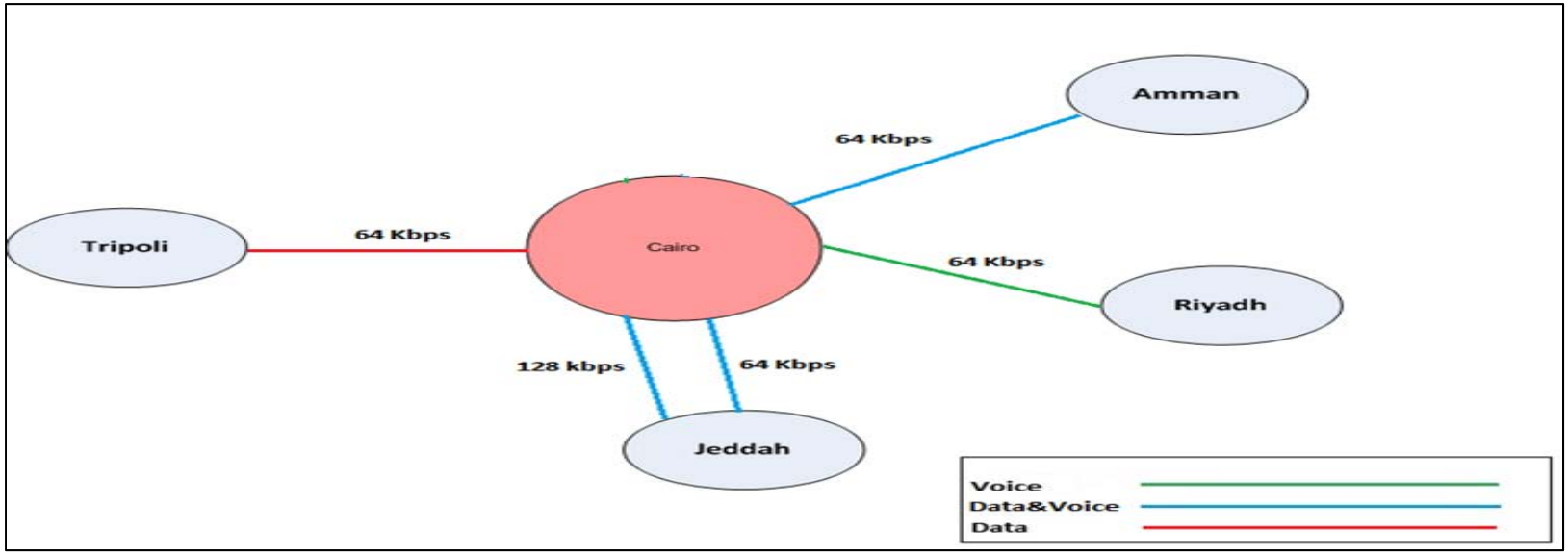


Figure 2: Cairo Circuit Diagram

State Saudi Arabia

(Jeddah)

State	Speed	ISP	IP Address	Net Mask	Router Type	Data end user interface	Applications in use
Cairo1	128k	N/A	192.168.12.0	255.255.255.0	Motorola Vangurd 6455	IP	AHHS
						FXO/FXS	Voice
Cairo2	64k	N/A	N/A	N/A	Motorola Vangurd 6455	IP	AMHS
					Motorola Vangurd 6455	FXO/FXS	Voice
Amman	64k	N/A	192.168.12.0	255.255.255.0	Motorola Vangurd 6455	IP	AHHS
						FXO/FXS	Voice
Muscat	64k	N/A	192.168.12.0	255.255.255.0	Cisco 2811	IP	AHHS
						FXO/FXS	Voice
Manama	64k	N/A	TBD	TBD	Motorola Vangurd 6435	Serial	CIDIN
						FXO/FXS	Voice

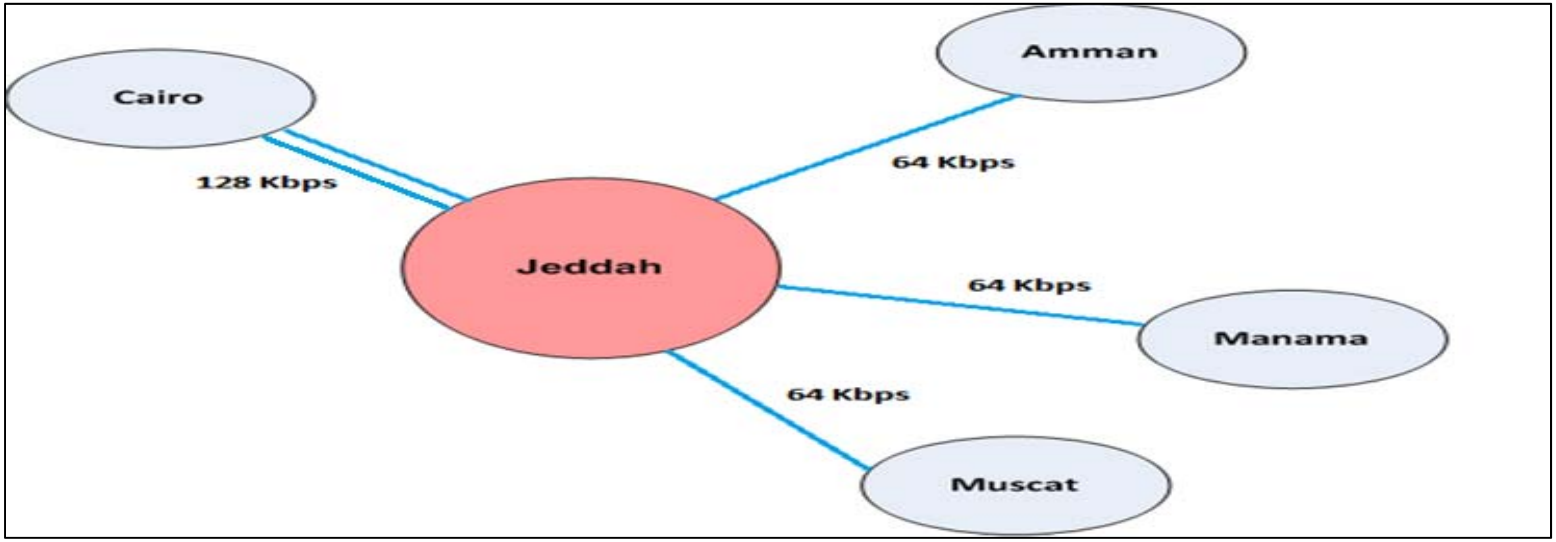


Figure 3: Jeddah Circuit Diagram

State IRAN(Tehran)

State	Speed	ISP	IP Address	Net Mask	Router Type	Data end user interface	Applications in use
Bahrain	64k	Iran PPT	172.16.10.2	255.255.255.0	Cisco2811	Serial	AFTN
						FXO/FXS	Voice
Baghdad	32k	Iran PPT	192.168.191.14	255.255.255.0	Cisco2811	FXO/FXS	Voice
Kuwait	64k	Iran PPT	172.16.12.0	255.255.255.0	Cisco2811	Serial	AFTN
						FXO/FXS	Voice
Abu Dhabi	64k	Iran PPT	172.16.15.0	255.255.255.0	Cisco2811	Serial	AFTN
						FXO/FXS	Voice
Muscat	64k	Iran PPT	172.16.14.0	255.255.255.0	Cisco2811	Serial	AFTN
						FXO/FXS	Voice

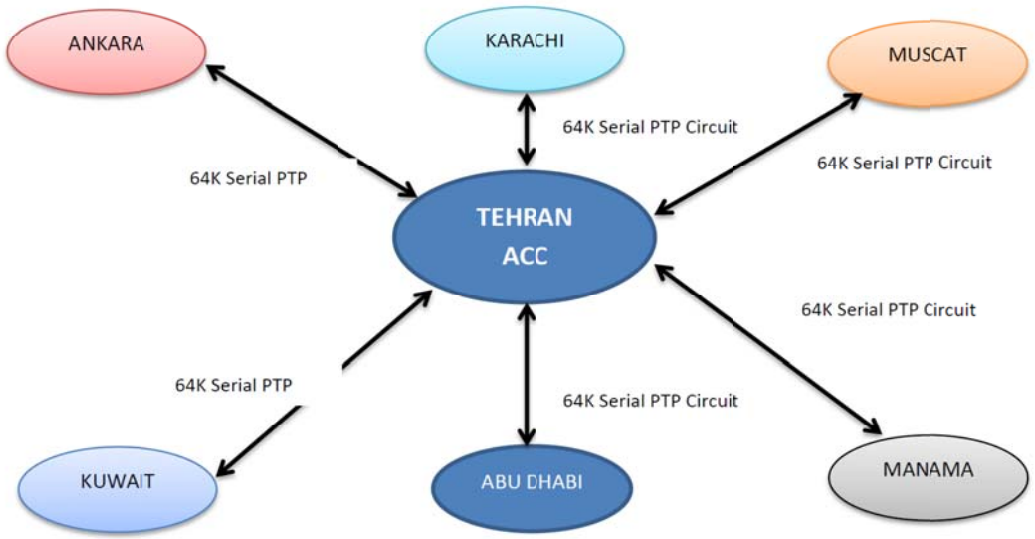


Figure 4: Tehran Circuit diagram

State UAE (Abu Dhabi)

State	Speed	ISP	IP Address	Net Mask	Router Type	Data end user interface	Applications in use
Bahrain1[1]	64K	Etisalat	N/A	N/A	Motorola Vangurd 6455	Serial	Radar
						FXO/FXS	Voice
Bahrain2[1]	64K	Etisalat	N/A	N/A	Motorola Vangurd 6455	Serial	AFTN/CIDIN
						FXO/FXS	Voice
Oman	64K	Etisalat	192.168.130.0	255.255.255.0	Motorola Vangurd 6455	Ethernet	AMHS
						FXO/FXS	Voice
Qatar	128K	Etisalat	192.168.131.0	255.255.255.0	Motorola Vangurd 6435	Ethernet	AMHS/OLDI
						FXO/FXS	Voice
Qatar[2]	256K	Etisalat	84.255.163.140	255.255.255.252	Motorola Vanguard 6840	Ethernet	AMHS
Qatar[2]	256K	Etisalat	192.168.10.0	255.255.255.252	Cisco 1921	FXS Ethernet	Voice Radar
Amman[3]	2Mb	Etisalat	94.56.192.202	255.255.255.0	Fortigate 110C firewall	Ethernet	AMHS
Iran	64K	Etisalat	N/A	N/A	Cisco 2811	Ethernet FXS	AMHS Voice

Remarks: [1] The IP addresses for Bahrain links is configured by ISP and not identified on UAE side.

[2] These are planned circuits still under test

[3] The link type between Jordan and Abu Dhabi is over an IPSec connection over the public internet (VPN)

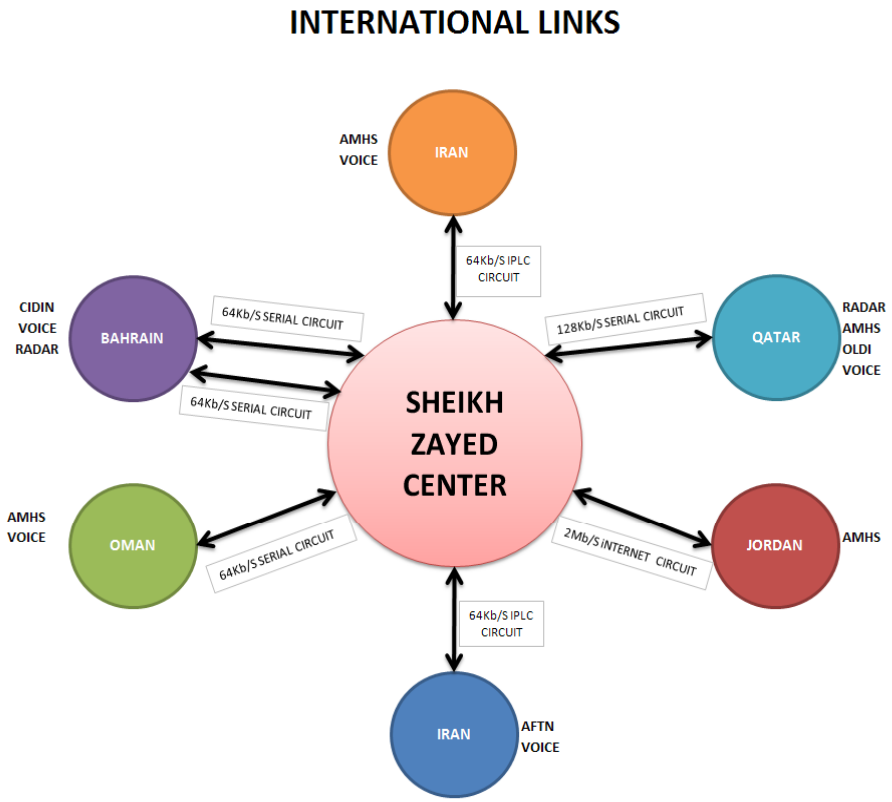


Figure 5: Abu Dhabi Circuit Diagram

State Kuwait (Kuwait)

State	Speed	ISP	IP Address	Net Mask	Router Type	Data end user interface	Applications in use
Beirut	64K	Qualitynet	--	--	Motorola Modem 3460	N/A	AFTN
Doha	64K	Qualitynet	--	--	Motorola Modem 3460	N/A	AFTN
Tehran	64K	Qualitynet	172.16.12.2	255.255.255.252	Cisco 2800	N/A	AFTN-Voice
Damascus	64K	Qualitynet	--	--	Motorola Modem 3460	N/A	AFTN
Bahrain	128K	Qualitynet	--	--	Motorola Vanguard 6455	N/A	AFTN, Radar
							Voice
Baghdad	64K	Qualitynet	192.168..0.160	255.255.255.0	Motorola Modem 3460	N/A	AFTN-Voice

Remarks:

- The connectivity for circuits (Beirut, Doha, Damascus, Karachi and Bahrain) is pure layer 2 there is no IP configuration on these circuits.
- For Tehran circuit there is IP configuration on the WAN side 172.16.12.2/30 (between Quality net and Tehran provider), but there is no IP configuration between Quality net and DGCA Kuwait.

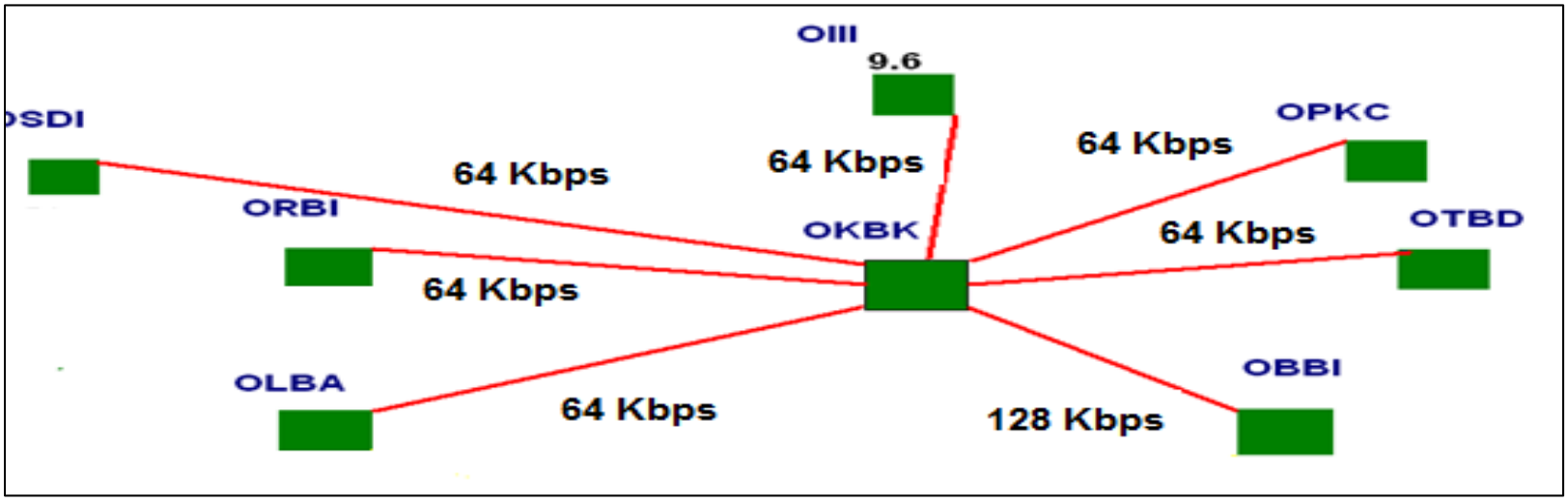


Figure 6: Kuwait Circuit Diagram

State Jordan (Amman)

State	Speed	ISP	IP Address	Net Mask	Router Type	Data end user interface	Applications in use
Cairo	64k	N/A	10.10.10.1	255.255.255.0	Vanguard	N/A	AMHS
						FXO/FXS	Voice
Jeddah	64k	N/A	10.10.10.1	255.255.255.0	Vanguard	N/A	AMHS
						FXO/FXS	Voice
Abu Dhabi*	2M	NITC	193.188.93.19	255.255.255.0	Cisco 5510	N/A	AMHS

* ***The*** link type between Jordan and Abu Dhabi is over public internet (VPN)

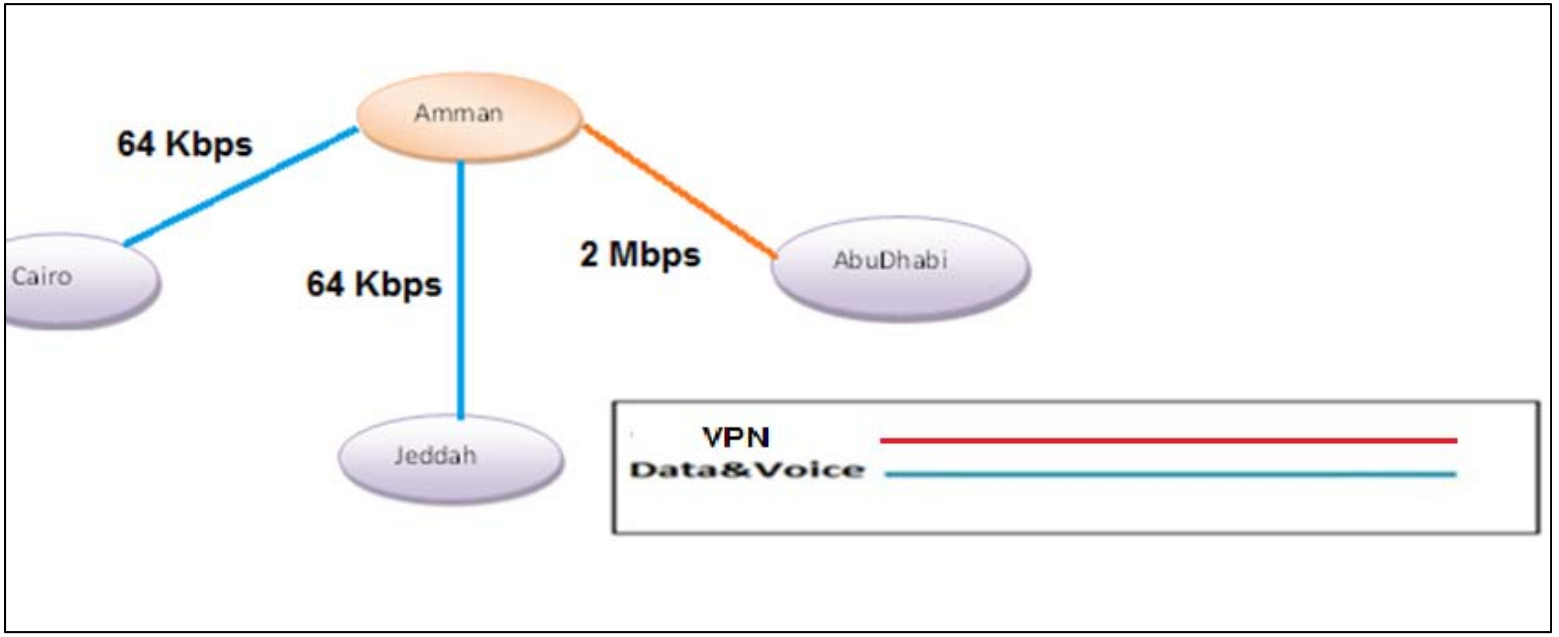


Figure 7: Jordan Circuit Diagram

State Iraq (Baghdad)

State	Speed	ISP	IP Address	Net Mask	Router Type	Data end user interface	Applications in use
Iran	32k	Passcom	192.168.191.10	255.255.255.0	NDsatcom SkyWan 5000	FXS	Voice
Kuwait	64k	Passcom	192.168.191.2	255.255.255.0	NDsatcom SkyWan 5000	FXS	Voice
			192.168.0.60	255.255.255.0		Ethernet	AFTN

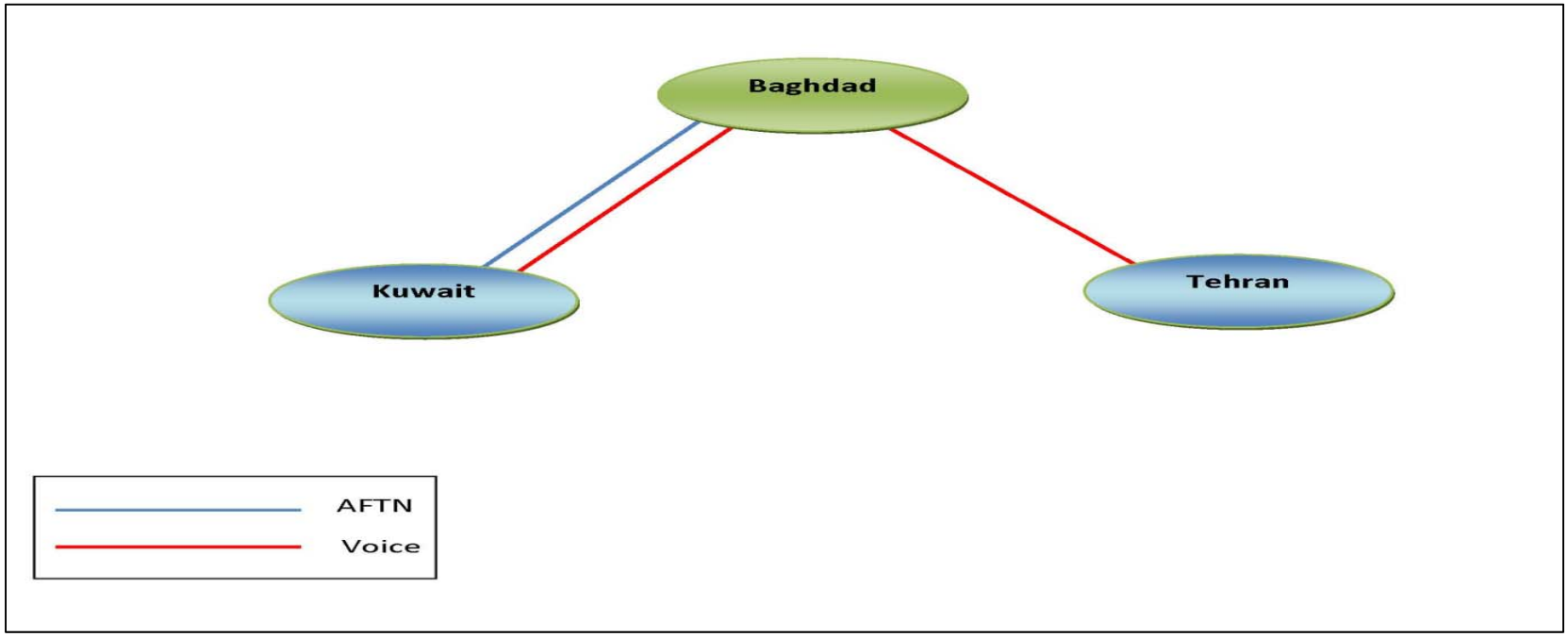


Figure 8: Iraq Circuit Diagram

State QATAR (Doha)

State	Speed	ISP	IP Address	Net Mask	Router Type	Data end user interface	Applications in use
Abu Dhabi	128k	QTEL	200.200.200.x	255.255.255.252	Motorola Vanguard 6455	serial	AFTN, Radar
						FXO/FXS	Voice
Kuwait	64 k	QTEL	N/A	N/A	New Bridge Modem 2602	Serial	AFTN
Bahrain	64 k	QTEL	N/A	N/A	Motorola Vanguard 6840	serial	AFTN, Radar
						FXO/FXS	AFTN, Radar
Bahrain	64 k	QTEL	N/A	N/A	Motorola Vanguard 6840	FXO/FXS	Voice

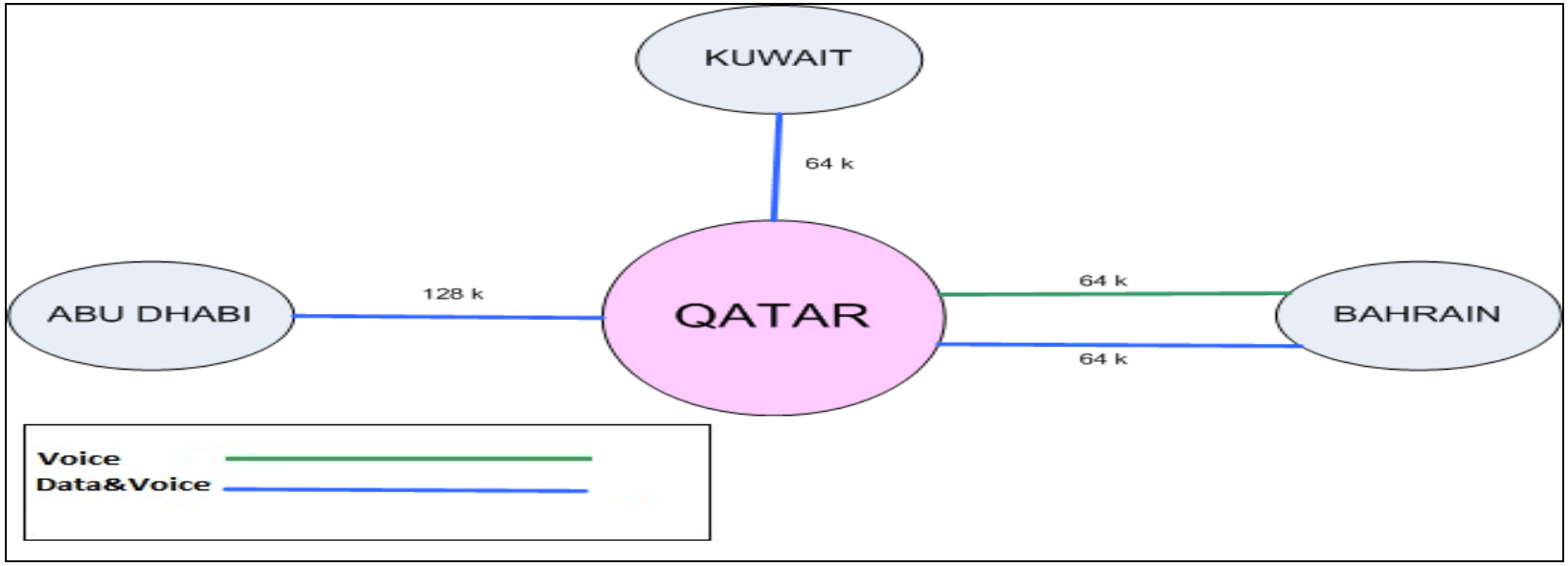


Figure 9: Qatar Circuit Diagram

State OMAN (Muscat)

State	Speed	ISP	IP Address	Net Mask	Router Type	Data end user interface	Applications in use
Abu Dhabi	64 k	OMANTEL	192.168.12.142	255.255.255.0	Motorola Vanguard 6455	serial	AFTN, AMHS
						FXO/FXS	Voice
JEDDAH	64 k	OMANTEL	10.10.10.1	255.255.255.0	Cisco 2800	serial	AFTN, AMHS
						FXO/FXS	Voice
Bahrain	64 k	OMANTEL	192.168.30.1	255.255.255.0	Cisco 2800	serial	AFTN, Radar
						FXO/FXS	AFTN, Radar
Iran	64 k	OMANTEL	172.16.14.0	255.255.255.252	Cisco 2800	FXO/FXS	Voice

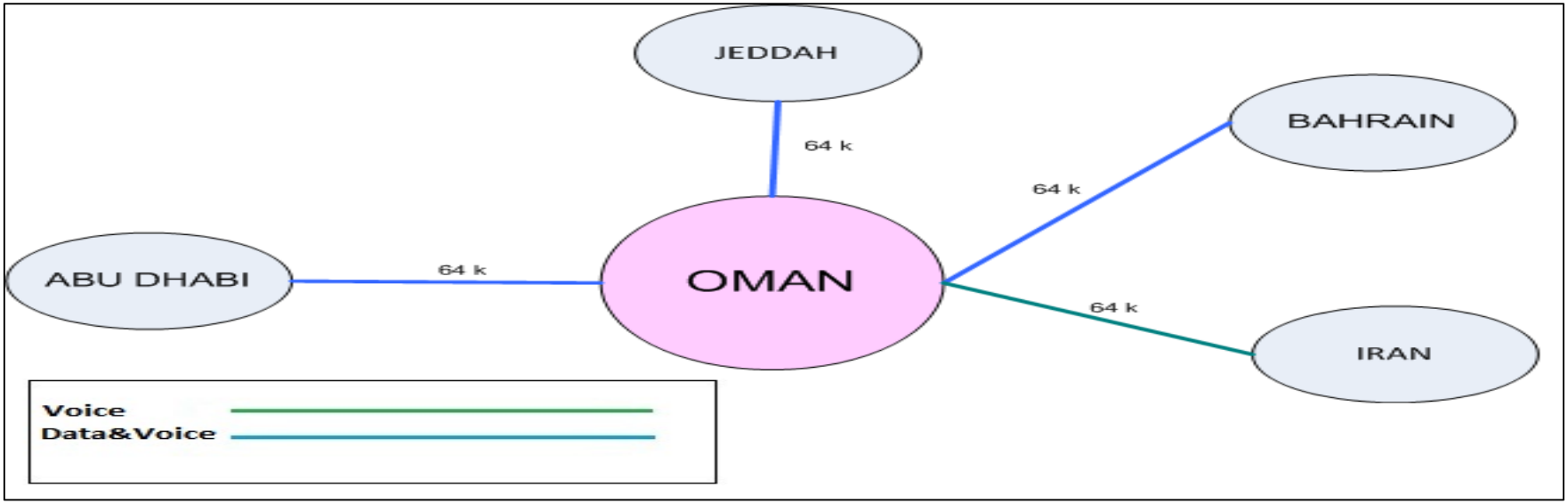


Figure 10: Oman Circuit Diagram

Remark:

After conducting the IP network Survey, *Common infrastructure characteristics in all states have been found as follows:*

- *Lebanon is in process of migration three circuits to IP networks (Kuwait, Bahrain, and Jeddah).*
- *Libya, Sudan, Syria and Yemen do not have IP circuits implemented*
- *Security Measure: Not implemented**
- *Voice interfaces: FXO/FXS*
- *Voice Protocol Supported: SIP,H.323*
- *All IP circuits is using IPv4*
- *Link Type: Leased Line.*
- *Router interfaces:* Async Serial, Sync Serial ,Ethernet

* *Jordan has a firewall device CISCO ASA5510 for Abu Dhabi link (VPN)*

APPENDIX 5B

THE PROPOSED IPv4 ADDRESS PLAN for MID REGION

Introduction

The IPv4 address scheme is proposed by the Caribbean and South American Regional for its ATN/IPS Network. The MID Region's plan was also part of their global IPv4 addressing assignment. The MID Region is requested to review this proposed IP addressing assignment for consideration and adoption.

Objectives

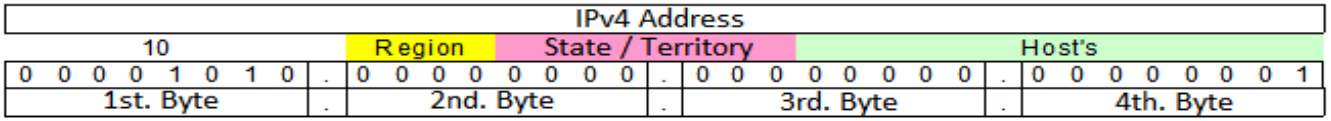
This document is meant to describe the addressing plan for IPv4 addresses throughout the MID Region. This document defines the recommended address format for IPv4 addresses. The document lists the addresses allocated to States in the MID Region and the interstate connections IP's. The implementation of the proposed plan will go into stages and should be carefully coordinated between States.

Acronyms

ICAO	-	International Civil Aviation Organization
AMHS	-	ATN Message Handling System
ARP	-	Address Resolution Protocol
ATN	-	Aeronautical Telecommunications Network
CNS		Communication Navigation Surveillance
BGP	-	Border Gateway Protocol
DNS	-	Domain Name Service
IANA	-	Internet Assigned Numbers Authority
ICS	-	ATN Internet Communication Service
IP	-	ATN Internet Communication Service

IPV4	-	Internet Protocol Version 4
IPV6	-	Internet Protocol Version 6
IPS	-	Internet Protocol suite
LACNIC	-	Latin American and Caribbean Internet Address Registry
LIR	-	Local Internet Registry
OSPF	-	Open Shortest Path First
RIR	-	Regional Internet Registry
ANSP	-	Air Navigation Service Provider
ISP	-	Internet Service Provider
APAC	-	Asia and Pacific
CAR	-	Caribbean
SAM	-	South America
MID	-	Middle east
WACAF	-	West And Central Africa
ESAF	-	East And South Africa
PDU	-	Packet Data Unit
MTA	-	Message Transfer Agent
UA	-	User Agent
ACP	-	Aeronautical Communication Panel
SWIM	-	System Wide Information Management
PENS	-	PAN European Network Service
IMS	-	Information Management Service

Global IPv4 assignments



- 0000 => SAM: South American Office.
- 0001 => NACC: North American, American Power station and Caribbean Office.
- 0010 => APAC: Asia and Pacific Office.
- **0011 => MID: Middle East Office.**
- 0100 => WACAF: Western and Central African Office.
- 0101 => ESAF: Eastern and Southern African Office.
- 0110 => EUR/NAT: European and North Atlantic Office.

IP address Scheme Characteristics:

The proposed IPv4 address allocation scheme will be able to cover:

- 128 States
- 8190 Hosts for each State.
- 2048 Point-to-Point links.

Network Assignments

Issue	State	Network	Direction Used	Decimal Notation	Binary Notation			
					1st Byte	*Region*	*State*	*Host*
1	Bahrain	10.48.0.0/19	First	10.48.0.1	00001010.	0011	0000.000	00000.00000001
			Last	10.48.31.254	00001010.	0011	0000.000	11111.11111110
2	Egypt	10.48.32.0/19	First	10.48.32.1	00001010.	0011	0000.001	00000.00000001
			Last	10.48.63.254	00001010.	0011	0000.001	11111.11111110
3	Iran	10.48.64.0/19	First	10.48.64.1	00001010.	0011	0000.010	00000.00000001
			Last	10.48.95.254	00001010.	0011	0000.010	11111.11111110
4	Iraq	10.48.96.0/19	First	10.48.96.1	00001010.	0011	0000.011	00000.00000001
			Last	10.48.127.254	00001010.	0011	0000.011	11111.11111110
5	Jordan	10.48.128.0/19	First	10.48.128.1	00001010.	0011	0000.100	00000.00000001
			Last	10.48.159.254	00001010.	0011	0000.100	11111.11111110
6	Kuwait	10.48.160.0/19	First	10.48.160.1	00001010.	0011	0000.101	00000.00000001
			Last	10.48.191.254	00001010.	0011	0000.101	11111.11111110
7	Lebanon	10.48.192.0/19	First	10.48.192.1	00001010.	0011	0000.110	00000.00000001
			Last	10.48.223.254	00001010.	0011	0000.110	11111.11111110
8	Libya	10.48.224.0/19	First	10.48.224.1	00001010.	0011	0000.111	00000.00000001
			Last	10.48.255.254	00001010.	0011	0000.111	11111.11111110
9	Oman	10.49.0.0/19	First	10.49.0.1	00001010.	0011	0001.000	00000.00000001
			Last	10.49.31.1	00001010.	0011	0001.000	11111.11111110
10	Qatar	10.49.32.0/19	First	10.49.32.1	00001010.	0011	0001.001	00000.00000001
			Last	10.49.63.254	00001010.	0011	0001.001	11111.11111110
11	Saudi Arabia	10.49.64.0/19	First	10.49.64.1	00001010.	0011	0001.010	00000.00000001
			Last	10.49.95.254	00001010.	0011	0001.010	11111.11111110
12	Sudan	10.49.96.0/19	First	10.49.96.1	00001010.	0011	0001.011	00000.00000001
			Last	10.49.127.254	00001010.	0011	0001.011	11111.11111110
13	Syria	10.49.128.0/19	First	10.49.128.1	00001010.	0011	0001.100	00000.00000001
			Last	10.49.159.254	00001010.	0011	0001.100	11111.11111110
14	UAE	10 .49 .160.0 /19	First	10 .49 .160.1	00001010.	0011	0001.101	00000.00000001
			Last	10 .49 .191.254	00001010.	0011	0001.101	11111.11111110
15	Yemen	10 .49 .192.0 /19	First	10 .49 .192.1	00001010.	0011	0001.110	00000.00000001
			Last	10 .49 .223.254	00001010.	0011	0001.110	11111.11111110

Range 1	Range 2	Range 3	Range 4
10 .48 .0 .0 - 10 .48 .31 .255	10 .49 .0 .0 - 10 .49 .31 .255	10 .50 .0 .0 - 10 .51 .31 .255	10 .51 .0 .0 - 10 .51 .31 .255
10 .48 .32 .0 - 10 .48 .63 .255	10 .49 .32 .0 - 10 .49 .63 .255	10 .50 .32 .0 - 10 .51 .63 .255	10 .51 .32 .0 - 10 .51 .63 .255
10 .48 .64 . 0 - 10 .48 . 95 .255	10 .49 .64 . 0 - 10 .49 . 95 .255	10 .50 .64 . 0 - 10 .51 . 95 .255	10 .51 .64 . 0 - 10 .51 . 95 .255
10 .48.96 . 0 - 10 .48 .127.255	10 .49.96 . 0 - 10 .49 .127.255	10 .50.96 . 0 - 10 .51 .127.255	10 .51.96 . 0 - 10 .51 .127.255
10 .48 .128.0 - 10 .48.159 .255	10 .49 .128.0 - 10 .49.159 .255	10 .50 .128.0 - 10 .51.159 .255	10 .51 .128.0 - 10 .51.159 .255
10 .48 .160.0 - 10 .48 .191 .255	10 .49 .160.0 - 10 .49 .191 .255	10 .50 .160.0 - 10 .51 .191 .255	10 .51 .160.0 - 10 .51 .191 .255
10 .48 .192.0 - 10 .48 .223 .255	10 .49 .192.0 - 10 .49 .223 .255	10 .50 .192.0 - 10 .51 .223 .255	10 .51 .192.0 - 10 .51 .223 .255
10 .48.224 .0 - 10 .48 . 225.255	10 .49.224 .0 - 10 .49 . 225.255	10 .50.224 .0 - 10 .51 . 225.255	10 .51.224 .0 - 10 .51 . 225.255
Range 5	**Range 6**	**Range 7**	**Range 8**
10 .52 .0 .0 - 10 .52 .31 .255	10 .53 .0 .0 - 10 .53 .31 .255	10 .54 .0 .0 - 10 .54 .31 .255	10 .55 .0 .0 - 10 .55 .31 .255
10 .52 .32 .0 - 10 .52 .63 .255	10 .53 .32 .0 - 10 .53 .63 .255	10 .54 .32 .0 - 10 .54 .63 .255	10 .55 .32 .0 - 10 .55 .63 .255
10 .52 .64 . 0 - 10 .52 . 95 .255	10 .53 .64 . 0 - 10 .53 . 95 .255	10 .54 .64 . 0 - 10 .54 . 95 .255	10 .55 .64 . 0 - 10 .55 . 95 .255
10 .52.96 . 0 - 10 .52 .127.255	10 .53.96 . 0 - 10 .53 .127.255	10 .54.96 . 0 - 10 .54 .127.255	10 .55.96 . 0 - 10 .55 .127.255
10 .52 .128.0 - 10 .52.159 .255	10 .53 .128.0 - 10 .53.159 .255	10 .54 .128.0 - 10 .54.159 .255	10 .55 .128.0 - 10 .55.159 .255
10 .52 .160.0 - 10 .52 .191 .255	10 .53 .160.0 - 10 .53 .191 .255	10 .54 .160.0 - 10 .54 .191 .255	10 .55 .160.0 - 10 .55 .191 .255
10 .52 .192.0 - 10 .52 .223 .255	10 .53 .192.0 - 10 .53 .223 .255	10 .54 .192.0 - 10 .54 .223 .255	10 .55 .192.0 - 10 .55 .223 .255
10 .52.224 .0 - 10 .52 . 225.255	10 .53.224 .0 - 10 .53 . 225.255	10 .54.224 .0 - 10 .54 . 225.255	10 .55.224 .0 - 10 .55 . 225.255
Range 9	**Range 10**	**Range 11**	**Range 12**
10 .56 .0 .0 - 10 .56 .31 .255	10 .57 .0 .0 - 10 .57 .31 .255	10 .58 .0 .0 - 10 .58 .31 .255	10 .59 .0 .0 - 10 .59 .31 .255
10 .56 .32 .0 - 10 .56 .63 .255	10 .57 .32 .0 - 10 .57 .63 .255	10 .58 .32 .0 - 10 .58 .63 .255	10 .59 .32 .0 - 10 .59 .63 .255
10 .56 .64 . 0 - 10 .56 . 95 .255	10 .57 .64 . 0 - 10 .57 . 95 .255	10 .58 .64 . 0 - 10 .58 . 95 .255	10 .59 .64 . 0 - 10 .59 . 95 .255
10 .56.96 . 0 - 10 .56 .127.255	10 .57.96 . 0 - 10 .57 .127.255	10 .58.96 . 0 - 10 .58 .127.255	10 .59.96 . 0 - 10 .59 .127.255
10 .56 .128.0 - 10 .56.159 .255	10 .57 .128.0 - 10 .57.159 .255	10 .58 .128.0 - 10 .58.159 .255	10 .59 .128.0 - 10 .59.159 .255
10 .56 .160.0 - 10 .56 .191 .255	10 .57 .160.0 - 10 .57 .191 .255	10 .58 .160.0 - 10 .58 .191 .255	10 .59 .160.0 - 10 .59 .191 .255
10 .56 .192.0 - 10 .56 .223 .255	10 .57 .192.0 - 10 .57 .223 .255	10 .58 .192.0 - 10 .58 .223 .255	10 .59 .192.0 - 10 .59 .223 .255
10 .56.224 .0 - 10 .56 . 225.255	10 .57.224 .0 - 10 .57 . 225.255	10 .58.224 .0 - 10 .58 . 225.255	10 .59.224 .0 - 10 .59 . 225.255
Range 13	**Range 14**	**Range 15**	**Range 16**
10 .60 .0 .0 - 10 .60 .31 .255	10 .61 .0 .0 - 10 .61 .31 .255	10 .62 .0 .0 - 10 .62 .31 .255	10 .63 .0 .0 - 10 .63 .31 .255
10 .60 .32 .0 - 10 .60 .63 .255	10 .61 .32 .0 - 10 .61 .63 .255	10 .62 .32 .0 - 10 .62 .63 .255	10 .63 .32 .0 - 10 .63 .63 .255
10 .60 .64 . 0 - 10 .60 . 95 .255	10 .61 .64 . 0 - 10 .61 . 95 .255	10 .62 .64 . 0 - 10 .62 . 95 .255	10 .63 .64 . 0 - 10 .63 . 95 .255
10 .60.96 . 0 - 10 .60 .127.255	10 .61.96 . 0 - 10 .61 .127.255	10 .62.96 . 0 - 10 .62 .127.255	10 .63.96 . 0 - 10 .63 .127.255
10 .60 .128.0 - 10 .60.159 .255	10 .61 .128.0 - 10 .61.159 .255	10 .62 .128.0 - 10 .62.159 .255	10 .63 .128.0 - 10 .63.159 .255
10 .60 .160.0 - 10 .60 .191 .255	10 .61 .160.0 - 10 .61 .191 .255	10 .62 .160.0 - 10 .62 .191 .255	10 .63 .160.0 - 10 .63 .191 .255
10 .60 .192.0 - 10 .60 .223 .255	10 .61 .192.0 - 10 .61 .223 .255	10 .62 .192.0 - 10 .62 .223 .255	10 .63 .192.0 - 10 .63 .223 .255
10 .60.224 .0 - 10 .60 . 225.255	10 .61.224 .0 - 10 .61 . 225.255	10 .62.224 .0 - 10 .62 . 225.255	10 .63.224 .0 - 10 .63 . 225.255

MID REGION SUB-NETWORKS *(Orange=State Range Blue=Vacancy **Red= Reserved**)*

MID Region intra-Regional Links (Point to Point)

		--	10.63.224.0
10.63.224. 0 /30	**Bahrain - Riyadh**	Bahrain	10.63.224.1
		Riyadh	10.63.224.2
		--	10.63.224.3
		--	10.63.224.4
10.63.224. 4 /30	**Bahrain - Dammam**	Bahrain	10.63.224.5
		Dammam	10.63.224.6
		--	10.63.224.7
		--	10.63.224.8
10.63.224. 8 /30	**Bahrain - Jeddah**	Bahrain	10.63.224.9
		Jeddah	10.63.224.10
		--	10.63.224.11
		--	10.63.224.12
10.63.224. 12 /30	**Bahrain - Kuwait**	Bahrain	10.63.224.13
		Kuwait	10.63.224.14
		--	10.63.224.15
		--	10.63.224.16
10.63.224. 16 /30	**Bahrain – Doha1**	Bahrain	10.63.224.17
		Doha1	10.63.224.18
		--	10.63.224.19
		--	10.63.224.20
10.63.224. 20 /30	**Bahrain – Doha2**	Bahrain	10.63.224.21
		Doha2	10.63.224.22
		--	10.63.224.23
		--	10.63.224.24
10.63.224. 24 /30	**Bahrain – AbuDhabi1**	Bahrain	10.63.224.25
		AbuDhabi1	10.63.224.26
		--	10.63.224.27
		--	10.63.224.28
10.63.224. 28 /30	**Bahrain – AbuDhabi2**	Bahrain	10.63.224.29
		AbuDhabi2	10.63.224.30

Sub-Network	Connected Route	Host / State	IP Address
		--	10.63.224.31
		--	10.63.224.32
10.63.224. 32 /30	**Bahrain – Tehran**	Bahrain	10.63.224.33
		Tehran	10.63.224.34
		--	10.63.224.35
7 Sub-Networks are reserved for future links (10.63.224.36/30 – 10.63.224.63/30)			
		--	10.63.224.64
10.63.224. 64 /30	**Egypt – Amman**	Egypt	10.63.224.65
		Amman	10.63.224.66
		--	10.63.224.67
		--	10.63.224.68
10.63.224. 68 /30	**Egypt – Jeddah1**	Egypt	10.63.224.69
		Jeddah1	10.63.224.70
		--	10.63.224.71
		--	10.63.224.72
10.63.224. 72 /30	**Egypt – Jeddah2**	Egypt	10.63.224.73
		Jeddah2	10.63.224.74
		--	10.63.224.75
		--	10.63.224.76
10.63.224. 76 /30	**Egypt – Riyadh**	Egypt	10.63.224.77
		Riyadh	10.63.224.78
		--	10.63.224.79
12Sub-Networks are reserved for future links (10.63.224.80/30 – 10.63.224.127/30)			
		--	10.63.224. 128
10.63.224. 128 /30	**Iran - Iraq**	Iran	10.63.224. 129
		Iraq	10.63.224. 130
		--	10.63.224. 131
		--	10.63.224. 132
10.63.224. 132 /30	**Iran - Kuwait**	Iran	10.63.224. 133
		Kuwait	10.63.224. 134
		--	10.63.224. 135
14 Sub-Networks are reserved for future links (10.63.224.136/30 – 10.63.224.191/30)			
		--	10.63.224. 192
10.63.224. 192 /30	**Jordan - Jeddah**	Jordan	10.63.224. 193

			Jeddah	10.63.224. 194
			--	10.63.224. 195
		15 Sub-Networks are reserved for future links (10.63.224.196/30 – 10.63.224.255/30)		
	Sub-Network	**Connected Route**	**Host / State**	**IP Address**
			--	10.63.225.0
	10.63.225. 0 /30	**Kuwait - Iraq**	Kuwait	10.63.225.1
			Iraq	10.63.225.2
			--	10.63.225.3
		15 Sub-Networks are reserved for future links (10.63.225.4/30 – 10.63.225.63/30)		
			--	10.63.225. 64
	10.63.225. 64 /30	**Qatar – Abu Dhabi**	Qatar	10.63.225. 65
			Abu Dhabi	10.63.225. 66
			--	10.63.225. 67
		15 Sub-Networks are reserved for future links (10.63.225.68/30 – 10.63.225.127/30)		
			--	10.63.225.128
	10.63.225. 128 /30	**Saudi Arabia (Jeddah) - Muscat**	Jeddah	10.63.225.129
			Muscat	10.63.225.130
			--	10.63.225.131
		15 Sub-Networks are reserved for future links (10.63.225.132/30 – 10.63.225.191/30)		
			--	10.63.225. 192
	10.63.225. 192 /30	**UAE (Abu Dhabi) - Muscat**	Abu Dhabi	10.63.225. 193
			Muscat	10.63.225. 194
			--	10.63.225. 195
		15 Sub-Networks are reserved for future links (10.63.225.196/30 – 10.63.225.255/30)		
			--	--
--	10.64.226. 0 /30	**Lebanon**	--	--
		16 Sub-Networks are reserved for future links (10.63.226.0/30 – 10.63.226.63/30)		
			--	--
--	10.63.226. 64 /30	**Sudan**	--	--
		16 Sub-Networks are reserved for future links (10.63.226.64/30 – 10.63.226.127/30)		

***Remark**: In case of a new IP link between two states, both States will have to use the next available IP address range as specified in the above table.*

MID Region intra-Regional Links (Per State)

No.	State	Connected Route	Local Interface	Next Hop Interface
1	**Bahrain**	Bahrain - Riyadh	10.63.224.1	10.63.224.2
		Bahrain - Dammam	10.63.224.5	10.63.224.6
		Bahrain - Jeddah	10.63.224.9	10.63.224.10
		Bahrain - Kuwait	10.63.224.13	10.63.224.14
		Bahrain – Doha1	10.63.224.17	10.63.224.18
		Bahrain – Doha2	10.63.224.21	10.63.224.22
		Bahrain – AbuDhabi1	10.63.224.25	10.63.224.26
		Bahrain – AbuDhabi2	10.63.224.29	10.63.224.30
		Bahrain – Tehran	10.63.224.33	10.63.224.34
2	**Egypt**	Egypt-Amman	10.63.224.65	10.63.224.66
		Egypt-Jeddah1	10.63.224.69	10.63.224.70
		Egypt-Jeddah2	10.63.224.73	10.63.224.74
		Egypt-Riyadh	10.63.224.77	10.63.224.78
3	**Iran**	Iran-Iraq	10.63.224. 129	10.63.224. 130
		Iran-Kuwait	10.63.224. 133	10.63.224. 134
		Iran-Bahrain	10.63.224.34	10.63.224.33
4	**Iraq**	Iraq-iran	10.63.224. 130	10.63.224. 129
5	**Jordan**	Jordan - Jeddah	10.63.224. 193	10.63.224. 194
		Jordan - Cairo	10.63.224.66	10.63.224.65
6	**Kuwait**	Kuwait-Bahrain	10.63.224.14	10.63.224.13
		Kuwait-Iraq	10.63.225.1	10.63.225.2
		Kuwait-Iran	10.63.224. 134	10.63.224. 133
7	**Lebanon**	--	--	--
8	**Libya**	--	--	--
9	**Oman**	--	--	--

No.		Connected Route	Local Interface	Next Hop Interface
10	Qatar	Qatar-AbuDhabi	10.63.225. 65	10.63.225. 66
		Qatar-Bahrain1	10.63.224.18	10.63.224.17
		Qatar-Bahrain2	10.63.224.22	10.63.224.21
11	Saudi Arabia	Jeddah - Muscat	10.63.225.129	10.63.225.130
		Jeddah - Cairo1	10.63.224.70	10.63.224.69
		Jeddah - Cairo2	10.63.224.74	10.63.224.73
		Jeddah - Amman	10.63.224. 194	10.63.224. 193
		Jeddah - Bahrain	10.63.224.10	10.63.224.9
12	Sudan	--	--	--
13	Syria	--	--	--
14	UAE	UAE - Muscat	10.63.225. 193	10.63.225. 194
		UAE - Bahrain1	10.63.224.26	10.63.224.25
		UAE - Bahrain2	10.63.224.30	10.63.224.29
		UAE - Qatar	10.63.225. 66	10.63.225. 65
15	Yemen	--	--	--

Impact of Changing Point-to-Point Ip address

The corresponding point-to-point IP line will be down during IP replacement process

Tips to Replace IP address

1- Coordinate with the adjacent State to agree on IPs, Routing, etc.

2- Make a backup of current configuration of the network devices (Routers, Firewalls… etc.)
3- Simulate new configuration on test network devices if possible

4- Advise AFS operators about downtime duration & time (for data line) or the controller(for voice line), the AFS operator should direct TFC to alternative CCT, and controller to use alternative voice means(dialup, Backup voice line,…etc.)

5- Configure network device with new setting

6- Send test data and decide about its reliability

7- Advise about its availability.

IP Change Schedule

No	State	Old IP	New IP	Net Mask	Router Type	Target date to change	State to connect to	Circuit speed	Circuit number	Type of Circuit	ISP	State Contact
1	**Bahrain**											
2	**Egypt**											
3	**Iran**											
4	**Iraq**											
5	**Jordan**											
6	**Kuwait**											
7	**Lebanon**											
8	**Libya**											
9	**Oman**											
10	**Qatar**											
11	**Saudi Arabia**											
12	**Sudan**											
13	**Syria**											
14	**UAE**											
15	**Yemen**											

APPENDIX 5C

INTERNATIONAL CIVIL AVIATION ORGANIZATION

ATS INTERFACILITY DATA COMMUNICATION AND ON-LINE DATA INTERCHANGE (AIDC/OLDI) SEMINAR

(Cairo, Egypt, 3-5 March 2014)

SUMMARY OF DISCUSSIONS

1. INTRODUCTION

1.1 The Seminar on the Implementation of ATS Interfacility Data Communication and On-Line Data Interchange (AIDC/OLDI Seminar) was successfully held at the ICAO Middle East (MID) Regional Office (Cairo, Egypt, 3-5 March 2014). The objective of the Seminar was to assist the MID States in implementing ASBU B0-FICE to Increase Interoperability, Efficiency and Capacity through Ground-Ground Integration.

1.2 The Seminar was attended by a total of thirty one (31) participants from nine (9) States (Bahrain, Egypt, Jordan, Kuwait, Oman, Qatar, Saudi Arabia, Sudan, and UAE), and two industry supplier (Indra and Thales). The list of participants is at **Attachment A** to the Summary of Discussions.

1.3 On behalf of Mr. Mohamed R. M. Khonji, ICAO Regional Director, Middle East Office, Mr. Raza Gulam, Regional Officer CNS welcomed the participants to Cairo and highlighted that the Seminar will provide the participants with up-to-date implementation status of AIDC and OLDI in the different ICAO Regions, the status of PAN Regional AIDC Interface Control Document (ICD) which is under development by the Inter-regional Taskforce (IRAIDCTF) and the requirements identified between adjacent Regions for implementing ground-ground integration. The Seminar will focus on MID States ATM systems capabilities, compatibilities and interoperability, which will assist to develop harmonized coordinated AIDC/OLDI implementation plan for the MID Region. The event will be an opportunity to share experience gained and lessons learnt by those States that have implemented AIDC and/or OLDI. Finally he thanked all the participants for attending the Seminar and wished them successful deliberations and outcome.

1.4 The Seminar was moderated by Mr. Raza Gulam Regional Officer CNS, ICAO Middle East Office, who was supported by Mr. Li Peng Regional Officer CNS, ICAO APAC Office in Bangkok and Mr. Celso Figueiredo Regional Officer ANS/Imp. ATM, ICAO - EUR/NAT Office in Paris.

1.5 The Seminar followed the below agenda:

Agenda Item 1:	Introductions
Agenda Item 2:	Global progress and requirements for AIDC/OLDI implementation
Agenda Item 3:	Technical and operational training requirements

Agenda Item 4: Template for bilateral letter of agreement on AIDC/OLDI
Agenda Item 5: Discussions and development MID AIDC/OLDI implementation plan
Agenda Item 6: Closing

2. DISCUSSIONS

2.1 The B0-FICE Module "Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration" as described in ASBU document was presented, this showed clearly that the communication in a data link environment improves coordination between air traffic service units (ATSUs) by using AIDC/OLDI, compared to the voice coordination and the transfer of flight control.

2.2 The Presentations covered the AIDC and OLDI implementation in different Regions. States also presented their experience and plan for implementing either AIDC and/or OLDI. The ATM systems (hardware and software) requirements along with the type of connection protocols were discussed in depth.

2.3 Basic set of messages in AIDC and OLDI were discussed in details and Basic set for implementation in the MID Region was agreed for both AIDC and OLDI. The requirement for the amendment of the Letter of Agreement (LOA) was discussed and templates were presented and the Seminar highlighted what is to be considered during the LOA amendment process.

2.4 The Seminar agreed that assignment of focal point for AIDC/OLDI Implementation will support the implementation. Accordingly, some of the States provided their focal points and it was agreed to send State Letter to all other MID States requesting them to provide focal point details. High level check list for the AIDC/OLDI implementation was also developed. The Seminar discussed the implementation plan and developed a comprehensive list of connections and systems capabilities along with detailed implementation plan as at **Appendix A** to the Summary of Discussions.

2.5 The Seminar developed the following Outcomes and Recommendations :

Outcomes:

- Identified six (6) MID States that should support both (AIDC/OLDI);
- developed an updated AIDC/OLDI Implementation Plan and system capabilities;
- agreed on a minimum AIDC/OLDI set of Messages for implementation in the MID Region;
- agreed on necessary consideration for the amendment of LoA Template;
- developed High level Implementation Check list;
- agreed that State should have AIDC/OLDI Focal points;
- agreed that APAC and EUR Regional Offices support interregional implementation ; and
- agreed on the following list of Recommendations.

Recommendations:

- States to share experience on AIDC/OLDI implementation including sharing of training and implementation packages and visits to other states;
- in order to expedite implementation States are encouraged to engage in test and trials even before signing the Official LoA;

- encourage bilateral AIDC/OLDI Workshops;
- States to identify operational requirements/Scope and improvements (know what are the messages which are needed/supported by other ATSU) and develop LoA accordingly;
- engage both technical and operational experts (CNS/ATM) in the update/amendment of the LoA;
- States (ATSU) having OLDI/AIDC capability to start implementation activities and plan implementation in Q2 2015;
- CNS and ATM Sub Groups to compile the MID AIDC/OLDI Implementation Strategy document to include all references, details of messages; test activities etc.;
- States to provide updates (progress reports) on AIDC/OLDI implementation by 15 August 2014;
- ICAO MID Regional Office to create a web page depositary for posting AIDC/OLDI Information etc.; and
- conduct of a follow-up Seminar in Q4 2015.

MID Region Strategy for the implementation of

AIDC/OLDI

Version 0.2, 9 September 2014

Table of Contents

DOCUMENT CHANGE RECORD

The following table records the history of the successive editions of the present document.

Edition Number	Edition Date	Description	Pages Affected
0.1	03 February 2014	Initial version	All
0.2	09 September 2014	CNS SG/6 update	All

1. Introduction:

Seeking to ensure continuous Safety improvement and Air Navigation modernization, the International Civil Aviation Organization (ICAO) has developed the strategic systems approach termed Aviation System Block Upgrade (ASBU). The latter, defines programmatic and flexible global systems, allows all States to advance their Air Navigation capacities based on their specific operational requirements.

The ASBU approach has four Blocks, namely Block 0, Block 1, Block 2 and Block 3. Each block is further divided into Modules. Block 0 is composed of Modules containing technologies and capabilities that are implemented currently.

Module FICE in Block 0 is introduced to improve coordination between air traffic service units (ATSUs) by using ATS inter-facility data communication (AIDC). The transfer of communication in a data link environment improves the efficiency of this process. The data link environment enhances capacity, efficiency, interoperability, safety and reduces cost.

The AIDC and the OLDI are tools to coordinate flight data between Air Traffic Service Units (ATSU) and both satisfies the requirements of basic coordination of flight notification, coordination and transfer of control.

Various items concerning MID Region Implementation of AIDC/OLDI have been detailed in this document.

2. Background and ASBU BO-FICE

Module N° B0-FICE: Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration:

Summary	To improve coordination between air traffic service units (ATSUs) by using ATS interfacility data communication (AIDC) defined by the ICAO *Manual of Air Traffic Services Data Link Applications* (Doc 9694). The transfer of communication in a data link environment improves the efficiency of this process particularly for oceanic ATSUs.	
Main performance impact as per Doc 9883	KPA-02 – Capacity, KPA-04 – Efficiency**,** KPA-07 – Global Interoperability, KPA-10 – Safety.	
Operating environment/ Phases of flight	All flight phases and all type of ATS units.	
Applicability considerations	Applicable to at least two area control centres (ACCs) dealing with en-route and/or terminal control area (TMA) airspace. A greater number of consecutive participating ACCs will increase the benefits.	
Global concept component(s) as per Doc 9854	CM – conflict management	
Global plan initiatives (GPI)	GPI-16: Decision support systems	
Main dependencies	Linkage with B*0-TBO*	
Global readiness checklist		Status (ready now or estimated date)
	Standards readiness	√
	Avionics availability	No requirement
	Ground systems availability	√
	Procedures available	√
	Operations approvals	√

1.1.2 General

1.1.1 Flights which are being provided with air traffic services are transferred from one air traffic services (ATS) unit to the next in a manner designed to ensure safety. In order to accomplish this objective, it is a standard procedure that the passage of each flight across the boundary of the areas of responsibility of the two units is co-ordinated between them beforehand and that the control of the flight is transferred when it is at, or adjacent to, the said boundary.

1.1.2 Where it is carried out by telephone, the passing of data on individual flights as part of the coordination process is a major support task at ATS units, particularly at area control centres (ACCs). The operational use of connections between flight data processing systems (FDPSs) at ACCs replacing phone coordination (on-line data interchange (OLDI)) is already proven in Europe.

1.1.3 This is now fully integrated into the ATS interfacility data communications (AIDC) messages in the *Procedures for Air Navigation Services — Air Traffic Management*, (PANS-ATM, Doc 4444) which describes the types of messages and their contents to be used for operational communications between ATS unit computer systems. This type of data transfer (AIDC) will be the basis for migration of data communications to the aeronautical telecommunication network (ATN).

1.1.4 The AIDC module is aimed at improving the flow of traffic by allowing neighbouring air traffic services units to exchange flight data automatically in the form of coordination and transfer messages.

1.1.5 With the greater accuracy of messages based on the updated trajectory information contained in the system and where possible updated by surveillance data, controllers have more reliable information on the conditions at which aircraft will enter in their airspace of jurisdiction with a reduction of the workload associated to flight coordination and transfer. The increased accuracy and data integrity permits the safe application of reduced separations.

1.1.6 Combined with air-ground data link applications, AIDC also allows the transfer of aircraft logon information and the timely initiation of establishing controller-pilot data link communications (CPDLC) by the next air traffic control (ATC) unit with the aircraft.

1.1.7 These improvements outlined above translate directly into a combination of performance improvements.

1.1.8 Information exchanges between flight data processing systems are established between air traffic services units for the purpose of notification, coordination and transfer of flights and for the purpose of civil/military coordination. These information exchanges rely upon appropriate and harmonized communication protocols to secure their interoperability.

1.1.9 Information exchanges apply to:

a) communication systems supporting the coordination procedures between air traffic services units using a peer-to-peer communication mechanism and providing services to general air traffic; and

b) communication systems supporting the coordination procedures between air traffic services units and controlling military units, using a peer-to-peer communication mechanism.

1.2 **Baseline**

1.2.1 The baseline for this module is the traditional coordination by phone, and procedural and/or radar distance/time separations.

1.3 **Change brought by the module**

1.3.1 The module makes available a set of messages to describe consistent transfer conditions via electronic means across ATS units' boundaries. It consists of the implementation of the set of AIDC messages in the flight data processing systems (FDPS) of the different ATS units involved and the establishment of a Letter of Agreement (LoA) between these units to set the appropriate parameters.

1.3.2 Prerequisites for the module, generally available before its implementation, are an ATC system with flight data processing functionality and a surveillance data processing system connected to each other.

1.4 **Other remarks**

1.4.1 This module is a first step towards the more sophisticated 4D trajectory exchanges between both ground/ground and air/ground according to the ICAO *Global Air Traffic Management Operational Concept* (Doc 9854).

2. **Intended performance operational improvement**

2.1 Metrics to determine the success of the module are proposed in the *Manual on Global Performance of the Air Navigation System* (Doc 9883).

Capacity	Reduced controller workload and increased data integrity supporting reduced separations translating directly to cross sector or boundary capacity flow increases.
Efficiency	The reduced separation can also be used to more frequently offer aircraft flight levels closer to the flight optimum; in certain cases, this also translates into reduced en-route holding.
Global interoperability	Seamlessness: the use of standardized interfaces reduces the cost of development, allows air traffic controllers to apply the same procedures at the boundaries of all participating centres and border crossing becomes more transparent to flights.
Safety	Better knowledge of more accurate flight plan information.
Cost Benefit Analysis	Increase of throughput at ATS unit boundary and reduced ATCO workload will outweigh the cost of FDPS software changes. The business case is dependent on the environment.

NECESSARY PROCEDURES (AIR AND GROUND)

3.1 Required procedures exist. They need local analysis of the specific flows and should be spelled out in a Letter of Agreement between ATS units; the experience from other Regions can be a useful reference.

4. **Necessary System capability**

4.1 **Avionics**

4.1.1 No specific airborne requirements.

4.2 **Ground systems**

4.2.1 Technology is available. It consists in implementing the relevant set of AIDC messages in flight data processing and could use the ground network standard AFTN-AMHS or ATN. Europe is presently implementing it in ADEXP format over IP wide area networks.

4.2.2 The technology also includes for oceanic ATSUs a function supporting transfer of communication via data link.

5. Human Performance

5.1 Human factors considerations

5.1.1 Ground interoperability reduces voice exchange between ATCOs and decreases workload. A system supporting appropriate human-machine interface (HMI) for ATCOs is required.

5.1.2 Human factors have been taken into consideration during the development of the processes and procedures associated with this module. Where automation is to be used, the HMI has been considered from both a functional and ergonomic perspective (see Section 6 for examples). The possibility of latent failures, however, continues to exist and vigilance is required during all implementation activity. In addition it is important that human factor issues, identified during implementation, be reported to the international community through ICAO as part of any safety reporting initiative.

5.2 Training and qualification requirements

5.2.1 To make the most of the automation support, training in the operational standards and procedures will be required and can be found in the links to the documents in Section 8 to this module. Likewise, the qualifications requirements are identified in the regulatory requirements in Section 6 which are integral to the implementation of this module**.**

6. Regulatory/standardization needs and Approval Plan (Air AND Ground)

- Regulatory/standardization: use current published criteria that include:

  a) ICAO Doc 4444, *Procedures for Air Navigation Services — Air Traffic Management*;
  b) EU Regulation, EC No 552/2004.

- Approval plans: to be determined based on regional consideration of ATS interfacility data communications (AIDC).

7. Implementation and demonstration activities (As known at time of writing)

7.1 Although already implemented in several areas, there is a need to complete the existing SARPs to improve harmonization and interoperabiltiy. For Oceanic data link application, North Atlantic (NAT) and Asia and Pacific (APAC) (cf ISPACG PT/8- WP.02 - GOLD) have defined some common coordination procedures and messages between oceanic centres for data link application (ADS-C CPDLC).

7.2 Current use

- **Europe:** It is mandatory for exchange between ATS units.
  http://europa.eu/legislation_summaries/transport/air_transport/l24070_en.htm

  The European Commission has issued a mandate on the interoperability of the European air traffic management network, concerning the coordination and transfer (COTR) between ATS units through REG EC 1032/2006 and the exchange of flight data between ATS units in support of air-ground data link through REG EC 30/2009. This is based on the standard OLDI-Ed 4.2 and ADEXP-Ed 3.1.

- **EUROCONTROL:** Specification of interoperability and performance requirements for the flight message transfer protocol (FMTP). The available set of messages to describe and negotiate consistent transfer conditions via electronic means across centres' boundaries have been used for trials in Europe in 2010 within the scope of EUROCONTROL's FASTI initiative.

- **India:** AIDC implementation is in progress in Indian airspace for improved coordination between ATC centres. Major Indian airports and ATC centres have integrated ATS automation systems having AIDC capability. AIDC functionality is operational between Mumbai and Chennai ACCs. AIDC will be implemented within India by 2012. AIDC trials are underway between Mumbai and Karachi (Pakistan) and are planned between India and Muscat in coordination with Oman.

- **AIDC:** is in use in the Asia-Pacific Region, Australia, New-Zealand, Indonesia and others.

7.3 Planned or ongoing activities

7.3.1 To be determined.

7.4 Currently in operation

7.4.1 To be determined.

8. Reference Documents

8.1 Standards

- ICAO Doc 4444, *Procedures for Air Navigation Services - Air Traffic Management,* Appendix 6 - *ATS Interfacility Data Communications (AIDC) Messages*

- ICAO Doc 9880, *Manual on Detailed Technical Specifications for the Aeronautical Telecommunication Network (ATN) using ISO/OSI Standards and Protocols*, Part II — *Ground-Ground Applications — Air Traffic Services Message Handling Services (ATSMHS).*

8.2 Procedures

8.2.1 To be determined.

8.3 **Guidance material** ICAO Doc 9694, *Manual of Air Traffic Services Data Link Applications;* Part 6; GOLD Global Operational Data Link Document (APANPIRG, NAT SPG), June 2010; Pan Regional Interface Control Document for Oceanic ATS Interfacility Data Communications (PAN ICD) Coordination Draft Version 0.3. 31 August 2010; Asia/Pacific Regional Interface Control Document (ICD) for ATS Interfacility Data Communications (AIDC) available at http://www.bangkok.icao.int/edocs/icd_aidc_ver3.pdf, ICAO Asia/Pacific Regional Office. EUROCONTROL Standard for On-Line Data Interchange (OLDI); and EUROCONTROL Standard for ATS Data Exchange Presentation (ADEXP).

- ASSEMBLY — 38TH SESSION A38-WP/266

3. ICAO General Assembly 38 WP-266:

International Civil Aviation Organization

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TE/120
12/09/13

WORKING PAPER

ASSEMBLY — 38TH SESSION

TECHNICAL COMMISSION

Agenda Item 33: Air Navigation — Standardization

OLDI as AIDC realisation in the MID Region

(Presented by the United Arab Emirates)

EXECUTIVE SUMMARY

The Aviation System Block Upgrade (ASBU) B0-25 recommends "Increased interoperability, efficiency and capacity through ground-ground integration". To this end ATS inter-facility data communication (AIDC) is presumed by many States. The EUROCONTROL uses a different tool called On Line Data Interchange (OLDI) satisfying all AIDC requirements.

The AIDC and the OLDI are tools to coordinate flight data between Air Traffic Service Units (ATSU) and both satisfies the basic coordination of flight notification, coordination and transfer of control. Additional options like pre-departure coordination, Civil-Military coordination and air-ground data link for forwarding log-on parameters are available in the OLDI.

The majority of States in the MID Region has either implemented or is planning to implement OLDI and have no intention of using only AIDC.

Action: The Assembly is invited to:
a) Recommend that OLDI implementation be accepted as MID regional variation of AIDC implementation.
b) Urge States to capitalise opportunities provided by OLDI and wherever both AIDC and OLDI are implemented, choose the suitable option satisfying the requirements of the partnering States.

Strategic Objectives:	This working paper relates to Strategic Objective B
Financial implications:	Not applicable
References:	1. Manual of Air Traffic Services Data Link Applications (Doc 9694) 2. MID Region ATN-IPS WG5 meeting report, 3. MID Region ATN-IPS WG5 WP4 Appendix A

1. INTRODUCTION

1.1 Seeking to ensure continuous Safety improvement and Air Navigation modernization, the International Civil Aviation Organization (ICAO) has developed the strategic systems approach termed Aviation System Block Upgrade (ASBU). The latter, which defines programmatic and flexible global systems, allows all States to advance their Air Navigation capacities based on their specific operational requirements.

1.2 The ASBU approach has four Blocks, namely Block 0, Block 1, Block 2 and Block 3. Each block is further divided into Modules. Block 0 is composed of Modules containing technologies and capabilities that are implemented to date.

1.3 Module 25 in Block 0 is introduced to improve coordination between air traffic service units (ATSUs) by using ATS inter-facility data communication (AIDC). The transfer of communication in a data link environment improves the efficiency of this process. The data link environment enhances capacity, efficiency, interoperability, safety and reduces cost.

2 DISCUSSION

2.1 EUROCONTROL uses a different tool called On Line Data Interchange (OLDI) satisfying all AIDC requirements. The AIDC and the OLDI are tools to coordinate flight data between Air Traffic Service Units (ATSU) and both satisfies the basic coordination of flight notification, coordination and transfer of control. Additional options like pre-departure coordination, Civil-Military coordination and air-ground data link for forwarding log-on parameters are available in the OLDI.

2.2 The OLDI is a proven technology and is in operational use for more than twenty years in the European Region and for more than four years in the United Arab Emirates. This technology meets all the AIDC requirements and is kept up to date to cope with the new developments in the industry. An example is the release of OLDI version 4.2 to accommodate INFPL requirements.

2.3 Based on the analysis carried out during the MID Region ATN-IPS WG5 meeting it was noted that the majority of States in the MID Region have either implemented OLDI or are planning to implement OLDI and have no intention of using only AIDC. Therefore, the meeting agreed that OLDI implementation should be considered and accepted as Regional variation of AIDC implementation as was the case in the European Region.

2.4 The MID Eegion ATN-IPS WG5 meeting further agreed that if both AIDC and OLDI are implemented, then it will be a bilateral issue and some States that are interfacing with adjacent Regions may require to support and implement dual capabilities (AIDC and OLDI).

2.5 The MID Region is monitoring the work of the joint taskforce harmonization of AIDC and OLDI in NAT and ASIA PAC as it is important to harmonize AIDC and OLDI in order that States in the interface areas have smooth operations.

3 CONCLUSION

3.1 The implementation of OLDI in the MID Region should be accepted as variation AIDC implementation. Wherever both AIDC and OLDI are implemented then States should choose the suitable one satisfying the requirements of the partnering State.

4. MID States Current status and detailed Plans

ATS INTER-FACILITY DATA COMMUNICATION (AIDC)/
ON-LINE DATA INTERCHANGE (OLDI) IMPLEMENTATION PLAN

Introduction:

The implementation of the AIDC/OLDI in the ICAO MID Region has to be in line with the Global Plan and corresponding Module N° B0-FICE: Increased Interoperability, Efficiency and Capacity through Ground-Ground, and the Implementation target dates are set in the MID Air Navigation Strategy.

Implementation high level activities are divided as follows:

2014 – 2015

- AIDC/OLDI capable ATSUs start implementation activities with a planned implementation date of Q3 2015. The activity should cover the following: Test activities, Safety assessment, Operator training, Revision of LoA, transition activities, Implementation and Post-implementation reviews.

- The ATSUs not capable of AIDC/OLDI should avail the facility of Standalone AIDC/OLDI terminals with a planned implementation date of Q1 2016 , and budget full AIDC/OLDI Integration for 2015 with a planned implementation date of Q2 2017

2015-2016

The ATSUs using AIDC/OLDI in an Operational environment should assist other ATSUs to implement AIDC/OLDI. The OLDI/AIDC software is readily available therefore the ATSUs waiting for software

upgrade should expect a software package by Q4 2015, On receipt of it they should start implementation activities with a planned implementation date of Q2 2016.

2017

All ATSUs are connected by Integrated OLDI/AIDC or Standalone terminals

Specific requirement:

The following States have been identified; that they need to support both AIDC/OLDI:

Egypt, Iran, Saudi Arabia, Oman, Libya, and Sudan.

EXPLANATION OF THE TABLE

Column

1 State/Administration – the name of the State/Administration;

2 Location of AIDC/OLDI end system – the location of the AIDC/OLDI end system under the supervision of State/Administration identified in column 1;

3 AIDC/OLDI Pair – the correspondent AIDC/OLDI end system;

Location – location of the correspondent AIDC/OLDI end system

State/Administration – the name of the State/Administration responsible for management of the correspondent AIDC end system

4 AIDC/OLDI standard used – Wither AIDC/OLDI and the adopted Standard for the connection between the corresponding pairs, AFTN, AFTN/AMHS or ATN;

5 Target Date of Implementation – date of implementation of the AIDC/OLDI end system; and

6 Remarks – any additional information.

the details on the AIDC/OLDI system and the focal point this will facilitate the implementation and contacting hat will accelerate the implementation.

State/Administration	Location of AIDC/OLDI end system	AIDC/OLDI Pair		AIDC/OLDI standard used	Target date of Implementation	Remarks
		Correspondent Location	Correspondent State/Administration			
1	2	3		4	5	6
Bahrain	Bahrain ACC	Jeddah ACC	Saudi Arabia	OLDI	Q2 2015	
	Bahrain ACC	Riyadh ACC	Saudi Arabia	OLDI	Q2 2015	
	Bahrain ACC	Dammam ACC	Saudi Arabia	OLDI	Q2 2015	
	Bahrain ACC	Doha ACC	Qatar	OLDI	Q2 2015	
	Bahrain ACC	Kuwait ACC	Kuwait	OLDI	Q2 2015	
	Bahrain ACC	Abu Dhabi ACC	UAE	OLDI	Q4 2014	
	Bahrain ACC	Tehran ACC	Iran	OLDI	TBD	

Egypt	CAIRO ACC Cairo Air Navigation Center (CANC)	Athens ACC	Greece	OLDI	Implemented	
	CAIRO ACC (CANC)	Jeddah ACC	Saudi Arabia	OLDI	Implemented but suspended from Saudi Arabia Side	OLDI over X25
	CAIRO ACC (CANC)	Riyadh ACC	Saudi Arabia	OLDI	Q2 2015	OLDI over X25
	CAIRO ACC (CANC)	Khartoum ACC	Sudan	OLDI	TBD	OLDI over X25
	CAIRO ACC (CANC)	Tripoli ACC	Libya	OLDI	Q2 2015	
	CAIRO ACC (CANC)	NICOSIA ACC	Cyprus	OLDI/AIDC	Q2 2015	
	CAIRO ACC (CANC)	Amman ACC	Jordan	OLD/AIDCI	Q2 2015	
	)					

Iran	Tehran ACC	Bahrain ACC	Bahrain	OLDI	TBD	
	Tehran ACC	Abu Dhabi ACC	UAE	OLDI	TBD	
	Tehran ACC	Baghdad ACC	Iraq	TBD	TBD	
	Tehran ACC	Kabul ACC	Afghanistan	TBD	TBD	
	Tehran ACC		Turkmenistan	TBD	TBD	
	Tehran ACC	Ankara ACC	Turkey			
	Tehran ACC					
Iraq	Baghdad ACC	Kuwait ACC	Kuwait	OLDI	TBD	
	Baghdad ACC	Tehran ACC	Iran	OLDI	TBD	
	Baghdad ACC	Amman ACC	Jordan	OLDI	TBD	
	Baghdad ACC	Ankara ACC	Turkey	OLDI	TBD	
				I		

Jordan	Amman ACC	Jeddah ACC	Saudi Arabia	OLDI	Q2 2015	
	Amman ACC	Baghdad ACC	Iraq	OLDI/AIDC	TBD	
	Amman ACC	Damascus ACC	Syria	OLDI/AIDC	TBD	
	Amman ACC	CAIRO ACC (CANC)	Egypt	OLDI	Q2 2015	
Kuwait	Kuwait ACC	Baghdad ACC	Iraq	OLDI	Q2 2016	
	Kuwait ACC	Bahrain ACC	Bahrain	OLDI	Q2 2016	
	Kuwait ACC	Riyadh ACC	Saudi Arabia	OLDI	Q2 2016	

Lebanon	Beirut ACC Rafic Hariri Intl Airport	Cyprus ACC	Cyprus	OLDI	Implemented	
	Beirut ACC Rafic Hariri Intl Airport	Damascus ACC	Syria	OLDI	TBD	
	Beirut ACC Rafic Hariri Intl Airport	Amman ACC	Jordant	OLDI	Q4 2014	
Libya	Tripoli ACC	Tunis ACC	Tunis	OLDI/AIDC	TBD	
	Tripoli ACC	Malta ACC	Malta	OLDI/AIDC	TBD	
	Tripoli ACC	Cairo ACC	Egypt	OLDI/AIDC	TBD	
	Tripoli ACC	Khartoum ACC	Sudan	OLDI/AIDC	TBD	
	Tripoli ACC	Chad ACC	Chad	OLDI/AIDC	TBD	
	Benghazi ACC	Malta ACC	Malta	OLDI/AIDC	TBD	
	Benghazi ACC	Tripoli ACC	Libya	OLDI/AIDC	TBD	

Oman	Muscat ACC Muscat Intl AP	Abu Dhabi Sheihk Zayed AN center	UAE	OLDI	Q1 2015	
	Muscat ACC Muscat Intl AP	Jeddah ACC	Saudi Arabia	OLDI	Q2 2015	
	Muscat ACC Muscat Intl AP	Mumbai ACC	India	AIDC	Q2 2015	
	Muscat ACC Muscat Intl AP	Bahrain ACC	Bahrain	OLDI	Q2 2015	
	Muscat ACC Muscat Intl AP					
Qatar	Doha ACC	Abu Dhabi Sheihk Zayed AN center	UAE	OLDI	Implemented 2010	
	Doha ACC	Bahrain ACC				
	Doha ACC					

Saudi Arabia	Riyadh ACC	Jeddah ACC	Saudi Arabia	AIDC (AFTN)	Implemented 2012	
	Riyadh ACC	Dammam ACC	Saudi Arabia	AIDC (AFTN)	Implemented 2012	
	Jeddah ACC	Cairo ACC	Egypt	OLDI	Q2 2015	
	Jeddah ACC	Amman ACC	Jordan	OLDI	Q2 2015	
	Jeddah ACC	Abu Dhabi Sheihk Zayed AN center	UAE	OLDI	Q2 2015	
	Jeddah ACC	Muscat	Oman	OLDI	Q2 2015	
	Jeddah ACC	Khartoum ACC	Sudan	OLDI	Q2 2015	
	Jeddah ACC	Sanaa ACC	Yemen	OLDI	TBD	
	Jeddah ACC					
	Jeddah ACC					
	Jeddah ACC					

Sudan	Khartoum ACC	Cairo ACC (CANC)	Egypt	AIDC/OLDI	Q3 2015	
	Khartoum ACC	Jeddah ACC	Saudi Arabia	AIDC/OLDI	Q2 2015	
	Khartoum ACC	N'Djamena ACC	Chad	AIDC (AFTN)	Implemented 2012	No Daily operations
	Khartoum ACC	Kigali ACC	Congo	AIDC (AFTN)	Implemented 2012	No Daily operations
	Khartoum ACC	Tripoli ACC	Libya	AIDC/OLDI	Q3 2015	
Syria	Damascus ACC	Beirut ACC	Lebanon			
	Damascus ACC	Cairo ACC	Egypt			
	Damascus ACC	Beirut ACC	Lebanon			
	Damascus ACC	Beirut ACC	Lebanon			
	Damascus ACC	Beirut ACC	Lebanon			

UAE	SZC Abu Dhabi	Abu Dhabi Int'l Airport	ADAC	OLDI V4.2	Implemented Apr2009	FMTP 2.0
	SZC Abu Dhabi	Dubai Int'l Airport	DANS	OLDI V4.2	Implemented Jun 2012	FMTP 2.0
	SZC Abu Dhabi	Sharjah Int'l Airport	Sharjah DCA	OLDI V4.2	Implemented Feb 2011	FMTP 2.0
	SZC Abu Dhabi	Ras al Khaimah Int'l Airport	Ras al Khaimah DCA	OLDI V4.2	Implemented Mar 2011	FMTP 2.0
	SZC Abu Dhabi	Al Ain Int'l Airport	ADAC	OLDI V4.2	Implemented Oct 2010	FMTP 2.0
	SZC Abu Dhabi	Doha ATC	Qatar CAA	OLDI V4.2	Implemented Jan 2010	FMTP 2.0
	SZC Abu Dhabi	Jeddah ACC	Saudi Arabia			
	SZC Abu Dhabi	Tehran ACC	Iran			
	SZC Abu Dhabi	Muscat ACC	Oman			
	SZC Abu Dhabi					

Yemen	Sanaa ACC	Jeddah ACC	Saudi Arabia			
	Sanaa ACC	Muscat ACC	Oman			
	Sanaa ACC	Djibouti ACC	Djibouti ACC			
	Sanaa ACC	Mogadishu ACC	Somalia			

Details on ATM systems to support implementation

State	Focal point contact for AIDC/ OLDI	ATM System	Protocol and Version used	Number of adjacent ATSUs	Number of adjacent ATSUs connected by AIDC/OLDI and type of connection	ATM System Capability		Current use		Planned Use		Intention of using AIDC only	Reasons and Remarks
						AIDC	**OLDI**	**AIDC**	**OLDI**	**AIDC**	**OLDI**		
Bahrain	Mr. Mohamed Ali Saleh masaleh@caa.gov.bh	Thales TopSky-C	OLDI 2.3 FMTP 2.0	7	None	☐	☐			☐	☐	No	OLDI to connect to neighboring ATSUs
Egypt	Ahmed Abdel Rasoul raad_mourad@yahoo.com	TOPSKY (THALES) Support X25 Protocol only	OLDI V2.3 AIDC V2.0	6	1 OLDI	☐	☐		☐	☐	☐	No	OLDI in use to connect to EUR (Athens)
Iran		Thales		8	None								
Iraq				5	none								

Jordan	Mr.MohammadAl Rousan m.rousan@carc.gov.jo	Aircon 2100 Indra	OLDI 4.1 AIDC 2.0	5	none	☐	☐			☐	☐	No	Planned with Jeddah Q2 2015
Kuwait	HAMAD ALNASER ha.alnaser@dgca.gov.kw	Aircon 2100 INDRA	OLDI v4.2 AIDC v3.0	3	none	☐	☐				☐	No	OLDI to connect to Bahrain and Riyadh
Lebanon				3	- 1 OLDI with Cyprus		☐				☐	No	OLDI in use to connect to EUR
Libya		Aircon 2000 Indra	OLDI 2.3 AIDC 2.0	7	None	☐	☐					No	Can connect with Sudan Chad and Egypt AIDC and for OLDI Tunis Malta and Egypt

Oman	Mr. Ali Al Ajmi alihassan@caa.gov.om	Indra Itec	OLDI 4.1 AIDC 2.3	5	none	□	□					No	UAE Q1 2015 Jeddah Q2 2015 Mumbai Q1 2015
Qatar	Mr. Ahmed Al Eshaq ahmed@caa.gov.qa	Selex	OLDI V4.2 FMTP 2.0 AIDC 2.0	3	1	□	□		□		□		OLDI in use with UAE and planned for use with Bahrain
Saudi Arabia		PRISMA from COMSOFT	OLDI V4.2 FMTP 2.0 AIDC xx	11	- None - AIDC Connected between Riyadh and Jeddah	□	□	□		□	□	No	AIDC for internal and OLDI for neighboring units requests
Sudan	Mr. Abdulmonem Alshkaieh	TopSky	OLDI 4.3 AIDC 2.0	5	2	□	□	□	□	□	□	No	Both AIDC and OLDI to cater to neighboring units requests
Syria				5	none								

UAE	Mr. Hamad Al Belushi hbelushi@szc.gcaa.ae	PRISMA from COMSOFT	OLDI V4.2 FMTP 2.0	10	-3 two-way integrated OLDI connections -2 two-way standalone OLDI -1 one-way Standalone OLDI connection Total 6 OLDI connections		☐		☐		☐	No	OLDI already in use with 6 partners and all neighboring ATSUs are OLDI capable
Yemen				3	none								

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5. Message Types – Phase 1

These are the initial messages that agreed during the AIDC/OLDI Seminar Mar 2014

I. Basic Procedure Messages

1.	Advance Boundary Information	ABI
2.	Activate	ACT
3.	Revision	REV
4.	Preliminary Activation	PAC
5.	Abrogation of Co-ordination	MAC
6.	SSR Code Assignment	COD
7.	Arrival Management	AMA
8.	Logical Acknowledgement Message	LAM

II. Advance Boundary Information ABI

1. Purpose of the ABI Message

   The ABI message satisfies the following operational requirements:

   - Provide for acquisition of missing flight plan data;
   - Provide advance boundary information and revisions thereto for the next ATC unit;
   - Update the basic flight plan data;
   - Facilitate early correlation of radar tracks;
   - Facilitate accurate short-term sector load assessment;
   - Request the assignment of an SSR code from the unit to which the above notification is sent, if required.

   The ABI is a notification message.

2. Message Contents

   The ABI message shall contain the following items of data:

   - Message Type;
   - Message Number;
   - Aircraft Identification;
   - SSR Mode and Code (if available);
   - Departure Aerodrome;
   - Estimate Data;
   - Destination Aerodrome;
   - Number and Type of Aircraft;
   - Type of Flight;
   - Equipment Capability and Status.

   If bilaterally agreed, the ABI message shall contain any of the following items of data:

   - Route;
   - Other Flight Plan Data.

3. Example
   - (ABIOMAE/OMSJ578-ABY464/A5476-VIDP-MAXMO/0032F100-OMSJ-9/A320/M-15/N0457F360 OBDAG LUN G333 TIGER/N0454F380 G452 RK G214 PG G665 ASVIB M561 MOBET/N0409F260 A419 DARAX -80/S-81/W/EQ Y/EQ U/NO R/EQ/A1B1C1D1L1O1S1)

III. Activate ACT

1. Purpose of the ABI Message

   The ACT message satisfies the following operational requirements:
   - Replace the verbal boundary estimate by transmitting automatically details of a flight from one ATC unit to the next prior to the transfer of control;
   - Update the basic flight plan data in the receiving ATC unit with the most recent information;
   - Facilitate distribution and display of flight plan data within the receiving ATC unit to the working positions involved;
   - Enable display of correlation in the receiving ATC unit;
   - Provide transfer conditions to the receiving ATC unit.
2. Message Contents

   The ACT message shall contain the following items of data:
   - Message Type;
   - Message Number;
   - Aircraft Identification;
   - SSR Mode and Code;
   - Departure Aerodrome;
   - Estimate Data;
   - Destination Aerodrome;
   - Number and Type of Aircraft;
   - Type of Flight;
   - Equipment Capability and Status.

   If bilaterally agreed, the ACT message shall contain any of the following items of data:
   - Route;
   - Other Flight Plan Data;
   - Actual Take-Off Time.

   Note: The Actual Take-Off Time is normally used in the cases where the ACT follows a PAC message that included the Estimated Take-Off Time.

3. Example
   - (ACTOMAE/OMSJ727-ABY604/A7306-HEBA-ALRAR/0130F110-OMSJ-9/A320/M-15/N0428F250 DCT NOZ A727 CVO/N0461F350 UL677 MENLI UN697 NWB W733 METSA UB411 ASH G669 TOKLU UP559 ASPAK/N0438F290 UP559 NALPO P559 ITGIB/N0409F230 P559 -80/S-81/W/EQ Y/EQ U/NO R/EQ/A1B1C1D1L1O1S1)

IV. Revision Message REV

1. Purpose of the REV Message

   The REV message is used to transmit revisions to co-ordination data previously sent in an ACT message provided that the accepting unit does not change as a result of the modification.

2. Message Contents

   The REV message shall contain the following items of data:

   - Message Type;
   - Message Number;
   - Aircraft Identification;
   - Departure Aerodrome;
   - Estimate Data and/or Co-ordination point;
   - Destination Aerodrome;

   Note: The Estimate Data contained in the REV has to include complete data in the Estimate Data field in order to eliminate any ambiguity regarding the transfer elements. If the ACT message included the supplementary flight level, the following REV message will include the supplementary flight level if still applicable.

   The REV message shall contain the following items of data if they have changed:

   - SSR Mode and Code;
   - Equipment Capability and Status.

   If bilaterally agreed, the REV message shall contain any of the following items of data, if they have changed:

   - Route.

   If bilaterally agreed, the REV message shall contain any of the following items of data:

   - Message Reference.

3. Example

   - (REVBC/P873-UAE4486-OMDB-TUMAK/2201F360-LERT-81/Y/NO U/EQ)

V. Preliminary Activation PAC

1. Purpose of the PAC Message

   The PAC message satisfies the following operational requirements:

   - Notification and pre-departure co-ordination of a flight where the time of flight from departure to the COP is less than that which would be required to comply with the agreed time parameters for ACT message transmission;
   - Notification and pre-departure co-ordination of a flight by a local (aerodrome /approach control) unit to the next unit that will take control of the flight;
   - Provide for acquisition of missing flight plan data in case of discrepancies in the initial distribution of flight plan data;
   - Request the assignment of an SSR code from the unit to which the above notification/coordination is sent

2. Message Contents

   The PAC message shall contain the following items of data:

   - Message Type;
   - Message Number;
   - Aircraft Identification;
   - SSR Mode and Code;
   - Departure Aerodrome;
   - Estimated Take-Off Time or Estimate Data;
   - Destination Aerodrome;
   - Number and Type of Aircraft;

   A PAC message sent from a TMA control unit or an ACC shall contain the following items of data:

   - Type of Flight;
   - Equipment Capability and Status.

   If bilaterally agreed, the PAC message shall contain any of the following items of data:

   - Route;
   - Other Flight Plan Data;
   - Message Reference.

3. Example

   - (PACOMSJ/OMAE292-SQC7365/A9999-OMSJ0020-WSSS-9/B744/H-15/N0505F310 DCT RIKET B525 LALDO B505 NADSO A777 VAXIM P307 PARAR N571 VIRAM/N0505F330 N571 LAGOG/M084F330 N571 IGOGU/M084F350 N571 GUNIP/N0500F350 R467 -80/S-81/W/EQ Y/EQ U/NO R/EQ/)

VI. Message for the Abrogation of Co-ordination MAC

1. Purpose of the MAC Message
   A MAC message is used to indicate to the receiving unit that the co-ordination or notification previously effected for a flight is being abrogated.
   The MAC is not a replacement for a Cancellation (CNL) message, as defined by ICAO, and therefore, shall not be used to erase the basic flight plan data.
2. Message Contents
   The MAC message shall contain the following items of data:
   - Message Type;
   - Message Number;
   - Aircraft Identification;
   - Departure Aerodrome;
   - Co-ordination point;
   - Destination Aerodrome;

   If bilaterally agreed, the MAC message shall contain any of the following items of data:
   - Message Reference;
   - Co-ordination Status and Reason
3. Example
   - (MACAM/BC112 AM/BC105-HOZ3188-EHAM-NIK-LFPG-18/STA/INITFL)

VII. SSR Code Assignment Message COD

1. Purpose of the COD Message
   The Originating Region Code Allocation Method (ORCAM) is provided to permit a flight to respond on the same code to successive units within a participating area. Unless code allocation is performed centrally, e.g. by an ACC, airports may need to be individually allocated a set of discrete SSR codes. Such allocations are very wasteful of codes.
   The COD message satisfies the operational requirement for the issue of a Mode A SSR code by one Air Traffic Service Unit to another for a specified flight when requested.
   The COD message also satisfies the operational requirement to inform the transferring Air Traffic Service Unit of the next Mode A SSR code when the code assigned cannot be retained by the accepting Air Traffic Service Unit.
2. Message Contents
   The COD message shall contain the following items of data:
   - Message Type;
   - Message Number;
   - Aircraft Identification;
   - SSR Mode and Code;
   - Departure Aerodrome;
   - Destination Aerodrome;

If bilaterally agreed, the COD message shall contain any of the following items of data:

- Message Reference.

3. Example
   - (CODOMAE/OMSJ720-ABY567/A3450-OMSJ-OAKB)

VIII. Arrival Management Message AMA

1. Purpose of the AMA Message

   Arrival management requires the capability for an accepting unit to pass to the transferring unit information on the time that a flight is required to delay (lose) or gain in order to optimise the approach sequence.

   The AMA message satisfies the following operational requirements in order to alleviate ATC workload in co-ordinating arriving flights:

   - Provide the transferring ATC unit with the time that the flight is to delay/gain at the arrival management metering fix;
   - Where procedures have been bilaterally agreed between the units concerned, provide the transferring ATC unit with a target time for the flight to be at the COP;
   - When bilaterally agreed, provide the transferring unit with a speed advisory. The speed advisory needs to be communicated to the flight, prior to transfer.

2. Message Contents

   The AMA message shall contain the following items of data:

   - Message Type;
   - Message Number;
   - Aircraft Identification;
   - Departure Aerodrome;
   - Destination Aerodrome;

   and based on bilateral agreement, contain one or more of the following items of data:

   - Metering Fix and Time over Metering Fix;
   - Total Time to Lose or Gain;
   - Time at COP;
   - Assigned speed;
   - Application point;
   - Route;
   - Arrival sequence number

   Note: The item Route contains the requested routing

3. Example
   - (AMAM/BN112-AZA354-LIRF-CLS/0956-LEMD-18/MFX/PRADO TOM/1022 TTL/12)

IX. Logical Acknowledgement Message LAM

4. Purpose of the LAM Message

   The LAM is the means by which the receipt and safeguarding of a transmitted message is indicated to the sending unit by the receiving unit.

   The LAM processing provides the ATC staff at the transferring unit with the following:

   - A warning when no acknowledgement has been received;
   - An indication that the message being acknowledged has been received, processed successfully, found free of errors, stored and, where relevant, is available for presentation to the appropriate working position(s).

5. Message Contents

   The LAM message shall contain the following items of data:

   - Message Type;
   - Message Number;
   - Message Reference.

6. Example

   - (LAMOMSJ/OMAE939OMAE/OMSJ718)

6. D – Message Types – Phase 2

The messages during this phase will be the advance messages covering all phases of flight

Intentionally left blank

7. Test objectives

Test Objectives		
No	**Test step**	**Test Description**
01	Connectivity between FDPSs	Check connectivity between FDPSs
02	FPL Processing	Check FPLs are correctly received and processed
Preliminary Activation Message (PAC)		
03	PAC Message association	Check PAC messages are correctly sent, received, processed and associated with the correct FPL. If the system is unable to process a message that is syntactically and semantically correct, it should be referred for Manual intervention.
04	Coordination of Changes to previous PAC message	Check changes to previous PAC messages such as Change in SSR code, Aircraft type, Coordination point, Flight level and Destination aerodrome are correctly sent, received and associated with the correct FPL.
Advance Boundary Information (ABI)		
05	ABI Message association	Check ABI messages are correctly sent, received, processed and associated with the correct FPL. If the system is unable to process a message that is syntactically and semantically correct, it should be referred for Manual intervention.
06	Coordination of Changes to previous ABI message	Check changes to previous ABI messages such as Change in SSR code, Aircraft type, Coordination point, Flight level and Destination aerodrome are correctly sent, received and associated with the correct FPL.
Activate (ACT)		
07	ACT Message association	Check ACT messages are correctly sent, received, processed and associated with the correct FPL. If the system is unable to process a message that is syntactically and semantically correct, it should be referred for Manual intervention.
Logical Acknowledgement Messages (LAM)		
08	LAM Message generation	Check LAM messages are generated for messages that are syntactically and semantically correct.
SSR Code Request Messages (COD)		
09	COD Message association	Check COD messages are sent with correct SSR Code, received, processed and associated with the correct FPL. If the system is unable to process a message that is syntactically and semantically correct, it should be referred for Manual intervention.

8. Sample Test Scripts

NOTE: All the samples are provided by UAE

1. Test 001 Connectivity:

Test 001 – Connectivity				
No	Test description	UAE ACC FDPS	Doha FDPS	Remarks
01	Ping Doha FDPS from RDS FDPS	OK / Not OK	OK / Not OK	
02	Ping RDS FDPS from Doha FDPS	OK / Not OK	OK / Not OK	
03	Check the link	Log in as root in rds fdps Type in netstat –tnap, should show the link "established" OK / Not OK	Check the link "established" OK / Not OK	

2. Test 002 Flight plan:

Test 002 – Flight Plan – *sent from UAE ACC*				
No	Test description	UAE ACC FDPS	Doha FDPS	Remarks
01	Send TST001 (OMAA-OTBD)	OK / Not OK	OK / Not OK	
02	Send TST002 (OMAM-OTBH)	OK / Not OK	OK / Not OK	
03	Send TST003 (OMAA-OEJN)	OK / Not OK	OK / Not OK	

04	Send TST004 (OOMS – OTBD)	OK / Not OK	OK / Not OK	
05	Send TST005 (OTBD – OMDB)	OK / Not OK	OK / Not OK	
06	Send TST006 (OTBH – OMDM)	OK / Not OK	OK / Not OK	
07	Send TST007 (OEJN-OMAD)	OK / Not OK	OK / Not OK	
08	Send TST008 (OTBD – OOMS)	OK / Not OK	OK / Not OK	

3. Test 003 Preliminary Activation Message (PAC):

Test 003 – Preliminary Activation Message (PAC) *Doha FDPS to UAE ACC FDPS*				
No	Test description	UAE ACC FDPS	Doha FDPS	Remarks
01	Activate start up TST005 (OTBD – OMDB) SSR code:0001 RFL : FPL level	SFPL moves from Pending to Workqueue with SSR code, check CFL field OK / Not OK	OK / Not OK	
02	Change SSR of TST005 New SSR Code:0002	SFPL colour changes to Green in Workqueue OK / Not OK	OK / Not OK	
03	Change ATYP of TST005 New ATYP: A332	SFPL colour changes to Green in Workqueue OK / Not OK	OK / Not OK	
04	Change ADES of TST005 New ADES: VOMM	New FPL is created by OLDI with new ADES OK / Not OK	OK / Not OK	

05	Change RFL of TST005 New RFL: 370	Manual coordination requires OK / Not OK	OK / Not OK	
06	Change COP of TST005 New COP : NADAM	SFPL colour changes to Green in Workqueue OK / Not OK	OK / Not OK	
07	Check LAM messages	OK / Not OK	OK / Not OK	

4. Test 004 ABI & ACT messages:

Test 004 – Advance Boundary Information Message (ABI), Activate Message (ACT) *Doha FDPS to UAE ACC FDPS*				
No	Test description	UAE ACC FDPS	Doha FDPS	Remarks
01	Enter estimate for TST007 (OEJN – OMAD) SSR code:0003 Exit level : 190 ETX : Current time	SFPL moves from Pending to Work queue with SSR code, check ETN and CFL field OK / Not OK	OK / Not OK	
02	Change SSR of TST007 New SSR code: 0004	SFPL colour changes to Green if in Workqueue OK / Not OK	OK / Not OK	
03	Change ATYP of TST007 New ATYP: C130	SFPL colour changes to Green if in Workqueue OK / Not OK	OK / Not OK	
04	Change ADES of TST007 New ADES: OMAL	New FPL is created by OLDI with new ADES OK / Not OK	OK / Not OK	

05	Change XFL of TST007 New XFL: 170	SFPL colour changes to Green if in Workqueue OK / Not OK	OK / Not OK	
06	Change COP of TST007 New COP: NAMLA	SFPL colour changes to Green if in Workqueue OK / Not OK	OK / Not OK	
07	when ETX is Current time + 5 minutes the ACT should be automatically generated	No change, SFPL already in active. OK / Not OK	OK / Not OK	
08	Change ATYP of TST007 New ATYP:C30J	No change, SFPL already in active Expect manual coordination. OK / Not OK	Flag to notify ATCA that ATYP change is not communicated OK / Not OK	
09	Check LAM messages	OK / Not OK	OK / Not OK	

5. Test 005 ABI & ACT messages:

Test 005 – Advance Boundary Information Message (ABI), Activate Message (ACT) *UAE ACC FDPS to Doha FDPS*				
No	Test description	UAE ACC FDPS	Doha FDPS	Remarks
01	Enter estimate for TST004 (OOMS – OTBD) SSR code:0005 Exit level : 180 ETN : Current time COPX: MEKMA	SFPL moves from Pending to Active with SSR code A new ABI wiil be generated OK / Not OK	SSR, ETN and Entry level and entry point should be automatically updated for the concerned flight and flagged for ATCA OK / Not OK	

02	Change SSR of TST004 New SSR code: 0006	A new ABI wiil be generated OK / Not OK	SSR should be automatically updated for the concerned flight and flagged for ATCA OK / Not OK	
03	Change ATYP of TST004 New ATYP: AT45	A new ABI wiil be generated OK / Not OK	ATYP should be automatically updated for the concerned flight and flagged for ATCA OK / Not OK	
04	Change ADES of TST004 New ADES: OTBH	A new ABI wiil be generated OK / Not OK	ADES should be automatically updated for the concerned flight and flagged for ATCA OK / Not OK	
05	Change XFL of TST004 New XFL: 160	A new ABI wiil be generated OK / Not OK	Entry level should be automatically updated for the concerned flight and flagged for ATCA OK / Not OK	
06	Change COP of TST004 New COP: BUNDU	A new ABI wiil be generated OK / Not OK	COP should be automatically updated for the concerned flight and flagged for ATCA OK / Not OK	
07	when ETX is Current time + 5 minutes the ACT should be automatically generated	ACT will be generated OK / Not OK	OK / Not OK	
08	Change ATYP of TST004 New ATYP: B738	An indication to ATCO to show that this change needs to be manually coordinated	Expect manual coordination OK / Not OK	
09	Check LAM messages	OK / Not OK	OK / Not OK	

6. Test 006 PAC, ABI, ACT without FPL for UAE:

Test 006 – PAC, ABI, ACT – No FPL for UAE *Doha FDPS to UAE ACC FDPS*				
No	Test description	UAE ACC FDPS	Doha FDPS	Remarks
01	Activate start up TST009 (OTBD – OMAA) SSR code:0007 ATYP:A320 XFL: 210 COP: NAMLA	SFPL is created by PAC. OLDI window pops up. OK / Not OK	Automatically generates PAC message OK / Not OK	
02	Enter estimate for TST010, (OEJN – OOMS) SSR Code: 0010 ATYP: B738 XFL: 230 COP: BUNDU ETX: Current time	SFPL is created by ABI. OLDI window pops up. OK / Not OK	Automatically generates ABI message OK / Not OK	
03	Enter estimate for TST011, (OEJN – OOMS) SSR Code: 0011 ATYP: B738 XFL: 230 COP: BUNDU ETX: Current time + 3 mins	SFPL is created by ACT. OLDI window pops up. OK / Not OK	Automatically generates ACT message OK / Not OK	
04	Check LAM messages	OK / Not OK	OK / Not OK	

7. Test 007 ABI, ACT without FPL for Doha:

Test 007 – ABI, ACT – No FPL for Doha FDPS *UAE ACC FDPS to Doha FDPS*				
No	Test description	UAE ACC FDPS	Doha FDPS	Remarks
01	Enter estimate for TST012, (TACT – OTBH) SSR Code: 0012 ATYP: K35R XFL: 220 COP: TOSNA ETN: Current time	Automatically generates ABI message OK / Not OK	FPL created by ABI and flags for ATCA attention. OK / Not OK	
02	Enter estimate for TST013, (OOMS – OTBD) SSR Code: 0013 ATYP: A321 XFL: 180 COP: MEKMA ETN: Current time -20 mins	Automatically generates ACT message OK / Not OK	FPL created by ACT and flags for ATCA attention. OK / Not OK	
03	Check LAM messages	OK / Not OK	OK / Not OK	

8. Test 008 Duplicate SSR:

Test 008 – Duplicate SSR				
No	Test description	UAE ACC FDPS	Doha FDPS	Remarks
01	Create a FPL TST020 at Doha with SSR 0014 to block SSR code Enter estimate data for TST002 at UAE RDS (OMAM – OTBH) SSR Code : 0014 ETN: Current time XFL: 180	OLDI message window pops up with a question mark on TST002 OK / Not OK	Duplicate SSR should be duly flagged to operator OK / Not OK	
02	Create a FPL TST030 at UAE RDS with SSR 0015 to block SSR code Enter estimate data for TST008 at Doha (OTBD – OOMS) SSR Code : 0015 ETN: Current time XFL: 230	OLDI message window pops up with a question mark on TST008 OK / Not OK	Duplicate SSR should be duly flagged to operator OK / Not OK	

9. Test 009 Communication failure:

Test 009 – Communication failure				
No	Test description	UAE ACC FDPS	Doha FDPS	Remarks
01	Simulated link failure	OLDI messages that are not coordinated will move from Active to Workqueue OK / Not OK	Failures should be duly flagged to operator OK / Not OK	

10. Flight plans:

a. TST001 (OMAA – OTBD)

(FPL-TST001-IS
-A320/M-SDFHIJLOPRVWY/SD
-OMAA0655
-N0415F220 TOXIG Z994 VEBAT P899 MEKMA DCT NAJMA DCT DOH
-OTBD0030 OEDF
-PBN/A1B1C1D1L1O1S1 NAV/GPSRNAV DOF/13???? REG/A6TST
EET/OMAE0008 OBBB0020 SEL/ARKQ OPR/TST RMK/TEST FPL)

b. TST002 (OMAM – OTBH)

(FPL-TST002-IM
-C17/H-SGHJPRWXYZ/SD
-OMAM0820
-N0454F280 DCT MA270020 DCT MA285032 DCT DASLA Z994 BUNDU B415 DOH
DCT
-OTBH0032 OMAM
-PBN/A1B1C1D1L1O1S1 NAV/GPSRNAV DOF/13???? REG/A6TST EET/OBBB0019 SEL/CFPR NAV/RNP10 RNAV1 RNAV5
RNVD1E2A1 RMK/TEST FPL)

c. TST003 (OMAA – OEJN)

(FPL-TST003-IS
-A320/M-SDGHIJLPRWXY/S
-OMAA0800
-N0467F220 TOXIG Z994 BUNDU B415 DOH A415 KIA G782 RGB/N0461F360
UM309 RABTO G782 ASLAT DCT
-OEJN0201 OEMA
-PBN/A1B1C1D1L1O1S1 NAV/GPSRNAV DAT/SV DOF/13???? REG/A6TST EET/OMAE0009 OBBB0021 OEJD0044
SEL/BMAR RMK/TCAS EQUIPPED RMK/TEST FPL)

d. TST004 (OOMS – OTBD)

(FPL-TST004-IS
-A320/M-SDFHIJLOPRVWY/SD
-OOMS0655
-N0458F320 MCT L764 PAXIM P899 ITRAX ALN P899 DASLA/N0440F260 Z994
VEBAT/N0424F220 P899 MEKMA DCT NAJMA DCT DOH
-OTBD0057 OMAA
-PBN/A1B1C1D1L1O1S1 DAT/V NAV/TCAS DOF/13???? REG/A6TST EET/OMAE0023 OBBB0047 SEL/GLEH RMK/TEST FPL)

e. TST005 (OTBD – OMDB)

(FPL-TST005-IS
-B738/M-SHPRWXYIGZ/S
-OTBD1230
-N0390F210 DOH L305 ITITA L308 DESDI DESDI4T
-OMDB0049 OMRK OMAL
-PBN/A1B1C1D1L1O1S1 NAV/RNAV1 RNAV5 RNP4 RNP10 RNP5 RNVD1E2A1 DOF/13???? REG/A6TST EET/OMAE0015 SEL/HQER RMK/TEST FPL)

f. TST006 (OTBH – OMDM)

(FPL-TST006-IM
-C130/M-SHITUY/S
-OTBH1000
-N0311F150 UL305 ALSEM L305 ITITA L308 SHJ DCT
-OMDM0059 OBBI
-PBN/A1B1C1D1L1O1S1 NAV/RNAV1 RNAV5 RNP4 RNP10 RNP5 RNVD1E2A1 DOF/13???? REG/A6TST EET/OMAE0020 RMK/TEST FPL)

g. TST007 (OEJN – OMAD)

(FPL-TST007-IN
-GLF4/M-SDGHIRVWXY/S
-OEJN0600
-N0458F210 JDW T532 KIA B418 ASPAN N318 XAKUM Q666 BOXAK DCT
-OMAD0212 OMAL
-PBN/A1B1C1D1L1O1S1 NAV/RNAV1 RNAV5 RNP4 RNP10 RNP5 RNVD1E2A1 DOF/13???? REG/A6TST EET/OBBB0113 OMAE0151 RMK/TEST FPL)

h. TST008 (OTBD – OOMS)

(FPL-TST008-IS
-A320/M-SDFHIJLOPRVWY/SD
-OTBD0630
-N0466F310 B415 AFNAN B415 ADV N685 LAKLU G216 MCT DCT
-OOMS0103 OMAL
-PBN/A1B1C1D1L1O1S1 NAV/RNAV1 RNAV5 RNP4 RNP10 RNP5 RNVD1E2A1 DOF/13???? REG/A6TST EET/OBBB0007 OMAE0012 OOMM0038 SEL/GLEH RMK/TEST FPL)

9. Bilateral Agreement Template

Bilateral Agreement Template to be appended to the main Letter of Agreement (LoA) Template

NOTE:
This part of the LOA only to be used as guidance it is related to the Automatic data exchange either OLDI or AIDC which are attachments 1 and 2 respectively to Appendix C of the complete letter of agreement.

Appendix C (1).

Exchange of Flight Data.

(With automatic data exchange)

Unit 1 **Unit 2**

Revision: xxxx

Effective: xx xxxx xxxx

Revised: xxx

C.1 General.

C.1.1 **Basic Flight Plans.**

Basic flight plan data should normally be available at both ATS Units.

C.1.2 **Current Flight Plan Data.**

Messages, including current flight plan data, shall be forwarded by the transferring ATS unit to the accepting ATS unit either by automatic data exchange or by telephone to the appropriate sector/position.

C.1.2.1 Automatic Data Exchange.

The messages (List agreed message for OLDI/AIDC e.g. ABI/ACT/LAM/PAC/REV/MAC messages are exchanged between the two ATS units in accordance with Attachment 1 or Attachment 2 to Appendix C.

C.1.2.2 Verbal Estimates.

For conditions that are not supported by the automatic data exchange, verbal estimates will be exchanged.

A verbal estimate shall be passed to the appropriate sector at the accepting ATS unit at least value minutes prior, but not earlier than 30 minutes before the aircraft is estimated to pass the transfer of control point.

A verbal estimate shall contain:

a) Callsign.

Note: To indicate that the flight plan is available, the accepting ATS unit should state aircraft type and destination after having received the callsign.

b) SSR code:

Note: Normally, the notification of a SSR code indicates that the selection of that code by the aircraft was verified.

c) ETO for the appropriate COP as laid down in Appendix D to this LoA.

d) Cleared level, specifying climb or descent conditions if applicable, at the transfer of control point.

Requested level if different from cleared level.

e) Other information, if applicable.

Normally, verbal estimates will not be passed in parallel with ACT messages.

In all cases, verbally passed data shall take precedence over data exchanged automatically.

C.1.2.3 Failure of Automatic Data Exchange.

In the event of a failure which prevents the automatic transfer of data, the Supervisors shall immediately decide to revert to the verbal exchange of estimates.

After recovery from a system failure, the Supervisors shall agree as to when they will revert to automatic data exchange.

C.1.3 **Non-availability of Basic Flight Plan Data.**

If the accepting ATS unit does not have basic flight plan data available, additional information may be requested from the transferring ATS unit to supplement the ACT message or a verbal estimate.

Within the context of RVSM, such additional information should include:

a. the RVSM approval status of the aircraft; and

b. whether or not a non-RVSM approved aircraft is a State aircraft.

C.1.4 **Revisions.**

Any significant revisions to the flight data are to be transmitted to the accepting ATS unit. Time differences of value minutes or more are to be exchanged.

Any levels which different than describe in Appendix D of this LOA are subject to an Approval Request.

C.1.5 **Expedite Clearance and Approval Requests.**

Whenever the minimum time of value minutes for a verbal estimate, or those prescribed in Attachment 1 to Appendix C for ACT messages, cannot be met, either an expedite clearance request, an approval request (*or a PAC)*, as appropriate, shall be initiated.

C.2 Means of Communications and their Use.

C.2.1 **Equipment.**

The following lines are available between Unit 1 and Unit 2:

Line Type	Amount	Additional Information
Data Line		
Telephone Lines		

"Additional Information" column should indicate if telephone lines meet the requirements for Direct Controller-Controller Voice Communication (DCCVC) or Instantaneous Direct Controller-Controller Voice Communication (ICCVC)

C.2.2 **Verbal Co-ordination.**

All verbal communications between non-physically adjacent controllers should be terminated with the initials of both parties concerned.

Exchange of flight plan data, estimates and control messages by voice shall be carried out in accordance with the following tables:

C.2.2.1 Messages from Unit 1 to Unit 2.

Receiving Sector/COPs	Message	Position
Sector Name COPs	Flight Plan Data and Estimates	
	Control Messages, Expedite Clearances, Approval Requests and Revisions	
	Surveillance Co-ordination	

C.2.2.2 Messages from Unit 2 to Unit 1.

Receiving Sector/COPs	Message	Position
Sector Name COPs	Flight Plan Data and Estimates	
	Control Messages, Expedite Clearances, Approval Requests and Revisions	
	Surveillance Co-ordination	

C.3 Failure of Ground/Ground Voice Communications.

C.3.1 Fall-Back Procedures for Co-ordination.

To mitigate the effects of failures of direct speech circuits, both parties will establish and maintain dial-up facilities via PABX and ATC Voice Communications Systems (VCS) as follows:

Sector Name Tel Number (For Both Units)

Stand-alone telephones with auto-dial facilities will be maintained as a second level of fall-back to cover the event of failure of PABX or VCS:

Sector Name Tel Number (For Both Units)

C.3.2 Alternate Fall-Back Procedures for Co-ordination.

In case of communications failure where the alternatives described in paragraph C.3.1 above are not available or practicable, pilots shall be instructed, at least 5 minutes prior to the transfer of control point, to pass flight data on the appropriate frequency of the accepting ATS unit for the purpose of obtaining an ATC entry clearance from the accepting ATS unit.

If the accepting ATS unit cannot issue an entry clearance to the pilot upon his initial contact, the pilot shall be instructed to inform the transferring ATS unit accordingly via RTF.

The transferring ATS unit shall hold the aircraft within its AoR and after a minimum of 10 minutes instruct the pilot to re-establish RTF contact with the accepting ATS unit.

This procedure shall be repeated until an onward clearance has been obtained from the accepting ATS unit.

C.4 Validity

This Appendix to the LoA takes effect on xxx xxxx xxxx and supersedes previous Appendix to Letter of arrangements between the Unit 1 and Unit 2.

Date: Date:

_____ _____

Name Name

Title Title

Authority 1 Authority 2

Attachment 1 to Appendix C

Automatic Data Exchange related to OLDI

ABI/ACT/LAM messages are exchanged between the two ATS units in accordance with the table below:

Messages	COPs	Time and/or Distance Parameters	
		Messages from Unit 1 To Unit 2	Messages from Unit 1 To Unit 2
ABI			
ACT			
LAM			
REV			
PAC			
MAC			
LOF			
NAN			

Attachment 2 to Appendix C

Automatic Data Exchange related to AIDC

AIDC Messages

(For each message used describe when it will be sent by each ATSU under the parameter column and use the Notes column to describe other applicable information for the message use by each ATSU. The data below provides an example of the type of information that could be incorporated.)

Messages	Parameter	Notes
ABI	***ATSU1*:** Sends ABI approx. 80 minutes prior to boundary (73 min prior to the 50 nm expanded sector boundary). ***ATSU2:*** Sends ABI approx. 87 minutes prior to boundary (80 min prior to the 50 nm expanded sector boundary). (*Note: An updated ABI will not be sent once a CPL has been sent.)*	***ATSU1 : ATSU2*** *Updated ABI's will be sent automatically if there is any change to profile. ABI is sent automatically and is transparent to the controller. ABI automatically updates the receiving unit's flight data record.*
CPL	***ATSU1 : ATSU2*** *Send CPL messages approx 37 minutes prior to the boundary (30 minutes prior to the 50 nm expanded sector boundary).*	***ATSU1 : ATSU2*** *CPL messages should be sent by the transferring controller in sufficient time to allow the completion of coordination at least 30 minutes prior to the boundary or 30 minutes prior to the aircraft passing within 50nmof the FIR boundary for information transfers.*
CDN	***ATSU1 : ATSU2*** *CDN messages are sent by either the transferring or receiving facility to propose a change once the coordination process has been completed, i.e., CPL sent and ACP received. CDN's must contain all applicable profile restrictions (e.g. weather deviations, speed assignment, block altitude). If the use of a CDN does not support this requirement, then verbal coordination is required.*	***ATSU1 : ATSU2*** *The APS will display a flashing "DIA" until receipt of ACP. If ACPJ not received within ten (10) minutes, controller is alerted with a message to the queue.* *CDN messages are not normally used for coordination of reroutes; however, with the receiving facilities approval a CDN may be used to coordinate a reroute on a critical status aircraft such as in an emergency.*

PAC	***ATSU1 : ATSU2*** *PAC messages will normally be sent when the time criteria from the departure point to the boundary is less than that stipulated in the CPL.*	***ATSU1 : ATSU2*** *Will respond to a PAC message with an ACP. PAC messages should be verbally verified with receiving facility.*
ACP	***ATSU1 : ATSU2***	***ATSU1 : ATSU2*** *The APS will display a flashing "DIA" until receipt of ACP. If ACP not received within ten (10) minutes, controller is alerted with a message to the queue.*
TOC	***ATSU1 : ATSU2*** *Not supported. Implicit hand in/off.*	***ATSU1 : ATSU2***
AOC	***ATSU1 : ATSU2*** *Not supported. Implicit hand in/off.*	
MAC	***ATSU1 : ATSU2*** *MAC messages are sent when a change to the route makes the other facility no longer the "next" responsible unit.*	***ATSU1 : ATSU2*** *Receipt of a MAC message must not be interpreted as meaning that the flight plan has been cancelled. Voice coordination must be conducted by the transferring controller to confirm the status of the flight.*
REJ	***ATSU1 : ATSU2*** *REJ messages are sent in reply to a CDN message when the request change is unacceptable*	***ATSU1 : ATSU2*** *REJ messages are sent only as a response to a CDN message.*

10. Implementation Plan

In line with ASBU Block 0 time lines, the OLDI/AIDC implementation shall be completed by 2017. The implementation should be accomplished in phases.

Phase 1 2014 - 2015	• OLDI/AIDC capable ATSUs should start implementation activities with a planned implementation date of Q4 2014. The activity should cover the following: ➢ test activities ➢ operator training ➢ Revision of LoA ➢ transition activities ➢ implementation ➢ post-implementation reviews • The ATSUs not capable of OLDI/AIDC should avail the facility of Standalone OLDI terminals with a planned implementation date of Q1 2015 , and budget full OLDI Integration for FY2015 with a planned implementation date of Q2 2016.
Phase 2 2015 - 2016	• The ATSUs using OLDI/AIDC in an Operational environment should assist other ATSUs to implement OLDI/AIDC • The OLDI/AIDC software is readily available therefore the ATSUs waiting for software upgrade should expect a software package by Q4 2015. On receipt of it they should start implementation activities with a planned implementation date of Q2 2016. The activity should cover the following: ➢ test activities ➢ operator training ➢ Revision of LoA ➢ transition activities ➢ implementation ➢ post-implementation reviews
Phase 3 2017	• All ATSUs are connected by Integrated OLDI/AIDC or Standalone OLDI terminals

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Use of GNSS pseudolites and repeaters

1. Introduction

1.1 As for all systems using the radio frequency spectrum, GNSS is vulnerable to interference and measures (radio regulatory) are in place through the provisions of the ITU Radio Regulations to protect GNSS systems from harmful interference. Technical measures such as the specification of the GNSS receiver interference mask are in Annex 10.

1.2 Despite various regulatory mechanisms being in place, including those agreed at European (CEPT) level. In the recent years harmful interference that was either caused intentionally or unintentionally has been experienced to GNSS systems.

1.3 In addition to interference caused by RF emissions, GNSS signals are also vulnerable to ionospheric scintillation which may cause loss of GNSS signals in particular in equatorial and auroral regions.

1.4 Detailed material on GNSS vulnerability and GNSS interference is in the ICAO GNSS Manual (Doc. 9849) which is currently being revised by the Navigation Systems Panel. Relevant (draft) material on interference from this Manual is reproduced in **Appendix A**

1.5 Of concern to aviation is the protection of the frequency bands 1559 – 1610 MHz, used by GLONASS and GPS and the band 1164 – 1215 MHz which is foreseen to be used by GLONASS and GPS. Also the European Galileo system and the Chinese BEIDOU system are planning to use these bands to provide GNSS signals for use by aviation. Various satellite based augmentation systems are operating in the frequency band 1559 – 1610 MHz.

2. Interference

2.1 Unintentional interference.

2.1.1 Unintentional interference is normally caused by equipment authorized to operate on GNSS frequencies under strict conditions that are aimed at not causing harmful interference to the reception of GNSS signals. Problematic is that not in all cases such equipment is being used in accordance with these conditions, thus resulting in causing harmful interference.
Equipment that can cause such interference include GNSS repeaters and GNSS Pseudolites

2.1.2 In Europe provisions were developed by the ECC/CEPT to avoid harmful interference by inappropriate use of GNSS pseudolites and GNSS repeaters. These provisions and other relevant material is available from the website of the European Communications Office (ECO) in the following Reports and Recommendation:

ECC Report 129: Technical and operational provisions required for the use of GNSS repeaters
ECC Report 145: Regulatory framework for Global Navigation Satellite System (GNSS) repeaters
ECC Recommendation (10)02, A framework for authorization regime of Global Navigation Satellite System
ECC Report 128: Compatibility Studies between Pseudolites and Services in the frequency bands 1164-1215 MHz, 1215-1300 MHz and 1559-1610 MHz
ECC REC (04)01, which declares jammers as illegal.
ECC Report 183, Regulatory Framework for Outdoor Pseudolites

2.1.3 In addition various ITU-R Recommendations provide relevant information on the compatibility and use of RNSS networks, including:

Recommendation ITU-R M.1904: Characteristics, performance requirements and protection criteria for receiving stations of the radionavigation-satellite service (space-to-space) operating in the frequency bands 1 164-1 215 MHz, 1 215-1 300 MHz and 1 559-1 610 MHz

Recommendation ITU-R M.1901: Guidance on ITU-R Recommendations related to systems and networks in the radionavigation-satellite service operating in the frequency bands 1 164-1 215 MHz, 1 215-1 300 MHz, 1 559-1 610 MHz, 5 000-5 010 MHz and 5 010-5 030 MHz

Recommendation ITU-R M.1787: Description of systems and networks in the radionavigation-satellite service (space-to-Earth and space-to-space) and technical characteristics of transmitting space stations operating in the bands 1 164-1 215 MHz,1 215-1 300 MHz and 1 559-1 610 MHz

Recommendation ITU-R M.1903: Characteristics and protection criteria for receiving earth stations in the radionavigation-satellite service (space-to-Earth) and receivers in the aeronautical radionavigation service operating in the band 1 559-1 610 MHz

Recommendation ITU-R M.1318: Evaluation model for continuous interference from radio sources other than in the radionavigation-satellite service to the radionavigation-satellite service systems and networks operating in the 1 164-1 215 MHz, 1 215-1 300 MHz, 1 559-1 610 MHz and 5 010-5 030 MHz bands

Recommendation ITU-R M.2030: Evaluation method for pulsed interference from relevant radio sources other than in the radionavigation-satellite service to the radionavigation-satellite service systems and networks operating in the 1 164-1 215 MHz, 1 215-1 300 MHz and 1 559-1 610 MHz frequency bands

ITU R M.2220 which provides criteria to determine compatibility between DME and GNSS L5.

2.1.4 States are invited to consult this material with the view to develop national regulations that will enforce the operation of GNSS Pseudolites and Repeater in a manner that harmful; interference to the reception of GNSS signals by aviation is prevented. Particular attention should be given to the practicality to enforce these provisions.

2.2 Intentional interference

Intentional interference is caused by equipment of which the user has the intention to cause harmful interference to the reception of GNSS signals, either on a local (e.g. less than 100 m) scale or a large scale (e.g. in the order of 100 – 200 NM).

Equipment used to cause intentional interference includes jammers and spoofers (intentional interference that may result in an aircraft to follow a false flight path).

The sale and use for jammers developed to cause Intentional interference, (e.g. to avoid tracking of vehicles) and spoofers should be forbidden. Although difficult, these systems should not be allowed on any market (national or international).

2.3 ICAO Electronic Bulletin on Interference to GNSS Signals.

ICAO has drawn the attention of States to the need to ensure protection of GNSS signals from interference and point to the need of cooperation between national aeronautical and telecommunication authorities in the introduction and enforcement of appropriate regulations (Electronic Bulletin EB 2011/56 from 21 November refers). This Electronic Bulletin is, for the ease of reference, reproduced in **Appendix B**

3. Cooperation with ITU

3.1 Interference to GNSS systems can affect international civil aviation and [in some cases] international coordination may be required to solve such interference. A framework for cooperation in the

format of a Memorandum of Understanding between the ITU and ICAO has been established with the prime view to maximize the joint efforts of the ITU and ICAO to eliminate cases of harmful interference. This Memorandum is reproduced in Appendix C

4. Fixed Service

4.1 The frequency band 1559 – 1610 MHz is shared with the (terrestrial) Fixed Service. Use of this band by both the Radionavigation Satellite Service and the Fixed service in a compatible manner is not feasible. Although the allocation to the Fixed Service is on a secondary basis, attention is drawn to the fact that the Fixed Service may cause harmful interference to the reception of GNSS signals. In 2015 the allocation to the Fixed Service is expected to be withdrawn from the Radio Regulations and attention should be given to the need to secure that any operation of the Fixed Service in this band will cease by that time.

5. Summary

5.1 This information material highlights a number of cases where harmful interference can be caused to the reception of GNSS signals by aviation. Measures to prevent such interference are recommended together with an operational evaluation of the interference risks.
Work on the assessment of RF interference (intentional and unintentional) is ongoing in the Navigation Systems Panel.

APPENDIX A of the ICAO GNSS Manual (Doc. 9849)

Source: GNSS Manual – Chapter 5

5.8 GNSS VULNERABILITY

5.8.1 General

5.8.1.1. The most notable GNSS vulnerability lies in the potential for interference, which exists in all radionavigation bands. As with any navigation system, the users of GNSS navigation signals should be protected from harmful interference resulting in the degradation of navigation performance.

5.8.1.2 The GNSS SARPs require a specified level of performance in the presence of levels of interference as defined by the receiver interference mask. These interference levels are generally consistent with the International Telecommunication Union (ITU) regulations. Interference at levels above the mask may cause degradation or even loss of service, but such interference is not allowed to result in hazardously misleading information (HMI).

5.8.1.3 GPS and Global Navigation Satellite System (GLONASS) have filings with the ITU to operate, using spectrum allocated to the Radionavigation Satellite Service (RNSS) in the 1 559 – 1 610 MHz and 1 164 – 1 215 MHz bands. The RNSS allocation in these bands is shared with the Aeronautical Radionavigation Service (ARNS). SBAS also has a filing under the RNSS allocation in the former band. GBAS is operated in the 108 – 117.975 MHz band, shared with ILS and VOR (ARNS).

5.8.2 Sources of Vulnerability

5.8.2.1 There are a number of sources of potential interference to GNSS from both in-band and out-of-band sources. Of particular concern is the use of the 1 559 – 1 610 MHz band by point-to-point microwave links that are allowed by a number of States. The use of these links, as stated in footnotes 5.362B and 5.362C in the Radio Regulations of the ITU, is due to be phased out starting in 2005 and completed by no later than 2015. In addition, no new links should be permitted.

5.8.2.2 *Unintentional interference*. The likelihood and operational effect of interference vary with the environment. Unintentional interference is not considered a significant threat provided that States exercise proper control and protection over the electromagnetic spectrum for both existing and new frequency allocations. Furthermore, the introduction of GNSS signals on new frequencies will ensure that unintentional interference does not cause the complete loss of GNSS service (outage) although enhanced services depending upon the availability of both frequencies might be degraded by such interference.

5.8.2.3 *Intentional interference*. The risk of intentional interference depends upon specific issues that must be addressed by States. For States that determine that the risk is unacceptable in specific areas, operational safety and efficiency can be maintained by adopting an effective mitigation strategy through a combination of on-board mitigation techniques (e.g. use of inertial navigation system (INS)), procedural methods and terrestrial navigation aids.

5.8.2.4 *Ionosphere*. Scintillation can cause loss of GNSS satellite signals in the equatorial and auroral regions, but is unlikely to cause complete loss of GNSS service and will be mitigated with the addition of new GNSS signals and satellites. Ionospheric changes may limit the SBAS and GBAS services that can be

provided in the equatorial region using a single GNSS frequency. These changes must be considered when designing operations based on the augmentation systems.

5.8.2.5 *Other vulnerabilities*. System failure, operational errors and discontinuation of service could be significantly mitigated by independently managed constellations, funding and robust system design. Spoofing, the intentional corruption of signals to cause an aircraft to deviate and follow a false flight path, is mitigated through normal procedures and independent ground and collision avoidance systems.

5.8.2.6 States should assess the GNSS vulnerability in their airspace and select appropriate mitigations depending on the airspace in question and the operations that must be supported. These mitigations can ensure safe operations and enable States to avoid the provision of new terrestrial navigation aids, reduce existing terrestrial navigation aids, and discontinue them in certain areas. Fault detection features such as RAIM are built into GNSS receivers, which eliminate the risk of position errors posing threat to navigation availability. To date, no vulnerabilities have been identified that compromise the ultimate goal of a transition to GNSS as a global system for all phases of flight. The assessment of GNSS vulnerability aspects and mitigation alternatives should continue.

5.8.3 Evaluating GNSS vulnerabilities

5.8.3.1 There are three principal aspects to be considered in the evaluation of GNSS vulnerabilities.

a) Interference and atmospheric (ionosphere) effects are of primary concern. Operational experience is the best way to assess the likelihood of unintentional interference. Each State must consider the motivation to intentionally interfere with GNSS based on the potential safety and economic impacts on aviation and non-aviation applications. Atmospheric effects are unlikely to cause a total loss (outage) of GNSS but may impact some services (e.g. approaches with vertical guidance in equatorial regions). The likelihood of specific effects can be categorized as negligible, unlikely or probable.

b) All operations and services dependent on GNSS should be identified and considered together, since GNSS interference can potentially disrupt all GNSS receivers at the same time over a certain area. GNSS is used for navigation services as well as other services such as precision timing with communications and radar systems, and may also be used for ADS services. In these cases, GNSS represents a potential common point of failure.

c) The impact of a GNSS outage on an operation or service should be assessed by considering the types of operations, traffic density, availability of independent surveillance and communications and other factors. The impact can be categorized as none, moderate or severe.

5.8.3.2 By considering these aspects as a function of airspace characteristics, air navigation service providers can determine whether mitigation is required and, if so, at what level. Appendix D provides examples of assessments. Mitigation is most likely to be required for vulnerabilities with major impacts that have a moderate to high likelihood of occurrence.

5.8.4 Reducing the Likelihood of Unintentional Interference

5.8.4.1 On-aircraft interference can be prevented by proper installation of GNSS equipment, its integration with other aircraft systems (e.g. shielding, antenna separation and out-of-band filtering) and restrictions on the use of portable electronic devices on board aircraft.

5.8.4.2 *Spectrum management*. Effective spectrum management is the primary means of mitigating unintentional interference from man-made transmitters. Operational experience has indicated that the threat of unintentional interference can be virtually eliminated by applying effective spectrum management. There are three aspects of effective spectrum management, namely:

a) creation of regulations/laws that control the use of spectrum;

b) enforcement of those regulations/laws; and

c) vigilance in evaluating new radio frequency (RF) sources (new systems) to ensure that they do not interfere with GNSS.

APPENDIX B of the ICAO GNSS Manual (Doc. 9849)
ELECTRONIC BULLETIN EB 2011/56 AN 7/5 FROM 21 NOVEMBER 2011

INTERFERENCE TO GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS) SIGNALS

1. Aviation operations increasingly rely on the global navigation satellite system (GNSS) to improve navigation performance and to support air traffic control surveillance functions.

2. However, the full benefits of GNSS can only be achieved if GNSS signals are adequately protected from electromagnetic interference which can cause loss or degradation of GNSS services.

3. Potential sources of interference to GNSS include both systems operating within the same frequency bands as GNSS and systems operating outside those bands. Interference can be intentional ("jamming") or unintentional.

4. ICAO Member States have an essential role in ensuring protection of GNSS signals from interference. This can be achieved through cooperation of national aviation and telecommunication authorities in the introduction and enforcement of appropriate regulations controlling the use of the radio spectrum.

5. Attachment A briefly describes some sources of interference to GNSS and discusses regulatory means available to States to deal with them. Attachment B contains a list of documents that can be used as guidance for States in developing a regulatory framework.

Enclosures:
A — Sources of interference to GNSS
B — References

ATTACHMENT A to EB 2011/56

SOURCES OF INTERFERENCE TO THE GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS)

1. INTERFERENCE TO GNSS CAUSED BY SYSTEMS TRANSMITTING IN GNSS FREQUENCY BANDS

1.1 GNSS repeaters and pseudolites

1.1.1 Certain non-aeronautical systems transmit radio signals intended to supplement GNSS coverage in areas where GNSS signals cannot be readily received (e.g. inside buildings). These systems include GNSS repeaters and pseudolites.

1.1.2 GNSS repeaters (also known as "re-radiators") are systems that amplify existing GNSS signals and re-radiate them in real-time. Pseudolites are ground-based systems that generate ranging signals similar to those transmitted by GNSS satellites.

1.1.3 When these systems do not operate under appropriate conditions, harmful interference may be caused to the reception of the original GNSS signals by aircraft and other aeronautical systems (such as the reference receivers used in augmentation systems). This may disrupt a wide range of GNSS applications.

1.1.4 To prevent this disruption, a State needs to create a regulatory framework for the sale, ownership and operation of these systems. The framework must include regulations to ensure that use of the systems be permitted only where they have a legitimate application and their operation is not harmful to existing primary users of GNSS-based services. Additional measures may be necessary when repeaters and pseudolites are used on or in the vicinity of airports (e.g. in hangars, for testing/maintenance purposes).
1.1.5 Attachment B contains a list of documents that can be used as guidance for States developing a regulatory framework. They include interference analyses and examples of regulations currently in force in Europe and the United States.

1.2 GNSS jammers

1.2.1 GNSS jammers are devices which intentionally generate harmful interference to GNSS signals to impair or deny their reception. They may be employed for various reasons, typically with the intent of disabling devices that record and/or relay GNSS position information (e.g. for tracking or fee collection purposes). However, the interference they generate can potentially affect all users of GNSS, not only the intended targets of the jamming. Thus, they may have an impact far greater than intended by their operator.

1.2.2 Usage of GNSS jammers may proliferate further if GNSS-based fee collection or tracking services are not adequately designed, e.g. if the simple use of a jamming device enables the avoidance of the charge or tracking.

1.2.3 To prevent degradation of GNSS services due to GNSS jammers, States should implement and enforce policies and regulations that forbid the sale, export, purchase, ownership and use of GNSS jammers, and they should prohibit all actions that lead to an interruption of GNSS signals[1].
Adequate means of enforcement of such policies and regulations require the availability of GNSS signal monitoring capabilities. Furthermore, GNSS-based services should be designed in such a way that simple jamming does not result in denial of the service.

2. INTERFERENCE TO GNSS CAUSED BY SYSTEMS TRANSMITTING OUTSIDE THE GNSS FREQUENCY BANDS

2.1 In addition to the threats described above, systems operating outside the GNSS frequency bands that are not properly designed or are inappropriately regulated and operated may interfere with GNSS.

2.2 GNSS frequencies are protected by international agreements (ICAO *Convention on International Civil Aviation* and ITU Radio Regulations), and enable aviation services that have significant economical and societal benefits. However, there is also significant demand for electromagnetic spectrum for new applications, such as mobile phone and broadband data services, which may compromise spectrum compatibility. States should require that any such application will not interfere with GNSS signals through execution of adequate spectrum management practices.

— — — — — — — —

1 In some States, military authorities test their equipment by occasionally transmitting jamming signals that deny service in a specific area. This activity should be coordinated with State spectrum authorities and air navigation service providers to enable them to determine the airspace affected, advise aircraft operators and develop any required contingency procedures.

ATTACHMENT B to EB 2011/56

REFERENCES

ECC Report 129: "Technical and operational provisions required for the use of GNSS repeaters", Dublin, January 2009 (available at: http://www.ecodocdb.dk/, see under "ECC Reports")

ECC Report 145: "Regulatory framework for Global Navigation Satellite System (GNSS) repeaters", St. Petersburg, May 2010 (available at: http://www.ecodocdb.dk/, see under "ECC Reports")

ECC Recommendation (10)02, "A framework for authorization regime of Global Navigation Satellite System (GNSS) repeaters" (available at: http://www.ecodocdb.dk/, see under "ECC Recommendations")

United States National Telecommunications and Information Administration (NTIA) Manual of Regulations and Procedures for Federal Radio Frequency Management (Redbook), sections 8.3.28 – 8.3.30 (available at: http://www.ntia.doc.gov/page/2011/manual-regulations-and-procedures-federalradio-frequency-management-redbook)

Note.— The relevant sections of the NTIA Redbook only apply to the United States Federal Government users. Use of repeaters by non-government users is prohibited in the United States.

-END-

APPENDIX 5F

B0 – FICE: Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration

Description and purpose

To improve coordination between Air Traffic Service Units (ATSUs) by using ATS Interfacility Data Communication (AIDC) defined by the ICAO *Manual of Air Traffic Services Data Link Applications* (Doc 9694). The transfer of communication in a data link environment improves the efficiency of this process particularly for oceanic ATSUs.

Main performance impact:

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

Applicability consideration:

Applicable to at least two Area Control Centres (ACCs) dealing with enroute and/or terminal control area (TMA) airspace. A greater number of consecutive participating ACCs will increase the benefits.

B0 – FICE: Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration				
Elements	***Applicability***	***Performance Indicators/Supporting Metrics***	***Targets***	***Remarks***
AMHS capability	*All States*	Indicator: % of States with AMHS capability Supporting metric: Number of States with AMHS capability	70 % of States with AMHS capability by December 2017	Final Targets to be agreed by the MSG/*4*
AMHS implementation /interconnection	*All States*	Indicator: % of States with AMHS implemented (interconnected with other States AMHS) Supporting metric: Number of States with AMHS implemented (interconnections with other States AMHS)	4 States with AMHS interconnected December 2017	Final Targets to be agreed by the MSG/*4*
Implementation of AIDC/OLDI between adjacent ACCs	*All ACCs*	Indicator: % of FIRs within which all applicable ACCs have implemented at least one interface to use AIDC/OLDI with neighboring ACCs Supporting metric: Number of AIDC/OLDI interconnections implemented between adjacent ACCs	70% by December 2017	Final Targets to be agreed by the MSG/*4*

B0 –TBO: Improved Safety and Efficiency through the initial application of Data Link En-Route

Description and purpose

To implement an initial set of data link applications for surveillance and communications in ATC, supporting flexible routing, reduced separation and improved safety.

Main performance impact:

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

Applicability consideration:

Requires good synchronization of airborne and ground deployment to generate significant benefits, in particular to those equipped. Benefits increase with the proportion of equipped aircraft.

B0 –TBO: Improved Safety and Efficiency through the initial application of Data Link En-Route				
Elements	***Applicability***	***Performance Indicators/Supporting Metrics***	***Targets***	***Remarks***
ADS-C and CPDLC	Muscat and Sanaa FIRs Oceanic	Indicator: % of FIRs having implemented data link en-route, as and where required Supporting Metric: Number of FIRs having implemented data link en-route, as and where required	50% by December 2017	Final Targets to be agreed by MSG/4

B0 – ACAS: ACAS Improvements

Description and purpose

To provide short-term improvements to existing Airborne Collision Avoidance Systems (ACAS) to reduce nuisance alerts while maintaining existing levels of safety. This will reduce trajectory deviations and increase safety in cases where there is a breakdown of separation.

Main performance impact:

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

Applicability consideration:

Safety and operational benefits increase with the proportion of equipped aircraft.

B0 – ACAS: ACAS Improvements				
Elements	***Applicability***	***Performance Indicators/Supporting Metrics***	***Targets***	***Remarks***
Avionics	All States	Indicator: % of States requiring carriage of ACAS (TCAS v 7.1) for aircraft with a max certificated take-off mass greater than 5.7 tons Supporting metric: Number of States requiring carriage of ACAS (TCAS v 7.1) for aircraft with a max certificated take-off mass greater than 5.7 tons	*80% by December 2015* *100% by December 2016*	Final Targets to be agreed by MSG/4

APPENDIX 5G

TABLE CNS II-1 - AERONAUTICAL FIXED TELECOMMUNICATIONS NETWORK (AFTN) PLAN

State/Station	Category	Requirement				Remarks
		Type	Signaling Speed	Protocol	Code	
1	2	3	4	5	6	
BAHRAIN						
BAHRAIN	M					
ABU DHABI	M		64 – 96 bps	CIDIN	IA-5	
BEIRUT	T		9600 bps	CIDIN	IA-5	
DOHA	M		64 – 96 bps	None	IA-5	
JEDDAH	T		64 – 96 bps		IA-5	
~~KABUL~~	M		--	None		
KUWAIT	M		64 – 96 bps	None	IA-5	
MUSCAT	M		300 baud	None	IA-5	
SINGAPORE	M		9600 bps	None	IA-5	
TEHRAN			64 – 96 bps		IA-5	
EGYPT						
CAIRO	M					
AMMAN	M		64/9.6	None	IA-5	
ATHENS	T		64/9.6	CIDIN	IA-5	
BEN GURION	M		64/9.6	None	IA-5	
BEIRUT	M		9600	CIDIN	IA-5	
JEDDAH	T		128/9.6	CIDIN	IA-5	
KHARTOUM	M		9600	None	IA-5	
NAIROBI	M		9600	None	IA-5	
TUNIS	M		64/9.6	None	IA-5	
TRIPOLI	M		64/19.2	None	IA-5	
TRIPOLI	M		9600	None	IA-5	
DAMASCUS			64/9.6	None	IA-5	
IRAN						
TEHRAN	T					
BAHRAIN	M		64 Kbps	None	IA-5	
KABUL	T		-			
KUWAIT	M		64 Kbps	None	IA-5	
ABU-DHABI						

State/Station	Category	Requirement				Remarks
		Type	Signaling Speed	Protocol	Code	
1	2	3	4	5	6	
IRAQ						
BAGHDAD	T		-	None	IA-5	
AMMAN	T		-	None	IA-5	
BEIRUT						
KUWAIT						
ANKARA						
JORDAN						
AMMAN	T		-	-	-	
BAGHDAD	M		-	-	-	
BEIRUT	T		1200	None	IA-5	
BEN GURION	M		64/9.6	None	IA-5	
CAIRO	T		64/9.2	None	IA-5	
DAMASCUS	S		64/19.2	None		
JEDDAH	T					
KUWAIT						
KUWAIT						
BAHRAIN	M	LDD/d	64/9.6 bps	None	I A-5	
DAMASCUS	T	LDD/a	50 BD	None	ITA-2	
BEIRUT	M	LDD/a	100 baud	None	ITA-2	
DOHA	M	LDD/a	64/9.6 bps	None	IA- 5	
(EUR)	-					
KARACHI	M	LDD/d	2.4 K	None	IA-5	
TEHRAN	M	LDD/d	64/9.6 baud	None	IA-5	
BAGHDAD	T	SAT/ad	9.6 bps	None	IA- 5	
LEBANON						
BEIRUT	M					
AMMAN	T		-	-	-	
BAGHDAD	M		-	None	-	
BAHRAIN	M		9600	CIDIN	IA-5	
CAIRO	T		9600	CIDIN	IA-5	
DAMASCUS	M		2 x 50 bd	None	ITA-2	
JEDDAH	M		9600	CIDIN		
KUWAIT	M		100 BD	None	ITA-2	
NICOSIA			9600	CIDIN	IA-5	

State/Station	Category	Requirement				Remarks
		Type	Signaling Speed	Protocol	Code	
1	2	3	4	5	6	
LIBYA						
TRIPOLI	T					
MALTA	T					
TUNIS	M					
BENGHAZI	T					
CAIRO	T					
KHARTOUM	T					
OMAN						
MUSCAT						
ABU DHABI	T		9600	AMHS		
BAHRAIN	M		300 BD	None	IA-5	
MUMBAI	M		9600	None	ITA-2	
JEDDAH	M		300 BD	None	ITA-2	
SANA'A	T		100 BD	None	ITA-2	
QATAR						
DOHA						
BAHRAIN	M		9600	None	IA-5	
KUWAIT	M		100 BD	None	ITA-2	
ABU DHABI	T		9600	AMHS		
SAUDI ARABIA						
JEDDAH						
ADDIS-ABABA	M		9600	None	IA-5	
BAHRAIN	M		64 /9.6	CIDIN	IA-5	
BEIRUT	M		9600	CIDIN	IA-5	
CAIRO	M		128/9.6	CIDIN	IA-5	
MUSCAT	M		300	None	ITA-2	
SANA'A	T		9600	None	IA-5	
AMMAN						
SUDAN						
KHARTOUM	M					
CAIRO	T					
JEDDAH	M					
TRIPOLI	T					
NDJAMENA	M					
KIGALI	M					

State/Station	Category	Requirement				Remarks
		Type	Signaling Speed	Protocol	Code	
1	2	3	4	5	6	
SYRIA						
DAMASCUS						
ATHENS	M		2 X 50	None	ITA-2	
AMMAN	T		64/9.6	None		
BEIRUT	M		2 X 50	None	ITA-2	
CAIRO	M		50 BD	None	ITA-2	
KUWAIT	M		50BD	None	ITA-2	
TEHRAN	T		50BD	None	ITA-2	
UAE						
ABU DHABI						
BAHRAIN	M		64 – 96 bps	CIDIN	IA-5	
AMMAN	T		2 MG bps	AMHS		
MUSCAT	M				IA-5	
QATAR			9600 bps	None		
TEHRAN	M					
			64 – 96 bps	None	IA-5	
YEMEN						
SANA'A						
JEDDAH	M		9600	None	IA-5	
MUSCAT	M		9600	None	IA-5	

APPENDIX 5G

TABLE CNS II-2 - REQUIRED ATN INFRASTRUCTURE ROUTING PLAN

Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remarks
1	2	3	4	5	6	7	8
BAHRAIN, Bahrain	BIS		ASIA/PAC Oman,Saudi Arabia Kuwait,Lebanon Iran, Afganistan Qatar, UAE				
EGYPT, Cairo	BIS		AFI, EUR Israel, Jordan, Lebanon, Athena Saudi Arabia				
IRAN, Tehran	BIS		Kuwait, Bahrain Afganistan				
IRAQ, Baghdad	IS		Jordan, Lebanon				
JORDAN, Amman	BIS		Egypt,Israel Lebanon,Iraq,Syria				
KUWAIT,Kuwait	BIS		EUR, Pakistan, Iran,Qatar,Bahrain, Lebanon				
LEBANON, Beirut	BIS		EUR Jordan,Syria Iraq,Kuwait,Bahrain Saudi Arabia,Egypt				
LIBYA	IS						
OMAN, Muscat	BIS		ASIA/PAC Yemen, Bahrain, UAE, Saudi Arabia				
QATAR, Doha	IS		Kuwait, Bahrain				
SAUDI ARABIA, Jeddah	BIS		AFI Egypt, Lebanon Bahrain,Oman Yemen				
SUDAN	IS						
SYRIA, Damascus	IS		Jordan, Lebanon				
U.A.E, Abu Dhabi	BIS		Bahrain, Oman Qatar				
YEMEN, Sana'a	IS		Oman, Saudi Arabia				

APPENDIX 5G

TABLE CNS II-3 - ATS DIRECT SPEECH CIRCUITS PLAN

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	TERMINAL II	TYPE	SERVICE	DIR/SW	TO BE SWITCHED VIA	
1	2	3	4	5	6	7
BAHRAIN						
Bahrain	Emirates ACC	A	LTF	DIR		2 LINES
	Dammam	A	LTF	DIR		
	Doha	A	LTF	DIR		2 LINES
	Jeddah	A	LTF	DIR		2 LINES
	Kuwait	A	LTF	DIR		
	Muscat	A	LTF	DIR		
	Riyadh	A	LTF	DIR		
	Shiraz	A	LTF			
	Tehran	A	LTF	DIR		
EGYPT						
Cairo	Amman	A	LTF	DIR		
	Athens	A	LTF	DIR		
	Jeddah	A	LTF	DIR		
	Khartoum	A	LTF			
	Nicosia	A	LTF	DIR		
	Tel Aviv	A	LTF	DIR		
	Tripoli	A	LTF	DIR		
IRAN (ISLAMIC REPUBLIC OF)						
Abadan	Basrah	A	LTF			
	Shiraz	A	LTF	DIR		
Shiraz	Abadan	A	LTF	DIR		
	Bahrain	A	LTF	DIR		
	Basrah	A	LTF			
	Doha	A	LTF	DIR		
	Karachi	A	LTF	DIR		
	Kuwait	A	LTF	DIR		
	Tehran	A	LTF	DIR		

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	**TERMINAL II**	**TYPE**	**SERVICE**	**DIR/SW**	**TO BE SWITCHED VIA**	
1	**2**	**3**	**4**	**5**	**6**	**7**
Tehran	Emirates ACC	A	LTF	DIR		1I
	Ankara	A	LTF	DIR		
	Ashgabat	A	LTF	DIR		
	Baghdad	A	LTF			
	Bahrain	A	LTF	DIR		
	Baku	A	LTF	DIR		
	Basrah	A	LTF			
	Doha	A	LTF	DIR		
	Kabul	A	LTF			
	Karachi	A	LTF	DIR		
	Kuwait	A	LTF	DIR		
	Muscat	A	LTF	DIR		
	Shiraz	A	LTF	DIR		
	Yerevan/Zvartnots	A	LTF	DIR		
IRAQ						
Baghdad	Amman	A	LTF			
	Ankara	A	SAT			
	Basrah	A	LTF			
	Damascus	A	LTF			
	Jeddah	A	LTF			
	Kuwait	A	LTF			
	Mosul	A	LTF			
	Tehran	A				
Basrah	Abadan	A	LTF			
	Baghdad	A	LTF			
	Kuwait	A	LTF			
	Shiraz	A	LTF			
	Tehran	A	LTF			
Mosul	Baghdad	A	LTF			

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	**TERMINAL II**	**TYPE**	**SERVICE**	**DIR/SW**	**TO BE SWITCHED VIA**	
1	**2**	**3**	**4**	**5**	**6**	**7**
JORDAN						
Amman	Baghdad	A	LTF			
	Cairo	A	LTF			
	Damascus	A	LTF			
	Jeddah	A	LTF			
	Tel Aviv	A	LTF			
KUWAIT						
Kuwait	Baghdad	A	LTF			
	Bahrain	A	LTF	DIR		
	Basrah	A	LTF			
	Jeddah	A	LTF	DIR		
	Shiraz	A	LTF	DIR		
	Tehran	A	LTF	DIR		
LEBANON						
Beirut	Ankara	A	LTF	DIR		
	Damascus	A	LTF	DIR		
	Nicosia	A	LTF	DIR		
LIBYA						
Tripoli	Cairo					
	Malta					
	Khartoum					
OMAN						
Muscat	Emirates ACC	A	LTF	DIR		
	Bahrain	A	LTF	DIR		
	Mumbai	A	LTF	DIR		
	Jeddah	A	LTF	DIR		
	Karachi	A	LTF	DIR		
	Salalah	A	LTF	DIR		
	Sana'a	A	LTF	DIR		
	Tehran	A	LTF	DIR		
Salalah	Muscat	A	LTF			
QATAR						
Doha	Emirates ACC	A	LTF	DIR		1I + 1
	Bahrain	A	LTF	DIR		
	Shiraz	A	LTF	DIR		
	Tehran	A	LTF	DIR		

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	**TERMINAL II**	**TYPE**	**SERVICE**	**DIR/SW**	**TO BE SWITCHED VIA**	
1	**2**	**3**	**4**	**5**	**6**	**7**
SAUDI ARABIA						
Dammam	Bahrain	A	LTF	DIR		
	Jeddah	A	LTF	DIR		
	Riyadh	A	LTF	DIR		
Jeddah	Addis Ababa	A	LTF			
	Amman	A	LTF	DIR		
	Asmara	A	LTF			
	Baghdad	A	LTF			
	Bahrain	A	LTF	DIR		
	Cairo	A	LTF	DIR		
	Dammam	A	LTF	DIR		
	Khartoum	A	LTF			
	Kuwait	A	LTF	DIR		
	Muscat	A	LTF	DIR		
	Riyadh	A	LTF	DIR		
	Sana'a	A	LTF	SW	Via Bahrain	
Riyadh	Bahrain	A	LTF	DIR		
	Jeddah	A	LTF	DIR		
	Dammam	A	LTF	DIR		
SUDAN						
Khartoum	Cairo	A	LTF			
	Jeddah	A	LTF			
SYRIAN ARAB REPUBLIC						
Damascus	Amman	A	LTF			
	Ankara	A	LTF			
	Baghdad	A	LTF			
	Beirut	A	LTF	DIR		
	Nicosia	A	LTF			

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	**TERMINAL II**	**TYPE**	**SERVICE**	**DIR/SW**	**TO BE SWITCHED VIA**	
1	**2**	**3**	**4**	**5**	**6**	**7**
UNITED ARAB EMIRATES						
Emirates ACC	Abu Dhabi	A	LTF	DIR		21
	Al Ain	A	LTF	SW		
	Bahrain	A	LTF	DIR		
	Doha	A	LTF	DIR		
	Dubai	A	LTF	DIR		
	Muscat	A	LTF	DIR		
	Tehran	A	LTF	DIR		
Abu Dhabi	Emirates ACC	A	LTF	SW		21
	Al Ain	A	LTF	DIR		21
	Dubai	A	LTF	SW		21
Al Ain	Emirates ACC	A	LTF	SW		21
	Abu Dhabi	A	LTF	DIR		21
	Dubai	A	LTF	SW		21
Dubai	Emirates ACC	A	LTF	DIR		2I + 1
	Abu Dhabi	A	LTF	DIR		2I
	Al Ain	A	LTF	SW		1I
	Fujairah	A	LTF	DIR		1I
	Ras Al	A	LTF	DIR		1I
	KhaimahSharjah	A	LTF	DIR		3I
	Sharjah					
Fujairah	Ras Al Khaimah	A	LTF	DIR		1I
	Emirates ACC	A	LTF	DIR		1I
Ras Al Khaimah	Dubai	A	LTF	DIR		1I
Sharjah	Dubai	A	LTF	DIR		31

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	**TERMINAL II**	**TYPE**	**SERVICE**	**DIR/SW**	**TO BE SWITCHED VIA**	
1	**2**	**3**	**4**	**5**	**6**	**7**
YEMEN						
Aden	Djibouti	A	LTF			
	Sana'a	A	LTF			
Mukalla	Aden	A	LTF			
	Sana'a	A	LTF			
Sana'a	Aden	A	LTF			
	Addis Ababa	A	LTF			
	Asmara	A	LTF			
	Mumbai	A	LTF			
	Djibouti	A	LTF			
	Jeddah	A	LTF		Via Bahrain	
	Mogadishu	A	LTF	DIR		
	Muscat	A	LTF			
	Riyan	A	LTF			

APPENDIX 5H

EUROPEAN ORGANISATION
FOR THE SAFETY OF AIR NAVIGATION

Requirements for the coordinated allocation and use of Mode S Interrogator Codes in the ICAO Middle East Region

DOCUMENT IDENTIFIER :

Edition Number	**:**	**v 1.02**
Edition Date	**:**	**07 August 2014**
Status	**:**	**Working Draft**
Intended for	**:**	**General Public**
Category	**:**	

DOCUMENT CHARACTERISTICS

TITLE		
Requirements for the coordinated allocation and use of Mode S Interrogator Codes in the ICAO Middle East Region		
	Publications Reference:	
	ISBN Number:	
Document Identifier	**Edition Number:**	v 1.02
	Edition Date:	07 August 2014
Abstract		
Keywords		

Contact Person(s)	Tel	Unit
BODART Jérôme	+32 2 729 4695	NMD/NS/SCC
POTIER Eric	+32 2 729 4741	NMD/NS/SCC

STATUS, AUDIENCE AND ACCESSIBILITY					
Status		**Intended for**		**Accessible via**	
Working Draft	☑	General Public	☑	Intranet	☐
Draft	☐	EUROCONTROL	☐	Extranet	☐
Proposed Issue	☐	Restricted	☐	Internet (www.eurocontrol.int)	☐
Released Issue	☐				

DOCUMENT APPROVAL

The following table identifies all management authorities who have successively approved the present issue of this document.

AUTHORITY	NAME AND SIGNATURE	DATE

DOCUMENT CHANGE RECORD

The following table records the complete history of the successive editions of the present document.

EDITION NUMBER	EDITION DATE	REASON FOR CHANGE	PAGES AFFECTED
1	01/02/2012	Review by CNS/ATM/IC SG/6	11,17
2	09/09/2014	Review by CNS SG/6	All

Publications
EUROCONTROL Headquarters
96 Rue de la Fusée
B-1130 BRUSSELS

Tel: +32 (0)2 729 4715
Fax: +32 (0)2 729 5149
E-mail: publications@eurocontrol.int

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EXECUTIVE SUMMARY

The introduction of SSR Mode S interrogators requires a coordinated approach to the allocation and implementation of the Interrogator Codes.

Provisions regarding the implementation and monitoring of Mode S IC allocations have been defined by ICAO.

In the ICAO European region, the management of the plan is exercised by EUROCONTROL on behalf of the European regional office of ICAO. EUROCONTROL has put in place a cell (the MICA Cell) to provide the centralised service of Interrogator Code (IC) allocation to Mode S Operators through their competent Focal Point. To support the coordinated allocation and implementation of the IC to Mode S interrogators in the ICAO European region, the Mode S IC allocation process has been formalized in the “EUROCONTROL Specification for the Mode S IC Allocation Coordination and IC Conflict Management” document.

Mode S interrogators are also installed in the ICAO Middle East region. The operational coverage of some of these interrogators is overlapping coverage of Mode S interrogators installed in the ICAO European region. In order to avoid any Mode S IC conflict with operational Mode S interrogator, it is therefore critical to coordinate the Mode S IC allocation in the ICAO Middle East region in close cooperation with the ICAO Middle East regional office.The Mode S IC allocation process applied in the ICAO European region will also be applied for IC allocation to Mode S interrogators in the ICAO Middle East region. This process is based on 168 days (approximately 6 months) cycles, aligned on AIRAC effective dates. The IC allocation to Mode S interrogators in the ICAO Middle East region and the ICAO European region will be processed together during the same MICA cycles.

This document defines processes applicable to the use of the centralised Mode S interrogator code allocation service in charge of coordinating interrogator code allocations within the ICAO European region and ICAO Middle-East region. It specifies the detailed procedures for Mode S Operators to obtain a coordinated Mode S interrogator code and particularly the interfaces between the Mode S Operators, the single ICAO Middle-East Regional Officer CNS acting as Focal Point for all competent States of ICAO Middle-East region, and the EUROCONTROL centralised Mode S interrogator code allocation service.

This document also specifies the procedures in place to manage interrogator code conflicts and the resolution of issues with respect to the interrogator code allocation plan.

In addition, the IC allocation in the ICAO European region relies on required Mode S interrogator performances and airborne carriage. The last part of this document introduces recommended functionalities for Mode S interrogators and transponders which could compromise future IC allocations if not implemented in that region.

1. Introduction

1.1 Purpose of the document

The purpose of this document is to lay down recommendations and requirements for an efficient support of the EUROCONTROL MICA Cell to the allocation of Mode S Interrogator Code by the ICAO Middle East regional office.

It describes the process and procedures in order to coordinate the Mode S Interrogator Code (IC) allocation for Mode S interrogators with a fixed position within the International Civil Aviation Organisation (ICAO) Middle-East (MID) region.

This document defines the procedures and the role of the following parties involved in the process:

- Mode S Operators
- ICAO MID regional office
- International Organisations
- MID Focal Point(s)
- EUROCONTROL Mode S IC Allocation Cell (hereinafter MICA Cell)

The document also describes the management and resolution of IC allocation and IC conflict issues.

1.2 Context

Whilst traditional Mode A/C Secondary Surveillance Radar (SSR) stations continuously interrogate all aircraft within their range, Mode S interrogators perform selective interrogations.

In order to avoid ambiguity in the operation of the system it is essential that each eligible Mode S interrogator is allocated an eligible Interrogator Code (IC) and is protected from interference by other Mode S interrogators operating in overlapping or contiguous airspace. The coverage areas of two Mode S interrogators using the same IC must not overlap, except if they are grouped in a cluster or if other appropriate operational mitigations are in place.

The introduction of Mode S interrogators has identified the need for a coordinated approach to the allocation and implementation of the ICs used by ground-based, airborne and shipborne platforms.

Note: systems such as ACAS or current Multilateration systems do not require the co-ordinated allocation of an IC. Even if they use Mode S interrogations and replies, they do not rely on "All Call" for acquisition or perform lockout.

Interrogator Codes can be either Interrogator Identifiers (II) or Surveillance Identifiers (SI). The design of the Mode S system limits the number of Interrogator Codes available (excluding II zero) to 15 II codes and 63 SI codes. For more information, please refer to ANNEX A.

Due to the limited number of ICs, it is necessary to have a centralised IC allocation system to ensure an optimised allocation and a safe operation. In the ICAO EUR region, the centralised IC allocation system is exercised by EUROCONTROL on behalf of the European regional office of ICAO. The MICA Cell has been created to provide the centralised service of IC allocation to Mode S Operators through their competent State Focal Point.

In 2011, the ICAO MID regional office requested EUROCONTROL to formally provide support for Mode S interrogator code allocation in ICAO MID region. It has been agreed that the MICA Cell will also support the ICAO MID regional office, with the same standard bi-annual MICA cycle (see Section 5) as that for Mode S interrogators within EUR region. This includes a coordinated listing of IC and coverage for Mode S interrogators in MID region. It has also been agreed that a single ICAO MID Regional Officer CNS will coordinate directly with the MICA Cell for all countries in MID region.

1.3 Abbreviations

ANSP	Air Navigation Service Provider
EANPG	European Air Navigation Planning Group
EMS	European Mode S Station
EU	European Union
EUR	Europe (ICAO region)
IC	Interrogator Code
ICAO	International Civil Aviation Organisation
ICD	Interface Control Document
II	Interrogator Identifier
MICA	Mode S Interrogator Code Allocation
MICoG	Mode S Interrogator Code Coordination Group
MID	Middle-East (ICAO region)
SGEG	Surveillance Ground Environment Group
SI	Surveillance Identifier
SSR	Secondary Surveillance Radar
TRD	Test, Research and Development

1.4 Definitions

For the purpose of this EUROCONTROL Specification, the following definitions are applicable.

Cluster: a set of Mode S interrogators connected with each other in the same network and using the same IC to share track information in order to allow aircraft acquisition already acquired by other stations in the same cluster.

Competent State:

(a) in the case of an ANSP from an EU Member State or States having chosen to transpose the EU regulation, the State that has certified the provider in accordance with Commission Regulation (EC) No 1035/2011 repealing Regulation 2096/2005;

(b) in other cases for an EU Member State or States having chosen to transpose the EU regulation, the State within the area of responsibility in which the Mode S Operator operates, or intends to operate, an eligible Mode S interrogator.

(c) for States not subject to EU regulation, the State within the area of responsibility in which the Mode S Operator operates, or intends to operate, an eligible Mode S interrogator in accordance with the ICAO EUR FASID and Doc024 (European Principles And Procedures for the Allocation of Secondary Surveillance Radar Mode S Interrogator Codes (IC)).

(d) States from ICAO MID region

Eligible Interrogator Code: any code among the II codes and the SI codes, except:

1. II code 0;
2. the interrogator code(s) reserved for military entities, including intergovernmental organisations in particular North Atlantic Treaty Organisation (NATO) management and allocation;

Eligible Mode S Interrogator: Mode S interrogator for which at least one of the following conditions is satisfied:

1. the interrogator relies, at least partly, on Mode S all call interrogations and replies for Mode S targets acquisition; or
2. the interrogator locks out acquired Mode S targets in reply to Mode S all call interrogations, permanently or intermittently, in part or totality of its coverage; or
3. the interrogator uses multi-site communications protocols for data link applications;

Focal Point: a person representing one or several competent States or an international organisation applying for interrogator codes, who is responsible for the coordination of all matters concerning the IC allocations between the MICA Cell and the Mode S Operators in his area of oversight.

Interrogator Code Allocation Plan: the most recently approved complete set of interrogator code allocations.

Interrogator Code Allocation Plan Proposal: a proposal for a complete set of IC allocations, submitted by the interrogator code allocation service for approval by competent States.

Interrogator Code Allocation System: means a system within the European Air Traffic Management Network, and the associated procedures, through which a centralised service of interrogator code allocation (hereinafter interrogator code allocation service), for dealing with the processing of interrogator code applications and the distribution of an interrogator code allocation plan proposal, is provided for Mode S Operators through competent States.

Interrogator Code Application (hereinafter IC application): an application from a Mode S Operator for the allocation of an eligible interrogator code.

Interrogator Code Conflict: uncoordinated coverage overlap of two or more Mode S interrogators operating on the same interrogator code, potentially resulting in aircraft remaining undetected by at least one of the Mode S interrogators.

Lockout: protocol that allows the suppression of Mode S all call replies from already acquired Mode S targets.

Lockout Coverage: Mode S interrogator configuration defining where and how to apply lockout to Mode S targets. The Lockout Coverage can be provided in different formats depending on Mode S interrogator capabilities: European Mode S Coverage Map ICD, lockout range per sector, unique lockout range.

Lockout Coverage in European Mode S Coverage Map ICD format Map (hereinafter Lockout Map): Mode S interrogator configuration file defining where and how to apply lockout to Mode S targets.

MICA Cell: the EUROCONTROL Team operating the interrogator code allocation system in accordance with its associated procedures in order to provide a centralised interrogator code allocation service.

MICA Cycle: a recurrent 6 monthly procedure for Mode S IC allocation.

MICA Cycle Effective Date: the last date of a given MICA cycle.

MICA website: the Mode S IC Allocation web-based application (hereinafter MICA website) is used to coordinate and manage the allocation of eligible IC to eligible Mode S interrogators in ICAO EUR region and ICAO MID region. The access to the web application is managed through the Eurocontrol OneSkyOnline portal. The MICA website is part of the interrogator code allocation system.

Mode S: cooperative surveillance technique for air traffic control which enables the selective interrogation of aircraft and the extraction of air derived data through which new air traffic management functionalities can be developed.

Mode S All Call interrogations: messages that are normally used by Mode S interrogators to acquire Mode S targets entering their area of coverage.

Mode S interrogator: a system composed of antenna and electronics, supporting addressing of individual aircraft through the Mode Select, known as Mode S.

Mode S Operator: a person, organisation or enterprise operating or offering to operate a Mode S interrogator, including:

(a) Air navigation service providers;

(b) Mode S interrogators manufacturers;

(c) Airport operators;

(d) Military authorities;

(e) Research establishments;

(f) Any other entity entitled to operate a Mode S interrogator;

Mode S target: a platform equipped with a Mode S transponder.

Third Country: a country where the Mode S IC allocation is not coordinated by the EUROCONTROL MICA Cell.

1.5 References

[RD 1] ICAO Annex 10 to the Convention on International Civil Aviation

Aeronautical Telecommunications

Volume IV Surveillance and Collision Avoidance Systems

Amendment 85 or latest

[RD 2] EUROCONTROL Specification for the Mode S IC Allocation Coordination and IC Conflict Management
EUROCONTROLSPEC153
14th June 2013

1.6 Document structure

Section 2 describes how the IC Allocation coordination is organized in ICAO European region. The IC Allocation status in the ICAO European region and ICAO Middle East region is also provided in this chapter.

Section 3 provides details about the actors and their role in the IC allocation process.

Section 4 details the procedure to submit an IC application in order to request an IC allocation.

Section 5 details the Mode S IC allocation cycle (MICA cycle) which is the default procedure for processing IC applications.

Section 6 details the Ad-Hoc allocation process which is an alternative but more constraining procedure to process IC applications.

Section 7 provides details about the IC conflict reporting procedure.

Section 8 provides details on how to resolve IC allocation and conflict issues.

Section 9 provides some guidance for IC allocation in ICAO Middle East Region. In particular the Mode S interrogator performances are discussed.

2. IC Allocation Coordination in Europe

2.1 Organization

Provisions regarding the implementation and monitoring of Mode S IC allocations have been defined by ICAO.

In the ICAO EUR region, the management of the plan is exercised by EUROCONTROL on behalf of the European regional office of ICAO.

EUROCONTROL has put in place the MICA Cell to perform the allocation of the Interrogator Codes. In addition the Mode S Interrogator Codes Co-ordination Group (MICoG) had been created to oversee the allocation process and provide guidance to the MICA Cell. Presently, the Surveillance Ground Environment Group - Mode S Interrogator Codes Co-ordination Group (hereinafter SGEG-MICoG) performs this task. The SGEG-MICoG members are the Focal Points representing the National Regulatory Authorities of European States and those international organisations applying for IC.

The Focal Points are also responsible for the coordination of all matters concerning the IC allocations between the MICA Cell and the Mode S Operators in their area of oversight.

The Figure 1 here blow depicts the co-ordination for IC allocation to Mode S interrogators in ICAO EUR region.

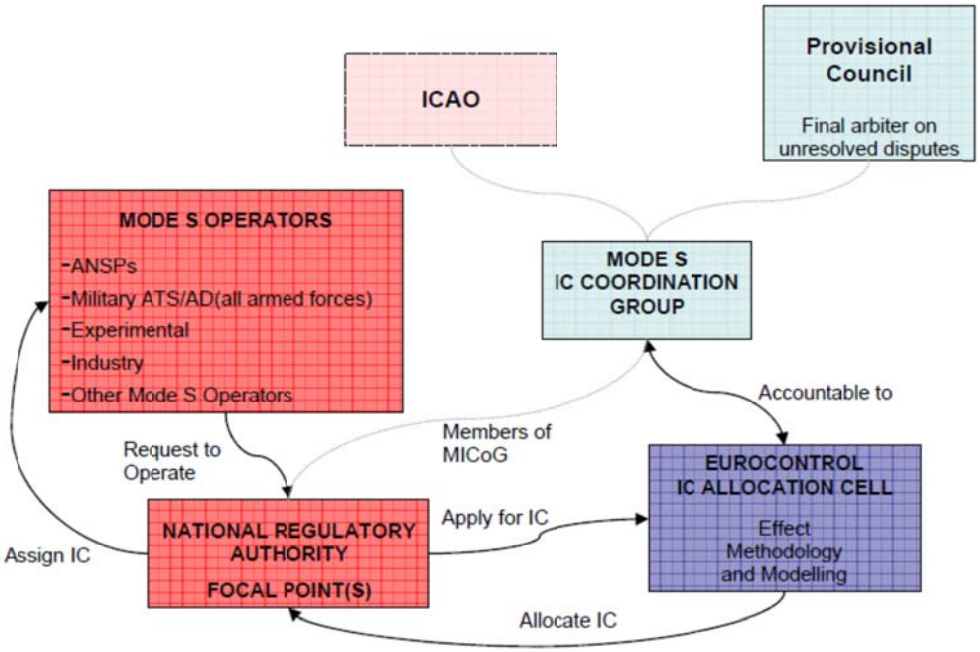


Figure 1: Mode S IC Allocation Coordination in Europe

2.2 IC Allocations Framework

IC allocation started with deployment of the first Mode S interrogators in Europe. The deployment of more Mode S interrogators required a coordinated process which was formalized in 2005:

Mode S Interrogator Codes Allocation Process 1.0

29 September 2005

From that date, the Mode S IC allocation is managed in cycle of 6 months.

To enforce the requirements and responsibilities on each participant, the following European Regulation was issued in 2009:

COMMISSION REGULATION (EC) No 262/2009 of 30 March 2009

laying down requirements for the coordinated allocation and use of Mode S interrogator codes for the single European sky

In 2013, the "EUROCONTROL Specification for the Mode S IC Allocation Coordination and IC Conflict Management" document ([RD 2]) has been issued. This EUROCONTROL specification defines processes applicable to the use of the centralised Mode S interrogator code allocation service (managed by the EUROCONTROL MICA Cell) in charge of coordinating IC allocations within the ICAO EUR region and ICAO MID region. It superseded the "Mode S Interrogator Codes Allocation Process 1.0" document identified above.

This document specifies the detailed procedures for Mode S Operators to obtain a coordinated Mode S IC and particularly the interfaces between the Mode S Operators, the Focal Points representing competent States in the ICAO EUR region, the single ICAO MID Focal Point representing all competent States of ICAO MID region and the EUROCONTROL centralised Mode S interrogator code allocation service.

This document also specifies the procedures in place to manage interrogator code conflicts and the resolution of issues with respect to the interrogator code allocation plan.

EU Member States that comply with this specification comply with a number of regulatory provisions of the European Regulation identified above.

In addition, a web application, called MICA website, has been developed to improve the processing and coordination of IC Allocation to Mode S interrogators in the European region.

2.3 IC Allocation Status

At the end of MICA Cycle 19 (June 2014), 364 Mode S interrogators were allocated an IC, either an II code or an SI code, in the ICAO EUR region.

The Figure 2 here below depicts the IC Allocation Status in the ICAO EUR region at the end of MICA Cycle 19.

Mode S interrogators are also installed in ICAO MID region. The operational coverage of some of these interrogators is overlapping coverages of Mode S interrogators installed in ICAO EUR region. In order to avoid any Mode S IC conflict with interrogator already operational in Mode S, it is therefore critical to coordinate the Mode S IC allocation in ICAO MID region in close cooperation with the ICAO MID regional office.

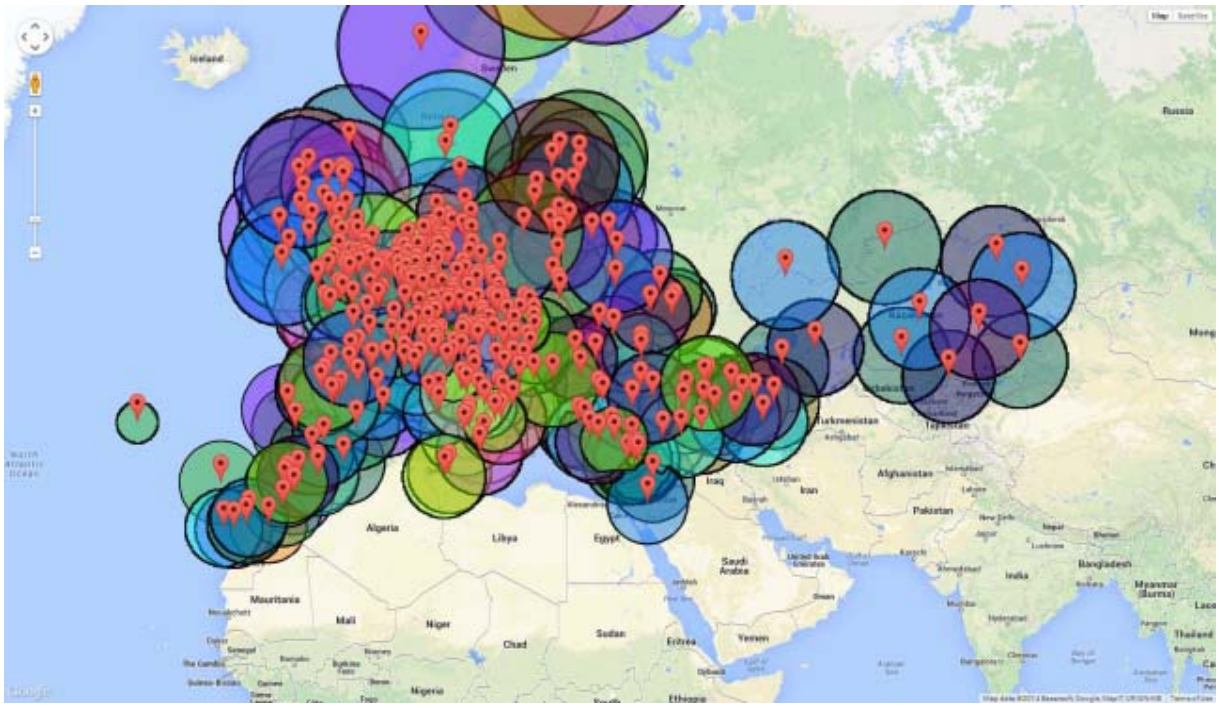


Figure 2: IC Allocation Status in European region at the end of MICA Cycle 19

At the end of MICA Cycle 19 (June 2014), 38 Mode S interrogators were allocated an II code in the Middle East region.

The Figure 3 here below depicts the IC Allocation Status in the ICAO MID region at the end of MICA Cycle 19.

Figure 3: IC Allocation Status in Middle East region at the end of MICA Cycle 19

3. General Requirements and Responsibilities

3.1 Focal Point Nomination

The ICAO MID regional office **shall** nominate an ICAO Middle East Regional Officer CNS to act as MID Focal Point for all Mode S Operators within the ICAO Middle East region. The MID Focal Point is responsible for the coordination of all matters concerning the allocation of ICs between the MICA Cell and Mode S Operators that operate in a State of the ICAO MID region.

The ICAO MID regional office **should** nominate a backup MID Focal Point to support and to replace the MID Focal Point in order to ensure continuity of service.

Note: It is expected that the Focal Point availability is ensured during standard business hours. There is no requirement for 24 hours a day, 7 days per week (24/7) availability.

The ICAO MID regional office **should** provide known points of contact for third countries to the MICA Cell through their MID Focal Point(s).

3.2 Focal Point Responsibilities

MID Focal Point(s) **shall** be registered on the MICA website. Prior to MICA website registration, MID Focal Point(s) **shall** self-register on the EUROCONTROL OneSkyOnline portal[1].

MID Focal Point(s) **shall** inform their respective civil and military Mode S Operators of their responsibilities described in this document.

MID Focal Point(s) **shall** transmit to the MICA Cell the MICA website registration requests they have received and accepted from Mode S Operators representing either civil or military organisations under their responsibility.

MID Focal Point(s) **shall** inform the MICA Cell within 6 months of when a Mode S interrogator ceases operation in order to permit the withdrawal of the corresponding IC allocation.

MID Focal Point(s) **shall** revalidate the IC allocations under their responsibility every 5 years and confirm to the MICA Cell via e-mail whether the issued IC allocations are still in use. This revalidation is to occur every 5 years following the effective date of the issued IC allocation. The IC allocation system automatically identifies which IC allocations need to be revalidated and notifies the MID Focal Point(s) for action. An IC allocation that has not been revalidated may be withdrawn from the allocation plan if it is no longer in use (see Section 3.5).

Note: The effective date of an IC allocation is either the end date of the MICA cycle (see Section 5) or the end date of the Ad-Hoc allocation process (see Section 6). The effective date of an IC allocation is indicated on the MICA website and will be part of any exported IC allocation file from the website.

3.3 Mode S Operator Responsibilities

Mode S Operators **should** be registered on the MICA website. Prior to this registration, they **shall** self-register on the EUROCONTROL OneSkyOnline portal[2] and send a request to their responsible MID Focal Point(s) to enable access to the MICA website.

[1] https://extranet.eurocontrol.int/http://was.eurocontrol.int/elsh/registerNewUserForApplication.do?eurocontrolresourceid=circa

[2] https://extranet.eurocontrol.int/http://was.eurocontrol.int/elsh/registerNewUserForApplication.do?eurocontrolresourceid=circa

Mode S Operators **shall** only operate an eligible Mode S interrogator, using an eligible IC and coverage map if they have received an issued IC allocation, for this purpose, from their responsible MID Focal Point(s).

Mode S Operators **shall** ensure that all Mode S interrogators under their responsibility of operation are programmed with the latest issued IC allocation.

Mode S Operators **shall** report to their responsible MID Focal Point(s) (at least every six months) any update on the installation and operation of eligible Mode S interrogators:

- Any change in the installation planning **shall** be reported.
- Any change in the operational status of the eligible Mode S interrogators **shall** be reported.

Mode S Operators **shall** develop their IC and associated lockout coverage programming procedures, to take into account their own specific arrangements. If Mode S Operators rely on the Mode S interrogator manufacturer to program the Mode S interrogator, they **shall** ensure that the manufacturer has developed programming procedures.

As a minimum, procedures **shall** include the following verification steps, to be completed for each IC allocation programming:

1. Verification of the compliance of programming parameters with the IC allocation data, including:
    - Position of the radar;
    - IC;
    - Lockout range and coverage map.
2. Verification of the validity status of the IC allocation used for programming.
3. Verification of following parameters:
    - Parameters related to II/SI Code Operation;
    - Default parameters to apply when the coverage map is not correctly loaded, if any.
4. When operating in a cluster, verification that the relevant parameters of cluster states are compliant with the IC allocation data.
5. Verification that the programmed data, including following radar chain switch-over and switch-off/switch-on cycles are applied correctly.

The procedure results **shall** be recorded, dated, signed and archived for future reference.

3.4 International Organisation Responsibilities

International Organisations **shall** only operate an eligible Mode S interrogator, using an eligible IC and coverage map if they have received an issued IC allocation, for this purpose, from their responsible MID Focal Point(s).

International Organisations intending to operate, or operating, an eligible Mode S interrogator, using an eligible IC and coverage map, **shall** comply with all Mode S Operator responsibilities described in the current document.

3.5 MICA Cell Responsibilities

The MICA Cell **shall** maintain the interrogator code allocation plan.

The MICA Cell **shall** maintain the MICA website.

The MICA Cell **shall** inform Focal Point(s) about IC allocations that need to be revalidated (after the 5-year period).

The MICA Cell **shall** coordinate with the responsible Focal Point(s) when an IC allocation has not been revalidated. If it is determined that the IC allocation is no longer in use, it may be withdrawn from the allocation plan.

The MICA Cell **shall** develop and maintain complementary guidance material on the operation of the centralised Mode S interrogator code allocation service.

3.6 IC Allocation Coordinated Area

For the EUR region, the MICA Cell manages the Mode S IC Allocation coordination on behalf of the European regional office of ICAO.

The MICA Cell is also supporting the Middle East regional office in the coordination and allocation of Mode S ICs for the ICAO Middle East Region.

The list of countries where the Mode S IC Allocation coordination is managed or supported by the MICA Cell can be downloaded from the MICA website (MICA – List of Coordinated Countries.doc). This list provides the status at a given date and may be subject to modification.

Where a potential overlap exists between the coverage of an eligible Mode S interrogator located within the area of responsibility of a competent State whose IC allocation is carried out through the MICA Cell and the coverage of a Mode S interrogator located within the area of responsibility of a third country which is not in the list of coordinated countries, provided that the MID Focal Point(s) has communicated a point of contact for the third country to the MICA Cell, the MICA Cell **shall**:

a. inform the third country of the safety requirements related to the allocation and use of interrogator codes;

b. coordinate the use of ICs with that third country

4. IC Application Procedures

4.1 Mode S Operator Responsibilities

Civil or military Mode S Operators intending to operate, or operating, an eligible Mode S interrogator for which no IC has been allocated, **shall** submit an IC application to the responsible MID Focal Point, including the following key items, as a minimum:

- A unique application reference from the competent State;
- Full details of the Mode S Operator point of contact for Mode S IC allocation matters;
- Mode S interrogator name;
- Mode S interrogator use (operational or test);
- Mode S interrogator position using the World Geodetic System 1984 (WGS 84) reference (Latitude and Longitude in degree, minute, seconds format);
    - If the Mode S interrogator position is sensitive information (e.g. military interrogators), that position may be accurate to the minute.
- Antenna centre height above ground and ground altitude above mean sea level;
- Rotation period;
- Mode S interrogator manufacturer and model;
- Planned date of first Mode S transmission;
- Planned date of end of transmission in case of temporary allocation;
- Ad-Hoc allocation process requested;
    - The Operator **shall** justify why the IC application is to follow the Ad-Hoc allocation process. No justification is required if the IC application is for a TRD Mode S interrogator.
- Requested Mode S coverage;
    - expressed as a range (in NM) per sector
- Specific operational requirements;
- SI code capability;
- “II/SI code operation” capability;
- EMS Map ICD coverage map capability.
- Mode S interrogator operating in cluster or not.
    - second IC requested or not in case of cluster

Note: Fixed operational interrogators are normally allocated a single IC, unless they are operated in a cluster. In that case, a second IC may be allocated to the cluster for fallback modes of operation, and to test and integrate new clustered interrogators.

Mode S Operators **shall** either submit an IC application by using the MICA website or through the responsible MID Focal Point(s).

Note: An IC application form has been developed for this purpose and can be downloaded from the MICA website or from the EUROCONTROL MICA webpage.

When an IC application is submitted using the MICA website, an automatic notification e-mail is sent to inform the responsible MID Focal Point(s) and the MICA Cell.

Mode S Operators **shall** inform their MID Focal Point(s) of any changes in the installation or planning of eligible Mode S interrogators as soon as possible and at least every six months. IC applications which have not yet been processed **shall** also be updated to reflect those changes.

Note: The planned date of first Mode S transmission provided in an IC application will determine when the IC application will be processed by the MICA Cell. Therefore, once the planned date of first Mode S transmission changes and the IC application has not been processed, it is important to update this date information in the IC application.

4.2 MID Focal Point Responsibilities

MID Focal Point(s) **shall** check the validity of IC applications received from Mode S Operators, before they are submitted to the Mode S IC allocation system. The validity check shall include the key items listed in Section 4.1. That validity check depends on the way the IC application has been submitted by the Mode S Operator:

- If the IC application has been directly submitted on the MICA website, the MID Focal Point is informed by a notification e-mail sent by the MICA website. The MID Focal Point **shall** then use the MICA website to review and acknowledge this IC application.

  Upon acknowledgement, an automatic notification e-mail is sent by the MICA website to inform the IC application creator, the responsible MID Focal Point(s) and the MICA Cell.

- If the MID Focal Point has received from a Mode S Operator an IC application which has not been submitted on the MICA website, the MID Focal Point **shall** review and submit this IC application on the MICA website.

  Upon submission, an automatic notification e-mail is sent by the MICA website to inform the responsible MID Focal Point(s) and the MICA Cell.

- In the event of MICA website service unavailability for MID Focal Point IC Allocation submission:

  1. The MID Focal Point **may** submit the IC application by e-mail to the MICA Cell accompanied by the appropriate form which has been developed for that purpose (the IC application form can be downloaded from the MICA website or from the EUROCONTROL MICA webpage). In this case the MID Focal Point **shall** add full details about the MID Focal Point who is responsible for the coordination of the Mode S IC Allocation.

  2. Once the MICA Cell has submitted the IC application on the MICA website, the MID Focal Point **shall** review and acknowledge this IC application using the MICA website when service availability is resumed.

     Upon acknowledgement, an automatic notification e-mail is sent by the MICA website to inform the responsible MID Focal Point(s) and the MICA Cell.

MID Focal Point(s) **shall** submit and acknowledge IC applications on the MICA website before the requirement freeze date of the MICA cycle preceding the Mode S interrogator planned date of first Mode S transmission.

Note: Key MICA cycle dates are available on the MICA website.

IC applications requesting the Ad-Hoc allocation process (see Section 6) **shall** be submitted and acknowledged on the MICA website by the responsible MID Focal Point before being processed. IC applications may be processed in Ad-Hoc once issued IC allocations of the current cycle are published.

MID Focal Point(s) **shall** report to the MICA Cell any change in the installation planning of eligible Mode S interrogators received from Mode S Operators. IC applications which have not yet been processed **shall** be updated to reflect those changes.

4.3 MICA Cell Responsibilities

The MICA Cell **shall** validate IC applications on the MICA website in terms of their compliance with the format and data conventions, and for completeness, accuracy and timeliness.

- If the IC application cannot be validated (e.g. errors), the MICA Cell shall contact the responsible Focal Point(s) for corrective actions.
- Validated IC applications **shall** be integrated into the system by the MICA Cell.

  Upon integration, an automatic notification e-mail is sent by the MICA website to inform the IC application creator, the responsible Focal Point(s) and the MICA Cell.

If an IC application is provided by a Focal Point to the MICA Cell by e-mail:

1. The MICA Cell **shall** submit this IC application on the MICA website.

   Upon submission, an automatic notification e-mail is sent by the MICA website to inform the responsible Focal Point(s) and the MICA Cell that a new IC application has been created.
2. Once the Focal Point has acknowledged the IC application on the MICA website, the MICA Cell **shall** integrate this IC application. The IC application is then ready to be processed.

   Upon integration, an automatic notification e-mail is sent by the MICA website to inform the responsible Focal Point(s) and the MICA Cell.

The MICA Cell **shall** process submitted IC applications within the adequate MICA cycle on the basis of their planned date of first Mode S transmission (except for IC applications that follow the Ad-Hoc process).

5. Mode S IC Allocation Cycle

The IC allocation cycle is the standard procedure for processing IC applications and to issue corresponding IC allocations. An IC application is submitted to request an allocation for a new eligible Mode S interrogator or to request an update of an existing IC allocation.

There are only two Mode S IC allocation process cycles per year (at 168 days intervals). Each cycle is composed of 4 periods and foresees a contingency of 14 days.

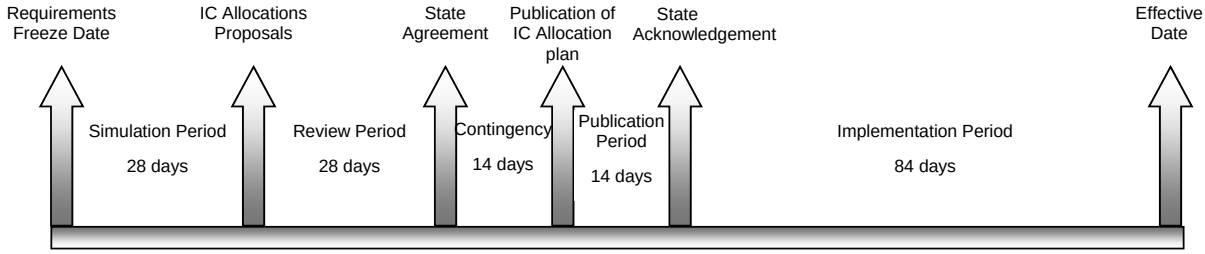


Figure 4: Mode S IC Allocation cycle (MICA cycle)

A flowchart describing the MICA cycle is provided in ANNEX C.

5.1 Simulation Period

The simulation period of the MICA cycle lasts 28 days. During this period, the MICA Cell performs interrogator code allocation plan update simulations and prepares a proposed update of the interrogator code allocation plan. This proposed update is to be approved during the subsequent review period.

5.1.1 Mode S Operator Responsibilities

This period does not apply to Mode S Operators.

5.1.2 MID Focal Point Responsibilities

This period does not apply to MID Focal Points.

5.1.3 MICA Cell Responsibilities

During the simulation period of a Mode S IC Allocation Cycle, the MICA Cell **shall**:

- perform interrogator code allocation plan update simulations on the basis of the pending IC applications
- prepare a proposed update of the interrogator code allocation plan for approval by the Focal Points representing the competent States that are affected by it

At the end of the 28-day simulation period, the MICA Cell **shall** create IC allocation proposals covering:

- pending IC applications for new Mode S interrogators,
- pending IC applications to modify the IC allocation of existing Mode S interrogators,

- changes to existing IC allocations impacted by the proposed interrogator code allocation plan update[3].

Upon creation of the IC allocation proposals, an automatic e-mail notification is sent by the MICA website to inform all Focal Points and the MICA Cell. This notification contains the list of all IC allocation proposals that constitute the proposed interrogator code allocation plan update.

The proposed update of the interrogator code allocation plan **shall** be free of IC conflict.

The IC allocations proposed by MICA Cell **shall** to the greatest extent meet the following operational requirements of the IC applications:

- Mode S interrogator planned date of first Mode S transmission
- Requested Mode S coverage
- Any specific operational requirements

IC allocation proposals **shall** be available online on the MICA website where they can be accessed by all Focal Points for review.

5.2 Review Period

The review period of the MICA cycle lasts 28 days. During this period, the Focal Points review the IC allocation proposals that constitute the proposed interrogator code allocation plan update. An acknowledgement is required from the Focal Points representing competent States that are affected by the proposed interrogator code allocation plan.

5.2.1 Mode S Operator Responsibilities

Mode S operator may access the MICA website to consult the status of the IC allocations proposed for the Mode S interrogators that they operate or plan to operate.

Mode S operators shall not program IC allocation proposals in Mode S interrogators.

5.2.2 MID Focal Point Responsibilities

The proposed updated interrogator code allocation plan **shall** be subject to the approval, through their MID Focal Point(s), by all competent States that are affected by the update of the plan.

MID Focal Point(s) **should** check the suitability of the proposed IC allocations with the responsible Mode S Operators for the Mode S interrogators installed or planned to be installed in a member State of the ICAO MID region.

MID Focal Point(s) **shall** use the MICA website to accept or reject IC allocation proposals for planned or existing Mode S interrogators in a member State of the ICAO MID region before the end of the review period. Once an IC allocation proposal is accepted or rejected, its status is updated on the MICA website and an automatic e-mail notification is sent by the MICA website to inform the responsible MID Focal Point(s) and the MICA Cell.

In the event of MICA website service unavailability, the MID Focal Point **shall** contact the MICA Cell by e-mail to indicate acceptance or rejection of the proposed IC allocations.

If an IC allocation proposal is rejected by a MID Focal Point, this **shall** be duly justified.

[3] It may be necessary to change existing IC allocations in order to accommodate the IC applications.

5.2.3 MICA Cell Responsibilities

If any of the proposed IC allocations are rejected within the first 14 days of the review period, the MICA Cell **shall** prepare a new proposed IC allocation plan update.

Note: If any IC allocation proposal is rejected after the initial 14 days of the review period, the MICA Cell will attempt to provide a new IC allocation proposal which is acceptable. As a measure of last resort, the MICA Cell will cancel an unacceptable IC allocation proposal and the corresponding IC application will be re-processed in the next MICA cycle.

If a Focal Point contacts the MICA Cell by e-mail to accept or reject the IC allocation proposals, the MICA Cell **shall** use the MICA website on behalf of the Focal Point to submit the acceptance or rejection of these IC allocation proposals. Once an IC allocation proposal is accepted or rejected, its status is updated on the MICA website and an automatic e-mail notification is sent by the MICA website to inform the responsible Focal Point(s) and the MICA Cell.

5.3 Publication Period

The publication period of the MICA cycle lasts 14 days. On the first day of the publication period, the MICA Cell updates the interrogator code allocation plan and communicates it to all Focal Points. All IC allocation proposals which have not been rejected are issued on the MICA website.

An automatic e-mail notification containing the list of all issued IC allocations is sent by the MICA website to inform all Focal Points and the MICA Cell. An automatic e-mail notification is also sent by the MICA website to the Mode S Operators if IC allocations are issued for the Mode S interrogators they operate.

5.3.1 Mode S Operator Responsibilities

Mode S operator may access the MICA website to consult or export the IC allocations issued for the Mode S interrogators that they operate or plan to operate.

Mode S operators shall not program issued IC allocations in Mode S interrogators during the publication period.

5.3.2 MID Focal Point Responsibilities

Within the 14 days of reception of the updated interrogator code allocation plan, MID Focal Point(s) **shall**:

- Communicate issued IC allocations covering pending IC applications as well as changes to existing IC allocations impacted by the update of the interrogator code allocation plan to the relevant Mode S Operators under their responsibility;
- Provide the implementation sequence to all impacted Mode S Operators;

  Note: IC allocation programming may need to be carefully sequenced in order to avoid temporary IC conflicts.
- Acknowledge issued IC allocations under their responsibility by using the MICA website;

  Upon acknowledgement, an automatic e-mail notification is sent by the MICA website to inform the responsible MID Focal Point(s) and the MICA Cell.

In the event of MICA website service unavailability, the MID Focal Point **shall** contact the MICA Cell by e-mail to submit the acknowledgement.

5.3.3 MICA Cell Responsibilities

On the first day of the publication period, the MICA Cell **shall**:

- Update and communicate to all Focal Points the interrogator code allocation plan which has been approved, without prejudice to national procedures for the communication of information on Mode S interrogators operated by military
- Provide the implementation sequence to all Focal Points

If a Focal Point contacts the MICA Cell by e-mail to acknowledge issued IC allocations, the MICA Cell **shall** acknowledge these issued IC allocations on behalf of the Focal Point on the MICA website. Upon acknowledgement, an automatic notification e-mail is sent by the MICA website to inform the responsible Focal Point(s) and the MICA Cell.

5.4 Implementation Period

The implementation period of the MICA cycle lasts 84 days. The end date of this period is also the end date of the MICA cycle and the MICA cycle effective date.

All changes to existing IC allocations issued during the Mode S IC allocation cycle must be programmed in Mode S interrogators before the end of the implementation period.

IC allocations issued for new Mode S interrogators should be programmed conforming as much as possible to the planned date of first Mode S transmission provided in the IC application.

The programming of IC allocations which are covered by the implementation sequence must be coordinated as described in the implementation sequence. An example of the implementation sequence diagram is provided in ANNEX D.

5.4.1 Mode S Operator Responsibilities

When programming a Mode S interrogator, Mode S Operators **shall** comply with:

- The allocated IC provided in the issued IC allocation;
- The surveillance and lockout coverage provided in the issued IC allocation;
- The implementation sequence document and coordinate IC Allocation programming with other Mode S Operators if necessary;

Prior to programming an issued IC allocation in a Mode S interrogator, the Mode S Operator **shall** perform the following verification steps:

1. verify if the issued IC allocation is identified in the implementation sequence document
    a. If the IC allocation is not identified in the implementation sequence, then no coordination with other Mode S Operators is required.

       The Mode S Operator may proceed to program the IC allocation in the Mode S interrogator and skip the below steps 2 and 3.

    b. If the IC allocation is identified in the implementation sequence, then coordination with other Mode S Operators may be required.

       Step 2 **shall** be performed.
2. verify the position of the issued IC allocation in the implementation sequence

a. If the IC allocation is at the beginning of the implementation sequence, the programming of this IC allocation does not depend on any other IC allocation programming.

   The Mode S Operator **should** proceed to program the IC allocation in the Mode S interrogator as soon as possible.

b. If the IC allocation is not at the beginning of the implementation sequence, there is a dependency on the programming of other Mode S interrogators which precede it in the implementation sequence.

   Step 3 **shall** be performed.

3. verify on the MICA website if all preceding IC allocations in the implementation sequence for other Modes S interrogators have been programmed

   a. If all preceding IC allocations in the implementation sequence are confirmed on the MICA website as being implemented, the Mode S Operator **should** program the IC allocation in the Mode S interrogator as soon as possible in case of changes to existing IC allocations.

   b. If any of the preceding IC allocations in the implementation sequence are not confirmed on the MICA website as being implemented, the Mode S Operator **shall** wait before programming the IC allocation.

Mode S Operators **shall** implement all changes to existing IC allocations before the end of the implementation period.

Once an issued IC allocation has been programmed, the responsible Mode S Operator **shall** inform his responsible MID Focal Point(s) and, if he's registered on the MICA website, **shall** confirm its implementation on the MICA website.

When the implementation of an IC allocation is confirmed on the MICA website, the status of the issued IC allocation is updated on the MICA website and an automatic notification e-mail is sent by the MICA website to inform the responsible Mode S Operator(s), the responsible MID Focal Point(s) and the MICA Cell that issued IC allocation has been programmed into the respective Mode S interrogator.

This IC allocation implementation confirmation mechanism enables the IC allocation system to provide to all registered users on the MICA website the up-to-date status of the implementation of the interrogator code allocation plan in Mode S interrogators.

Mode S Operators **shall** contact their responsible MID Focal Point(s) if they encounter problems or difficulties when implementing IC allocations.

5.4.2 MID Focal Point Responsibilities

MID Focal Point(s) **shall** ensure that all changes to existing IC allocations are programmed before the end of the implementation period.

When a MID Focal Point is informed that an IC allocation is programmed, he **shall** verify that the implementation status of that IC allocation is confirmed on the MICA website. If not, the MID Focal Point **shall** confirm the implementation. Upon confirmation of implementation, the status of the issued IC allocation is updated on the MICA website and an automatic e-mail notification is sent by the MICA website to inform the responsible Mode S Operator(s), the responsible MID Focal Point(s) and the MICA Cell.

In the event of MICA website service unavailability to confirm the implementation of an issued IC allocation, the MID Focal Point **shall** contact the MICA Cell by e-mail to confirm the implementation of the issued IC allocation.

5.4.3 MICA Cell Responsibilities

If a Focal Point contacts the MICA Cell by e-mail to confirm the implementation of an issued IC allocation, the MICA Cell **shall** confirm the implementation of the issued IC allocation on behalf of the Focal Point on the MICA website. Upon confirmation of implementation, the status of the issued IC allocation is updated on the MICA website and an automatic e-mail notification is sent by the MICA website to inform the responsible Mode S Operator(s), the responsible Focal Point(s) and the MICA Cell.

6. Ad-hoc Allocation Process

IC applications may be processed on an Ad-Hoc basis, but this process must not impact any existing Mode S IC allocations issued to other Mode S interrogators.

The Ad-Hoc process is suited for IC applications for TRD Mode S interrogators as there is no need to allocate a de-conflicted interrogator code. It is not recommended to apply this process for operational Mode S interrogator IC applications. Indeed, as no change will be made to existing issued IC allocations, the provided allocation may be far more constraining than one provided within a standard MICA cycle (see Section 5).

To avoid any impact on the proposed IC allocation plan update, Ad-Hoc IC applications are only processed after the publication of the issued IC allocations of the current MICA cycle.

The time frame of the Ad-Hoc allocation process in the MICA cycle is provided in the figure below.

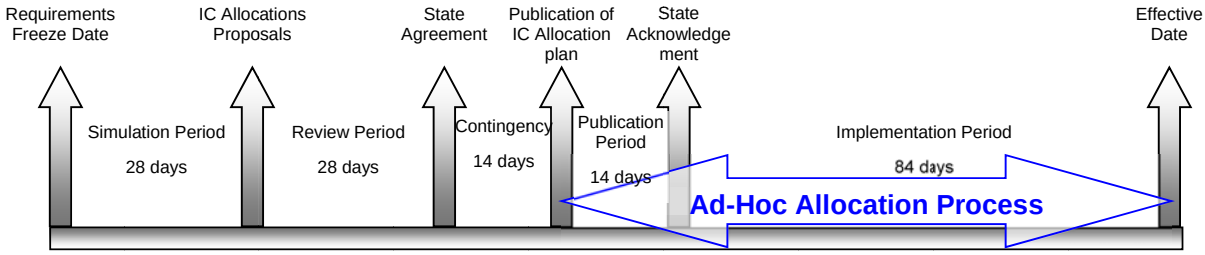


Figure 5: Ad-Hoc Allocation Process Time Frame in MICA Cycle

In general, the Ad-Hoc process is a short process lasting 15 days.

6.1 Simulation Period

During the simulation period of the Ad-Hoc allocation process, the MICA Cell performs interrogator code allocation plan update simulations on the basis of the pending IC applications and prepares a proposed update of the interrogator code allocation plan for approval by the competent States that are affected by it.

As the number of Ad-Hoc IC applications to be processed is usually low and no change to the existing IC allocations is made, the IC allocation proposals are created within a few days.

6.1.1 Mode S Operator Responsibilities

This period does not apply to Mode S Operators.

6.1.2 MID Focal Point Responsibilities

This period does not apply to MID Focal Points.

6.1.3 MICA Cell Responsibilities

The responsibilities on the MICA Cell are identical to those detailed within the Mode S IC Allocation Cycle (see Section 4.1.3) with the exception of:

- The MICA Cell **shall** issue IC allocation proposals which only cover Ad-Hoc IC applications. No change will be made to existing IC allocations issued for other Mode S interrogators.

- The IC allocations proposed by MICA Cell may not meet the following operational requirements of the IC applications:
    - Mode S interrogator planned date of first Mode S transmission in case the IC application is received at short notice;
    - Requested Mode S coverage;
    - Specific operational requirements;

6.2 Review Period

Contrary to the standard MICA cycle review period of 28 days, the Ad-Hoc process review period is generally limited to 14 days. An acknowledgement is required from the Focal Points representing the competent States that are affected by the proposed interrogator code allocation plan update.

If an IC allocation proposal is rejected, the MICA Cell may prepare an updated IC allocation proposal. Nevertheless, due to the limitations inherent to the Ad-Hoc process, it may not be possible to fulfil all the requirements requested by the Mode S Operator. In such case, the unsuitable IC allocation proposal is withdrawn and the IC application will be processed in the next MICA cycle (see Section 5).

6.2.1 Mode S Operator Responsibilities

Mode S operator may access the MICA website to consult the status of the IC allocations proposed for the Mode S interrogators that they operate or plan to operate.

Mode S operators shall not program IC allocation proposals in Mode S interrogators.

6.2.2 MID Focal Point Responsibilities

The responsibilities on the MID Focal Point are identical to those detailed within the Mode S IC Allocation Cycle (see Section 5.2.2).

6.2.3 MICA Cell Responsibilities

The responsibilities on the MICA Cell are identical to those detailed within the Mode S IC Allocation Cycle (see Section 5.2.3) with the exception of:

- If an IC allocation proposal is rejected, the MICA Cell may prepare an updated IC allocation proposal.

6.3 Publication Period

Once the review period of the Ad-Hoc process is finalised, the MICA Cell updates the interrogator code allocation plan and communicates it to all Focal Points. All IC allocation proposals which have not been rejected are issued on the MICA website. This date of issue becomes the effective date for the IC allocations processed in Ad-Hoc.

Once IC allocations are issued, an automatic e-mail notification is sent by the MICA website to inform all Focal Points and the MICA Cell. This notification contains the list of all issued IC allocations.

No coordination with other Modes S operators is required as there is no change to the existing Mode S allocations issued for other Mode S interrogators.

6.3.1 Mode S Operator Responsibilities

Mode S operator may access the MICA website to consult or export the IC allocations issued for the Mode S interrogators that they operate or plan to operate.

Mode S operators shall not program issued IC allocations in Mode S interrogators during the publication period.

6.3.2 MID Focal Point Responsibilities

The responsibilities on the MID Focal Point are identical to those detailed within the Mode S IC Allocation Cycle (see Section 5.3.2) with the exception of:

- There is no time limit to communicate issued IC allocations to the relevant Mode S Operators;
- There is no implementation sequence to be provided to the Mode S Operators;

6.3.3 MICA Cell Responsibilities

The responsibilities on the MICA Cell are identical to those detailed within the Mode S IC Allocation Cycle (see Section 5.3.3) with the exception of:

- There is no implementation sequence to be provided to the Focal Points;

6.4 Implementation Period

IC allocations processed Ad-Hoc can be programmed by the Mode S Operators once they are issued by the MICA Cell.

6.4.1 Mode S Operator Responsibilities

When programming a Mode S interrogator, Mode S Operators **shall** comply with:

- The allocated IC provided in the issued IC allocation;
- The surveillance and lockout coverage provided in the issued IC allocation;

Once an issued IC allocation has been programmed, the responsible Mode S Operator **shall** inform his responsible MID Focal Point(s). If he is registered on the MICA website, he **shall** confirm its implementation on the MICA website

When the implementation of an IC allocation is confirmed on the MICA website, the status of the issued IC allocation is updated on the MICA website and an automatic e-mail notification is sent by the MICA website to inform the responsible Mode S Operator(s), the responsible MID Focal Point(s) and the MICA Cell that the issued IC allocation has been programmed into the respective Mode S interrogator.

This IC allocation implementation confirmation mechanism enables the IC allocation system to provide to all registered users on the MICA website the up-to-date status of the implementation of the interrogator code allocation plan in Mode S interrogators.

Mode S Operators **shall** contact their responsible MID Focal Point(s) if they encounter problems or difficulties when implementing IC allocations.

6.4.2 MID Focal Point Responsibilities

The responsibilities on the MID Focal Point are identical to those detailed within the Mode S IC Allocation Cycle (see Section 5.4.2) apart that there is no impacted IC allocation to be considered.

6.4.3 MICA Cell Responsibilities

The responsibilities on the MICA Cell are identical to those detailed within the Mode S IC Allocation Cycle (see Section 5.4.3).

7. IC Conflict Reporting

7.1 Introduction

Operating Mode S interrogators may be impacted by an IC conflict or may be the source of an IC conflict.

An IC conflict is defined as an uncoordinated overlap of lockout coverage of two or more Mode S interrogators operating on the same IC, potentially resulting in aircraft remaining undetected by at least one of the Mode S interrogators.

The Mode S IC allocation system provides a means to report an IC conflict through a reporting mechanism implemented in the MICA website.

7.2 IC Conflict Reporting Procedure

7.2.1 Mode S Operator Responsibilities

Mode S Operator **should** assess the possible impact on air traffic services of Interrogator Code conflicts, and the corresponding potential loss of Mode S target surveillance data from the impacted Mode S interrogators, taking into account their operational requirements and available redundancy.

Unless the potential loss of Mode S target surveillance data has been assessed to have no safety significance, Mode S operators **should**:

- implement monitoring means to detect interrogator code conflicts caused by other Mode S interrogators impacting eligible Mode S interrogators they operate on any operational interrogator code;
- ensure that the interrogator code conflict detection provided by the implemented monitoring means is achieved in a timely manner and within a coverage that satisfy their safety requirements;
- identify and implement as appropriate, a fallback mode of operation to mitigate the possible interrogator code conflict hazards on any operational code;
- ensure that the implemented fallback mode of operation does not create any interrogator code conflict with other Mode S interrogators referred to by the interrogator code allocation plan.

When a Mode S Operator identifies a potential IC conflict impacting a Mode S interrogator under his responsibility, he **shall**:

1. Report the potential IC conflict to his representative MID Focal Point(s) and make available, through the MICA website (if he's registered), any related information for other Mode S Operators.

   Once reported on the MICA website, the system will send an automatic e-mail notification to inform all registered users (MICA Cell, Focal Points and Mode S Operators) that a potential IC conflict has been identified.

2. Report the potential IC conflict accompanied with the related information to the MICA Cell if it has not been possible to report it on the MICA website.

3. Investigate the conflict and coordinate bilaterally with appropriate Mode S Operators to determine the potential cause of conflict. Mode S Operators contact details are provided on the MICA Contact List which is published by the MICA Cell on the MICA website.
4. Advise the MICA Cell, respective MID Focal Point(s) and relevant Mode S Operators once the potential cause of the conflict has been identified.
5. Advise the MICA Cell, respective MID Focal Point(s) and appropriate Mode S Operators once the conflict has been resolved.

7.2.2 MID Focal Point Responsibilities

When a MID Focal Point is notified by a Mode S Operator of an IC conflict within his area of responsibility, the MID Focal Point **shall** provide the necessary assistance and advice to achieve an early resolution of the IC conflict.

If the Mode S Operator has not been able to report the conflict on the MICA website, the MID Focal Point **shall** report the IC conflict on the MICA website with any related information.

The MID Focal Point **shall** ensure that all appropriate parties that might be affected by the IC conflict are informed:

- Mode S Operator(s) who might be the cause of conflict and responsible Focal Point(s)
- Mode S Operator(s) who might be impacted by the conflict and responsible Focal Point(s)
- MICA Cell

When a MID Focal Point is notified that a conflict might originate from within his area of responsibility, he **shall** ensure that the relevant Mode S Operator(s) cooperate to identify the cause of the conflict and take the necessary actions in a timely manner.

7.2.3 MICA Cell

If a potential IC conflict accompanied with the related information has been reported to the MICA Cell but has not been reported on the MICA website, the MICA Cell **shall** report it on the MICA website accompanied with any related information provided by the Mode S Operator.

The MICA Cell **should** provide whatever assistance and advice it can to facilitate the dissemination of information and early resolution of the conflict.

8. Resolution of IC Allocation and IC Conflict Issues

8.1 IC Allocation Issues

The Mode S IC allocation process is executed in a constrained environment. Notably, to avoid overlapping coverage with other Mode S interrogators using the same IC, an IC allocation proposed by the MICA Cell may not meet the requested operational requirements of the IC application. As a result the MICA Cell allocation proposal for a Mode S interrogator may contain operational restrictions.

These operational restrictions may not be acceptable to the concerned Focal Point and the IC allocation proposal for the Mode S interrogator can be rejected.

Other proposals may lead to unacceptable operational restrictions on existing IC allocations for other Mode S interrogators. If no other acceptable IC allocation can be proposed, then no IC allocation will be issued at the end of the IC Allocation process for the Mode S interrogator. As a consequence, the update of the interrogator code allocation plan will not contain an IC allocation covering the IC application submitted for the Mode S interrogator.

If no IC allocation has been issued, the MICA Cell will perform the following actions:

1. Re-process the IC application in the next Mode S IC Allocation cycle.
2. Investigate and propose an interim IC allocation to the responsible Focal Point(s), i.e. a temporary IC allocation that would be valid until a satisfactory IC allocation is issued. This temporary IC allocation may be on a test IC or on an operational IC with operational restrictions. This temporary IC allocation should permit to start the Mode S interrogator installation and test.
3. Attempt to determine IC allocation options in close collaboration with the Focal Point(s) of competent States that could participate in the identification of an acceptable proposal for all parties.

8.2 IC Conflict Issues

Operation of Mode S interrogators may be impacted by an IC conflict. This may prevent them to reliably detect incoming traffic, potentially compromising the safety of air navigation. Mode S interrogators impacted by such conflicts may need to apply the appropriate fallback mode of operation to mitigate the IC conflict.

The IC conflict resolution depends on the collaboration between Mode S Operators (see Section 7). In the event of lack of collaboration, the MICA Cell will initiate mediation with the Focal Points of the competent States concerned.

8.3 Resolution of Issues

Dispute may happen during the Mode S IC Allocation process. Discussions with the impacted Mode S operator(s) and the responsible Focal Point(s) may be sufficient to find a solution.

If no solution is found, a final arbiter to unresolved dispute is required.

The MID Focal Point(s) shall manage disputes inside the ICAO Middle East region.

Final arbiter has to be identified to resolve disputes that could occur between countries of ICAO EUR region and ICAO MID region.

9. Guidance for IC allocation in ICAO MID Region

9.1 Mode S Interrogators Performances

9.1.1 SI code capability

It is recommended for Mode S Interrogators to support SI code capability.

Initially, for technical reasons, only Interrogator Identifier codes (II codes) 1 to 15 were defined and allocated as Interrogator Codes in the ICAO EUR region. Due to the expected number of Mode S interrogators, measures were later taken to allow the use of additional Surveillance Identifier codes (SI codes) 1 to 63.

Only SI code capable Mode S targets will be correctly detected by Mode S interrogators operating on SI code. ICAO annex 10 requires all Mode S transponders to be SI code capable however the experience shows that there are still old versions of Mode S transponders flying without the SI code capability.

9.1.2 II/SI code operation

It is recommended for Mode S Interrogators to support II/SI code operation.

Normally, the use of SI codes requires that all Mode S targets within the coverage of Mode S interrogators are equipped for this purpose. However, specifications were developed by EUROCONTROL for an II/SI code operation which enables the early use of SI codes by Mode S interrogators in an environment where not all Mode S targets are equipped for the use of SI codes.

A Mode S interrogator which operates on an SI code with II/SI code operation enabled will correctly detect both SI capable and II only capable Mode S targets.

For more information, please refer to ANNEX B.

9.1.2.1 II/SI code operation in ICAO Middle East region

Even if the current number of Mode S interrogators installed in ICAO MID region is not as high as in the ICAO EUR region, there is no guarantee that allocating only II code to Mode S interrogators in the ICAO MID region will remain possible in the future.

Without any regulation to support SI code allocation (on Mode S interrogators to support SI code and II/SI code operation), it may not be possible to keep on allocating Interrogator Code to Mode S interrogators in the future, preventing them to operate in Mode S.

9.1.2.2 II/SI code operation in the European Union

In order to facilitate and support the use of SI code in European Union, requirements on SI code and II/SI code support capabilities have been lay down in article 3 of COMMISSION REGULATION (EC) No 262/2009:

Article 3

Interoperability and performance requirements:

Mode S operators shall ensure that the radar head electronics constituent of their Mode S interrogators using an operational interrogator code:

1. support the use of SI codes and II codes in compliance with the International Civil Aviation Organisation provisions[4]
2. support the use of II/SI code operation in compliance with the requirements specified in Annex B

9.1.3 Mode S Coverage

Several formats exist to define the Mode S coverage:

- Mode S responsibility map (in European Mode S Coverage Map ICD format[5]).
    - This map format has been developed by EUROCONTROL in the frame of the POEMS contract[6]. System Maps are geodesic maps (latitude/longitude) sub-divided into horizontal cells of approx. 5NM by 5NM (latitude of Paris) and an associated vertical extent.
    - When supported by the Mode S interrogator, the coverage allocated during the Mode S IC Allocation Cycle is provided in this format.
- Sectored Range
    - The circular coverage is divided into sectors (by default 32 sectors). Surveillance and Lockout ranges are provided per sector.
    - When coverage map in EMS Map ICD format is not supported by the interrogator, then surveillance and lockout coverage allocated to the radar are provided in this format.
- Global Range for the circular coverage.
    - One unique surveillance range and one unique lockout range are provided for the circular coverage.
    - When none of the both formats above are supported, then this format is used.

Mode S Operators are encouraged to support the use of European Mode S coverage maps.

As these coverage maps are all aligned on the same common origin and have the same cell size, coverage maps can be joint without overlapping which is optimal in terms of allocation volume and RF band usage (as there may be no gap between coverage of neighbouring Mode S interrogators on the same Interrogator Code, aircraft lockout is optimized).

The second solution is less optimal as their will be gaps between allocated coverage. Nevertheless to use range per sector is better than to apply the same range to the circular coverage (Third solution).

Concerning the third solution, the maximum range without overlap of neighbouring Mode S interrogators on the same IC will be used as the circular range.

[4] Chapter 3 'Surveillance radar systems', Section 3.1.2.5.2.1.2 'IC: Interrogator code' of ICAO Annex 10 'Aeronautical Telecommunications', Volume IV 'Surveillance Radar and Collision Avoidance Systems' (Third Edition, July 2002, incorporating Amendment 77).

[5] European Mode S Station Coverage Map Interface Control Document, Edition 1.16

[6] European Mode S Station Functional Specification, Edition 3.11

9.2 Requirements for airborne carriage

It is required for Mode S targets to support SI code capability.

In ICAO Annex 10 Vol. IV - §2.1.5.1.7.1: “SI code capability shall be provided in accordance with the provisions of 2.1.5.1.7 for all Mode S transponders installed on or after 1 January 2003 and by all Mode S transponders by 1 January 2005.”

Airspace regulation should enforce the carriage of Mode S transponder capable to support SI capability as defined in ICAO Annex 10 Vol. IV.

Middle East ICAO office should verify and ensure the correct transponder capability in order to allow the use of SI codes in the ICAO MID region.

It is already possible to start using SI code without having 100% of the fleet SI capable. However in this case Mode S ground stations shall have the II/SI code operation capability in order to acquire aircraft which are not SI capable.

When using II/SI code operation aircrafts which are not SI cable must not be locked-out. Depending on the number of aircrafts which are not SI capable, the II/SI code operation may increase the RF pollution.

9.3 MICoG working arrangement

SGEG-MICoG working arrangement has been created to oversee the allocation process and provide guidance to the MICA Cell. SGEG-MICoG members are the Focal Points representing the National Regulatory Authorities of European States and those international organisations applying for Interrogator Codes.

As Focal Point for all countries in ICAO MID region, the ICAO MID regional officer is invited to be a SGEG-MICoG member and to attend SGEG-MICoG meetings (twice a year).

ICAO MID regional office should determine the necessity to meet Middle East Mode S Operators at regular interval to discuss about technical problems and other topics related to Mode S interrogators installation in ICAO MID region. The MICA cell would not participate to Middle East Mode S Operators meetings.

The ICAO MID regional officer could submit problems encountered in ICAO MID region during the SGEG-MICoG meeting.

ANNEX A – Discrete Code Allocation

A.1 II code and mobile interrogators

II code 0 has been reserved by ICAO for Mode S interrogators that have not been assigned with a unique discrete Interrogator Code and are authorized to transmit (please refer to §3.1.2.5.2.1.4.2 of [RD 1] for more information).

Mode S interrogators using II code 0 in accordance with the ICAO Standards and Recommended Practices do not need to be subject to the coordinated IC allocation process.

Discrete code allocations are not issued for mobile installations for which special modes of acquisition on II code 0 are used.

SI codes matching II code 0 (SI 16, SI 32, SI 48) are not allocated.

Note: as not all Mode S aircraft are SI capable, II/SI code operation has to be programmed on stations operating both on II code and matching SI codes in order to acquire both SI capable and non SI capable aircraft. As there is no requirement to support II/SI code operation for mobile stations interrogating on II code 0, matching SI codes (SI 16, SI 32, SI 48) are currently not allocated by MICA Cell.

A.2 Test, Research and Development Mode S interrogators on II code 14

In order to save interrogator codes for operational ATC (and Air Defence…) Mode S interrogators, SGEG-MICoG decided that, when transmitting for non-essential Test, Research or Development (TRD) activities, interrogators should operate on a reserved, shared interrogator code: II 14.

Due to the mode of operation of TRD stations on II code 14 (no constraint on II/SI Code Operation programming (see ANNEX B for more information on II/SI Code Operation)), SI codes matching II 14 (SI 14, SI 30, SI 46, SI 62) are currently not allocated to operational Mode S interrogators. As a consequence, SI codes matching II 14 may currently be allocated to TRD stations.

In order to avoid unnecessary RF pollution in the 1090 MHz band, SGEG-MICoG decided that TRD sites with allocated II code 14 would need to use permanent lockout in their entire coverage, and would not be allowed to use All Call lockout override.

SGEG-MICoG is aware that this is a very restrictive mode of operation which does not guarantee detection performances when two or more TRD stations with overlap transmit concurrently. Therefore SGEG-MICoG agreed on the following:

- Should a TRD operator require guaranteed detection performances for limited trials, he can initiate a co-ordination with overlapping TRD operators to make sure that they do not transmit at the same time (informing the MICA Cell and regulators as well). The TRD operator is responsible for initiating this co-ordination. When TRD operators do not need guaranteed detection performances, they can transmit without coordinating with other TRD operators, as long as they do not conflict with critical operations announced by others through the above mechanism.
- Should a TRD operator need to operate for extended periods with guaranteed performance (for transponder monitoring for instance), then he should apply for a distinct code allocation, using the normal IC allocation request procedure. This request will be processed by the MICA Cell, with due regard to the operational requirements, as for any other IC application.

- Should a TRD operator need to test and evaluate modes of operation that are normally not allowed on code 14 (e.g. lockout override…), then he should apply for an exemption, using the normal IC allocation request procedure. This request will be processed by the MICA Cell, with due regard to the operational requirements, as for any other IC application.

An IC application has to be submitted to get an IC allocation to test systems. However, as there is no need to prevent conflict situation on II 14, applications for TRD stations are most of the time processed in Ad-Hoc.

A.3 Specific Interrogator Codes for specific military operations

II code 15 is currently reserved in ICAO EUR region for NATO management. It is not available for allocation as part of the process run by EUROCONTROL.

SI codes matching II code 15 (SI 15, SI 31, SI 47, SI 63) are reserved for military operations in ICAO EUR region (see MICoG Report Meeting #25). They are not available for allocation as part of the process run by EUROCONTROL. The management of these codes is the responsibility of NATO.

This decision only applies to non-fixed, deployable military installations.

Fixed military interrogators are still eligible to get a discrete Interrogator Code following the normal Mode S IC allocation process. In that case, they have to coordinate with the Focal Point responsible of the country where the fixed military interrogators will be installed.

A NATO Focal Point has been nominated and is member of SGEG-MICoG.

ICAO Middle East regional office has to decide how to use II code 15.

ICAO Middle East regional office has to decide how to use SI codes matching II code 15.

A.4 Interrogator Codes allocated to operational Mode S interrogators

All other ICs, i.e. those IC which have not been detailed previously in this Annex, are available for allocation to operational eligible Mode S interrogators:

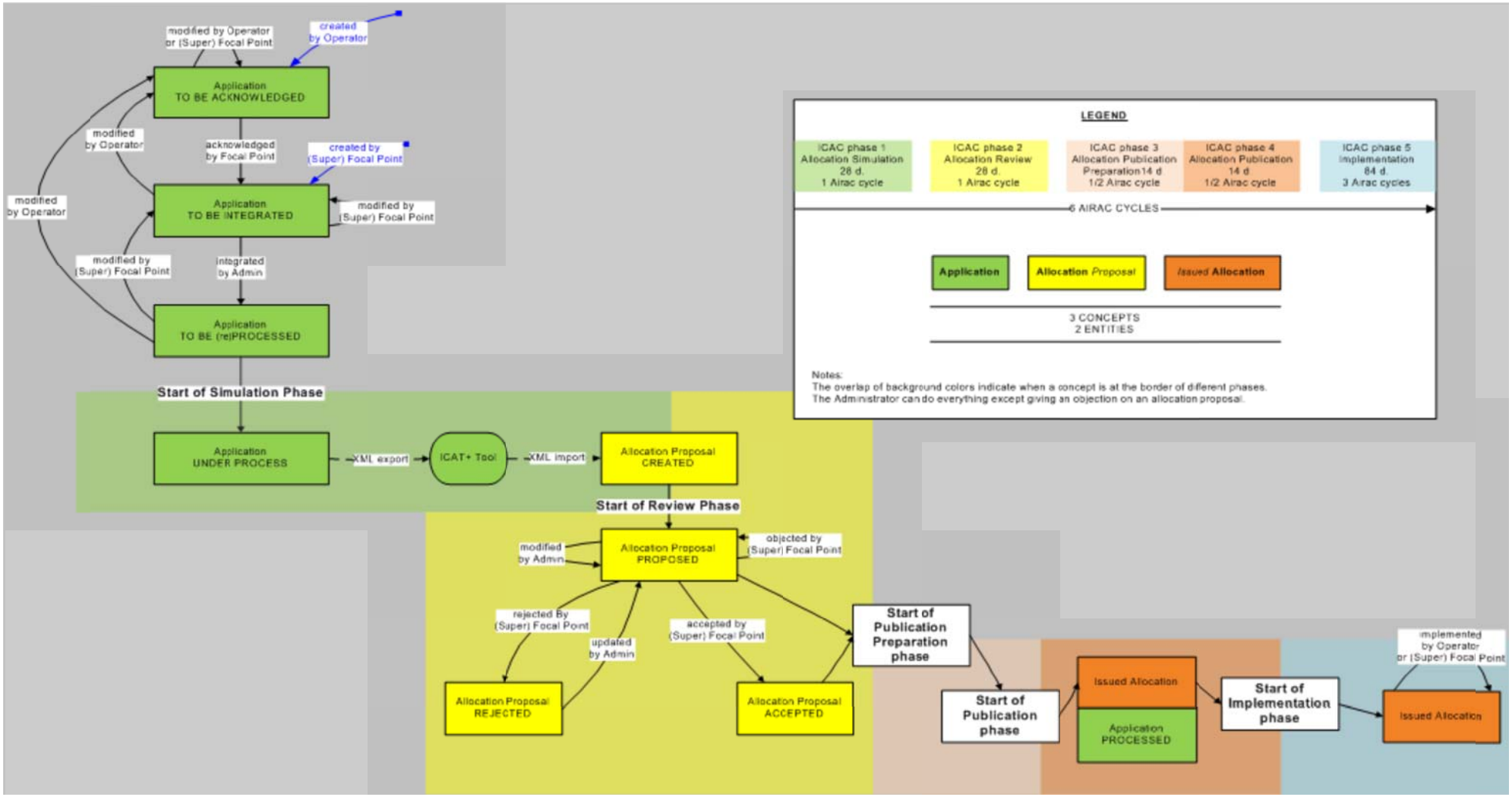
- II code 01 and matching SI codes (SI 01, SI 17, SI 33, SI 49)
- II code 02 and matching SI codes (SI 02, SI 18, SI 34, SI 50)
- II code 03 and matching SI codes (SI 03, SI 19, SI 35, SI 51)
- II code 04 and matching SI codes (SI 04, SI 20, SI 36, SI 52)
- II code 05 and matching SI codes (SI 05, SI 21, SI 37, SI 53)
- II code 06 and matching SI codes (SI 06, SI 22, SI 38, SI 54)
- II code 07 and matching SI codes (SI 07, SI 23, SI 39, SI 55)
- II code 08 and matching SI codes (SI 08, SI 24, SI 40, SI 56)
- II code 09 and matching SI codes (SI 09, SI 25, SI 41, SI 57)
- II code 10 and matching SI codes (SI 10, SI 26, SI 42, SI 58)
- II code 11 and matching SI codes (SI 11, SI 27, SI 43, SI 59)

- II code 12 and matching SI codes (SI 12, SI 28, SI 44, SI 60)
- II code 13 and matching SI codes (SI 13, SI 29, SI 45, SI 61)

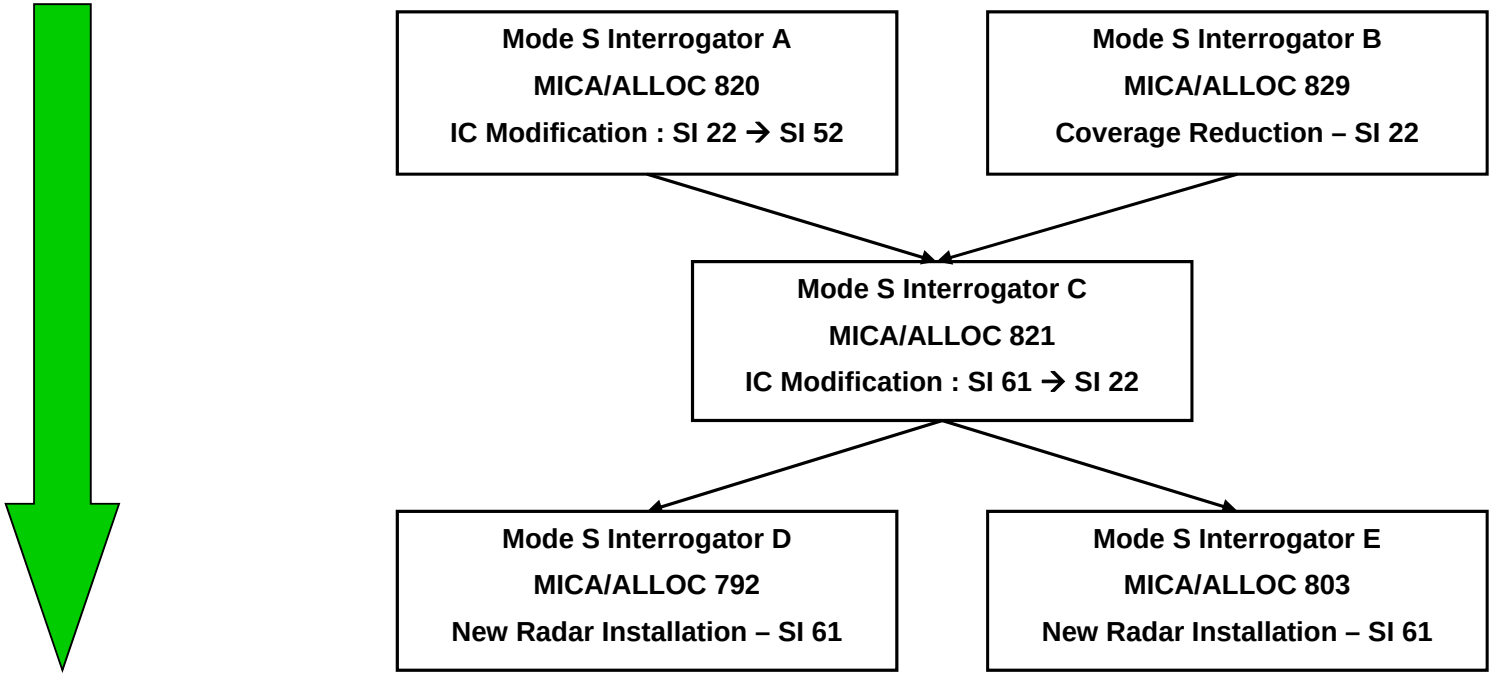
ANNEX B – II/SI code operation

1. Mode S interrogators, when operating with an SI code and if enabled by an appropriate operational parameter, shall also acquire targets through all call replies which are encoded using the matching II code.
2. Mode S interrogators, when operating with an SI code and if enabled by an appropriate operational parameter, shall consider transponders replying with all call replies encoded using the matching II code as non-SI equipped transponders, irrespectively of the SI capability reported in the data link capability report.
3. Mode S interrogators, when operating with an SI code and if enabled by an appropriate operational parameter, shall interrogate transponders lacking SI code capability using the Mode S multisite lockout protocol messages foreseen for II code operation. The II code to be used shall be the matching II code.
4. Mode S interrogators, when operating with an SI code and if enabled by an appropriate operational parameter, shall be configurable by the operator to either:
    - not use lockout on the matching II code for transponders lacking SI code capability, or
    - use intermittent lockout on the matching II code for transponders lacking SI code capability.
5. Mode S interrogators, when operating with an II code and if enabled by an appropriate operational parameter, shall be configurable by the operator to either:
    - not use lockout for transponders which report no SI capability in their data link capability report or cannot report their data link capability, or
    - use intermittent lockout for transponders which report no SI capability in their data link capability report or cannot report their data link capability.
6. When the II/SI code operation is activated, the lockout maps shall not be taken into account for transponders lacking SI code capability.

ANNEX C – Mode S IC Allocation Cycle Flow



ANNEX D – Implementation Sequence Diagram



In the Implementation Sequence Diagram provided above, the sequence of Mode S radar programming is the following:

1. The IC programmed in **Mode S Interrogator A** has to be changed from SI 22 to SI 52 conforming to MICA/ALLOC 820.

   The coverage programmed in **Mode S Interrogator B** on SI 22 has to be modified conforming to MICA/ALLOC 829.

   As these 2 IC allocations are at the beginning of the implementation sequence diagram, the programming of these IC allocations does not depend on the programming of any IC allocation.

   MICA/ALLOC 820 and MICA/ALLOC 829 must be programmed before the end of the Implementation Period of MICA Cycle.

2. As MICA/ALLOC 821 is not at the beginning of the implementation sequence, the programming of this IC allocation depends on the programming of the IC allocations which precede it in the implementation sequence: MICA/ALLOC 820 and MICA/ALLOC 829.

   Once step 1 above is done, the IC programmed in **Mode S Interrogator C** has to be changed from SI 61 to SI 22 conforming to MICA/ALLOC 821.

   MICA/ALLOC 821 must be programmed before the end of the Implementation Period of MICA Cycle.

3. As MICA/ALLOC 792 and MICA/ALLOC 803 are not at the beginning of the implementation sequence, the programming of these IC allocations depends on the programming of the IC allocation which precedes them in the implementation sequence: MICA/ALLOC 821.

   Once step 2 above is done, **Mode S Interrogator D** can be programmed on SI 61 conforming to MICA/ALLOC 792 and **Mode S Interrogator E** can be programmed on SI 61 conforming to MICA/ALLOC 803.

APPENDIX 5I

MODE S INTERROGATOR CODE (IC) ALLOCATIONS & Surveillance FOCAL POINTS

State	Name	Tel./Fax	Mobile	Email
Bahrain	Eng. Ahmed Ali El Sayed Senior Engineer of Standard and Development	+973 17321034 +973 17329977	+973 36663693	Ahmed.alsayed@caa.gov.bh
Egypt	Eng. Abdel Maboud Mohamed Ahmed Avionics Engineering Dept. Manager	+20-100 6571904	+20100 6571904	Ang_aca_abd@yahoo.com
Iran				
Iraq				
Jordan				
Kuwait	Mr. Anas Alkhulaifi			aa.Alkhulaifi@dgca.gov.kw
Lebanon				
Libya				
Oman				
Qatar	Mr. Mohammed Al Nuaimmi Senior Electronic Engineer	+974 44656515	+974 44656515	Moh.alnuaimi@caa.gov.qa
Saudi Arabia				
Sudan	Mr. Ahmed Alamin Omer	+249 123288078	+249 123288078	ahmedomer262@gmail
Syria				
UAE	Mr. Stanley James Facey Air Navigation Inspector	+971 2 4054356 +971 2 4054406	+971 50 8189407	sfacy@gcaa.gov.ae
Yemen				

APPENDIX 5J

MID REGION SURVEILLANCE STRATEGY

Considering that:

a) Cooperation between States is the key to achieve harmonized ATM system operations;

b) States are implementing CNS/ATM systems to gain safety, efficiency and environmental benefits;

c) the future air traffic environment will require increased use of aircraft-derived surveillance information;

d) the 12th Air Navigation Conference endorsed Aviation System Block Upgrades (ASBU) framework with modules specifying effective use of ADS-B/MLAT and associated communication technologies in bridging surveillance gaps and its role in supporting future trajectory-based ATM operating concepts;

e) cooperation between States is key towards improving flight efficiency and enhancing safety involving the use of ADS-B technology;

f) the 38th ICAO Assembly endorsed 4th edition of the Global Air Navigation Capacity & Efficiency Plan along with technology roadmaps;

g) SARPs, PANS and guidance material for the use of ADS-B have been developed;

h) ADS-B avionics and ground systems are available;

i) Multilateration is a technology that can supplement SSR, ADS-B and SMR; and

The MID Region Surveillance Strategy is to:

1) implement surveillance technologies in close collaboration with users;

2) be evolutionary and consistent with the Global Air Navigation Plan taking into consideration MID Region priorities;

3) maximize contiguous coverage and use of ADS-B on major routes/terminal areas;

4) implement ADS-B according to MID Region Air Navigation agreed priorities and set 2017 as implementation timeline;

5) prioritize ADS-B implementation in areas where there is no radar coverage followed by areas where implementation would otherwise bring capacity and operational efficiencies and when cost/benefit models warrant it;

6) identify sub-regional areas where the implementation of ADS-B would result in a positive cost/benefit in the near term, while taking into account overall Regional developments and implementation of ADS-B in adjacent homogeneous ATM areas;

7) ensure that the surveillance technologies including ADS-B deployment should be associated at early stages in coordination with the States/Regional/International Organizations responsible for the control of adjacent areas,;

8) share ADS-B data to enhance safety, increase efficiency and achieve seamless surveillance;

9) ensure before implementing ADS-B that aircraft are equipped with adequate avionics;

10) minimise the reliance on voice position reporting, for surveillance of aircraft;

11) utilise the SSR Mode 'S' capabilities, fully and reduce reliance on 4 digit octal code;

12) make use of ADS-C when ADS-B, SSR or multilateration not supported;

13) encourage Multilateration for surface, terminal & area surveillance;

14) improve safety through sharing ATS surveillance data across FIR boundaries;

15) increase use of Aircraft Derived Data; and

16) ensure that implementation of Surveillance technologies are harmonized, compatible and interoperable with respect to operational procedures, supporting data link and ATM applications;

17) implement surveillance technologies following successful trial programmes with regards to safety and operational feasibility, taking into account studies and implementation experiences from other ICAO Regions;

18) request airspace users periodically to provide information on aircrafts surveillance equipage,

19) consider implementing surveillance for surface movement control by the implementing the required technologies as per the global plan roadmaps and MID Air Navigation Strategy; in the Global plan; and

20) ensure that implementation is according to SARPs, ASBU working document; and MIDANPIRG conclusions and according to MID Surveillance Strategy and implementation should be monitored to ensure collaborative development and alignment with the MID Region projects.

APPENDIX 5K

Status of ADS-B OUT implementation

State	Mandate	Ground Station Capabilities	Flight Level	ATC Procedure	Data sharing Protocol	Data sharing States
Bahrain	12 Dec 2014	ADS-B GS accept DO260, DO260A, DO260B by June 2015,	At or above FL 290 (ADS-B air Space) Below FL 290 (none ADS-B airspace)	Published Will publish 12 NOV 2014	ASTERIX Cat. 21 Version 0.23 UAE Oman	UAE Dec 2014 Oman
Egypt						
Iran						
Iraq						
Jordan						
Kuwait	April 2016	ADS-B GS Accept DO260,DO260A,DO260B ASTERIX (CAT 21 VER 0.26)	Will Be Implemented by April 2016	Will be Published by April 2016	N/A	N/A
Lebanon						
Libya						
Oman						
Qatar						
Saudi Arabia						
Sudan						
Syria						
UAE						
Yemen						

APPENDIX 6A

Deficiencies in the CNS Field

BAHRAIN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	AFTN Rationalized Plan (LIM MID RAN Rec 6/6, 6/9 and MIDANPIRG/4 Conclusion 4/19).	Afghanistan-Bahrain-Kabul-Bahrain AFTN Circuit	The circuit is not yet implemented.	Oct, 1998	~~Bahrain is ready to implement the circuit.~~ Bahrain is ready to implement the circuit.Bahrain service provider (BATELCO) informed they can supply VSAT connection. No information from Afghanistan.	O	~~Bahrain side ready.~~ ~~Bahrain service provider (BATELCO) informed they can supply VSAT connection. No information from Afghanistan.~~ No Corrective Action Plan submitted by the State	Afghanistan-Bahrain	~~Sep, 2014~~ Dec, 2015	A

(1) Rationale for non-elimination: "F"= Financial "H"= Human Resources "S"= State (Military/political) "O"= Other unknown causes

Deficiencies in the CNS Field

IRAN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	MID ANP (AFTN Rationalized Plan).	Afghanistan-Iran-Kabul-Tehran AFTN Circuit	The circuit is not yet implemented.	Oct, 1998	~~VSAT network to be implemented.~~ VSAT network to be implemented.Iran advised that they are ready. No information from Afghanistan	~~S~~ O	~~Iran advised that they are ready.~~ ~~No information from Afghanistan~~ No Corrective Action Plan submitted by the State	Afghanistan-Iran	~~Sep, 2014~~ Dec, 2015	A

(1) Rationale for non-elimination: "F"= Financial "H"= Human Resources "S"= State (Military/political) "O"= Other unknown causes

Deficiencies in the CNS Field

IRAQ

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	ATS Direct Speech Circuit Iraq-Syria.	ATS Direct Speech circuit	ATS Direct speech circuit is needed.	Oct, 2008	~~In progress between Iraq and Syria.~~ In progress between Iraq and Syria. Iraq advised that they can provide VSAT.	O	~~Iraq advised that they can provide VSAT.~~ No Corrective Action Plan submitted by the State	Iraq- Syria	~~Jun, 2014~~ Dec, 2015	~~U~~ A
2	MID FASID.	Baghdad VOR	VOR not installed.	Jan, 2009	~~In progress.~~ In progress. Iraq advised that all NAV AIDs will be installed according to the master plan.	O	~~Iraq advised that all NAV AIDs will be installed according to the master plan.~~ No Corrective Action Plan submitted by the State	Iraq	~~Sep, 2014~~ Dec, 2015	~~U~~ A
3	MID FASID.	Baghdad DME	DME not installed.	Jan, 2009	~~In progress.~~ In progress.Iraq advised that all NAV AIDs will be installed according to the master plan.	O	~~Iraq advised that all NAV AIDs will be installed according to the master plan.~~ No Corrective Action Plan submitted by the State	Iraq	~~Sep, 2014~~ Dec, 2015	~~U~~ A

(1) Rationale for non-elimination: "F"= Financial "H"= Human Resources "S"= State (Military/political) "O"= Other unknown causes

Deficiencies in the CNS Field

JORDAN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	MID ANP (AFTN Rationalized Plan).	Jordan-Lebanon-Amman-Beirut AFTN Circuit	AFTN Circuit is not yet implemented.	Oct, 1998	~~Jordan is ready to implement the circuit.~~ Jordan is ready to implement the circuit. Jordan is already co-ordinating with Lebanon.	S	~~Jordan is aleady co-ordinating with Lebanon.~~ No Corrective Action Plan submitted by the State	Jordan- Lebanon	~~Sep, 2014~~ Dec, 2015	A

(1) Rationale for non-elimination: "F"= Financial "H"= Human Resources "S"= State (Military/political) "O"= Other unknown causes

Deficiencies in the CNS Field

LEBANON

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	MID ANP (AFTN Rationalized Plan).	Amman-Beirut AFTN Circuit	AFTN Circuit is not yet implemented.	Oct, 1998	~~Lebanon working on the implementation of the circuit.~~ Lebanon working on the implementation of the circuit. If problem persists, another alternative should be proposed in the MID AFTN Plan.	S	~~If problem persists, another alternative should be proposed in the MID AFTN Plan.~~ ~~No update received from Lebanon~~ No Corrective Action Plan submitted by the State	Jordan- Lebanon	~~Sep, 2014~~ Dec, 2015	A

(1) Rationale for non-elimination: "F"= Financial "H"= Human Resources "S"= State (Military/political) "O"= Other unknown causes

Deficiencies in the CNS Field

OMAN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	Direct Speech Circuit (LIM MID RAN) in Oman and Yemen.	Direct speech Circuit	Direct Speech circuit is required.	Oct, 1998	~~Under implementation.~~ Under implementation. Oman Ready. Oman and Yemen are working to implement the circuit	O	~~Oman Ready.~~ ~~Oman and Yemen are working to implement the circuit~~ No Corrective Action Plan submitted by the State	Oman- Yemen	~~Sep, 2014~~ Dec, 2015	A

(1) Rationale for non-elimination: "F"= Financial "H"= Human Resources "S"= State (Military/political) "O"= Other unknown causes

Deficiencies in the CNS Field

SYRIA

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	ATS Direct Speech Circuit Syria- Iraq.	ATS Direct Speech Circuit	Direct Speech circuit required between Syria and Iraq.	Oct, 2008	~~Matter pending in Syria.~~ Matter pending in Syria. Iraq advised they are ready to provide VSAT for the implementation	O	~~Iraq advised they are ready to provide VSAT for the implementation.~~ No Corrective Action Plan submitted by the State	Syria- Iraq	~~Sep, 2014~~ Dec, 2015	~~U~~ A

(1) Rationale for non-elimination: "F"= Financial "H"= Human Resources "S"= State (Military/political) "O"= Other unknown causes

Deficiencies in the CNS Field

YEMEN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	Direct Speech Circuit with Adjacent Centre in Djibouti.	Direct Speech Circuit	Requirement for a Direct Speech Circuit with Adjacent Centre Djibouti.	Oct, 1998	No updates received from Yemen.	O	~~No updates received from Yemen.~~ No Corrective Action Plan submitted by the State	Yemen-Djibouti	~~Sep, 2014~~ Dec, 2015	A
2	Direct Speech Circuit with Adjacent Centre in India.	Direct Speech Circuit	Direct speech Circuit with Adjacent Centre in India.	Oct, 1998	No updates received from Yemen.	O	~~No updates received from Yemen.~~ No Corrective Action Plan submitted by the State	Yemen- India	~~Sep, 2014~~ Dec, 2015	A
3	Direct SPeech Circuit with Adjacent Centers in Oman and Yemen.	Direct Speech Circuit	Requirement for a Direct SPeech Circuit with Adjacent center Oman.	Oct, 1998	~~No updates received from Yemen.~~ No updates received from Yemen. Establish a direct Speech Circuit with Adjacent centre in Oman. Oman Ready.	O	~~Establish a direct Speech Circuit with Adjacent centre in Oman.~~ ~~Oman Ready. No update from Yemen.~~ No Corrective Action Plan submitted by the State	Yemen- Oman	~~Sep, 2014~~ Dec, 2015	A

(1) Rationale for non-elimination: "F"= Financial "H"= Human Resources "S"= State (Military/political) "O"= Other unknown causes

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
4	Direct speech Circuits with Adjacent Centres in Eritrea and Somalia.	Direct Speech Circuit	Requirement for direct speech Circuits with adjacent Centres in Eritrea and Somalia.	Oct, 1998	No updates received from Yemen.	O	~~No updates received from Yemen.~~ No Corrective Action Plan submitted by the State	Yemen- Eritrea-Somalia	~~Sep, 2014~~ Dec, 2015	A

Note:* Priority for action to remedy a deficiency is based on the following safety assessments:

'U' priority = Urgent requirements having a direct impact on safety and requiring immediate corrective actions.

Urgent requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is urgently required for air navigation safety.

'A' priority = Top priority requirements necessary for air navigation safety.

Top priority requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is considered necessary for air navigation safety.

'B' priority = Intermediate requirements necessary for air navigation regularity and efficiency.

Intermediate priority requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is considered necessary for air navigation regularity and efficiency.

Definition:

A deficiency is a situation where a facility, service or procedure does not comply with a regional air navigation plan approved by the Council, or with related ICAO Standards and Recommended Practices, and which situation has a negative impact on the safety, regularity and/or efficiency of international civil aviation.

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(1) Rationale for non-elimination: "F"= Financial "H"= Human Resources "S"= State (Military/political) "O"= Other unknown causes

APPENDIX 7A

COMMUNICATION, NAVIGATION AND SURVEILLANCE SUB-GROUP

(CNS SG)

1. TERMS OF REFERENCE

1.1 The Terms of Reference of the CNS Sub-Group are:

a) ensure that the implementation of CNS in the MID Region is coherent and compatible with developments in adjacent Regions, and is in line with the Global Air Navigation Plan (GANP), the Aviation System Block Upgrades (ASBU) methodology and the MID Region Air Navigation Strategy;

b) monitor the status of implementation of the MID Region CNS-related ASBU Modules included in the MID Region Air Navigation Strategy as well as other required CNS supporting infrastructure, identify the associated difficulties and deficiencies and provide progress reports, as required;

c) keep under review the MID Region CNS performance objectives/priorities, develop action plans to achieve the agreed performance targets and propose changes to the MID Region CNS plans/priorities, modernization programmes through the ANSIG, as appropriate;

d) seek to achieve common understanding and support from all stakeholders and involved in or affected by the CNS developments/activities in the MID Region;

e) provide a platform for harmonization of developments and deployments of CNS facilities and procedures within Region and inter regional;

f) monitor and review the latest developments in the area of CNS, provide expert inputs for CNS-related issues; and propose solutions for meeting ATM operational requirements;

g) follow-up the developments of ICAO position for future ITU World Radio Communication (WRC) Conferences and provide expert advises to States;

h) follow-up the establishment of the MID ATS Message Management Center (MIDAMC);

i) provide regular progress reports to the ANSIG and MIDANPIRG concerning its work programme; and

j) review periodically its Terms of Reference and propose amendments, as necessary.

1.2 In order to meet the Terms of Reference, the CNS Sub-Group shall:

a) provide necessary assistance and guidance to States to ensure harmonization and interoperability in line with the GANP, the MID ANP and ASBU methodology;

b) provide necessary inputs to the MID Air Navigation Strategy through the monitoring of the agreed Key Performance Indicators related to CNS facilities and procedures;

c) identify and review those specific deficiencies and problems that constitute major obstacles to the provision of efficient CNS implementation, and recommend necessary remedial actions;

d) lead the work programme of the MID-AMC including the conduct of trainings and upgrades;

e) assist, coordinate, harmonize and support in the implementation of CNS facilities and procedures;

f) seek States support to ICAO Position at WRCs, and encourage States for the proper utilization of the Frequency Spectrum and Interrogation Code Allocations;

g) update ATN Plan as necessary MID Region and assist in its implementation conduct; and

h) follow-up surveillance technologies implementation to be in line with the surveillance strategy and MID operational improvements in coordination with other Sub-Groups and coordinate Interrogation Code Allocations.

2. COMPOSITION

2.1 The Sub-Group is composed of:

a) MIDANPIRG Member States;

b) concerned International and Regional Organizations as observers; and

c) other representatives from provider States and Industry may be invited on ad-hoc basis, as observers, when required.

LIST OF PARTICIPANTS

NAME	TITLE & ADDRESS
STATES	
BAHRAIN Mr. Mohammed Hassan Al-Asfoor	Chief Electronics Engineering Civil Aviation Affairs P.O. Box 586 KINGDOM OF BAHRAIN Fax: +973 17 329 977 Tel: +973 17 321 033 Mobile: +973 3969 1035 Email: malasfoor@caa.gov.bh
Mr. Salah Mohamed Alhumood	Chief, Aeronautical Information & Airspace Planning Civil Aviation Affairs Bahrain International Airport P.O. Box 586 KINGDOM OF BAHRAIN Fax: +973 17 329 977 Tel: +973 17 321 180 Mobile: +973 3640 0424 Email: shumood@caa.gov.bh
ISLAMIC REPUBLIC OF IRAN Mr. Alireza Esmaeilnia	Deputy of General Director CNS Engineering Iran Airports Company (IAC) Mehrabad International Airport P.O. Box 13445 – 1558 Tehran - ISLAMIC REPUBLIC OF IRAN Fax: +98 21 44544001 Tel: +98 21 44544000 Mobile: +98 912 2255431 Email: aesmaeelnia@airport.ir
Mr. Arash Khodaei	Deputy D.G. Aeronautical Operations and Airports Oversight Civil Aviation Organization of I.R. Iran Mehrabad International Airport P.O. Box 13445 – 1558 Tehran - ISLAMIC REPUBLIC OF IRAN Fax: +98 21 44665576 Tel: +98 21 66073534 Mobile: +98 9121483840 Email: a-khodaei@cao.ir arashkhodaei@yahoo.com

NAME	TITLE & ADDRESS
Mr. Hossein Karimi	Manager of Navigation Engineering Department Iran Airport Company (IAC) Mehrabad International Airport P.O. Box 13445 - 1558 Tehran - ISLAMIC REPUBLIC OF IRAN Fax: +98 21 44544001 Tel: +98 21 44544000 Mobile: +98 9126368868 Email: hkarimi@airport.ir
Mr. Mostafa Qorbani	Manager of RADAR Engineering Department Iran Airports Company (IAC) Mehrabad Int'l Airport P.O.Box 13445 - 1558 Tehran - ISLAMIC REPUBLIC OF IRAN Fax: +98 21 44544001 Tel: +98 21 44544000 Mobile: +98 912 4238652 Email: m.qorbani@airport.ir
Mr. Seyyed Reza Yousefzadeh	Deputy of Communication Engineering Department Iran Airport Company (IAC) Mehrabad International Airport P.O. Box 13445 – 1558 Tehran - ISLAMIC REPUBLIC OF IRAN Fax: +98 21 44665478 Tel: +98 21 44665532 Mobile: +98 9124849638 Email: yousefzadeh@airport.ir Seyyedreza.yousefzadeh@yahoo.com
Mr. Bahaeddin Sadr	Aeronautical Expert Civil Aviation Organization of I.R. Iran Mehrabad International Airport P.O. Box 13445 – 1558 Tehran - ISLAMIC REPUBLIC OF IRAN Tel: +98 21 61022072 Email: bahaeddin.sadr@yahoo.com
Mrs. Maryam Alimardani	Inspection and Uniformity Office ATS Air Traffic Service Tehran - ISLAMIC REPUBLIC OF IRAN Tel: +98 21 44544109 Mobile: +98 912 6943313 Email: mrm_alimardani@yahoo.com

NAME	TITLE & ADDRESS
Mr. Amir Hossein Sadeghcheh	Expert – Tehran ACC Iran Airports Company (IAC) Mehrabad International Airport P.O. Box 13445 – 1558 Tehran - ISLAMIC REPUBLIC OF IRAN Fax: +98 21 44544061 Tel: +98 21 44544061 Mobile: +98 912 6358816 Email: a.sadeghcheh@yahoo.com
Mr. Majid Rezaei	AIS Officer Iran Airports Company (IAC) Mehrabad International Airport P.O. Box 13445 – 1558 Tehran - ISLAMIC REPUBLIC OF IRAN Mobile: +98 912 6045391 Email: majidre@gmail.com
Mr. Ali Tahouri	ATC Civil Aviation Organization of I.R. Iran Mehrabad International Airport P.O. Box 13445 – 1558 Tehran - ISLAMIC REPUBLIC OF IRAN Tel: +98 21 22341633 Mobile: +91 21 893061 Email: alitahouri1975@gmail.com
Mr. Amir Pourjabar	Senior Expert in Airworthiness Civil Aviation Organization of I.R. Iran Mehrabad International Airport P.O. Box 13445 – 1558 Tehran - ISLAMIC REPUBLIC OF IRAN Fax: +98 21 66025045 Tel: +98 21 66025066 Mobile: +98 912 2140655 Email: nimae05@yahoo.com
Mr. Seyed Mahmood Qazimirsaeed	Surveillance Aviation Expert Iran Airports Company (IAC) Surveillance Office Radar Automation Mehrabad International Airport P.O. Box 13445 – 1558 Tehran - ISLAMIC REPUBLIC OF IRAN Fax: +98 21 445 44030 Tel: +98 21 445 44030-2 Mobile: +98 912 244 3706 Email: mirsaeed@airport.ir

NAME	TITLE & ADDRESS
Mr. Alireza Mahdavisefat	Senior Expert of AFTN/AMHS Iran Airports Company (IAC) Mehrabad International Airport 1AC Building, Mea'raj St. Tehran - ISLAMIC REPUBLIC OF IRAN Fax: +98 21 66025101 Tel: +98 216314 6442 Mobile: +98 920 3991356 Email: mahdavi@airport.ir
Mr. Mohsen SaadatPour	ATC Iran Airports Company (IAC) Mehrabad International Airport P.O. Box 13445 – 1558 Tehran - ISLAMIC REPUBLIC OF IRAN Tel: +98 912 4902611/98 21 44544111 Mobile: +98 912 490 2611 Email: saadat782000@yahoo.com
Mr. Ali Akbar Salehi Valojerdi	Senior Expert of AFTN/AMHS Training Department Iran Airports Company (IAC) Mehrabad International Airport Tehran - ISLAMIC REPUBLIC OF IRAN Tel: +98 2163146413 Mobile: +98 912 4202775 Email: aasalehi@airport.ir
Mr. Reza Arab	Air Traffic Controller Civil Aviation Organization of I.R. Iran Mehrabad International Airport P.O. Box 13445 – 1558 Tehran - ISLAMIC REPUBLIC OF IRAN Tel: +98 21 33334064 Mobile: +98 917 3010433 Email: rezaarabchadegani@yahoo.com
Mr. R. Ali Ziaee	Deputy of General Director of ATC Iran Airports Company (IAC) Mehrabad International Airport Tehran - ISLAMIC REPUBLIC OF IRAN Fax: +98 21 44544102 Tel: +98 21 44544135 Mobile: +98 912 3874917 Email: r.a.ziaee@airport.ir

NAME	TITLE & ADDRESS
KUWAIT Mr. Ahmad Bader Farhan	Telecommunication Supervisor Assistant Directorate General of Civil Aviation Kuwait International Airport P.O. Box 17 Safat 13001 State of KUWAIT Fax: +965 4319232 Tel: +975 7644425 Mobile: +965 97644425 Email: ab.frhan@dgca.gov.kw
Eng. Fahad s. Albaloushi	Superintendent of Communication Equipment Directorate General of Civil Aviation P.O. Box 17 Safat 13001 State of KUWAIT Fax: +965 2 431 9232 Tel: +965 2 431 2977 Mobile: +965 6607 2288 Email: fs.albaloushi@dgca.gov.kw
Mr. Hamad A. H. Al-Naser	Head of Radar Center Equipment Directorate General of Civil Aviation Kuwait International Airport P.O. Box 17 Safat 13001 State of KUWAIT Fax: +965 24727340 Tel: +965 161 Ext. 2294 Mobile: +965 97652527 Email: ha.alnaser@dgca.gov.kw
OMAN Mr. Ali Humaid Al-Adawi	Standards Officer Public Authority for Civil Aviation Muscat International Airport P.O.Box 1 - Code 111 Muscat, SULTANATE OF OMAN Fax: +968 24 518659 Tel: +968 24 519 699 Mobile: +968 9943 3003 Email: ali@caa.gov.om
Mr. Nasser Salim Al Suleimany	Chief ATC Systems Public Authority for Civil Aviation Muscat International Airport P.O.Box 1 - Code 111 SULTANATE OF OMAN Fax: +968 24 51 8659 Tel: +968 24 51 9777 Mobile: +968 9944 1443 Email: nassers@caa.gov.om

NAME	TITLE & ADDRESS
Mr. Saleh Abdullah Al-Harthy	Director of Air Navigation Services Public Authority for Civil Aviation Muscat International Airport P.O.Box 1 - Code 111 Muscat, SULTANATE OF OMAN Fax: +968 24 518 659 Tel: +968 24 519 789 Mobile: +968 9520 5073 Email: saleh@caa.gov.om
UNITED ARAB EMIRATES Mr. Ahmed Yousif Al Obeidli	Senior Air Navigation Inspector General Civil Aviation Authority P.O.Box 6558 Abu Dhabi UNITED ARAB EMIRATES Fax: +971 2 405 4406 Tel: +971 2 405 4410 Mobile: +971 56 611 3023 Email: aobaidli@gcaa.gov.ae
Mr. Waleed Salem Alhemeiri	Director-Communication, Navigation and Surveillance General Civil Aviation Authority Sheikh Zayed Air Navigation Center P.O.Box 666 Abu Dhabi UNITED ARAB EMIRATES Fax: +971 2 5996 872 Tel: +971 2 5996 860 Mobile: +971 50 8119 151 Email: waleeds@szc.gcaa.ae
ORGANIZATIONS	
IATA Mr. George Rhodes	Assistant Director Infrastructure MENA International Air Transport Association King Abdallah II Street P.O.Box 940587 Amman 11194, JORDAN Fax: +962 6 593 9923 Tel: +962 6 580 4256 Mobile: +962 79 944 4252 Email: rhodesg@iata.org

NAME	TITLE & ADDRESS
Mr. Jehad Faqir	Head of Safety and Flight Operations IATA, MENA King Abdallah II Street P.O.Box 940587 Amman 11194, JORDAN Fax: +962 6 593 9912 Tel: +962 6 580 4200 Ext. 1216 Mobile: +962 79 511 1238 Email: faqirj@iata.org
Mr. Mohammad Apesh	Aviation Solutions Assistant Manager IATA King Abdallah II Street P.O.Box 940587 Amman 11194, JORDAN Fax: +962 6 593 9933 Tel: +962 6 580 4220 Ext. 1204 Email: apeshm@iata.org
Mr. Murad Alkhatib	Area Manager IATA King Abdallah II Street P.O.Box 940587 Amman 11194, JORDAN Fax: +962 6 593 9933 Tel: +962 6 580 4220 Ext. 1205 Email: alkhatibm@iata.org
Mr. Peter J. Raw	Manager Aeronautical & ATM Flight Operations Support The Emirates Group Headquarters P.O. Box 92 Dubai-United Arab Emirates Fax: +971 4 286 4085 Tel: +971 4 708 4302 Mobile: +971 50 950 8624 Email: peter.raw@emirates.com
Mr. Shamel Shishani	Head, Regional Vice President Office Africa & Middle East IATA King Abdallah II Street P.O.Box 940587 Amman 11194, JORDAN Fax: +962 6 593 9923 Tel: +962 6 580 4200 Ext. 1401 Mobile: +962 79 594 4911 Email: shishanis@iata.org

NAME	TITLE & ADDRESS
SITA Mr. Mansour Rezaei Mazinani	Lead Architect Communication and Infrastructure Solutions Switzerland/SITA 26, Chemin de Joinville 1216 Cointrin- Geneva Switzerland Tel: +41 0 22 747 6581 Mobile: +41 0 79 615 5857 Email: mansour.rezaei-mazinani@sita.aero

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