INTERNATIONAL CIVIL AVIATION ORGANIZATION

REPORT OF THE FOURTH MEETING OF THE COMMUNICATION NAVIGATION AND SURVEILLANCE SUB-GROUP

CNS SG/4

(Cairo, Egypt, 25 – 27 September 2011)

The views expressed in this Report should be taken as those of the MIDANPIRG Communication Navigation and Surveillance Sub-Group and not of the Organization. This Report will, however, be submitted to the MIDANPIRG and any formal action taken will be included in the Report of the MIDANPIRG.

Approved by the Meeting

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PART I - HISTORY OF THE MEETING

1. PLACE AND DURATION

1.1 The Fourth Meeting of the MIDANPIRG Communication Navigation and Surveillance Sub-Group (CNS SG/4) was held at ICAO Middle East Regional Office, Cairo, Egypt, 25 – 27 September 2011.

2. OPENING

2.1 Mr. Mohamed R. M. Khonji, Regional Director, welcomed all the delegates to ICAO MID Regional Office and to Cairo, highlighting the important topics that the meeting will address especially the outcome of the successful meeting of the ATN-IPS Working Group and the development in the MID Region concerning the implementation of the AMHS for which the ICAO MID Region are establishment the MID ATS Message Management Center (AMC) in order to have regional capabilities.

2.2 Mr. Khonji thanked Saudi Arabia for hosting successful MID Surveillance workshop in Jeddah and requested the meeting to consider the outcome of the workshop in the work programme of the meeting, he highlighted that the outcome needs to be translated into actions. With regard to the navigation area Mr. Khonji stressed on the support to the Performance Based Navigation (PBN) implementation in the Region, according to the MIDANPIRG/12 approved PBN implementation plan and Strategy. Finally he wished the meeting every success in its deliberations.

3. ATTENDANCE

3.1 The meeting was attended by a total of twenty-one (21) participants, which included delegates from six (6) States and two (2) Organizations. The list of participants is as at **Attachment A** to the Report.

4. OFFICERS AND SECRETARIAT

4.1 The meeting was chaired by Mr. Ali Ahmed Mohamed Director Air Navigation, Civil Aviation Affairs, from Kingdom of Bahrain. Mr. Raza Ali Gulam, Regional Officer, Communications Navigation and Surveillance (CNS) from the ICAO Middle East Cairo Office, was Secretary of the meeting.

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 and election of Chairpersons

Agenda Item 2: Follow-up action the MIDANPIRG and other meetings Conclusions and Decisions relevant to CNS field

Agenda Item 3: Review IPS Working Group reports

Agenda Item 4: Review and update of AFTN CIDIN Directory and CNS Part of MID ANP and FASID (Doc 9708)

Agenda Item 5: Developments in CNS field

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

Agenda Item 7: CNS Performance Objective for MID Region

Agenda Item 8: Future Work Programme

Agenda Item 9: Any other business

7. CONCLUSIONS AND DECISIONS – DEFINITION

7.1 The Sub-Group records its actions in the form of Draft Conclusions and Draft Decisions for further action and adoption by the MIDANPIRG as its Conclusions and Decisions with the following significance:

a) **Conclusions** deal with 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.

7.2 In the same context, the Sub-Group can record its actions in the form of Conclusions and Decisions where no further action is required by the MIDANPIRG or already authorized by MIDANPIRG.

8. LIST OF DRAFT CONCLUSIONS AND DECISIONS

DRAFT CONCLUSION 4/1:	MID IP NETWORK SURVEY
DRAFT CONCLUSION 4/2:	DEVELOPMENT OF IP BASED MID NETWORKS
DRAFT DECISION 4/3:	REVISED TOR OF THE ATN-IPS WORKING GROUP
DRAFT CONCLUSION 4/4:	UPDATE THE AMC SYSTEM
DRAFT CONCLUSION 4/5:	SUPPORT FROM EUROCONTROL TO ESTABLISH MID AMC
DRAFT CONCLUSION 4/6:	SUPPORT TO MID-AMC

DRAFT CONCLUSION 4/7:	MID AFTN/CIDIN DIRECTORY
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DRAFT CONCLUSION 4/9:	SUPPORT ICAO POSITION TO WRC 12
DRAFT CONCLUSION 4/10:	UPDATED ICAO POSITION
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DRAFT CONCLUSION 4/12:	MID REGION STRATEGY FOR THE IMPLEMENTATION OF ADS-B
DRAFT CONCLUSION 4/13:	ALLOCATION OF 24 BIT AIRCRAFT ADDRESS
DRAFT DECISION 4/14:	TERMS OF REFERENCE OF THE CNS SUB-GROUP

PART II: REPORT ON AGENDA ITEMS

REPORT ON AGENDA ITEM 1: ADOPTION OF THE PROVISIONAL AGENDA AND ELECTION OF CHAIRPERSONS

1.1 The meeting was presented with the Provisional Agenda, which was adopted after review.

1.2 The meeting recalled that Mr. Ali Ahmed Mohammed director air navigation, Civil Aviation Affairs, Bahrain, has been the Chairperson for the CNS Sub-Group since its establishment, and Mr. Ahmed O. Al Omari from Saudi Arabia as the Vice Chairperson for the CNS Sub-Group since the First meeting of CNS SG in 2007.

1.3 The meeting recalled the provisions of MIDANPIRG Procedural hand book, Fifth Edition – June 2011, Part III, para. 6.1, "the Chairperson, the First Vice-Chairperson and Second Vice-Chairperson of the Group should assume their functions at the end of the meeting at which they are elected and serve for two cycles unless otherwise re-elected, in which (case) the term would be limited to one additional cycle only".

1.4 In light of the above, the representative from Bahrain nominated Mr. Ali Humaid Al-Adawi, Superintendent Standards Directorate General of Meteorology & Air Navigation (DGMAN), Muscat International Airport, as the chairperson of the CNS Sub-Group, the nomination was supported by Saudi Arabia, Jordan and UAE. Furthermore Saudi Arabia nominated Dr. Suleiman Deeb Zayed, Director Technical Support, Civil Aviation Regulatory Commission, Jordan as vice chairperson for the CNS Sub-Group.

REPORT ON AGENDA ITEM 2: FOLLOW-UP ON MIDANPIRG AND OTHER MEETINGS CONCLUSION AND DECISION RELEVANT TO CNS FIELD

2.1 The meeting recalled that it has been agreed by MIDANPIRG that each subsidiary body review the Conclusions and Decisions related to its terms of reference and decide whether to maintain or replace by an updated Conclusions and Decisions, in order not to have too many Conclusions and Decisions which are ongoing.

2.2 The meeting noted the status of relevant MIDANPIRG/12 Conclusions and Decisions related to the CNS field and the follow up actions taken by concerned parties as at **Appendix 2A** to the Report on Agenda Item 2.

2.3 The meeting urged MID States, to ensure that replies to the State Letters issued by the ICAO MID Regional Office as a follow up actions to the MIDANPIRG/12 Conclusions and Decisions are sent to the ICAO MID Regional Office, in a timely manner, and to provide feedback on the actions taken by States.

2.4 The meeting agreed in its deliberation to review the Conclusions and Decisions which are still current under the relevant Agenda Item.

CNS SG/4
Appendix 2A to the Report on Agenda Item 2

FOLLOW-UP ON MIDANPIRG/12 AND DGCA-MID/1 MEETING CONCLUSIONS AND DECISIONS RELATED TO CNS

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
CONC. 12/2: INCREASING THE EFFICIENCY OF THE MIDANPIRG SUBSIDIARY BODIES That, with a view to maintain the continuity in the activity of the MIDANPIRG subsidiary bodies and increase their efficiency: a) States be invited to nominate for each MIDANPIRG subsidiary body Experts/Specialists as Members of the body concerned to fully contribute to the work of this body; and b) the specialists nominated for membership in a MIDANPIRG subsidiary body, act as focal points within their Civil Aviation Administration for all issues and follow-up activities related to the Work Programme of that body.	Implementation of the Conclusion	ICAO States	State Letter Nomination of Experts/Specialist	January 2011	Ongoing SL Ref.: ME 3/56 - 11/041 dated 7 March 2011 4 States replied
CONC. 12/3: UPDATE OF THE MIDANPIRG PROCEDURAL HANDBOOK That, the ICAO MID Regional Office: a) proceed with the amendment of concerned pages of the MIDANPIRG Procedural Handbook to reflect the changes approved by MIDANPIRG/12; and b) publish the updated version of the Handbook on the ICAO MID website before 31 December 2010	Update the MIDANPIRG Procedural Handbook and post it on the web	ICAO	Fifth edition of the Procedural Handbook	January2011	Completed
DEC.12/33: TERMS OF REFERENCE OF THE AIS AUTOMATION ACTION GROUP That, the Terms of Reference of the AIS Automation Action Group (AISA AG) be updated as at Appendix 5.3H to the Report on Agenda Item 5.3.	Implement the Decision	MIDANPIRG	Updated TOR	October 2010	Completed

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
CONC. 12/38: POSTING OF AMHS PLANS IN AMC That, MID States be encouraged to post their AMHS implementation plans on the European ATS Messaging Management Centre (AMC).	Follow-up the posting of Plan on AMC	ICAO States	State Letter AMHS plans Posted	February 2011	Ongoing SL AN 7/5.1 – 11/016 Dated 20 January 2011 (To be replaced and superseded by Draft Conc. 4/4)
CONC. 12/39: MID IP NETWORK SURVEY That, MID States be urged to complete the MID IP Network survey as at **Appendix 5.4A** to the Report on Agenda Item 5.4 and send to ICAO MID Regional Office by February 2011.	Follow-up in IP Network in MID Region	ICAO States	State Letter Completed survey	February 2011	Ongoing SL AN 7/5.1 – 11/016 Dated 20 January 2011 (To be replaced and superseded by Draft Conc. 4/1)
CONC.12/40: USE OF PUBLIC INTERNET IN THE MID REGION That MID States be encouraged to: a) follow the guidance **Appendix 5.4B** to the Report on Agenda Item 5.4, when using the public internet for critical aeronautical communication; and b) provide to the ICAO MID Regional Office, the inventory on the public internet usage ; as at **Appendix 5.4C** to the Report on Agenda Item 5.4 by 20 February 2011.	Implement the Conclusion	States	State Letter Inventory of public internet ATN/IPS WG report	February 2011 March 2011	Ongoing AN 7/5.1 – 11/016 Dated 20 January 2011 completed
DEC. 12/41: REVISED NAME AND TOR OF THE IPS WG That, the IPS WG is renamed as ATN/IPS WG with same members; and its terms of reference and work programme of the ATN/IPS	Implement the Decision	MIDANPIRG/12	Revised TOR	October 2010	Completed (To be replaced and superseded by Draft

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
Working Group be updated as at **Appendix 5.4D** to the Report on Agenda Item 5.4.					Dec. 4/3)
DEC.12/42: DISSOLVE THE AD-HOC ACTION GROUP FOR THE SUPPORT OF AERONAUTICAL FREQUENCY BANDS That, the Ad-Hoc action group for the support of Aeronautical frequency bands is dissolved and its task to be carried by the CNS SG.	Implement the Decision	MIDANPIRG/12	Dissolve AD-HOC Group	October 2010	Completed
CONC. 12/43: SUPPORT ICAO POSITION FOR WRC-12 That, MID States be urged to: a) include ICAO Position on WRC-12 in their State Position to the extent possible; b) support Civil Aviation Authorities, aviation spectrum experts to participate actively in the national and regional level activities related to WRC-12 including ITU study groups to support ICAO Position; and c) support Civil Aviation Authorities, aviation spectrum experts to participate in WRC-12 and coordinate with the ICAO delegation to the conference	Follow up with States to support ICAO positions	ICAO States	State Letter CNS SG/4 Report Support ICAO positions	February 2012	Ongoing Follow-up during CNS SG/4 25-27 September 2011
CONC. 12/44: UPDATING THE AFTN/CIDIN DIRECTORY That, ICAO MID Regional Office request Authorization from EUROCONTROL to provide the routing function and any additional functions available in AMC to the MID Region.	Follow-up with EUROCONTROL for additional fun	ICAO	State Letter	February 2011	Ongoing AN 7/5.1 – 11/011 Dated 19 January 2011 (To be replaced and superseded by Draft Conc. 4/5)

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
CONC 12/45: MID SURVEILLANCE WORKSHOP That, a) the ICAO MID Regional Office organizes a workshop with an objective to raise awareness, develop MID Regional Surveillance strategy and road map; and b) MID States participate in the workshop and provide their future surveillance plans	Implement the Conclusion	ICAO State	Organize Workshop State to attend workshop and provide their plan	2011	Completed
CONC. 12/46: EXCHANGE OF SURVEILLANCE DATA That, MID States be encouraged, to share ATS surveillance data in order to improve surveillance coverage in the MID Region, which will enhance safety, efficiency, capacity and could be used as back-up where feasible.	Implement the Conclusion	ICAO States	State Letter Exchange Surveillance data	February 2011	Ongoing SL AN 7/5.9 – 11/025 Dated 16 February 2011
CONC. 12/47: MID REGION PERFORMANCE METRICS That: a) the following MID Region Metrics be adopted for performance monitoring of the air navigation systems: MID Metric 1: Number of accidents per 1,000 000 departures; MID Metric 2: Percentage of certified international aerodromes; MID Metric 3: Number of Runway incursions and excursions per year; MID Metric 4: Number of States reporting necessary data to the MIDRMA on regular basis and in a timely manner; MID Metric 5: The overall collision risk in MID RVSM airspace; MID Metric 6: Percentage of air navigation deficiencies priority "U" eliminated; MID Metric 7: Percentage of instrument Runway ends with	Monitor performance of ANS using the endorsed metrics	MIDANPIRG & subsidiary bodies	Develop performance targets	2011	Ongoing SL Ref.: AN 7/26.1-11/121 dated 24 May 2011

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
MID Metric 8: RNP/RNAV approach procedure; and Percentage of en-route PBN routes implemented in accordance with the regional PBN plan. b) the MIDANPIRG subsidiary bodies monitor the Metrics related to their work programmes; develop associated performance targets and provide feed-back to MIDANPIRG.					
CONC. 12/48: DATA COLLECTION FOR MID REGION PERFORMANCE METRICS That, States be invited to: a) incorporate the agreed MID Region Performance Metrics into their National performance monitoring process; b) collect and process relevant data necessary for performance monitoring of the air navigation systems to support the regional Metrics adopted by MIDANPIRG; and c) submit this data to the ICAO MID Regional Office on a regular basis.	Implement the Conclusion	ICAO States	State Letter Include metrics into national performance monitoring Submit data to ICAO	January 2011	Ongoing SL Ref.: AN 7/26.1-11/121 dated 24 May 2011
DEC. 12/49: REVIEW OF THE MID AIR NAVIGATION PLAN (ANP) That, in support to ICAO efforts to improve regional ANPs, the MIDANPIRG subsidiary bodies: a) carry out a complete review of the MID Basic ANP and FASID parts related to their Terms of Reference (TOR) and Work Programme; b) develop revised draft structure and content of the Basic ANP in order to reconcile it with the ATM Operational Concept, the Global Plan provisions and the performance based approach; c) identify the need for and development of those FASID Tables	Implement the Decision	ICAO States Users	New structure, format & content of ANP/FASID	2012	Ongoing

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
necessary to support the implementation of a performance-based global air navigation systems; and d) report progress to MIDANPIRG/13.					

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
DEC. 12/50: TERMS OF REFERENCE OF THE INFPL STUDY GROUP That, the Terms of Reference and Work Programme of the INFPL Study Group be updated as at **Appendix 5.5G** to the Report on Agenda Item 5.5	Implement the Decision	MIDANPIRG	Updated TOR	October 2010	Completed
CONC. 12/51: INFPL IMPLEMENTATION DIFFICULTIES That, MID States be urged to complete the impact studies and file any difficulties arising in the implementation of INFPL to the ICAO MID Regional Office for posting on FITS.	Implement the Conclusion	ICAO States	State Letter Completed impact study File difficulties	April 2011 October 2012	Ongoing SL AN 6/2B – 11/027 dated 16 February 2011
CONC. 12/52: ICAO NEW FLIGHT PLAN FORMAT IMPLEMENTATION That, MID States be urged to: a) secure necessary budget for the implementation of the ICAO New FPL Format; b) initiate necessary negotiation with their ATC systems manufacturers/ vendors for the implementation of necessary hardware/software changes, as soon as possible; c) develop National PFF related to the ICAO new FPL format project with clearly established milestones with timelines; and d) take all necessary measures to comply with the applicability date of 15 November 2012.	Implement the Conclusion	States	Secure resources	June 2012	Ongoing SL AN 6/2B – 11/027 Dated 16 February 2011
CONC. 12/53: QUESTIONNAIRE ON THE STATUS OF INFPL IMPLEMENTATION That, MID States be urged to reply to the Questionnaire on the Status of Implementation of Amendment 1 to the Procedures for Air Navigation Services-Air Traffic Management, Fifteenth Edition (PANS-ATM, Doc 4444) as at **Appendix 5.5J** to the Report on Agenda Item 5.5, by 20 February 2011.	Implement the Conclusion	States	Completed questionnaire	February 2011	Completed SL AN 6/2B – 11/027 dated 16 February 2011

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
CONC. 12/54: STRATEGY FOR THE IMPLEMENTATION OF INFPL That, MID Region Strategy for the implementation of INFPL be adopted as at **Appendix 5.5K** to the Report on Agenda Item 5.5	Implement the Conclusion	MIDANPIRG/12	Adopted Strategy	October 2010	Completed
CONC. 12/55: INFPL IMPLEMENTATION PLANS AND PROGRESS REPORT That, MID States be urged to send INFPL Implementation plans and progress report on the preparation for the implementation of INFPL to the ICAO MID Regional Office every (3) three months and whenever major progress is achieved.	Implement the Conclusion	States	Progress Report	Every 3 months	Ongoing Follow-up during INFPL SG/3 scheduled 22-23 June 2011
CONC. 12/56: STRATEGY FOR THE IMPLEMENTATION OF GNSS IN THE MID REGION That, the Strategy for implementation of GNSS in the MID Region be updated as at **Appendix 5.5N** to the Report on Agenda Item 5.5.	Implement the Conclusion	MIDANPIRG/12	Adopted new Strategy	October 2010	Completed (To be reviewed by PBN/GNSS TF/4 meeting)
CONC. 12/57: MID REGION PBN IMPLEMENTATION STRATEGY AND PLAN That, the MID Region PBN Implementation Strategy and Plan be updated as at **Appendix 5.5P** to the Report on Agenda Item 5.5.	Implement the Conclusion	MIDANPIRG/12	Approved Strategy	October 2010	Completed (To be reviewed by PBN/GNSS TF/4 meeting)
CONC. 12/58: PBN IMPLEMENTATION PROGRESS REPORT That, for future reporting on the status of PBN implementation, MID States be urged to: a) use the excel sheet as at **Appendix 5.5Q** to the Report on Agenda Item 5.5 and PBN Implementation Progress Report Template as at **Appendix 5.5R** to the Report on Agenda Item 5.5; and b) submit progress reports to ICAO MID Regional Office every six months or whenever major progress is achieved.	Implement the Conclusion	States	Progress Report	Every 6 months	Completed (To be reviewed by PBN/GNSS TF/4 meeting)

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
DEC. 12/59: TERMS OF REFERENCE OF THE PBN/GNSS TASK FORCE That, the Terms of Reference and Work Programme of the PBN/GNSS Task Force be updated as at **Appendix 5.5T** to the Report on Agenda Item 5.5.	Implement the Decision	MIDANPIRG	Updated TOR	October 2010	Completed (To be reviewed by PBN/GNSS TF/4 meeting)
DEC. 12/60: LIST OF TASK FOR PBN/GNSS TASK FORCE That, the list of tasks for the PBN/GNSS Task Force be updated with new task assignments as at **Appendix 5.5U** to the Report on Agenda Item 5.5.	Implement the Decision	MIDANPIRG	PBN/GNSS TF/3 Report	October 2010	Completed (To be reviewed by PBN/GNSS TF/4 meeting)
CONC. 12/61: IMPLEMENTATION OF CONTINUOUS DESCENT OPERATIONS That, recognizing the efficiency and environmental benefits of Continuous Descent Operations (CDO), and the need to harmonize these operations in the interest of safety, MID States be encouraged to include implementation of CDO as part of their PBN implementation plans and to implement CDO in accordance with the ICAO CDO Manual Doc 9931.	Follow up development in MID Region/States	States	Progressive introduction of CDO operations in TMAs	2012	Completed (To be reviewed by PBN/GNSS TF/4 meeting)
DEC. 12/62: DISSOLVE MID-FIT That, MID-FIT is dissolved and the matters related to data link activities are considered and followed by the CNS/ATM/IC SG.	Implement the Decision	MIDANPIRG	Dissolved MID-FIT	October 2010	Completed
CONC. 12/63: ADOPTION OF GOLD That, MID States be urged to: a) adopt Global Operational Data Link Document (GOLD) for data link operations; and b) contribute in future amendments to the GOLD as required.	Implement the Conclusion	MIDANPIRG States	Adopted GOLD	October 2010	Completed

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
CONC.12/75: ELIMINATION OF AIR NAVIGATION DEFICIENCIES IN THE MID REGION That, MID States be urged to: a) review their respective lists of identified deficiencies, define their root causes and forward an action plan for rectification of outstanding deficiencies to the ICAO MID Regional Office prior to 31 March 2011; b) use the online facility offered by the ICAO MID Air Navigation Deficiency Database (MANDD) for submitting online requests for addition, update, and elimination of air navigation deficiencies; c) accord high priority to eliminate all air navigation deficiencies with emphasis on those with priority "U"; in particular by allocating the necessary budget to ensure that their Civil Aviation Authorities have and retain a sufficient number of qualified technical personnel, who are provided with appropriate initial, on-the-job and recurrent training; and d) seek support from regional and international organizations (i.e. ACAC, GCC, etc.) for the elimination of identified air navigation deficiencies.	Implement the Conclusion	ICAO States	State Letter Feedback from States	January 2011	SL Ref.: AN2/2 – 11/123 dated 25 May 2011
DEC. 12/76: DISSOLUTION OF THE AIR NAVIGATION SAFETY SUB-GROUP That, recognizing that the Air Navigation Safety Sub-Group (ANS SG) work programme could be achieved more efficiently using alternative mechanisms and groupings, the ANS SG is dissolved.	Implement the Decision	MIDANPIRG	ANS SG dissolved	October 2010	Completed

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
DGCA-MID/1 **CONC. 1/2: ELIMINATION OF AIR NAVIGATION DEFICIENCIES IN THE MID REGION** That, States: a) accord high priority to the elimination of air navigation deficiencies; in particular by allocating the necessary budget to ensure that their Civil Aviation Authorities have and retain a sufficient number of qualified technical personnel, and provide appropriate initial, on-the-job and recurrent training; b) work cooperatively towards the elimination of common deficiencies; and c) consider the use of the Regional Safety Oversight Organizations (RSOOs) as an efficient mechanism for, inter-alia, the provision of appropriate training to technical staff and elimination of common deficiencies.					SL Ref.: AN2/2 – 11/123 dated 25 May 2011

REPORT ON AGENDA ITEM 3: REVIEW ATN/IPS WORKING GROUP REPORT

3.1 The meeting noted that the ATN/IPS WG/3 meeting was apprised on the outcome of the thirteenth meeting of Aeronautical Communication Panel (ACP) Working Group I – Internet Protocol Suite (ACP-WG-I 13), and the Seventeenth Meeting ACP Working Group on Maintenance of Air - Ground and Ground - Ground Communication (ACP-WG-M 17) held in Bangkok from 27 to 28 January and 31 January to 1 February 2011 respectively.

3.2 The meeting further noted that the ACP-WG-I 13 discussed the Voice over IP (VoIP) and noted the updates to EUROCAE Documents on VoIP in ATM. The ACP-WG-I 13 agreed to update the reference to ED 137A in Edition 2 of ICAO Doc 9896, for future publications.

3.3 The meeting noted that the ICAO Manual on ATN using Internet Protocol Suite (IPS) Standards and Protocol (Doc 9896) and the Manual on Detailed Technical Specifications for ATN using ISO/OSI Standards and Protocols (Doc 9880) were officially published in the second half 2010 and that the Manual of Technical Provisions for the Aeronautical Telecommunication Network (ATN) (Doc 9705) and the Comprehensive ATN Manual (Doc 9739) were withdrawn.

3.4 The ACP-WG-M 17 had decided to allow ICAO GIS Portal to be used as a means to timely capture information on bilateral AMHS connections and other CNS developments. This included the possibility of integrating some of the existing EUROCONTROL/ICAO EUR Region on-line database with the ICAO GIS Portal. Furthermore, the EUROCONTROL AMC could be used as an alternative to the GIS Portal for the purpose of indicating implementation status.

3.5 The meeting was apprised of the "MID REGIONAL ATN PLANNING AND IMPLEMENTATION DOCUMENT" which has been updated by the ATN/IPS WG, however since this document is extensive; the ATN/IPS WG/3 meeting extracted the material related to AMHS implementation and developed the AMHS part as at **Appendix 3A** to the Report on Agenda Item 3.

3.6 The meeting was informed that the Jordan integrated AFTN/AMHS system and started its operation. An international AMHS link between Jordan and the United Arab Emirates (UAE) using VPN has been established and operating efficiently.

3.7 Furthermore the meeting noted that Trilateral Tests that have been performed between Amman, Cairo, and Jeddah in November 2010 according to Appendix E of ICAO EUR Doc 020, which contains test cases for message submission, transfer, delivery and relay operation in addition to Alternative MTA routing and loop detection. As a result of the successful tests, the AMHS triangle was put into operational use, being the first AMHS triangle world-wide that uses static routing with pre-defined routing tables.

3.8 The meeting was in agreement with the ATN/IPS WG/3 views that conducting a timely and thorough post-implementation review (PIR) helps in identifying lessons which assist in planning, managing, and meeting the objectives of future AMHS projects, where it was noted that Asymmetric routing may cause loss of messages due to the fact that a gateway cannot map a Non-Delivery Report to a subject message. Furthermore, it was noted that Singular AMHS diversion for an area representing several PRMDs is substantial and cannot be performed by one letter as used in AFTN, to facilitate a diversion from AFTN to AMHS and vice versa.

3.9 Based on the above, the ATN/IPS WG/3 meeting urged MID AMHS COM Centers to review the current routing tables and make sure of deploying symmetric routes where possible, also encouraged MID States to make use of the corresponding PRMDs table to facilitate diversion from AFTN to AMHS and vice versa. Furthermore the meeting agreed with ATN/IPS WG/3 opinion that States start the PRMD with the first two letters for their location indicator.

3.10 Jordan had volunteered to keep the PRMD file updated on their website which can be accessed through link
http://carc.gov.jo/images/filemanager/061808AMC92%20corresponding%20PRMDs.pdf

3.11 The meeting noted that MIDANPIRG/12 meeting agreed with the global view, that the complete implementation of IPv6 will take time and consequently, there will be a long period of both protocols to co-exist IPv4 and IPv6. Furthermore, MIDANPIRG/12 meeting agreed that careful attention is required to the current implementation of AFTN, CIDIN and ISO/OSI based ATN, and the Provisions for continuation of CIDIN, AFTN and ISO/OSI should continue to be developed to secure these implementations. Accordingly MIDANPIRG/12 meeting agreed that the MID ATN implementation should take place on the basis of regionally agreed requirements, taking into consideration, the System Wide Information Management concept and any other new developments.

3.12 The meeting recalled, that MIDANPIRG/12 agreed for the development of the MID IP Network, where it was agreed that an IP Network survey be conducted to obtain first hand information. Accordingly, MIDANPIRG/12 agreed to Conclusion 12/39 MID IP NETWORK SURVEY. As a follow-up to the conclusion, ICAO MID Regional Office sent State Letter AN 7/5.1 – 11/016 dated 20 January 2011, requesting MID States to complete the survey and provide information on existing IP infrastructure and IP Networks implemented within their State.

3.13 The ATN/IPS WG/3 meeting noted that only 5 States (Bahrain, Egypt, Iran, Jordan and Saudi Arabia) provided the replies, the ATN/IPS WG/3 meeting performed analysis on the replies as at **Appendix 3B** to to the Report on Agenda Item 3.

3.14 The meeting noted that ATN/IPS WG/3 meeting reiterated MIDANPIRG/12 Conclusion 12/39 and urged MID State to submit their replies before the CNS SG/4 Meeting. Since further action on the establishment of MID IP Network is dependent on the analysis of the survey however the meeting noted that no additional survey replies received thus no analysis could be performed. Accordingly the meeting agreed to the following Draft Conclusion:

DRAFT CONCLUSION 4/1: MID IP NETWORK SURVEY

*That, MID States complete the MID IP Network survey as at **Appendix 3C** to the Report on Agenda Item 3 and send to ICAO MID Regional Office by 01 February 2012.*

3.15 The meeting noted that some MID States had already developed domestic networks based on IP network, while other States are in the process of developing IP network. Consequently, the ATN/IPS WG/3 meeting was of the view that for harmonization and compatibility issues these networks be based according to ICAO standards as outlined in Doc 9896. Accordingly, the meeting endorsed ATN/IPS WG/3 meeting Draft Conclusion as follows:

DRAFT CONCLUSION 4/2: DEVELOPMENT OF IP BASED MID NETWORKS

That, MID States be urged to:

a) develop national plans, in line with the ICAO Manual on the Aeronautical Telecommunication Network (ATN) using Internet Protocol Suite (IPS) Standards and Protocols (Doc 9896), for migration to IPv6 taking the existing IPv4 based aeronautical systems into account;

b) consider the use of IPv4/IPv6 protocol translation devices only as a provisional solution during the migration; and

c) include a requirement for both IPv4 and IPv6 in their ongoing Air Traffic Services (ATS) Message Handling System (AMHS) implementation programmes in order to ensure seamless transition and interoperability.

3.16 The meeting agreed with the ATN/IPS WG/3 views to consider the task concerning the use of public Internet is completed, since the public internet usage and guidance material and the survey for inventory have been approved by MIDANPIRG/12 and the developed documentation to be posted under the documentation in the new ICAO MID Forum website.

3.17 The meeting noted that ATN/IPS WG/3 meeting developed task list which was approved by the meeting after modification as at **Appendix 3D** to the Report on Agenda Item 3. The meeting also agreed to the updated TOR and work programme of the ATN/IPS Working Group as at **Appendix 3E** to the Report on Agenda Item 3 and agreed to the following Draft Decision:

DRAFT DECISION 4/3: REVISED TOR OF THE ATN-IPS WORKING GROUP

*That, the Terms of Reference and Work Programme of the ATN-IPS Working-Group be updated as at Appendix **3E** to the Report on Agenda Item.*

3.18 The meeting noted that MIDANPIRG/12 noted that a periodical data collection and publication in the MID ANP and FASID for the AFTN/CIDIN/AMHS circuits and other related information is a human resource extensive task and would need to be supported by electronic tools, e.g. centralized database, and further noted that these information are maintained in ICAO EURO Region through the AMC.

3.19 The meeting was apprised that MID Region could utilize the AMC to obtain some of the above information electronically. Consequently, the meeting urged MID State to access the AMC website http://www.eurocontrol.int/amc and keep all information related to their States updated. Accordingly, the meeting endorsed the following ATN/IPS WG/3 Draft Conclusion:

DRAFT CONCLUSION 4/4: UPDATE THE AMC SYSTEM

That, MID States be urged to keep the data related to their COM CENTER updated in the AMC system.

3.20 The transition from AFTN to AMHS requires an orderly operation of the AMHS on a global scale, it is also necessary to coordinate and synchronize the allocation of AMHS addresses. In response to this requirement, ICAO is utilizing the European ATS Messaging Management Centre (AMC), in cooperation with the European Organization for the Safety of Air Navigation (EUROCONTROL), which established the procedures for coordination and synchronization of AMHS addresses in the short-to medium-term.

3.21 The meeting recalled that a State Letter AN 7/49.1-09/34 was sent to States indicating the above agreement with EUROCONTROL, it also indicated that in order to use the AMC it is necessary for users to be trained before they are actually allowed to enter data in the AMC. In order to foster timely implementation of AMHS, ICAO MID Regional Office conducted a three days training in October 2009.

3.22 The ATN/IPS WG/3 meeting recalled MIDANPIRG/12 Conclusion *12/38: POSTING OF AMHS PLANS IN AMC*, in which as a follow-up to the conclusion, ICAO MID Regional Office, sent State Letter AN 7/5.1 – 11/016 dated 20 January 2011, requesting MID States to take necessary action to expedite the posting of their AMHS plans in the AMC and start using the AMC. It was noted that some MID States have not accessed the AMC application and no details are being posted or updated by these States.

3.23 The meeting noted that MID COM Centers participate in EUR-AMC as external COM operators that have access to some of the AMF-O functions, but they cannot use an important function like routing management which is currently available to EUR CCC operators. Therefore, during the second meeting of ATN/IPS WG, Jordan proposed to establish and host a MID AMC, by providing complete project along with hardware, software and the daily operation of the AMC, where it was agreed that ICAO MID Regional Office will provide the necessary support in the transfer of the AMC software from EUROCONTROL to the extent possible.

3.24 The meeting was apprised that MIDANPIRG/12 was in agreement that the manual "Maintenance of the Routing Directory" is becoming difficult and complicated and agreed that, ICAO MID Regional Office request EUROCONTROL to extend the Routing Table function provided by the AMC system to the MID Region.

3.25 Based on above, ICAO MID Regional Office sent an official letter requesting the provision of the routing function and additional functions to the MID Region. Accordingly, a meeting between EUROCONTROL and Jordan took place at EUROCONTROL Headquarters on 5 July 2011, during which the requirements for a Network Management Center for the MID Region, was discussed. The summary of discussion for the meeting is at **Appendix 3F** to the Report on Agenda Item 3. The summary identified three options for supporting the MID Region.

3.26 The meeting discussed in details the three options and was in total agreement with option C which is supporting the MID Region to develop its own AMC. In this regard, Jordan was requested to provide an official letter confirming their full commitment to the MID-AMC project.

3.27 Based on the above, the ATN/IPS WG/3 meeting agreed that following the receipt of the official commitment from Jordan, the ICAO MID Regional Office to request the needed support from EUROCONTROL. Accordingly, the meeting agreed to the following Draft Conclusion:

DRAFT CONCLUSION 4/5: SUPPORT FROM EUROCONTROL TO ESTABLISH MID AMC

That, ICAO MID Regional Office request EUROCONTROL's support for the establishment of MID AMC by providing needed documents, AMC operation training and other related issues.

3.28 Based on the above, and after receiving the commitment letter from Jordan ICAO MID Regional office requested EUROCONTROL to provide Jordan with the following in order to support the establishment of the MID AMC:

a) support / Interpretation of AMC Implementation Specification;
b) support for development of synchronization functions and procedures between the regions; and
c) provide advanced training to the MID AMC who will be like web administrator in addition they will also perform the management of data flow

3.29 EUROCONTROL had responded to the above request directly to Jordan as follows:

- EUROCONTROL support as described in the state letter mentioned above will be chargeable, as they expect to provide that support to a non-contracting state "Jordan" since its outside the EUROCONTROL states, so a contract should be signed between Jordan and EUROCONTROL.

- The first 2 points will costs 10K Euro (it needs 10 man days) and the training cost will be determined later, but as an indicator a man day in EC costs 650 Euro, so the training cost would depend on number of days and trainees.

- EUROCONTROL provides AMC service for the whole world on behalf of ICAO and they have an agreement with ICAO, so if this project "MID AMC" is an ICAO project and ICAO would pay for that cost NOT Jordan, then it's a different case and might cost less, the worst case would be that EC decide to charge ICAO and then ICAO refund them from Jordan.

- EUROCONTROL asked about some technical details, time frame for the project and about Jordan readiness to start the project.

3.30 Based on the above, the meeting appreciated the efforts of the ATN/IPS WG and thanked Jordan for taking the lead and agreed for providing all the support. Accordingly the meeting agreed to the following draft conclusion:

DRAFT CONCLUSION 4/6: SUPPORT TO MID-AMC

That, MID States and ICAO MID Regional Office commit fully to the MID AMC project and provide all necessary support to Jordan for the successful launch of the MID AMC.

3.31 With regard to the MID States AMHS administrators training, Jordan had confirmed that it will provide free training.

3.32 The meeting was updated on the AMHS test carried out between Bahrain and Singapore at 64K using public internet utilising the VPN technology, once tests are over the circuit will be put online using lease line.

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MID AMHS Implementation plan and guidance

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EXECUTIVE SUMMARY

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Amendment Record

Version	Change	Date	Page (s)
0.1	Initial Draft	30/7/2011	All

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References

Reference 1	Annex 10
Reference 2	Manual of Detailed Technical Specifications for ATN using ISO/OSI standards and Protocols Doc 9880
Reference 4	Manual on the ATN using IPS standards and protocols (Doc 9896 AN/469)
Reference 5	Middle East AFTN/CIDIN Routing Directory
Reference 6	ICAO Location Indicators – Document 7910
Reference 7	MID Air Navigation Plan and Facilities and Services Implementation Document (ANP-FASID – Doc. 9708)
Reference 8	ASIA/PAC Regional Aeronautical Telecommunication Network (ATN) Planning Documents
Reference 9	EUR AMHS Manual DOC 020 - 4th Edition - April 2009

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Abbreviations

The following abbreviations are used in this document:

ADMD	Administration Management Domain
AFTN	Aeronautical Fixed Telecommunication Network
AMHS	ATS Message Handling System
MIDANPIRG	Middle East Air Navigation Planning and Implementation Regional Group
ATN	Aeronautical Telecommunication Network
ATNTTF	ICAO ATN Transition Task Force
ATS	Air Traffic Service
ATSO	Air Traffic Service Organizations
ICAO	International Civil Aviation Organization
ITU-T	International Telecommunication Union Telecommunication Standardization Sector
MHS	Message Handling Service
MTA	Message Transfer Agent
MTCU	Message Transfer and Control Unit
MS	Message store
O/R	Originator/Recipient
PRMD	Private Management Domain
SARP	Standards and Recommended Practices
UA	ATS UserAgent

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Chapter 1

Introduction

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1.1 AFS

Annex 10 defines the aeronautical fixed service that shall comprise the following systems and applications that are used for ground ground (i.e. point-to-point and/or point-to-multipoint) communications in the international aeronautical telecommunication service:

a) ATS direct speech circuits and networks;

b) meteorological operational circuits, networks and broadcast systems;

c) the aeronautical fixed telecommunications network (AFTN);

d) the common ICAO data interchange network (CIDIN);

e) the air traffic services (ATS) message handling services;

f) the inter-centre communications (ICC).

1.1

1.1.1 The operational requirements for such an information exchange were met by the development of the Aeronautical Fixed Telecommunications Network. The AFTN provides a store-and-forward messaging service for the conveyance of text messages in ITA-2 or IA-5 format, using character-oriented procedures.

1.1.2 Although AFTN served its purpose well for many years, AFTN technology has become outdated due to the fact that is remains bound to its telex/telegraphic origins. One major step towards overcoming the limitations of the AFTN was taken with the introduction of the Common ICAO Data Interchange Network, which is based on packet switching techniques. The CIDIN provides a common transport service for the conveyance of binary or text application messages in an expeditious and reliable manner.

1.2 ATSMHS Overview

1.2.1 The ATN SARPs for the Air Traffic Services Message-Handling Service (ATSMHS) define the ICAO store and forward messaging service used to exchange ATS messages between users over the ATN internet.

1.2.2 The set of computing and communication resources implemented by Air Navigation Service Providers (ANSP) to provide the ATS Message Handling Service is commonly referred to as AMHS (ATS Message Handling System). The ATS Message Handling System SARPs are compliant with mature message handling systems standards such as ITU-T X.400.

1.2.3 ATSMHS End Systems:

Four End systems comprising ATSMHS system:

1. ATS Message User Agent: The component provides the user interface for message submission to the AMHS and message delivery from the AMHS. For the support of the extended ATSMHS, an ATS message user agent shall include a DUA.

AFTN/ CIDIN

2. ATS Message Server: The component accepts, relays and delivers messages in a store-and-forward fashion and serves attached ATS Message User Agents. An ATS message server shall include an MTA and optionally one or several MS, For the support of the extended ATSMHS, an ATS message server shall include a DUA.

3. AFTN/AMHS Gateway: The gateway serves as a bridge between the AFTN and AMHS by performing mutual conversions between AMHS and AFTN information objects.

1.2.4 Functional Objects

The systems comprising the AMHS shall themselves be comprised of the following functional objects**:**

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a) Message Transfer Agent(s) (MTA); which performs the function of the message switch.

b) User Agent(s) (UA); which performs the user access to the MTA and provides an appropriate user interface.

c) Message Store(s) (MS); which provides the intermediary storage between MTA and UA and is usually co-located with the MTA.

d) Access Unit(s) (AU); which provides for intercommunication with other Messaging Systems.

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Chapter 2

Topology & Routing strategy

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INTRODUCTION

This chapter presents a plan on the ATN ground activities applicable to the ICAO MID Region. It provides also information on the ground infrastructures required to support the ATN and to take into consideration progressively the ATN air-to-ground requirements of the Region.

2.1 The current ground infrastructure

2.1.1 The present ground-ground data communications system in the Middle Region comprises AFTN circuits and centers (tributary and main) that allow the exchange of ATS and other operational messages.

2.1.2 Five States of the Region already implemented the Common ICAO Data Interchange Network (CIDIN) as an upgrade of the low speed AFTN circuits to improve the efficiency and reliability of message exchange. These CIDIN circuits are operating at 9600Bps and the remaining circuits at 50 Bps to 300 Bps, using asynchronous protocols.

2.1.3 The detail of international circuits operating within the Region and between neighboring regions. is documented in Table CNS 1A of the ICAO MID CNS Facilities and Services Implementation Document (FASID), and provided by AMC.

2.1.4 The current AFTN topology in the Region shows that the majority of circuits will not be suitable to be used for the ATN without some form of upgrade. In later stage, it will be necessary to identify those circuits that need to be upgraded in both bandwidth and protocols.

2.1.5 With regard to bandwidth requirements, it is assumed that 64Kbps or higher shall be used for Intra-regional connections while 64Kbps (based on agreement with other regions) or higher speed could be preferred for Inter-Regional connections when full ATN is implemented.

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2.1.6 To run AMHS over extended service level for example exchange of file transfer body part (FTBP), the bandwidth should be at least 128 Kbps.

2.1.7 It is important to note that some States have already started the establishment of a communication infrastructure that would serve the AMHS. There have been implementations of high speed point-to-point digital links operating at 64KBPS and carrying voice and data traffic.

2.1.7 In respect to the upgrade of protocols, it is expected that they will be implemented on a bilateral arrangements between States according to the preferred protocols: prefaraberly TCP/IP V.6. Frame Relay or Asynchronous Transfer Mode (ATM) or any other protocol that will be included in the ICAO Standards in future.

2.1.8 Its important for the Gateway centers of the MID Region to use IPV6 with adjacent Region or have the capability to interoperable with IPV6.

2.1.9 It can happen that due to different planning activities, by States, not all States within the MID Region will be migrating to the AMHS at the same time. Therefore, there will be a need to maintain the existing AFTN circuits as well as a provision for an AMHS/AFTN Gateway; to operate in parallel with any new implementation of high-speed links to meet ATN requirements and could migrate the AFTN.

2.1.10 With the introduction of AMHS as the replacement for AFTN/CIDIN, a number of AFTN circuit links between centers will need to be upgraded to cater for the increase of traffic load generated by AMHS overheads. Analysis carried out in other Regions showed that there will be significant overheads generated by AMHS for a typical message of about 250 bytes. As the message size increases the amount of overheads

generated becomes less significant to the size of the body of the message. In transitioning from AFTN/CIDIN to AMHS, States will have to anticipate this increase in bandwidth to accommodate AMHS traffic so as to maintain current or better performance of traffic delivery.

2.1.10 States will need to ensure that not only are the links that are established between States are capable of transferring data in a timely manner but also for those links that provide an alternate path for the applications to use in times of disruption to the primary links.

2.2 Target AMHS Topology

There are many possibilities how to interconnect a given set of nodes, The fully meshed topology can fulfill the maximum performance, various network topologies can be implemented among them is establishment of fully meshed Regional IP network (MENS) that each COM center is adjacent to other COM center by means of IP connection, ATN/IPS WG members tasked to study different solutions.

- To be developed in next IPS WG meeting -

2.3 AMHS Routing

Routing to a destination which is adjacent to the source is referred to as direct routing. Routing to a more distant destination is called indirect routing.

2.3.1 Static and dynamic routing

Static routing is based on fixed paths across a given topology; in the event of topology changes pre-defined, alternative paths may be used. In contrast, with adaptive or dynamic routing, routing paths are updated by means of an algorithm when the topology or traffic load distribution change.

The current AMHS routing is static routing, the deploying of dynamic routing in the transition period will cause a lot of routing problem issues as it would create a lot of asymmetric routes which have an impact on the network reliability.

The Dynamic Routing should be deployed after the fully migration toward AMHS, however the legacy End systems in place that considered as indirect ATS users as well as AFTN existence in some MID COM center and absence of AMHS limit the fully migration.

The dynamic routing can be deployed at the network layer level, which can forms a fully meshed logical network topology and fulfill maximum performance.

For failure notification in case of dynamic routing usage, there are many methods can report the failure to the operators, however, a trial should be conducted in near future to find out the best solution and method.

2.3.2 **The nature of MHS (AMHS) routing**

Message Handling Systems transfer messages between users (UAs) in a store-and-forward manner. A message submitted by the originator will be transferred through one or more MTAs and delivered to one or more recipients (UAs). The originator does not specify the route (i.e. the MTAs to be passed) but identifies a recipient by means of its OR-address (or directory name). It is the responsibility of each routing MTA to determine the next MTA to which the message should be transferred to progress its journey to its recipient(s).

The connections between MTAs are, from the MHS point of view, realised by pair-wise established application associations. We can also interpret such an association between a pair of MTAs as "logical link" as an established association is not of physical nature.

2.3.3 Interrelations with underlying network services

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In implementations, logical links (or associations) make use of underlying network services offered by an appropriate network infrastructure.

1) A meshed MHS network (topology) allows alternate MHS routing paths between an originating UA and a recipient´s UA by passing alternate MTAs and logical links;

2) a meshed Internet allows alternate network paths between a pair of MTAs by using alternate routers and subnetworks; and

3) general-topology sub networks allow alternate sub network paths between given pairs of routers by using alternate switching nodes and physical links.

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Chapter 3

Addressing and Naming Plan

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3.1 Introduction

This chapter provides technical guidance on the addressing and naming convention for the transition of ground Aeronautical Fixed Telecommunication Network (AFTN) services to the ATS Message Handling System (AMHS) within the MID region.

An extract of the AMHS Register from the main ICAO register for the MID States is provided in this part for planning and implementation.

This document presents the naming assignment conventions for allocating Originator/Recipient (O/R) names to be used for the ATS Message Handling System (AMHS) in the MID Region.

The scope of this chapter includes:

- Describing the attributes of the AMHS address format, and
- Recommending the values for the relevant attributes that are to be used in the AMHS address.

The MID Regional AMHS naming convention presented here will comply with the relevant formats as specified in ICAO Doc. 9880 (Reference 2). The MID Regional ATN AMHS Naming Plan defines the method for assigning values to each of the relevant attributes of the AMHS address. States within the Region may choose to assign their AMHS addresses based upon the recommendations found here.

3.1-1 MF-Addressing Format

ICAO Document 9880 (Reference 2) states that the AMHS shall be organizationally composed of AMHS Management Domains. These AMHS Management Domains may elect to operate as either an Administration Management Domain (ADMD) or a Private Management domain (PRMD), depending on the national telecommunications regulation

in force in the country where it operates and on its relationships with other Management Domains.

Each AMHS user within an AMHS Management Domain is assigned an originator/Recipient (O/R) name, which is also referred to as a MHS-form address (MF-address). The attributes of a MF-address Shall comprise an AMHS management domain identifier (which known as a high level addressing) and low level attributes either XF or CAAS scheme.

An AMHS management domain identifier shall be unique and declared to ICAO for insertion in the ICAO Register of AMHS Management Domains, by the State or organization in which the management domain operates.

The ICAO Register of AMHS Management Domains shall include at least one record, for each ICAO State, composed of the attribute-values (C=XX/ A=ICAO/ P= "Two nationality letters of a state") to be used in case no other AMHS management domain identifier has been declared by the State.

The attributes of an AMHS management domain identifier are described in the table below.

Table 2.1-1 AMHS Management Domain Identifier Attributes

Attribute	**Notation**	**Value**
Country-name	C	XX
Administrative Domain Name (ADMD)	A	ICAO
Private Domain name (PRMD)	P	

3.1-2MF-Addressing Scheme

An AMHS management domain should avoid deviating from the common AMHS addressing scheme and refrain from implementing a locally defined AMHS addressing

scheme unless specific unavoidable constraints (e.g. regulatory) apply to the AMHS management domain.

The ATN SARPs have defined two addressing schemes format.

3.3.1 XF Addressing Scheme (translated Form Address) ICAO Document 9880 (Reference 2) stipulates that the XF-address of a direct or indirect AMHS user shall be composed exclusively of the following:

A) An AMHS Management Domain,
B) An Organization-name Attribute (O):
   Taking the four-character value "AFTN"
C) An Organizational-unit-name Attribute (OU): comprising a sequence of one single element, which takes the 8-character alphabetical value of the AF-address (AFTN-form address) of the user.

Attribute	**Notation**	**Value**
Country-name	C	XX
Administrative Domain Name (ADMD)	A	ICAO
Private Domain name (PRMD)	P	ATSO registered private domain
Organization-name Attribute	O	AFTN
Organizational-unit-name	OU	8-letters AFTN address

The XF-Address format is assigned by default to all states that have not yet implemented AMHS. A state wish to change the PRMD should follow the procedure for major change described in ATS messaging Management center manual , EUR ICAO doc 021.

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3.1-3 *Common AMHS Addressing Scheme* **(CAAS)**

Common AMHS addressing scheme shall be composed exclusively of:

1) an AMHS management domain identifier.

2) an *organization-name (O)* attribute taking a value representing a geographical unit.

3) An organizational-unit-names (OU) attribute comprising a sequence of a single element which takes the four-character alphabetical value of the location indicator included in the AF-address of the user.

4) a *common-name* attribute **(CN)** which takes the eight-character alphabetical value of the AF-address of the user

Attribute	**Notation**	**Assign By**	**Value**
Country-name	C	ITU-T	XX
Administrative Domain Name (ADMD)	A	ICAO	ICAO
Private Domain name (PRMD)	P	ATSO	ATSO registered private domain
Organization-name Attribute	O	ATSO	A value representing a geographical unit, usually its value is the FIR(s) of a

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			states
Organizational-unit-name	OU	ATSO	four-character alphabetical value of the location indicator included in the AF-address of the user.
Common Name	CN	ATSO	8-letters AFTN address

Its stressed that if States have not already started their implementation programs for AMHS that when planning to do so that they should adopt the MF-Address format over the XF-Address format.

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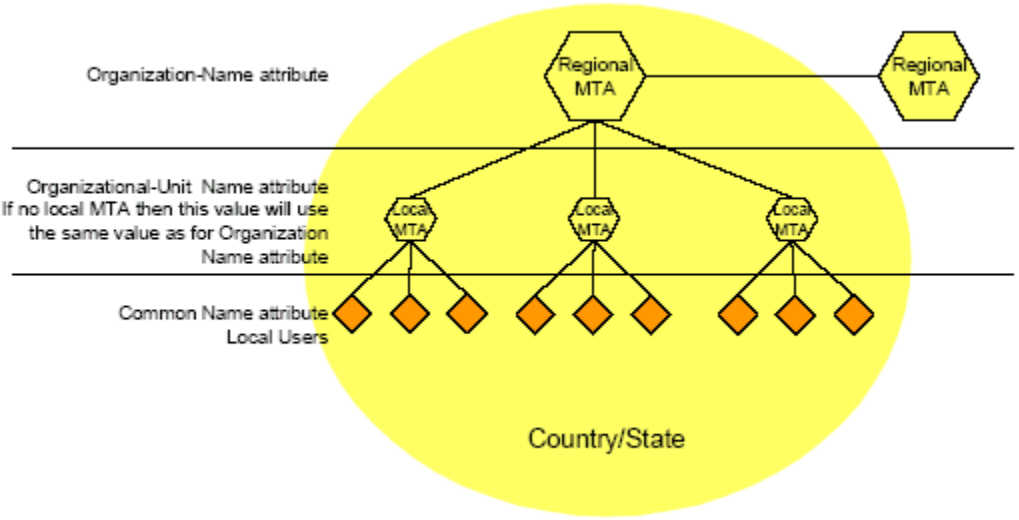

A complete list of attributes with different information concerning on the maximum length and type of allowed characters for each attribute type is provided in the following Table:

O/R address Attributes	**Max Length**
Country name	2 alpha or 3 numeric
ADMD name	24 PrintableString
PRMD name	24 PrintableString
Organisation name	64 PrintableString
Organisational unit name	32 PrintableString
Common name	64 PrintableString

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MID Region AMHS addresses

State		ATS Address					
State Name	**Nationality Letters or Designator**	**C**	**A**DMD	**PRMD**	**Addressing scheme**	**OU (for CAAS only)**	**Comments**
Bahrain	OB	XX	ICAO	OB	CAAS	see Table OB	confirmed by SL
Egypt	HE	XX	ICAO	HE	CAAS	HECA	confirmed by SL
Iran	OI	XX	ICAO	OI	XF		confirmed by SL
Iraq	OR	XX	ICAO	OR	XF		
Jordan	OJ	XX	ICAO	OJ	CAAS	OJAC	confirmed by SL
Kuwait	OK	XX	ICAO	OK	XF		
Lebanon	OL	XX	ICAO	OL	XF		
Oman	OO	XX	ICAO	OO	XF		
Qatar	OT	XX	ICAO	OT	XF		
Saudi Arabia	OE	XX	ICAO	Saudi Arabia	CAAS	OEJN	confirmed by SL
Syrian Arab Republic	OS	XX	ICAO	OS	XF		
UAE	OM	XX	ICAO	UAE	CAAS	OMAE	confirmed by SL
Yemen	OY	XX	ICAO	OY	XF		

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3.2 AMHS naming scheme

The ATN directory service (ATN DIR) application allows ATN users to obtain directory information about ATN users, applications and services participating in the ATN. The ATN DIR is composed of three parts: a directory information base, directory system agents (DSAs) and directory user agents (DUAs).

Currently the ATS Messaging Management Centre (AMC) provides limited, offline directory services with cyclic publications in support of ATS messaging. ICAO Doc 9880 specifies online directory services based on the X.500 Directory model.

For the support of the extended ATSMHS, the directory name of an AMHS user shall comply with the provisions of Part IV of ICAO doc 9880.

- *To be developed* -

MID AHMS Implementation

Com Center	Instal lation	Oper ation	MTA Name	AFTN/ AMHS GY	ATS UA	ATS service level	Protocol (IPS, ATN)	Remarks
Bahrain	**2008**	**-**	**MTA-OBBI-1**	**Y**	**Y**	**Extended**	**Dual Stack**	**Support IPv4 only**
Egypt	**2008**	**2010**	**MTA-HECA-1**	**Y**	**N**	**Extended**	**Dual Stack**	**Support IPv4 only**
Iran	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Iraq	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Jordan	**2008**	**2010**	**MTA-OJAM-1**	**Y**	**Y**	**Extended**	**Dual Stack**	**Support IPv4 only**
Kuwait		**-**	**MTA-OK-1**	**Y**	**Y**	**Extended**		**Support IPv4 only**
Lebanon	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

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Oman	**2008**	**2009**	**MTA-OOMS-1**	**Y**	**Y**	**Extended**		**Support IPv4 only**
Qatar		**-**	**MTA-OTBD-1**	**Y**	**Y**			**Support IPv4 only**
Saudi	**2008**	**2010**	**MTA-OEJN-1**	**Y**	**Y**	**Extended**	**Dual Stack**	**Support IPv4 only**
Syria	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
UAE	**2006**	**2009**	**MTA-OMEA-1**	**Y**	**Y**	**Basic**		**Support IPv4 only**
Yemen	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

CHAPTER FOUR

Testing Strategy

4.1 Introduction

MID region adopted European AMHS testing strategy, to ensure common interpretation of the SARPs and reduce the changes of implementation, European Experience has shown that, although it is claimed that systems have been implemented according to the one set of protocol specifications, they are often not capable of inter-working. This is due to errors in implementation or to different interpretations of the specifications(SARPs). Testing and validation of systems according to the same set of principles aims at the detection of such errors and the prevention of incompatibility instances.

4.2AMHS testing Phases:

4.2.1 AMHS Conformance testing:

Conformance testing is recommended and can be performed in parallel with or after the acceptance testing of a new system, the main AMHS functional areas covered by conformance testing are:

- Transfer of messages probes and reports.
- Submission of messages and probes/ delivery of messages and reports
- Intercommunication with AFTN.
- Naming and addressing
- System Management functions

The Conformance testing methodologies, configurations and procedures are defined in Appendix D of EUR DOC 020 (AMHS Manual).

4.2.2 Underlying Network Testing.

Before starting doing testing with adjacent center, its recommended to test the infrastructure network, assigning IP address, take all security measure, permit access via port 102 only.

4.2.3 AMHS Interoperability testing:

Interoperability testing considered Mandatory testing in order to ensure the end-to-end interoperability between AMHS systems under test. First step to this testing the interconnection between pairs of systems should be established and checked. AT bilateral level, the following functional area should be covered:

- Submission, Transfer and delivery operation (AMHS to AMHS)
- Gateway operations (AFTN to AMHS, AMHS to AFTN and AFTN to AMHS to AFTN)
- Stress traffic situations
- Submission /Transfer/Delivery and relay operations.

The Interoperability testing methodologies, configurations and procedures are defined in Appendix E of EUR DOC 020 (AMHS Manual).

Additional functions can tested with trilateral test.
Configuration and report templates are at Appendix A of this doc.

4.2.4 AMHS Pre-operational testing:

Pre-operational testing should be carried out between the AMHS systems concerned before going into operation. The objectives of the AMHS Pre-operational Tests are:

1. To test the interoperability between the AMHS systems in an operational environment.

2. To test the integrity of the messages exchanged.

3. To test the message exchange after a disturbance (e.g. queued messages).

The messages used in the AMHS Pre-operational Tests are generated either:

- Manually; or
- using parallel duplicated traffic;

The preoperational testing methodologies, configurations and procedures are defined in Appendix F of EUR DOC 020 (AMHS Manual).

Configuration and report templates are at Appendix B of this doc.

Chapter 5

Underlying Network

5.1 Background

The designers of OSI assumed that this model (and the protocols developed within the framework of this model) would come to dominate computer communications, eventually replacing proprietary protocol implementations and rival multi-vendor models as the Internet Protocol Suite (IPS).This has not happened. Although many useful protocols have been developed in the context of OSI, the overall seven-layer model has not flourished. Instead, the IPS architecture has become dominate. There are a number of reasons for this outcome. Perhaps the most important is that the key IPS protocols were mature and well tested at a time when similar OSI protocols were in the development stage. Another reason is that the OSI model is unnecessarily complex.

At the time of starting the ATN specifications in the early 90ties, there was a common believe that the OSI model would become the ultimate standard for data communication. In this view, the high level technical requirement was set up that the ATN shall use ISO communication standards

5.2 OSI/ISO Standard

MID Region states agreed to deploy ATN/IPS as a standard network in the region, and in order to ensure interoperability with Adjacent Region, its recommended that all centres have connection with ICAO Region utilising ATN/OSI, should have the capability to use this protocol.

5.2.1 NSAP Addressing Plan

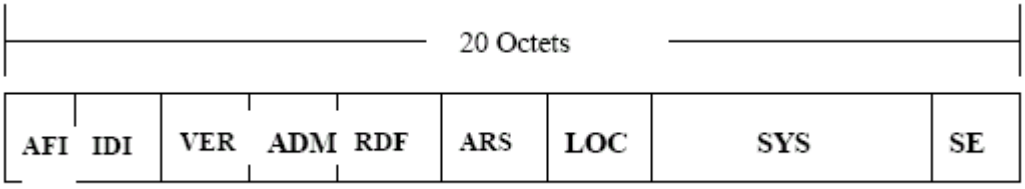
To find a suitable ATN addressing convention that would be acceptable for use in the MID region requires a routing architecture that minimizes routing updates and over heads within the ground ATN infrastructure for both ground-ground and air-ground services and applications.

The ATN addressing convention must allow for an addressing scheme that is:

- Practical - to provide autonomous administration of ATN addresses for States and Organizations, and
- Flexible - to allow for future expansion and/or routing re-configuration of the ground ATN infrastructure with minimal re-assigning of ATN addresses.

5.2.1.1 NSAP Address Format

The structure of the Network Service Access Point (NSAP) address is depicted in Figure 5.



The NSAP address structure contains 9 fields, which are described in the Table below.

Field Name	Field Description	Size	Syntax	Number of Characters/ Digits	Field Encoding
AFI	Authority and format Identifier	1 Octet	Decimal	2 Digits	BDC
IDI	Initial domain Identifier	2 Octets	Decimal	4 Digits	BCD
VER	Version	1 Octet	Hex	2 Digits	Binary
ADM	Administration Identifier	3 Octets	Alpha or Hex/Alpha	3 Characters 2 Digits/ 2 Characters	IA-5 Binary/ IA-5
RDF	Routing Domain Format	1 Octet	Hex	2 Digits	Binary
ARS	Administration Region Selector	3 Octets	Hex	6 Digits	Binary
LOC	Location	2 Octets	Hex	4 Digits	Binary
SYS	System Identifier	6 Octets	Hex	12 Digits	Binary
SEL	NSAP Selector	1 Octet	Hex	2 Digits	Binary

5.2.1.2 The AFI and IDI Fields

The ATN Internet SARPs (Reference 1) require allocation of the following values:

- Decimal for the AFI field to indicate the type of NSAP being used. This value has been assigned the character sequence “47”.
- Decimal for the IDI field to designate ICAO. This value has been assigned the character sequence “0027”.

As recommended in Reference 1, ATN NSAP addresses and NETs will be written as the character sequence “470027+” where the “+” is used to separate the Binary Coded Decimal (BCD) fields from subsequent Hexadecimal fields.

Hence the AFI and IDI fields will be set to 470027 for fixed ATSC systems/domains and for mobile ATSC systems/domains.

5.2.1.3 The VER Field

The VER field is used to partition the ATN Network Addressing domain into a number of sub-ordinate Addressing Domains.

The values currently specified in Reference 1 for the VER field are summarized in Table

3.2-1.

VER Field Value	**Network Addressing Domain**	**Common NSAP Address Prefix for Domain**	**Value to be used by States of MID region**
[0000 0001]	Fixed AINSC	470027+01	
[0100 0001]	Mobile AINSC	470027+41	
[1000 0001]	Fixed ATSC	470027+81	470027+81 (ATSO Iss and Ess)
[1100 0001]	Mobile ATSC	470027+C1	470027+C1 (General Aviation)

5.2.1.4 The ADM Field

The ADM field is used to further partition the ATN Network Addressing Domain. The field designates a single State or Organization. Depending on what the VER field is set to will determine what values should be used in the ADM field.

When the VER field is set to “81” (Fixed ATSC), the ATN SARPs permits two possible ways for encoding the ADM field.

The first method recommends that the State’s three character alphanumeric ISO country code is used, as defined in ISO 3166. States may choose this method, however it will provide less flexibility than the second method for the addressing of regional entities (e.g. regional RDCs or regional organizations that are not country specific).

The second method that is recommended for use in the MID region is to use the first octet of the field to define the ICAO region. This would permit the reduction of the routing information that would otherwise be generated. It is recommended that the remaining two octets of the field will further identify the country, RDCs and the regional organizations that are not country specific as follows:

- For the identification of a country, it is recommended that States use the ICAO two letter location indicator (Reference 6) instead of the two character alphanumeric ISO 3166 country code. The structure of the ICAO two letter location indicator allows for a more efficient identification of a location. For example, indicators starting with the same letter "O" designate several countries in the same local region (e.g. Jordan, Saudi, UAE, Kuwait etc.). The second letter will actually define the specific country within this local region (e.g. "OJ" for Jordan, "OE" for Saudi Arabia etc.).

- For regional organizations that are not country specific, it is recommended to allocate a lower case alphanumeric value so as there will be no conflict with the ICAO two letter location indicators.

- For the addressing of RDCs (e.g. Island RDCs, Backbone RDCs), in particular for those that are not country specific, it is recommended to allocate codes with the most significant bit set to 1 in the second octet. Valid values would be in the hexadecimal range [8000 – FFFF].

ICAO MID Regional group would be the allocation authority of the ADM field.

Fixed or Mobile MID ATSC Addressing Domain	**Hexadecimal Code of the ADM Field**	**Comment**
Bahrain	844F42	MID Region + 'OB'
Egypt	844845	MID Region + 'HE'
Iran	844F49	MID Region + 'OI'
Jordan	844F4A	MID Region + 'OJ'
Kuwait	844F4B	MID Region + 'OK'
Lebanon	844F4C	MID Region + 'OL'
Oman	844F4F	MID Region + 'OO'
Saudi Arabia	844F45	MID Region + 'OE'
UAE	844F4D	MID Region + 'OM'

MID Region Entities

5.2.1.5 The RDF Field

The RDF field is historical and is not used. Therefore the RDF field shall be set to [0000 0000].

5.2.1.6 The ARS Field

The ARS field is used to:

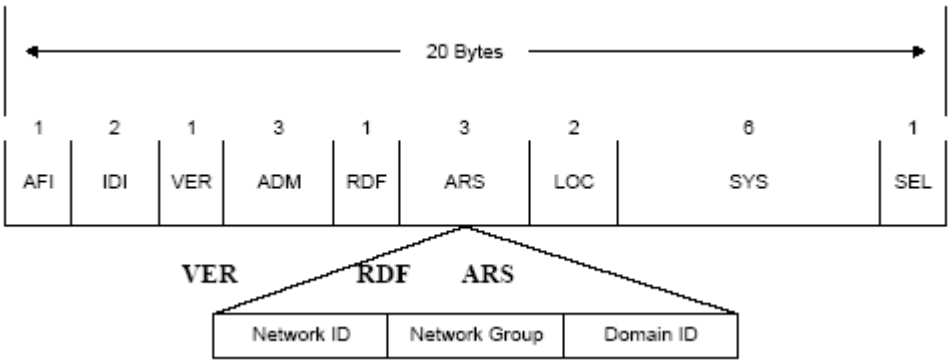
- Distinguish Routing Domains operated by the same State or Organization (in Fixed Network Addressing domains); and

- Identify the aircraft on which the addressed system is located (in Mobile Network Addressing Domains).

Each State or Organization identified in the ADM field will be responsible for assigning the values for the ARS field.

In accordance with the SARPs, for a Mobile Network Addressing Domain, the 24-bit ICAO Aircraft Identifier is inserted in the ARS field. However, no specific values have been specified for Fixed Network Addressing Domains.

The ARS field shall be assigned in a manner that simplifies the routing of data and makes provision for any potential lower level organizational units that could, in the future, operate an ATN Routing Domain.



Proposed ARS Field Format

5.2.1.5.1 Network ID

Potential future operators of an ATN Routing Domain could be:

- A national Air Traffic Service Organization(s) (ATSO);
- A national military organization;
- A national meteorological organization; and
- An airport operator.

At present it is assumed that military organizations and meteorological organizations will not start up their own ATN Routing Domains and will be located within a national ATSO ATN Routing Domain. The same may apply to airport operators.

However in planning for the long term it is deemed necessary that provision is made available for these future possibilities.

In allowing for this possible expansion, it is recommended that the different ranges of values for the Network ID subfield be allocated to the different national organizations as follows:

- Hexadecimal values [00 – 1F] of the first octet of the ARS field be reserved for the addressing of domains and systems operated by the national ATSO.
- Hexadecimal values [20 – 3F] of the first octet of the ARS field be reserved for the addressing of domains and systems operated by the national military organization.
- Hexadecimal values [40 – 5F] of the first octet of the ARS field be reserved for the addressing of domains and systems operated by the national airport operators. (Note: this range matches the ASCII range of alphabetical upper case characters).
- Hexadecimal values [60 – 7F] of the first octet of the ARS field is reserved for the addressing of domains and systems operated by the national meteorological organization.
- Hexadecimal values [80 – FF] are reserved.

A national organization would then be able to register one or several values for the Network ID subfield within the range that has been reserved for its organization category.

In addition to the Network ID subfield being used for distinguishing the different national organizations, it is proposed that this subfield also be used for the identification of the particular role of the addressed domain. For example, setting the Network ID subfield to the hexadecimal value "01" would represent the set of operational Routing Domains of the national ATSO. Setting the Network ID subfield to hexadecimal "11" would represent the set of non-operational Routing Domains of the national ATSO. In using the Network ID subfield in this manner, allows national ATSOs to provide for a duplicate non-operational network to be used for trials and pre-operational testing. Similar arrangements could be used for the other national organizations.

- **NETWORK GROUP ID**

This subfield can be used to subdivide a ground ATN network into smaller groups. This field is unique within a particular network. This may be useful for future expansion by allowing regions to be formed within a particular network as defined by the Network ID. The formation of regions may be useful in helping contain the routing traffic exchanged within the network.

This subfield is also used to designate an RDC. RDCs can also be used to assist in the formation of regions within an Administrative Domain and they offer an additional level of flexibility when used to combine RDs into a confederation. RDCs are designated by setting the uppermost bit of this subfield to "1".

- **Domain ID**

This subfield is a unique identifier assigned to each Routing Domain in the Network Group.

3.5.4 Addressing RDCs in the ARS field

The Network Group ID subfield is used to segregate the addressing space of actual RDs and RDCs. When the uppermost bit of the Network Group ID subfield is set to "1" the second and third octets of the ARS field are assigned from the RDC addressing space (i.e., 8000-FFFF) and must be unique within that addressing domain. Otherwise, the subfields are assigned from the NSAP Address Space as described above for the Network Group ID and Domain ID subfields.

Similar principles as explained in sections 3.5.2 and 3.5.3 for the addressing of RDs can be applied to the addressing of RDCs, as required:

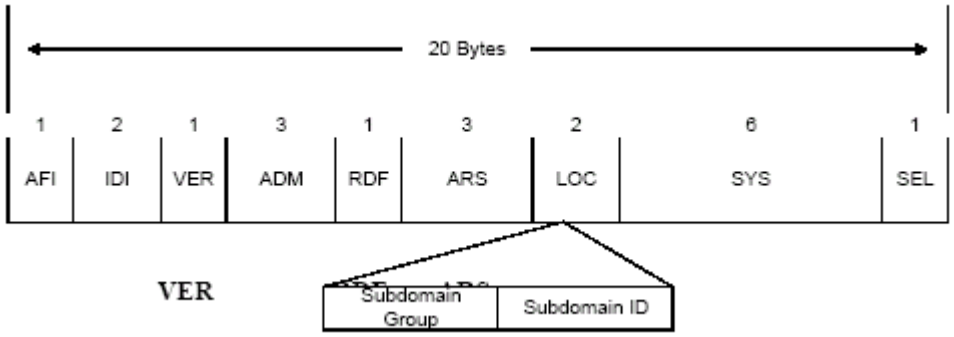
- The second octet of the ARD field may identify a group of RDCs.
- The third octet of the ARS field identifies RDCs.
    - **The LOC Field**

The LOC field is used to:

- Distinguish Routing Areas within Fixed Routing Domains, identified by the ARS field; and
- Distinguish Routing Areas and Routing domains within aircraft identified by the ARS field.

The assignment of the LOC field value is the responsibility of the State or organization that is the addressing authority for the routing domain in which the identified routing area is contained.

To assist States or organizations, it is recommended that the LOC field be decomposed into two subfields as shown in Figure 3.6-1: Subdomain Group ID and Subdomain ID.

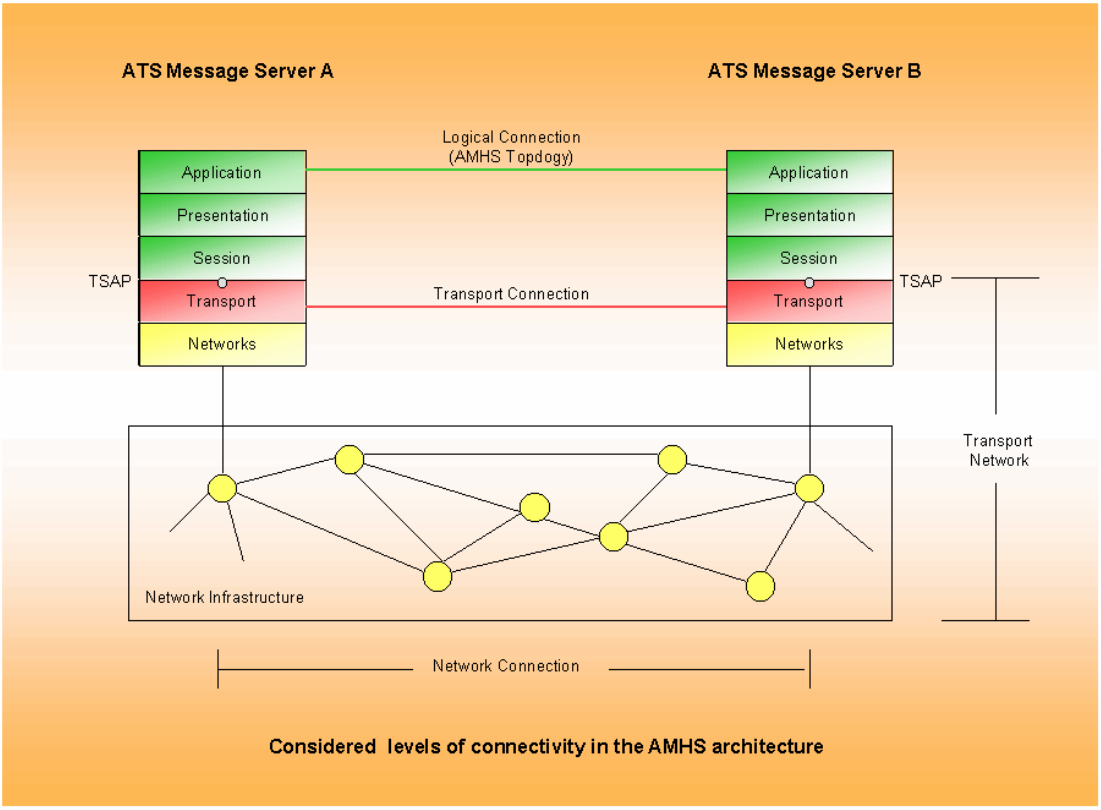


5.3 ATN using IPS standard:

The Internet Protocol suite (IPS) is made of four layers: media access, network, transport and application. There are three major physical components of the ATN/IPS: IPS host, IPS router and interconnecting sub networks.

5.3.1 Overview

The logical connection (links) of the AMHS topology implemented by means of a transport service could make use of the physical connectivity provided by a layer-3 network infrastructure.



5.3.2 IPV6 internetworking

The Internet Protocol (IP) is an unreliable and connectionless protocol that is performed across various technologies of subnetworks. ATN/IPS makes use of IP version 6 (IPv6) (RFC 2640). In comparison with the preceding IPv4, the IP address space has been expanded and more flexibility is provided with additional features.

Mobile (airborne) nodes in the ATN/IPS shall implement Mobile IPv6 (RFC 3775) that allows IPS host to move in the internet from one network to another. Mobile host has two IP addresses , its original address, called home address and a temporary address, called the care-of address.

5.3.3. Interior and exterior routing

To provide sufficient flexibility for the establishment of routing policy in large TCP/IP environment, the Internet is divided into autonomous systems (AS), AS are uniquely identified by AS numbers in Doc 9896, Table 1-1 show the AS number of countries in MID region:

Country	AS Number	Country	AS Number
Bahrain	64590	Lebanon	64596
Egypt	64559	Oman	65256
Iran, Islamic Republic of	64582	Qatar	65269
Iraq	64583	Saudi Arabia	65278
Israel	64584	Syria	65290
Jordan	64588	United Arab Emirates	65299
Kuwait	64593	Yemen	65309

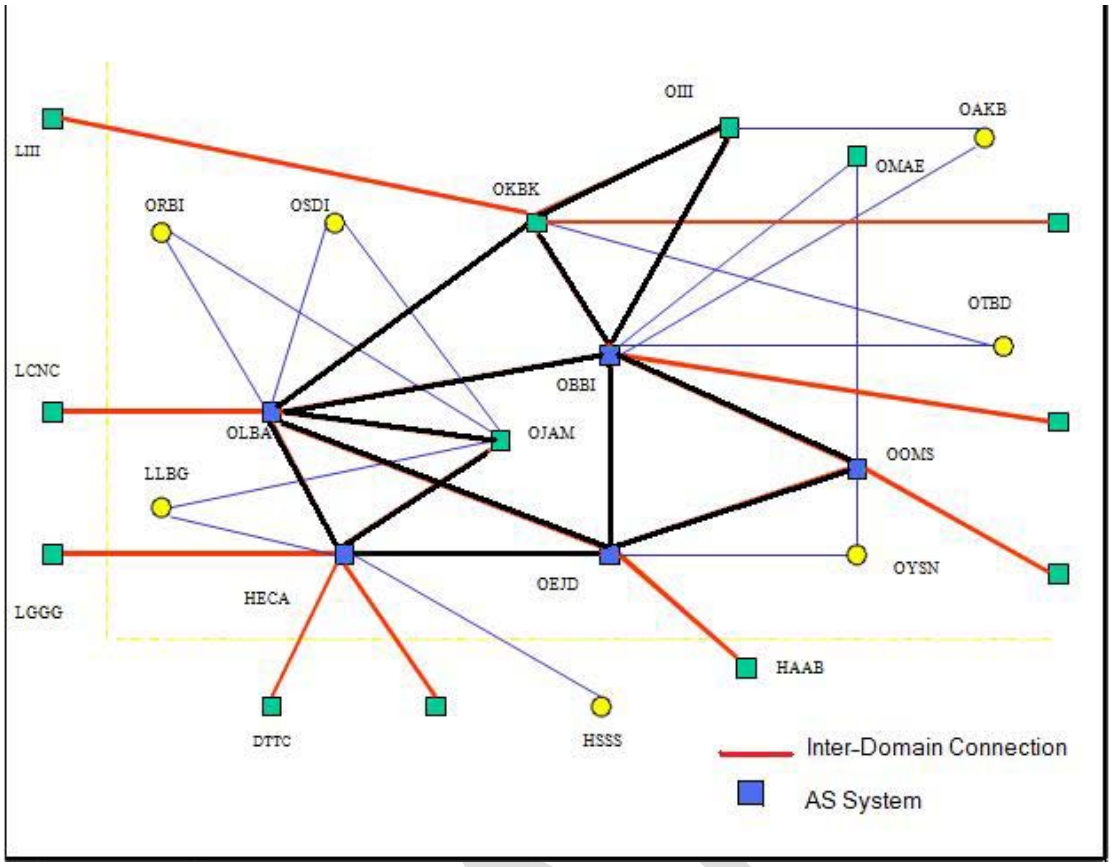
Table 1-1

Mid Region Main centers shall use dual stack IPS router which support IPv6 and IPv4 , IPS routers which support inter-domain dynamic routing shall implement the Border Gateway Protocol (BGP-4), and Static routes can be used with point-to-point Intra-domain connection or RIP routing protocol.

5.3.4 Border Gateway Protocol (BGP)

The Border Gateway protocol is the de facto standard exterior routing protocol in Internet, which allows routers in different Ass to cooperate in the exchange of routing information by means of message which are sent over TCP connections.

The BGP-4 algorithm has been expanded to solve the "multi-homing" issue of an AS, that means an AS can have multiple network interfaces so that the connectivity between Ass becomes fault-tolerant incase of network failure.



5.3.5 Transport Protocols

IPS host shall implement the Transmission Control Protocol (TCP) and the User Datagram Protocol (UDP), Furthermore ATN/IPS hosts are required to supporting the following registered port numbers:

- tcp 102 for ATSMHS

5.3.6 Transition Activities:

- Implementation of IPS Router that support IPv4 and IPv6 .
- Upgrade all systems to support IPv6.
- Implementation of Network Transition Mechanism.

5.3.7 Network Transition Mechanism

Three transitions mechanisms can assist countries to deploy the ATN IPS in a heterogeneous environment:

- Tunnelling: IPv6 has been specified to operate over a variety of lower layer interfaces such as Frame Relay, ATM, HDLC, PPP and LAN technologies. Tunnelling implies that a given protocol is encapsulated into another, meaning that IPv6 would be encapsulated into another functionally equivalent network protocol.
- Dual stack: The dual stack mechanism implies that an implementation handles more than one communications protocol for a given application or function by supporting both IPv4 and IPv6 protocols.
- Translation: Translation mechanisms imply the conversion from one protocol to another. Network Address Translation Protocol Translation (NAT-PT), have been developed in the context of the transition from IPv4 to IPv6 as both versions share a number of common features.

Appendix A

Example of Interoperability Test

Configuration and report Templates

AMHS Interoperability Tests
Jordan - United Arab Emirates

Configuration

CARC

GCAA

Document ID	:	**AMHS_INTEROP_CONF_JO-UAE_001**
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Change History

Version	Change	Date	Page(s)
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0.2	IP address and tsel of the UAE system updated, Agreement upon real addresses	2010-02-04	all
0.3	Section 3.6.6 TCP parameters appended	2010-02-12	12
0.4	Release of AFTN/AMHS software of IUT-A Updated	2010-02-15	7
0.5	Information provided by GCAA/COMSOFT, Mr. G. Szabados-Hann incorporated, Sections 2.1, 2.2, Table 2-1, Table 3-7, Table 3-8, Table 3-13 updated	2010-02-17	all
0.6	Isode Release updated, Table 3-7 updated	2010-02-20	7 10
0.7	Reference /2/ updated	2010-02-28	5
0.8	Section 2.3 Network Infrastructure added	2010-04-08	8
0.9	Phrase from section 3.6.6 removed, Section 1.2 updated	2010-04-22	12 5
1.0	Final version	2010-04-26	all

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1 INTRODUCTION

1.1 Purpose and Scope

This document contains a description of the configuration for bilateral AMHS Interoperability Tests according to /1/ between the AFTN/AMHS operational switch of the Jordanian CARC and the AFTN/AMHS test system of the General Civil Aviation Agency (GCAA) of the United Arab Emirates (UAE).

In /1/ the two systems under test are named IUT-A and IUT-B. It is agreed between both test partners that

- **IUT-A is the Jordanian system**, and
- **IUT-B is the system of the U.A.E..**

The setup of the test systems will be as depicted in /1/, section 2.1, figure 1. Additional AMHS User Agents and/or AFTN User Terminals may be provided on either side.

Wherever possible, the parameters defined in /1/ are used. Additionally, configuration parameters to achieve connectivity on the network, transport, session and application layer are defined. Both partners agree to use real addresses, MTA names, passwords instead of those including the placeholders IUTA, IUTB.

1.2 Referenced Documents

Reference	Title, Document No.	Date of Issue
/1/	ICAO EUR Doc 020 – EUR AMHS Manual, Version 4.0, Appendix E	2009-04-02
/2/	AMHS Interoperability Tests Jordan – United Arab Emirates, Test Report	2010-04-26

1.3 Abbreviations

ACC	Area Control Centre
ADAMS	Aeronautical Data And Messaging System
ADMD	Administration Management Domain
AFTN	Aeronautical Fixed Telecommunication Network
AIRAC	Aeronautical Information Regulation and Control
AMC	ATS Messaging Management Centre
AMHS	ATS Message Handling System
ATN	Aeronautical Telecommunication Network

ATS	Air Traffic Services
C	Country
CAAS	Common ICAO AMHS Addressing Scheme
CARC	Civil Aviation Regulatory Commission
COM	Communication
CN	Common Name
DSA	Directory System Agent
DUA	Directory User Agent
DL	Distribution List
GCAA	General Civil Aviation Authority
HP	Hewlett Packard
ICAO	International Civil Aviation Organisation
IP	Internet Protocol
iSCSI	Internet Small Computer System Interface
IUT	Implementation under Test
LAN	Local Area Network
MCP	Monitoring and Control Position
MS	Message Store
MTA	Message Transfer Agent
MTCU	Message Transfer and Control Unit
MTS	Message Transfer System
O	Organisation
O/R	Originator / Recipient
OU	Organisational Unit
PRMD	Private Management Domain
PSAP	Presentation Service Access Point
SSAP	Session Service Access Point
TCP	Transmission Control Protocol
TSAP	Transport Service Access Point
UA	User Agent
U.A.E.	United Arab Emirates
XF	Translated Form

2 SHORT DESCRIPTIONS OF BOTH SYSTEMS AND THE NETWORK INFRASTRUCTURE

2.1 Short Description of IUT-A

IUT-A is the fully integrated ADAMS AFTN/AMHS system of the International COM Centre of Jordan in Amman/Marka. The system is operationally used since 04-Dec-2008. It currently serves 4 international AFTN links and more than 30 domestic AFTN users or systems.

The switch is composed of 2 HP ProLiant BL 460 Linux servers and 2 iSCSI SB 600 servers which form a high-available 2-node cluster. RedHat 5.0 ES is the employed Linux Operating System. An AFTN switch, an X.400 MTA based on an X.500 Directory Server and an MTCU are the main functional components of the switch. The switch is monitored and controlled by means of 4 Microsoft Windows based MCP working positions.

Avitech AFTN Stations and legacy systems are connected to the switch via asynchronous lines or TCP/IP connections. Furthermore, currently 4 AMHS User Agents AMHS@AviSuite are connected to the MTA by use of the P3 MTS Access Protocol via TCP/IP.

In addition to the MD and CAAS Address Look-Up Tables described in 3.3 the operationally used MD, CAAS and User Address Look-Up table entries as provided by the AMC for the AIRAC cycle "OPER.81", of 11-02-2010, are configured.

The User Agents include Directory User Agents (DUA) supporting automatic translation of AFTN addresses into AMHS addresses and vice-versa.

Component	Release
ADAMS Integrated AFTN/AMHS system	MHS r3.42.00
MTA, DSA and MS	Isode Rel. 14.4v4
AMHS User Agent	Avitech AMHS@AviSuite jamhs-t1-atu-2.0.1-01-SNAPSHOT-install
AFTN Station	Avitech AFTN Station, Rel. 6.6.4.5

Table 2-1: Components of IUT-A

2.2 Short Description of IUT-B

Component	Release
ADAMS Integrated AFTN/AMHS system	AIDA-NG V2.79.0002
MTA, DSA and MS	Isode-MTA, integrated in AIDA-NG
AMHS User Agent	AMHS-Mailbox, Integrated in AIDA-NG
AFTN Station	AFTN Mailbox, Integrated in AIDA-NG

Table 2-2: Components of IUT-B

2.3 Network infrastructure

The two systems are interconnected by means of an IP SEC tunnel through the public internet as depicted in Figure 2-1:

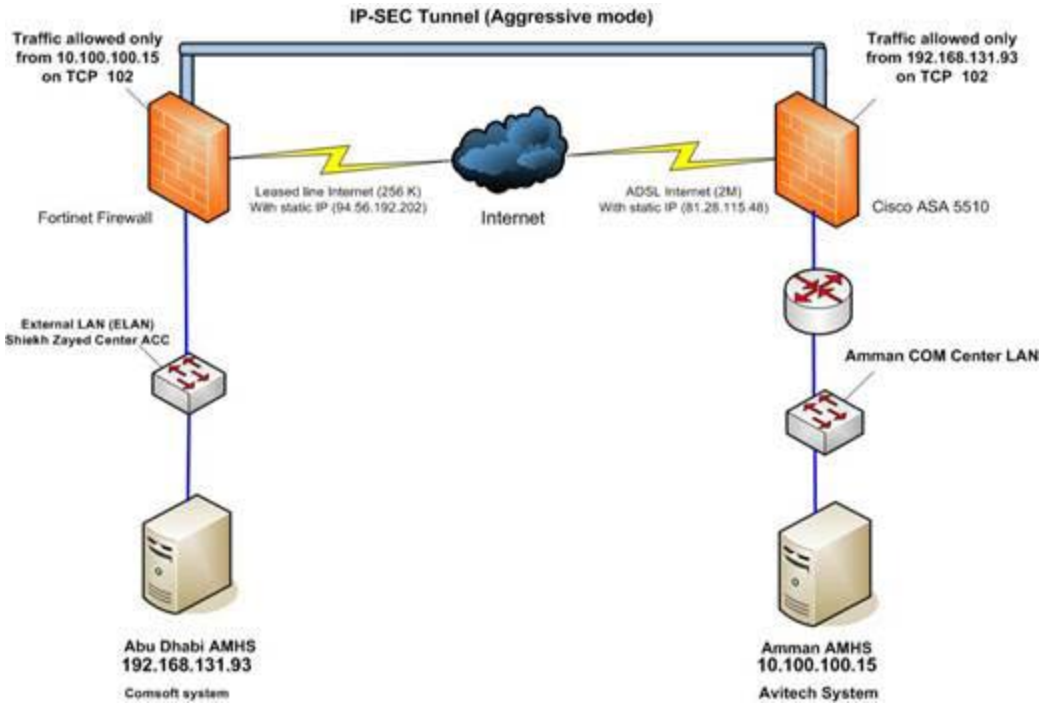

Figure 2-1: Network Infrastructure

3 CONFIGURATION OF BOTH SYSTEMS

3.1 Addressing Schemes

IUT-A implements the CAAS addressing scheme and IUT-B implements the XF addressing scheme.

3.2 User and DL Addresses

The test user and DL addresses used are derived from /1/, sections 3.1 and 3.2. In IUT-A the following address space is used:

O/R Address Component	Value
C	XX
ADMD	ICAO
PRMD	OJ
O	OJAC
OU1	OJAM
CN	OJAMFTNA … OJAMMHSA …

Table 3-1: User Addresses in IUT-A

In IUT-A the following DLs are used:

Distribution List Name	Member Addresses included in the DL
OJAMDLLO	OMAEFTNA, OMAEFTNB, OMAEMHSA
OJAMDLRE	OJAMFTNA, OJAMFTNB, OJAMMHSA

Table 3-2: Distribution Lists in IUT-A

In IUT-B the following address space is used:

O/R Address Component	Value
C	XX
ADMD	ICAO
PRMD	OM
O	AFTN
OU1	OMAEFTNA … OMAEMHSA …

Table 3-3: User Addresses in IUT-B

In IUT-B the following DLs are used:

Distribution List Name	Member Addresses included in the DL
OMAEDLLO	OJAMFTNA, OJAMFTNB, OJAMMHSA
OMAEDLRE	OMAEFTNA, OMAEFTNB, OMAEMHSA

Table 3-4: Distribution Lists in IUT-B

3.3 Address Look-Up Table

In order to ensure correct translation of AFTN addresses into AMHS addresses and vice versa, the address look-up tables in both systems have to include the following entries:

Name	Nationality Letters	Country Name	ADMD Name	PRMD Name	Address scheme	ATNDir
Jordan	OJ	XX	ICAO	OJ	CAAS	C=JO
U.A.E.	OM	XX	ICAO	OM	XF	

Table 3-5: MD Look-Up Table

country-name	ADMD-name	PRMD-name	organization-name	organizational-unit-name
XX	ICAO	OJ	OJAC	OJAM

Table 3-6: CAAS Look-Up Table

Both IUT-A and IUT-B import the look-up tables AIRAC cycle "OPER.81" of 11.02.2010 which include the converting entries as specified in Table 3-5 and Table 3-6.

Note: With these tables the values of the "generic" look-up table as described in /1/, 3.4.1 are implicitly configured.

3.4 Routing Tables

The AFTN and AMHS routing tables must be in accordance with /1/, 3.3.1 (for IUT-A) and 3.3.2 (for IUT-B). Additionally, it must be ensured that operationally used addresses are not affected.

AFTN Routing Indicator	Routing Direction
OM	AFTN Circuit to JEDDAH
OMAEFT	MTCU
OMAEDL	MTCU
OMAEMH	MTCU
OJAMFT	AFTN Terminal(s)
OJAMDL	MTCU
OJAMMH	MTCU

Table 3-7: AFTN Routing Table in IUT-A

X.400 Routing Indicator	Routing Direction
/C=XX/ADMD=ICAO/PRMD=OJ	MTCU
/C=XX/ADMD=ICAO/PRMD=OJ/O=OJAC/OU1=OJAM/CN=OJAMMHSA	UA in IUT-A

X.400 Routing Indicator	Routing Direction
/C=XX/ADMD=ICAO/PRMD=OJ/O=OJAC/OU1=OJAM/CN=OJAMMHSB	UA in IUT-A
/C=XX/ADMD=ICAO/PRMD=OJ/O=OJAC/OU1=OJAM/CN=OJAMMHSC	UA in IUT-A
/C=XX/ADMD=ICAO/PRMD=OJ/O=OJAC/OU1=OJAM/CN=OJAMDLLO	DL
/C=XX/ADMD=ICAO/PRMD=OJ/O=OJAC/OU1=OJAM/CN=OJAMDLRE	DL
/C=XX/ADMD=ICAO/PRMD=OM	MTA-OMAE-1

Table 3-8: X.400 Routing Table in IUT-A

AFTN Routing Indicator	Routing Direction
* (default route)	AFTN_BOX
OMAEMHS	AFTN_MTCU
OMAEYFYX	SVC_BOX
OJ	AFTN_MTCU

Table 3-9: AFTN Routing Table in IUT-B

X.400 Routing Indicator	Routing Direction
/C=XX/ADMD=ICAO/PRMD=OM	X400_MTCU
/C=XX/ADMD=ICAO/PRMD=OM/O=AFTN/OU1=OMAEMHSA	X400_ASDU
/C=XX/ADMD=ICAO/PRMD=OM/O=AFTN/OU1=OMAEMHSB	X400_ASDU
/C=XX/ADMD=ICAO/PRMD=OM/O=AFTN/OU1=OMAEMHSC	X400_ASDU
/C=XX/ADMD=ICAO/PRMD=OM/O=AFTN/OU1=OMAEDLLO	DL
/C=XX/ADMD=ICAO/PRMD=OM/O=AFTN/OU1=OMAEDLRE	DL
/C=XX/ADMD=ICAO/PRMD=OJ	MTA-OJAM-1

Table 3-10: X.400 Routing Table in IUT-B

3.5 Local User Address Book

An address book for local use in any UA is defined in /1/, section 3.5.1. Alternatively, a UA may use the directory service, if implemented, for the automatic translation of AFTN addresses entered by the user into AMHS O/R addresses and vice versa.

3.6 General Parameters

The following general parameters are agreed between both test partners.

3.6.1 MTA Authentication Parameters

	IUT-A	IUT-B
MTA Name	MTA-OJAM-1	MTA-OMAE-1
Password	ICAO-OJAM-1	ICAO-OMAE-1
Authentication	simple	simple
Check Network Address	Yes	Yes

Table 3-11: MTA Authentication Parameters

3.6.2 X.400 Protocol Type

	IUT-A	IUT-B
X.400 Protocol Type	X.400 (1988)	X.400 (1988)

Table 3-12: X.400 Protocol Type

3.6.3 Dialogue Mode, Type and Number of Associations

	IUT-A	IUT-B
Dialogue Mode	monologue	monologue
Type	permanent	on demand with idle time of 30 seconds
Number	3, one association reserved for messages of MTS – Priority URGENT, one association reserved for messages of MTS – Priorities URGENT and NORMAL	3

Table 3-13: Dialogue Mode, Type and number of associations

3.6.4 Service Access Points

	IUT-A	IUT-B
PSAP	---	---
SSAP	---	---
TSAP	MHS	P1

Table 3-14: Service Access Points

3.6.5 Network Addresses

It is agreed that IPv4 is used on the network layer.

	IUT-A	IUT-B
IPv4 Address	10.100.100.15	192.168.131.93
Port No.	102	102

Table 3-15: Network addresses

3.6.6 TCP Parameters

	IUT-A	IUT-B
tcp_keepalive_time	60 seconds	60 seconds
tcp_keepalive_intvl	5 seconds	5 seconds
tcp_keepalive_probes	3	3

Table 3-16: TCP Parameters

4 TEST RESULTS

The test results will be documented in a separate test report /2/.

AMHS Interoperability Tests
Jordan - United Arab Emirates

Report

CARC

GCAA

Document ID	:	**AMHS_INTEROP_RPT_JO-UAE_001**
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12, 13 7, 8 5 10 21 22	2010-02-28	Test Results and Remarks on Test Scenarios IT505/TC01 and IT505/TC03 updated CARC and GCAA release updated Section 1.1 updated Section 3.1 updated Chapter 4 updated Chapter 5 updated	0.11
9	2010-04-08	Section 2.3 with reference to the configuration document added	0.12
	2010-04-20	Tables Document Release and Distribution List removed	0.13

all	2010-04-21	Input from GCAA incorporated	0.14
5	2010-04-22	Date in 1.2 updated	0.15
all	2010-04-26	Final version	1.0

Table of Content

1 INTRODUCTION

1.1 Purpose and Scope

This document is a report about AMHS Interoperability Tests according to /1/ which were performed at 21st, 22nd, 24th and 28th of February 2010 between

- the ADAMS integrated AFTN/AMHS operational message switch in the COM Centre of Amman and
- the AIDA-NG integrated AFTN/AMHS test switch at the GCAA ACC in Abu-Dhabi

The content of this report is agreed by the test partners.

The test configuration is described in /2/. The test environment used for the interoperability tests is described in Chapter 2. Chapter 3 contains the test results. A Test Summary is given in Chapter 4. Chapter 5 provides a conclusion for the further steps on the way to the operational use of AMHS between the two partners.

1.2 Referenced Documents

Date of Issue	Title, Document No.	Reference
2009-04-02	ICAO EUR Doc 020 – EUR AMHS Manual, Version 4.0, Appendix F	/1/
2010-04-26	AMHS Interoperability Tests Jordan – United Arab Emirates, Configuration	/2/

1.3 Abbreviations

Area Control Centre	ACC
Aeronautical Data And Messaging System	ADAMS
Administration Management Domain	ADMD
Aeronautical Fixed Telecommunication Network	AFTN
Aeronautical Information Regulation and Control	AIRAC
ATS Messaging Management Centre	AMC
ATS Message Handling System	AMHS
Aeronautical Telecommunication Network	ATN
Air Traffic Services	ATS
Country	C
Common ICAO AMHS Addressing Scheme	CAAS
Civil Aviation Regulatory Commission	CARC
Communication	COM

Common Name	CN
Directory System Agent	DSA
Directory User Agent	DUA
Distribution List	DL
General Civil Aviation Authority	GCAA
Hewlett Packard	HP
International Civil Aviation Organisation	ICAO
Internet Protocol	IP
Internet Small Computer System Interface	iSCSI
Implementation under Test	IUT
Local Area Network	LAN
Monitoring and Control Position	MCP
Message Store	MS
Message Transfer Agent	MTA
Message Transfer and Control Unit	MTCU
Message Transfer System	MTS
Organisation	O
Originator / Recipient	O/R
Organisational Unit	OU
Private Management Domain	PRMD
Presentation Service Access Point	PSAP
Session Service Access Point	SSAP
Transmission Control Protocol	TCP
Transport Service Access Point	TSAP
User Agent	UA
Universal Time Coordinated	UTC
United Arab Emirates	U.A.E.
Translated Form	XF

2 TEST ENVIRONMENT

2.1 IUT-A ADAMS integrated AFTN/AMHS Operational System of the CARC COM Centre in Amman/Jordan

Identification and Version	**IUT-A Switch**
2 HP ProLiant BL 460, 2 iSCSI SB 600 servers, forming a 2 node cluster.	Computer Hardware
RedHat Linux 5.0 ES	Operating System
Isode M-Switch/M-Vault R14.4v4 Patch R14.4v4p1 activated at 25-02-2010, 15:40	ATN/X.400 Software
Avitech ADAMS r3.42.00	AMHS/MTCU Software
Avitech ADAMS r3.42.00	AFTN Software
AMC Oper 81	Address Look-Up Tables
Identification and Version	**IUT-A User Terminals**
Avitech AMHS@AviSuite™ jamhs-t1-atu-2.0.1-01-SNAPSHOT-install	AMHS User Agent
Avitech AFTN Station 6.6.4.5	AFTN User Terminal
Eng. Mona An-Naddaf, CARC	Tester

2.2 IUT-B AIDA-NG integrated AFTN/AMHS Test System of the GCAA ACC in Abu-Dhabi, U.A.E.

Identification and Version	**IUT-B Switch**
2x HP ProLiant G4 Server	Computer Hardware
Fedora FC5 Linux	Operating System
AIDA-NG integrated AFTN/AMHS software V2.79.0002, V2.79.0003 activated at 26-02-2010, 12:00	AFTN/AMHS Switch
AMC Oper 81	Address Look-Up Tables
Identification and Version	**IUT-B User Terminals**
AIDA-NG integrated AFTN/AMHS software V2.79.0002	AMHS User Agent
AIDA-NG integrated AFTN/AMHS software V2.79.0002	AFTN User Terminal
Varghese Koshy, GCAA	Tester

2.3 Network Infrastructure

The network infrastructure between the two systems is shown in /2/, section 2.3.

3 TEST RESULTS

3.1 Observations

The time difference between the transfer out of messages and probes from Amman to Abu Dhabi and the reception of corresponding reports was less than 1 second. The delivery time or arrival time in the reports showed that the time difference between both system clocks is also less than 1 second.

No other particular observations have been made which are not related to a particular test scenario.

3.2 Test Result Matrix

All times are UTC, according to the system clock in Amman.

Remark	Test Result	Date / Time	Test-case id
	PASSED	21-02-2010 09:03	IT101/TC01
	PASSED	21-02-2010 09:03	IT101/TC02
	PASSED	21-02-2010 09:04	IT101/TC03
	PASSED	21-02-2010 09:05	IT101/TC04
OMAEMHSA sent a Receipt Notification at 210908. OJAMMHSA received a Receipt Notification at 210908..	PASSED	21-02-2010 09:05	IT101/TC05
OJAMMHSA received IT102/TC02 twice, with 2 different filing times. OMAE asks to ignore the message with the filing time 040924.	PASSED	21-02-2010 09:04, 09:05	IT102/TC01
	PASSED	21-02-2010 09:06	IT102/TC02
	PASSED	21-02-2010 09:07	IT102/TC03
	PASSED	21-02-2010 09:07	IT102/TC04
OJAMMHSA sent a Receipt Notification at 210909. OMAEMHSA received a Receipt Notification	PASSED	21-02-2010 09:09	IT102/TC05

Remark	Test Result	Date / Time	Test-case id
at 210909.			
	PASSED	21-02-2010 09:18	IT201/TC01
	PASSED	21-02-2010 09:19	IT201/TC02
	PASSED	21-02-2010 09:19	IT201/TC03
	PASSED	21-02-2010 09:19	IT201/TC04
OMAEMHSA sent a Receipt Notification at 210923. OJAMFTNA received an SS Acknowledgement at 210923.	PASSED	21-02-2010 09:23	IT201/TC05
	PASSED	21-02-2010 09:19	IT202/TC01
	PASSED	21-02-2010 09:20	IT202/TC02
	PASSED	21-02-2010 09:21	IT202/TC03
	PASSED	21-02-2010 09:22	IT202/TC04
OJAMMHSA sent a Receipt Notification at 09:23. OMAEMHSA received a Receipt Notification from OJAMMHSA at 210923.	PASSED	21-02-2010 09:23	IT202/TC05
	PASSED	21-02-2010 09:28	IT301/TC01
	PASSED	21-02-2010 09:28	IT301/TC02
	PASSED	21-02-2010 09:29	IT301/TC03
	PASSED	21-02-2010 09:29	IT301/TC04
OMAEMHSA sent a Receipt Notification at 210934. OJAMMHSA received a Receipt Notification at 210934.	PASSED	21-02-2010 09:29	IT301/TC05

Remark	Test Result	Date / Time	Test-case id
	PASSED	21-02-2010 09:30	IT302/TC01
	PASSED	21-02-2010 09:31	IT302/TC02
	PASSED	21-02-2010 09:32	IT302/TC03
	PASSED	21-02-2010 09:33	IT302/TC04
OJAMFTNA sent an SS Acknowledgement at 210934. OM received a Receipt Notification at 210934.	PASSED	21-02-2010 09:34	IT302/TC05
	PASSED	21-02-2010 09:38	IT401/TC01
	PASSED	21-02-2010 09:38	IT401/TC02
	PASSED	21-02-2010 09:39	IT401/TC03
	PASSED	21-02-2010 09:39	IT401/TC04
OMAEFTNA sent an SS Acknowledgement at 210942. OJAMFTNA received an SS Acknowledgement at 210942.	PASSED	21-02-2010 09:39	IT401/TC05
	PASSED	21-02-2010 09:39	IT402/TC01
	PASSED	21-02-2010 09:39	IT402/TC02
	PASSED	21-02-2010 09:40	IT402/TC03
	PASSED	21-02-2010 09:41	IT402/TC04
OJAMFTNA sent an SS Acknowledgement at 210942. OMAEFTNA received an SS Acknowledgement at 210942.	PASSED	21-02-2010 09:42	IT402/TC05
	PASSED	21-02-2010 09:45	IT501/TC01

Remark	Test Result	Date / Time	Test-case id
	PASSED	21-02-2010 10:06	IT501/TC02
	PASSED	21-02-2010 10:10	IT501/TC03
OJAM received the message twice, OJAMFTNB missing the first time. OM asks to ignore the first message.	PASSED	21-02-2010 10:10, 10:12	IT501/TC04
	PASSED	21-02-2010 10:16	IT501/TC05
	PASSED	21-02-2010 10:20	IT501/TC06
	PASSED	21-02-2010 10:23	IT502/TC01
	PASSED	21-02-2010 10:26	IT502/TC02
	PASSED	21-02-2010 10:28	IT502/TC03
	PASSED	21-02-2010 10:51	IT502/TC04
OJAMMHSA received a NDR for OMAEFTNA: Reason code 1, diagnostic code 7, supplementary information “unable to convert to AFTN due to message text length”. The attempt was repeated once with the same result. Case a) implemented in OMAE	PASSED	21-02-2010 10:55, 11:09	IT503/TC01
Case b) configured in OJAM	PASSED	21-02-2010 11:00	IT503/TC02
	PASSED	21-02-2010 11:11	IT504/TC01
	PASSED	21-02-2010 11:20	IT504/TC02
OMAE sent DR for OMAEFTNA, OMAEFTNB and NDR for OMAEMHSA with reason code ‘’UNABLE TO TRANSFER’’. Diagnostic code ‘’UNSUPPORTED	FAILED	22-02-2010 07:27	IT505/TC01

Remark	Test Result	Date / Time	Test-case id
CRITICAL FUNCTION''. OJAMMHSA received a Delivery Report for OMAEFTNA and OMAEFTNB and a Non-Delivery-Report for OMAEMHSA with reason code "unable to transfer", diagnostic code "unsupported critical function". 22-02-2010 Explanation from COMSOFT:- As the diagnostic code indicates- an extension filed in the probe which is critical for delivery. If AIDA-NG receives a critical extension which is not mandatory and not supported, the message / probe will be rejected by an NDR. To find which extension is included (if any), a detailed trace of the message e.g with Wireshark is required. 24-02-2010 Explanation from COMSOFT:- Our investigations showed, that there are not allowed extension in the PerRecipientProbeTransferFields. Avitech should check it. 25-02-2010 Explanation Avitech: The perRecipientProbeTransferFields of the first recipient within the probe transfer envelope included the extensions 1 – recipient-reassignment-prohibited 3 – dl-expansion-prohibited 4 - conversion-with-loss-prohibited for the first recipient OMAEMHSA. X.411 does not list these extensions as being known for probe recipients. 25-02-2010 Explanation CARC/Avitech: A patch for the transformation of a Probe Submission Envelope into a Probe Transfer Envelope has been activated at 25-02-2010, 15:40. CARC/Avitech propose doing a retest. 26-02-2010 Explanation COMSOFT:- According to our observation the not allowed extensions were in the ''perrecipientProbeTransferfield'' and not in			

Remark	Test Result	Date / Time	Test-case id
the ''perProbeTransferfields''. The extensions ''recipient-reassignment-prohibited'' dl-expansion-prohibited'', and conversion-with-loss-prohibited'' are allowed in the ''perProbeTransferFields''. So precisely, the extensions must be removed from the PerRecipientProbeTransferFields'' 26-02-2010 12:00 UTC COMSOFT updated the software. OMAE sent DR for all 3 recipients OMAEFTNA, OMAEFTNB & OMAEMHSA. The supplementary information ''This report only indicates successful (potential) conversion to AFTN, not delivery to a recipient''. OJAMMHSA received a Delivery Report for all 3 recipients OMAEFTNA, OMAEFTNB, OMAEMHSA. For all 3 recipients it included the supplementary information "This report only indicates successful (potential) conversion to AFTN, not delivery to a recipient". OM would not have expected this supplementary information for OMAEMHSA which is the address of a direct AMHS user.	PASSED	Retest 28-02-2010 07:32	
	PASSED	22-02-2010 07:01	IT505/TC02
OMAE sent DR for OMAEFTUU and NDR for OMAEFTNA with reason code "unable to transfer", diagnostic code "unsupported critical function". OJAMMHSA received one Report, indicating Delivery to OMAEFTUU, Non-Delivery to OMAEFTNA with reason code "unable to transfer", diagnostic code "unsupported critical function". 25-02-2010: Explanation Avitech: The perRecipientProbeTransferFields of the first recipient within the probe transfer envelope included the extensions 1 – recipient-reassignment-prohibited 3 – dl-expansion-prohibited	INCONCLUSIVE	22-02-2010 07:47	IT505/TC03

Remark	Test Result	Date / Time	Test-case id
4 – conversion-with-loss-prohibited for the first recipient OMAEMHSA. X.411 does not list these extensions as being known for probe recipients. Therefore the behaviour for OMAEFTNA is in line with the behaviour for OMAEMHSA as in IT505/TC01. The delivery to OMAEFTUU is not in line with the test control. However, the test control is not in line with the conversion rules for XF and CAAS addresses.			
The probe was sent with the recipient addresses /OU=OMAEMHSA/O=AFTN/PRMD=OM/ADMD=ICAO/C=XX /OU=OMAEFTUUU/O=AFTN/PRMD=OM/ADMD=ICAO/C=XX OJAM did not receive any report, but the associations were disconnected. After manual intervention MTA-OMAE-1 re-connected to MTA-OJAM-1 at 13:55:12. 25-02-2010 Explanation CARC/Avitech: A patch for the transformation of a Probe Submission Envelope into a Probe Transfer Envelope has been activated at 25-02-2010, 15:40. CARC/Avitech propose doing a retest. 26-02-2010 Explanation GCAA/Comsoft: The failure in OMAE was caused actually by the coincidence of two invalid addresses used for the re-test of IT505/TC003. The first address contained the not allowed extensions, the second one was, however a correct X.400 address, but an invalid XF-address. At 26-02-2010, the new software version V2.79.0003 was activated in OMAE.	FAILED	Retest 24-02-2010 13:14	
OJAMMHSA received one report indicating Delivery to /OU=OMAEFTNA/O=AFTN/PRMD=OM/ADMD=ICAO/C=XX and Non-Delivery due to unrecognized O/R address to	PASSED	Retest 28-02-2010 07:48	

Remark	Test Result	Date / Time	Test-case id
/OU=OMAEFTNA/O=AFTN/PRMD=OM/ADMD=ICAO/C=XX			
The MTCU of OJAM sent one Delivery Report indicating Delivery to both OJAMFTNA and OJAMFTUU. OMAEMHSA received one DR for both OJAMFTNA and OJAMFTUU. The delivery to OJAMFTUU is not in line with the test control. However, the test control is not in line with the conversion rules for XF and CAAS addresses.	INCONCLUSIVE	22-02-2010 07:47	IT505/TC04
OJAM received a probe with the addresses /CN=OJAMFTNA/OU=OJAM/O=OJAC /PRMD=OJ/ADMD=ICAO/C=XX/ /CN=OJAMFTUUU/OU=OJAM/O=OJAC /PRMD=OJ/ADMD=ICAO/C=XX/ A Delivery Report was sent for the first address, a Non-Delivery-Report was sent for the second address. OMAEMHSA received a DR for OJAMFTNA and a NDR for OJAMFTUUU.	PASSED	Retest 24-02-2010 15:52	
See section 3.3.	PASSED	22-02-2010 08:40-08:42	IT601/TC01
See section 3.3.	PASSED	22-02-2010 09:45-09:47	IT601/TC02
See section 3.3.	PASSED	22-02-2010 10:30-10:34	IT601/TC03
Trilateral Tests not possible.	Skipped		IT70n series
Trilateral Tests not possible.	Skipped		IT80n series

3.3 Test Controls for Stress Load Tests IT601/TC01, TC02, TC03

All times are UTC.

Result IT601/TC03	Result IT601/TC02	Result IT601/TC01	IUT	Test Control	No.
10:30:59	09:45:30	08:40:37	IUT-A	Notice the time of re-establishing each association in sending direction.	1.
10:30:59	09:45:30	08:40:37	IUT-B		
10:31:00	09:45:31	08:40:38	IUT-A	Notice the time of sending the first message.	2.
10:31:00	09:45:31	08:40:38	IUT-B		
10:33:38	09:46:28	08:41:18	IUT-A	Notice the time of sending the last message.	3.
10:31:36	09:46:41	08:40:56	IUT-B		
10:30:37	09:46:10	08:40:40	IUT-A	Notice the time of re-establishing each association in receiving direction.	4.
10:30:37	09:46:10	08:40:40	IUT-B		
10:30:38	09:46:11	08:40:41	IUT-A	Notice the time of receiving the first message.	5.
10:31:00	09:45:31	08:40:38	IUT-B		
10:31:36	09:46:41	08:40:56	IUT-A	Notice the time of receiving the last message.	6.
10:33:38	09:46:50	08:41:17	IUT-B		
400	200	100	IUT-A	Notice the number of	

Result IT601/TC03	Result IT601/TC02	Result IT601/TC01	IUT	Test Control	No.
400	200	100	IUT-A	messages received (shall be equal to the number of messages expected.)	7.
400	200	100	IUT-B		
No abnormality	No abnormality	No abnormality	IUT-A	Check the event logging of the system for abnormalities in the area of AMHS / X.400 /AFTN/AMHS Gateway.	8.
No abnormality	No abnormality	No abnormality	IUT-B		
No NDR	No NDR	No NDR	IUT-A	Check the event logging / traffic traces for NDRs. (No NDRs are expected.)	9.
No NDR	No NDR	No NDR	IUT-B		
None	None	None	IUT-A	Check for Control Position events. (No related events are awaited.)	10.
None	None	None	IUT-B		
2 outbound associations used: 381 messages used the association with the internal id 31764,	2 outbound associations used: 190 messages used the association with the internal id 30016, 10 messages used the	2 outbound associations used: 99 messages used the association with the internal id 31262,	IUT-A Initiator	Check the X.400 / AMHS diagnostics, check the number of associations used (in particular possible	11.

Result IT601/TC03	Result IT601/TC02	Result IT601/TC01	IUT	Test Control	No.
19 messages used the association with the internal id 31863.	association with the internal id 30265.	1 message used the association with the internal id 31264.		hanging/unused associations). The numbers of used associations should be equal for IUT-A Initiator and IUT-B Responder and for IUT-B Initiator and IUT-A Responder	
3 inbound associations used (internal IDs 30291, 30203, 30513)	3 inbound associations used (internal IDs 32293, 32306, 32319)	3 inbound associations used (internal IDs 31705, 31713, 31741)	IUT-A Responder		
			IUT-B Initiator		
			IUT-B Responder		
No specific observations	No specific observations	No specific observations	IUT-A	Monitor the underlying network infrastructure (network specialist).	12.
No specific observations	No specific observations	No specific observations	IUT-B		
158 seconds	57 seconds	40 seconds	IUT-A	At both sides note the amount of time needed to flush the queues. (Unacceptable delays shall be treated as “FAILED”.)	13.
159 seconds	57 seconds	39 seconds	IUT-B		

4 TEST SUMMARY

61 test scenarios were performed at 21st and 22nd of February 2010, 2 tests were repeated at 24th and 28th of February after their initial results had been inconclusive. After the retests all 61 tests have the status PASSED.

5 CONCLUSION

The AMHS Interoperability Tests according to /1/ were conducted successfully. The result of the tests justifies the start of Pre-Operational Tests at 23rd of February 2010.

End of document

AMHS Pre-Operational Tests Jordan - United Arab Emirates

Configuration

CARC

GCAA

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all	2010-02-15	Software releases of IUT-A updated, TCP parameters appended	0.2
all	2010-02-22	Assignment of Jordanian real and copy addresses	0.3
all	2010-02-23	Copy address OJAMMHSA replaced by OJAMFTNC	0.4
all	2010-02-23	Updated (proposal) from COMSOFT	0.5
all	2010-02-23	Proposal by COMSOFT accepted by CARC	0.6
all	2010-02-24	Editorial updates	0.7

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1 INTRODUCTION

1.1 Purpose and Scope

This document contains a description of the configuration for bilateral AMHS Pre-Operational Tests according to /1/ between the operational AFTN/AMHS switch of the Jordanian CARC and the General Civil Aviation Agency (GCAA) of the United Arab Emirates (UAE).

In general the purpose, the objectives and an overview of the AMHS Pre-Operational Tests are given in /1/, sections 1.1 - 1.3.

If both test partners consider the pre-operational tests successful, they may decide to start operational use of the AMHS connection. In this case the addresses to be routed via AMHS have to be agreed upon.

Wherever possible, the parameters defined in /1/ are used. Additionally, configuration parameters to achieve connectivity on the network, transport, session and application layer are defined. Both partners agree that in addresses, MTA names and passwords the real values OJ, OJAM, OM are used instead of the placeholders IUTA, IUTB.

The two systems are interconnected by a leased line.

1.2 Referenced Documents

Date of Issue	Title, Document No.	Reference
2009-04-02	ICAO EUR Doc 020 – EUR AMHS Manual, Version 4.0, Appendix F	/1/
yet open	AMHS-Pre-Operational Tests Jordan – United Arab Emirates, Test Report	/2/

1.3 Abbreviations

Area Control Centre	ACC
Aeronautical Data And Messaging System	ADAMS
Administration Management Domain	ADMD
Aeronautical Fixed Telecommunication Network	AFTN
Aeronautical Information Regulation and Control	AIRAC
ATS Messaging Management Centre	AMC
ATS Message Handling System	AMHS
Aeronautical Telecommunication Network	ATN
Air Traffic Services	ATS
Country	C
Common ICAO AMHS Addressing Scheme	CAAS
Civil Aviation Regulatory Commission	CARC
Communication	COM

Common Name	CN
Directory System Agent	DSA
Directory User Agent	DUA
Distribution List	DL
General Civil Aviation Authority	GCAA
Hewlett Packard	HP
International Civil Aviation Organisation	ICAO
Internet Protocol	IP
Internet Small Computer System Interface	iSCSI
Implementation under Test	IUT
Local Area Network	LAN
Monitoring and Control Position	MCP
Message Store	MS
Message Transfer Agent	MTA
Message Transfer and Control Unit	MTCU
Message Transfer System	MTS
Organisation	O
Originator / Recipient	O/R
Organisational Unit	OU
Private Management Domain	PRMD
Presentation Service Access Point	PSAP
Session Service Access Point	SSAP
Transmission Control Protocol	TCP
Transport Service Access Point	TSAP
User Agent	UA
United Arab Emirates	U.A.E.
Translated Form	XF

2 SHORT DESCRIPTIONS OF BOTH SYSTEMS

2.1 Short Description of the Jordanian System (IUT-A)

On the Jordanian side the fully integrated AFTN/AMHS system of the International COM Centre of Jordan in Amman/Marka is used. The system is operationally used since 04-Dec-2008. It currently serves 3 international AFTN links and more than 30 domestic AFTN users or systems.

The switch is composed of 2 HP ProLiant BL 460 Linux servers and 2 iSCSI SB 600 servers which form a high-available 2-node cluster. RedHat 5.0 ES is the employed Linux Operating System. An AFTN switch, an X.400 MTA based on an X.500 Directory Server and an MTCU are the main functional components of the switch. The switch is monitored and controlled by means of 4 Microsoft Windows based MCP working positions.

Avitech AFTN Stations and legacy systems are connected to the switch via asynchronous lines or TCP/IP connections. Furthermore, currently 4 AMHS User Agents *AMHS@AviSuite* are connected to the MTA by use of the P3 MTS Access Protocol via TCP/IP.

In addition to the MD and CAAS Address Look-Up Tables described in 3.3 the operationally used MD, CAAS and User Address Look-Up table entries as provided by the AMC for the AIRAC cycle “OPER.81”, of 11-02-2010, are configured.

The User Agents include Directory User Agents (DUA) supporting automatic translation of AFTN addresses into AMHS addresses and vice-versa.

Release	Component
MHS r3.42.00	ADAMS Integrated AFTN/AMHS system
Isode Rel. 14.4v4	MTA, DSA and MS
Avitech *AMHS@AviSuite*™ jamhs-t1-atu-2.0.1-01-SNAPSHOT-install	AMHS User Agent
Avitech AFTN Station, Rel. 6.6.4.5	AFTN Station

Table 2-1: Components of IUT-A

2.2 Short Description of the system of the U.A.E. (IUT-B)

Release	Component
AIDA-NG V2.79.0002	ADAMS Integrated AFTN/AMHS system
Isode-MTA, integrated in AIDA-NG	MTA, DSA and MS
AMHS-Mailbox, Integrated in AIDA-NG	AMHS User Agent
AFTN Mailbox, Integrated in AIDA-NG	AFTN Station

Table 2-2: Components of IUT-B

2.3 Application Infrastucture

Upon request of the U.A.E. the tests will be started with an initial application infrastructure deviating from the one described in /1/, section 2.1:

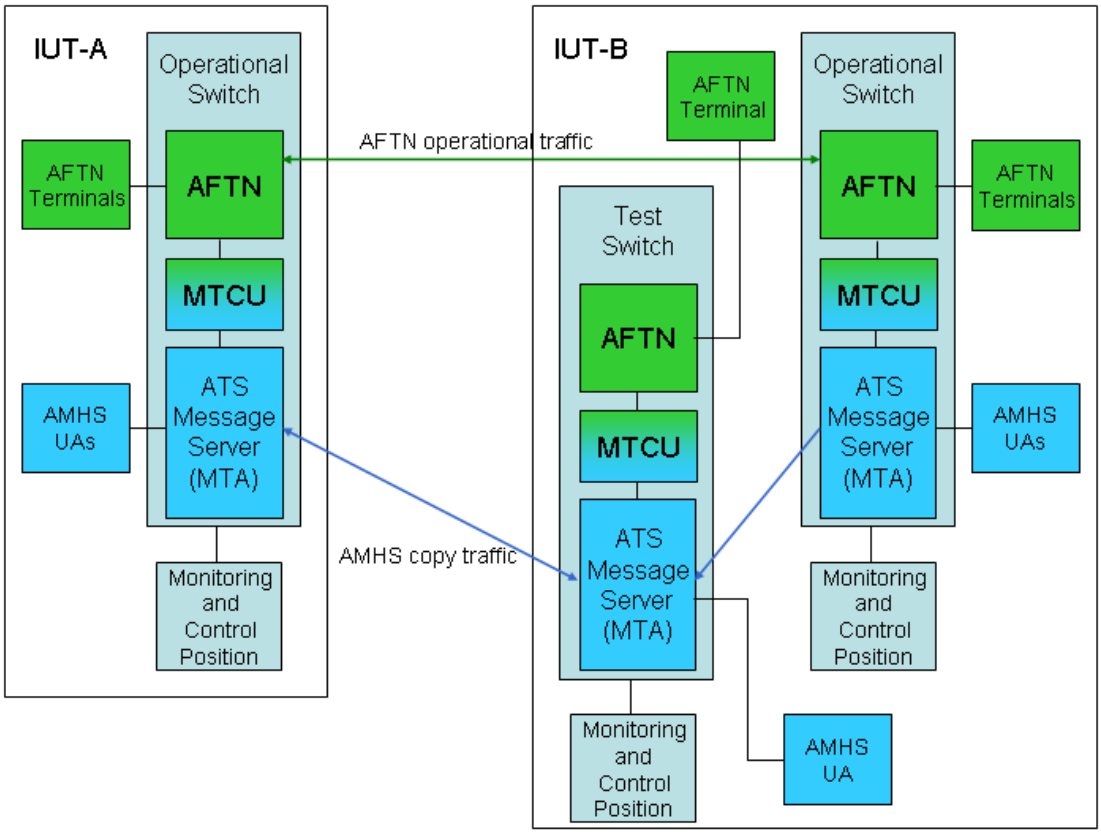

Figure 2-1: Initial Application Infrastructure

Figure 2-1 shows that both operational switches exchange operational traffic via AFTN. The fact that the AFTN parts are interconnected via other AFTN Com Centres is not important in this context and not reflected in the drawing. The Jordanian MTA is connected to the MTA of the test switch in the U.A.E. which in turn is connected to the MTA of the operational switch in the U.A.E. The MTA of the test switch in the U.A.E. routes all AMHS messages received from Jordan to a local UA. In this way the MTA of the operational switch shall be protected against potentially erroneous messages. Vice-versa, the MTA of the operational switch in the U.A.E. routes all messages with PRMD OJ to the test switch which relays them to the Jordanian MTA.

When the tests with this configuration are successful and the systems have proven to be stable, the final application infrastructure as depicted in

Figure 2-2 will be applied:

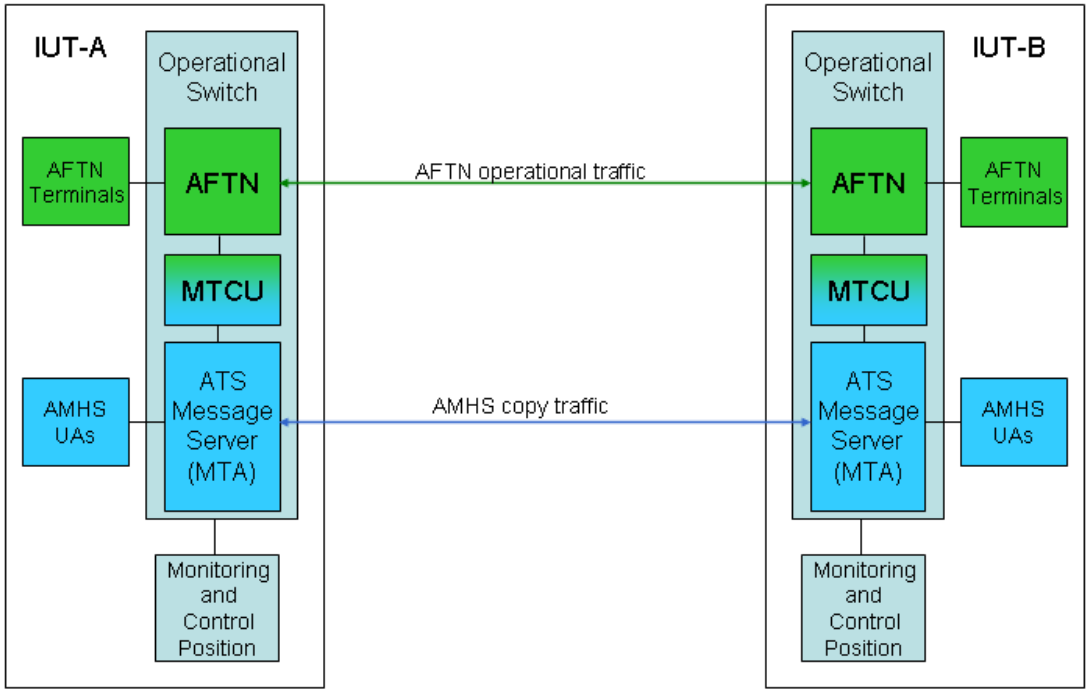

Figure 2-2: Final Application Infrastucture

Now the MTAs of the two operational switches will be connected directly.

With both application infrastructures the MTA in the U.A.E. which is adjacent to the Jordanian MTA-OJAM-1 will appear as MTA-OMAE-1. AFTN Messages to operational addresses as identified in section 3.4.2 will be copied/duplicated via AMHS.

2.4 Transport and Network Infrastructure

The two systems are interconnected by means of an IP SEC tunnel through the public internet as depicted in Figure 2-3:

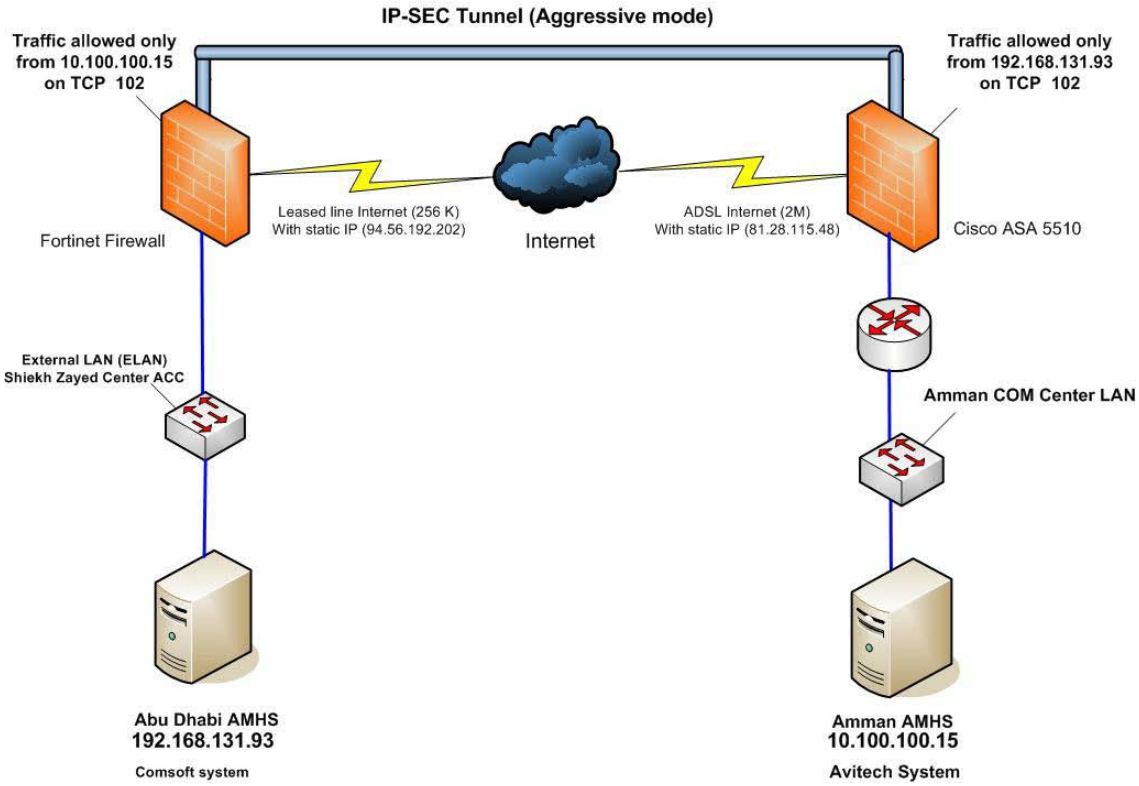

Figure 2-3: Network Infrastructure

3 CONFIGURATION

3.1 General

The Jordanian and the U.A.E. system involved in the pre-operational test are configured with operational data (with respect to routing tables and look-up tables). Special additional addresses needed for testing are listed in this document.

3.2 Addressing Schemes

Jordan implements the CAAS addressing scheme and the U.A.E. implement the XF addressing scheme.

3.3 Address Look-Up Table

Both systems will use the Address Look-Up Tables as provided by the AMC in the Operational Area valid at the date at which the Pre-Operational tests are conducted.

3.4 Addresses used for the Pre-Interoperability Tests

3.4.1 Addresses for Go-NoGo tests

Test cases PRE001 and PRE002 in /1/ are Go-NoGo tests to verify that AMHS messages can be exchanged in either direction.

These tests will be performed with the following not operationally used addresses:

United Arab Emirates	Jordan
OMAEFTNA -> AFTN Terminal	OJAMFTNA -> AFTN Terminal
OMAEAMHS -> AMHS User Agent	OJAMMHSA -> AMHS User Agent

Table 3-1: Fictitious Addresses for Go-NoGo Test

Note: For the Go – NoGo tests it does not matter whether the addresses used are direct (AMHS User Agent) or indirect (AFTN Station via MTCU) addresses. It is important the each system routes the address of the adjacent one via AMHS.

3.4.2 Addresses for Copy Test

In test case PRE003 each system copies the traffic to one or several operationally used AFTN addresses of the adjacent system to fictitious addresses at the adjacent system. The fictitious addresses are routed via AMHS whereas the operationally used addresses are routed via AFTN.

3.4.2.1 Jordanian Addresses for Copy Test

Copy addresses	Operationally used addresses
OJAMFTNA	OJACZQZX
OJAMFTNB	OJAIZPZX
OJAMFTNC	OJAIZTZX
…	…

Table 3-2: Copy addresses for Jordan

The system in the U.A.E. routes the addresses OJACZQZX, OJAIZPZX, OJAIZTZX, … to Bahrain via AFTN and the addresses OJAMFTNA, OJAMFTNB, OJAMFTNC to Amman via AMHS.

3.4.2.2 U.A.E. Addresses for Copy Test

The system in Jordan routes messages with all addresses "OM*" via AFTN to Jeddah and the same messages via AMHS directly to the MTA-OMAE-1 in Abu Dhabi. Following a proposal by GCAA and deviating from 3.4.2 the entire traffic from Amman to Abu Dhabi is duplicated via AMHS without replacing the recipient addresses.

3.5 Routing Tables

Both systems use operational AFTN and AMHS/X.400 routing tables. In particular the routing tables must include the following entries:

Routing Direction	AFTN Routing Indicator
…	…
domestic AFTN circuits	OJ……
AFTN circuit	OJACZQZX
AFTN circuit	OJAIZPZX
AFTN circuit	OJAIZTZX
AFTN Circuit to Jeddah and MTCU	OM

Table 3-3: AFTN Routing Table in Jordan

Routing Direction	X.400 Routing Indicator
…	…
MTCU	/C=XX/ADMD=ICAO/PRMD=OJ
MTA-OMAE-1	/C=XX/ADMD=ICAO/PRMD=OM
…	…

Table 3-4: X.400 Routing Table in Jordan

Routing Direction	AFTN Routing Indicator
…	…
AFTN_MTCU	OJ
domestic AFTN circuits	OM……
AFTN terminal	OMAEAFTN
AFTN terminal	OMAEFTNA
AFTN terminal	OMAEYFYX
AFTN terminal	OMAETEST

Table 3-5: AFTN Routing Table in the U.A.E. (test system)

Routing Direction	X.400 Routing Indicator
…	…
MTA-OJAM-1	/C=XX/ADMD=ICAO/PRMD=OJ
…	…
X400_MTCU	/C=XX/ADMD=ICAO/PRMD=OM
X400_ASDU (UA)	/C=XX/ADMD=ICAO/PRMD=OM/O=AFTN/OU1=OMAEAMHS
…	…

Table 3-6: X.400 Routing Table in the U.A.E.

3.6 General Parameters

The following general parameters are agreed between both test partners.

3.6.1 MTA Authentication Parameters

IUT-B	IUT-A	
MTA-OMAE-1	MTA-OJAM-1	**MTA Name**
ICAO-OMAE-1	ICAO-OJAM-1	**Password**
simple	simple	**Authentication**
Yes	Yes	**Check Network Address**

Table 3-7: MTA Authentication Parameters

3.6.2 X.400 Protocol Type

IUT-B	IUT-A	
X.400 (1988)	X.400 (1988)	**X.400 Protocol Type**

Table 3-8: X.400 Protocol Type

3.6.3 Dialogue Mode, Type and Number of Associations

IUT-B	IUT-A	
monologue	monologue	**Dialogue Mode**
on demand with idle time of 30 seconds	permanent	**Type**
3	3, one association reserved for messages of MTS – Priority URGENT, one association reserved for messages of MTS – Priorities URGENT and NORMAL	**Number**

Table 3-9: Dialogue Mode, Type and Number of associations

3.6.4 Service Access Points

IUT-B	IUT-A	
---	---	**PSAP**
---	---	**SSAP**
P1	MHS	**TSAP**

Table 3-10: Service Access Points

3.6.5 Network Addresses

It is agreed that IPv4 is used on the network layer.

Table 3-11: Network addresses

3.6.6 TCP Parameters

IUT-B	IUT-A	
60 seconds	60 seconds	**tcp_keepalive_time**
5 seconds	5 seconds	**tcp_keepalive_intvl**
3	3	**tcp_keepalive_probes**

Table 3-12: TCP Parameters

4 TEST RESULTS

The test results will be documented in a separate test report /2/

End of document

AMHS Pre-Operational Tests Jordan - United Arab Emirates

Report

CARC

GCAA

Document ID	:	**AMHS_PREOP_RPT_JO-UAE_001**
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			1

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Page(s)	Date	Change	Version
all	2010-01-04	Initial Draft	0.1
8, 9	2010-02-05	Remark about UTC time added	0.2

Table of Content

1 INTRODUCTION

1.1 Purpose and Scope

This document is a report about AMHS Interoperability Tests according to /1/ which were performed from *<date>* to *<date>* between

- the integrated AFTN/AMHS message switch in the COM Centre of Amman and
- *<a name of the U.A.E. system>*

The content of this report is agreed by the test partners.

The test environment and configuration is described in /2/. Chapter 2 contains the test results. A Test Summary is given in Chapter 3. Chapter 4 provides a conclusion related to the operational use of AMHS between the two partners.

1.2 Referenced Documents

Date of Issue	Title, Document No.	Reference
2009-04-02	ICAO EUR Doc 020 – EUR AMHS Manual, Version 4.0, Appendix F	/1/
t.b.d	AMHS Pre-Operational Tests Jordan – United Arab Emirates, Configuration	/2/

1.3 Abbreviations

ADAMS	Aeronautical Data And Messaging System
ADMD	Administration Management Domain
AFTN	Aeronautical Fixed Telecommunication Network
AIRAC	Aeronautical Information Regulation and Control
AMC	ATS Messaging Management Centre
AMHS	ATS Message Handling System
ATN	Aeronautical Telecommunication Network
ATS	Air Traffic Services
C	Country
CAAS	Common ICAO AMHS Addressing Scheme
CARC	Civil Aviation Regulatory Commission
COM	Communication
CN	Common Name
DSA	Directory System Agent
DUA	Directory User Agent

DL	Distribution List
GCAA	General Civil Aviation Authority
HP	Hewlett Packard
ICAO	International Civil Aviation Organisation
IP	Internet Protocol
iSCSI	Internet Small Computer System Interface
IUT	Implementation under Test
LAN	Local Area Network
MCP	Monitoring and Control Position
MS	Message Store
MTA	Message Transfer Agent
MTCU	Message Transfer and Control Unit
MTS	Message Transfer System
O	Organisation
O/R	Originator / Recipient
OU	Organisational Unit
PDAI	Predetermined Distribution Addressee Indicator
PRMD	Private Management Domain
PSAP	Presentation Service Access Point
SSAP	Session Service Access Point
TCP	Transmission Control Protocol
TSAP	Transport Service Access Point
UA	User Agent
U.A.E.	United Arab Emirates
UTC	Universal Time Coordinated
XF	Translated Form

2 TEST RESULTS

2.1 Observations

Here we could mention any observations which are not related to one single test case.

2.2 Test Result Matrix

All times are UTC.

Remark	Test Result	Date / Time	Test-case id
			PRE001
			PRE002
			PRE003
			PRE004

2.3 Detailed evaluation of test scenario PRE003

The following evaluation table is copied from /1/, section 5.2.2. The results and observations are inserted.

All times are UTC.

Result	Test Control
	1. Compare the number of messages received as AFTN copy with the number of messages received as AMHS copy
	2. Compare the contents of the messages.
	3. The messages can be displayed on two screens and compared one by one
	4. The traffic log can be exported and compared (partly) electronically/automated
	5. Check the event logging of the system for abnormalities in the area of AMHS / X.400 / AFTN/AMHS Gateway.
	6. NDRs
	7. Control Position events.
	8. X.400 / AMHS diagnostics, check the number of associations used (in particular possible hanging/unused associations).
	9. Monitor the underlying network infrastructure (network specialist).

2.4 Detailed evaluation of test scenario PRE004

The following evaluation table is copied from /1/, section 5.2.3. The results and observations are inserted.

All times are UTC.

Result	Test Control
	1. Compare the number of messages received as AFTN copy with the number of messages received as AMHS copy
	2. Compare the contents of the messages.
	3. The messages can be displayed on two screens and compared one by one
	4. The traffic log can be exported and compared (partly) electronically/automated
	5. Check the event logging of the system for abnormalities in the area of AMHS / X.400 / AFTN/AMHS Gateway.
	6. NDRs
	7. Control Position events.
	8. X.400 / AMHS diagnostics, check the number of associations used (in particular possible hanging/unused associations).
	9. Monitor the underlying network infrastructure (network specialist).

3 TEST SUMMARY

4 CONCLUSION

Here a statement should be made whether or not the result of the tests allows for operational cutover. The addresses routed via AMHS could be mentioned.

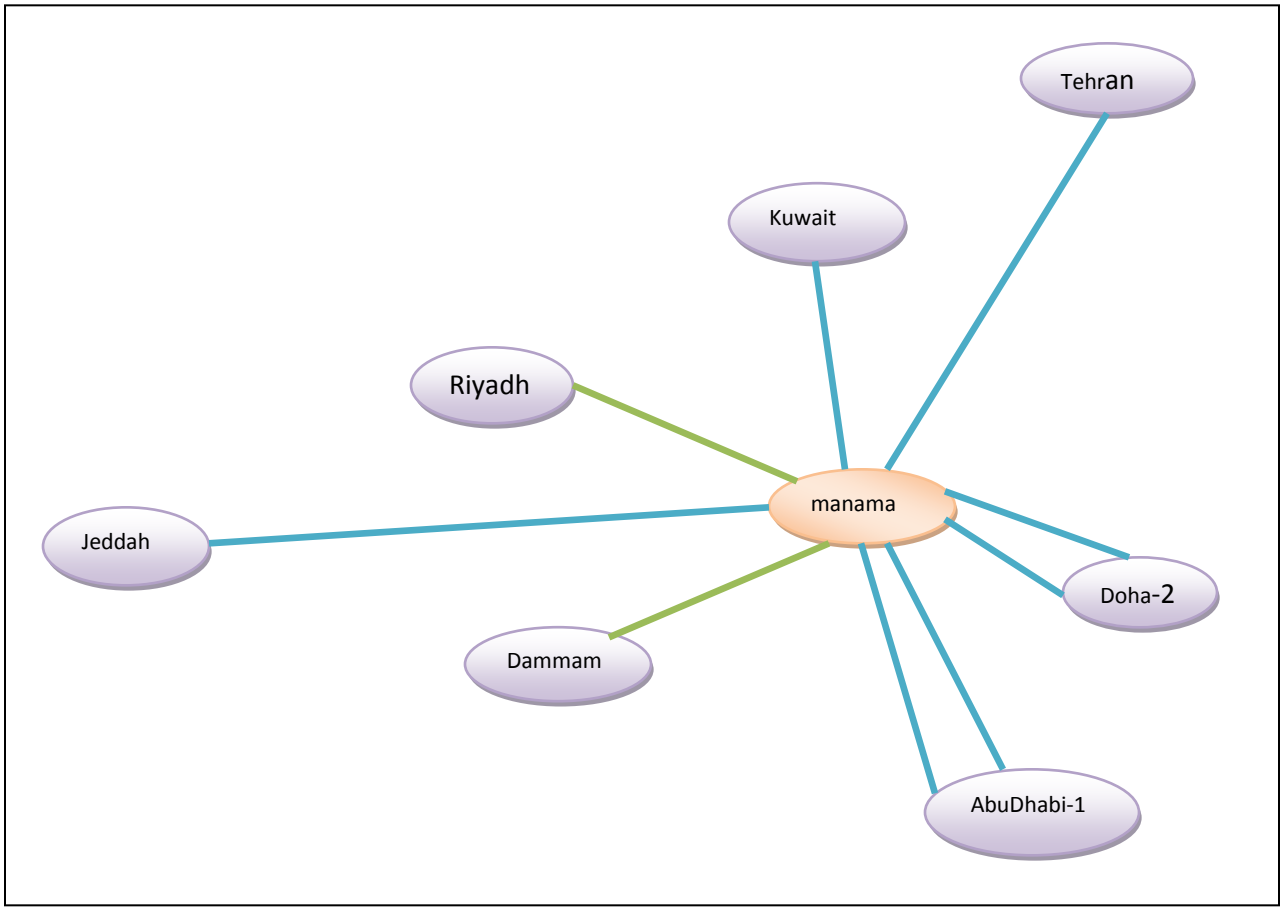
End of document

CNS SG/4
Appendix 3B to the Report on Agenda Item 3

MID IP NETWORK SURVEY ANALYSIS

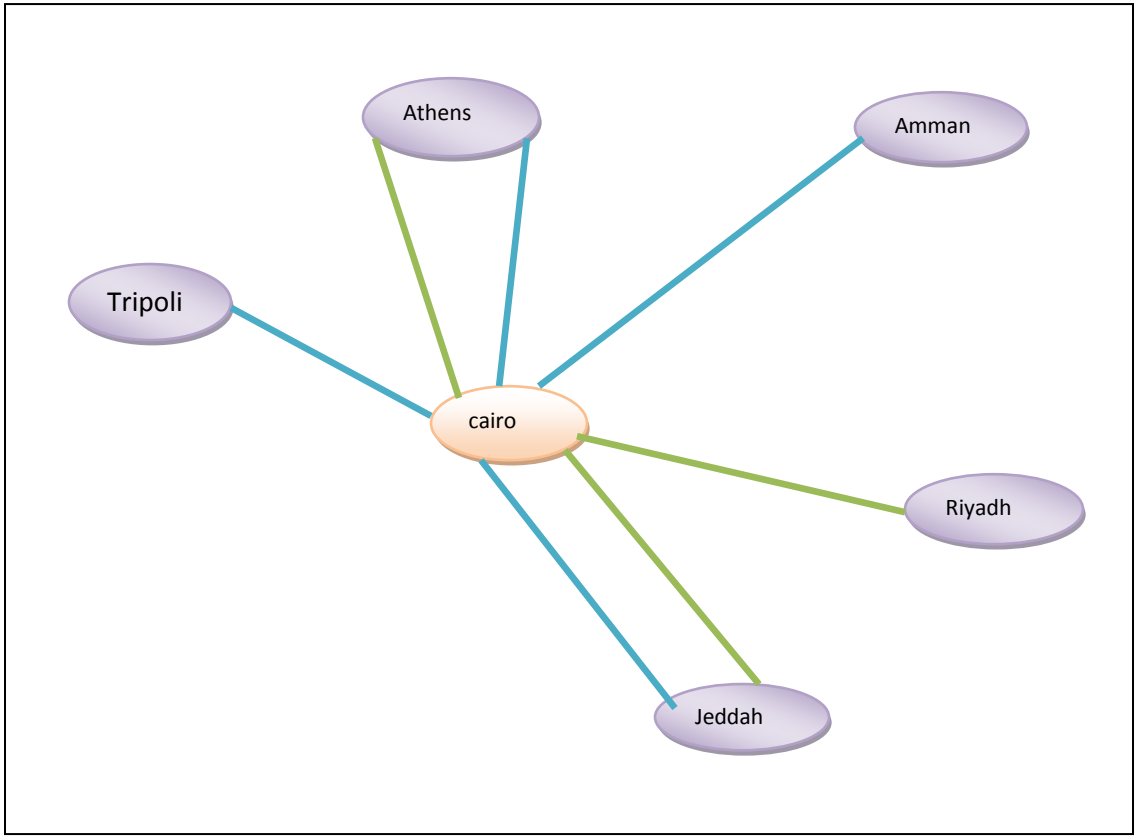
State Bahrain (Manama)

State	Speed	Protocol	IP Address	Net Mask	Router Type	IP.V	
Riyadh	64k	Leased line	10.61.11.12	255.255.255.252	Motorola Vangurd 6435	IPV4	Voice
Tehran	64k	Leased line	172.16.10.2	255.255.255.0	Cisco2800	IPV4	AFTN,Voice
Kuwait	64k	Leased line	10.61.11.8	255.255.255.252	Motorola Vangurd 6435	IPV4	AFTN,Radar, Voice
Jeddah	64k	Leased line	10.61.11.48	255.255.255.252	Motorola Vangurd 6435	IPV4	CIDIN,Voice
Doha-1	64k	Leased line	10.61.11.32	255.255.255.252	Motorola Vangurd 6455	IPV4	Radar,Voice
Doha-2	64k	Leased line	10.61.11.56	255.255.255.252	Motorola Vangurd 6455	IPV4	AFTN,Voice
Dammam	64k	Leased line	10.61.11.44	255.255.255.252	Motorola Vangurd 6435	IPV4	Voice
AbuDhabi-1	64k	Leased line	10.61.11.12	255.255.255.252	Motorola Vangurd 6435	IPV4	Radar,Voice
AbuDhabi-2	64k	Leased line	10.61.11.16	255.255.255.252	Motorola Vangurd 6435	IPV4	CIDIN,Voice


Tehran
Kuwait
Riyadh
manama
Jeddah
Doha-2
Dammam
AbuDhabi-1

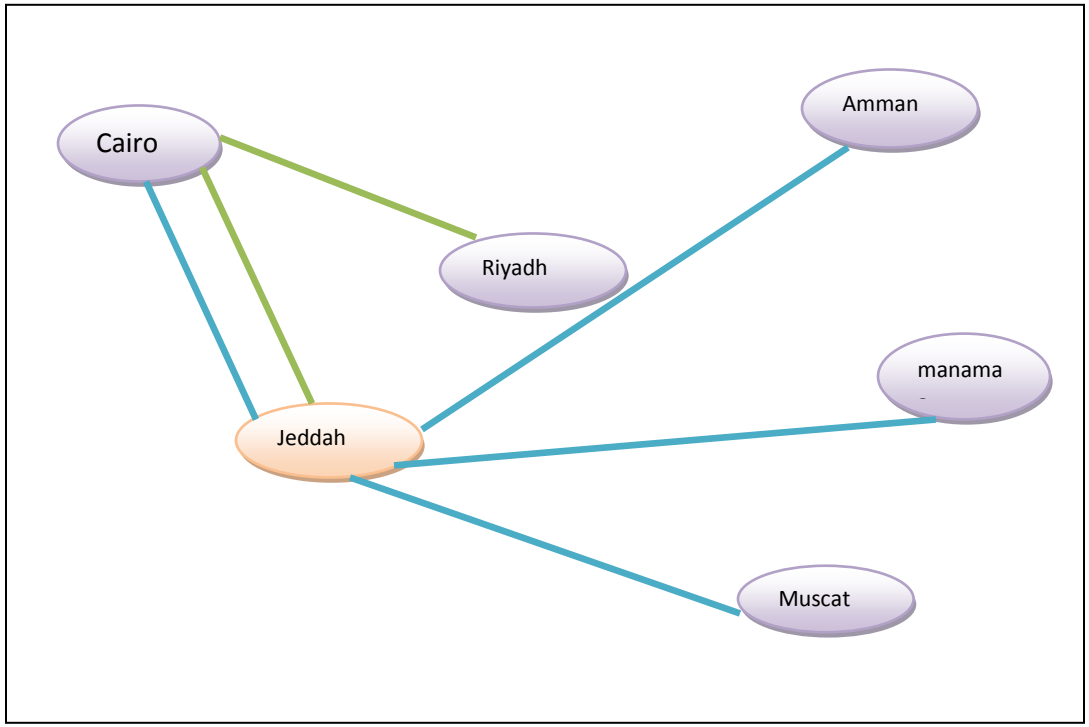
State Egypt (Cairo)

State	Speed		IP Address	Net Mask	Router Type	IP.V	
Amman	64k	Leased line	10.10.10.2 192.168.12.7	255.255.255.0	Motorola Vangurd 6800	IPV4	AMHS, Voice
Athens	64k	Leased line	192.168.80.2	255.255.255.0	Cisco2800	IPV4	Voice
Athens	64k	Leased line	10.10.10.1	255.255.255.0	Cisco2800	IPV4	CIDIN,Voice
Jeddah	64k	Leased line	192.168.80.2	255.255.255.252	Cisco2800	IPV4	Voice
Jeddah	128k	Leased line	192.168.12.244	255.255.255.0	Motorola Vangurd 6455	IPV4	AMHS, Voice
Riyadh	64k	Leased line	192.168.80.2	255.255.255.0	Cisco2800	IPV4	Voice
Tripoli	64k	Leased line	10.10.10.1	255.255.255.0	Cisco1700	IPV4	AFTN



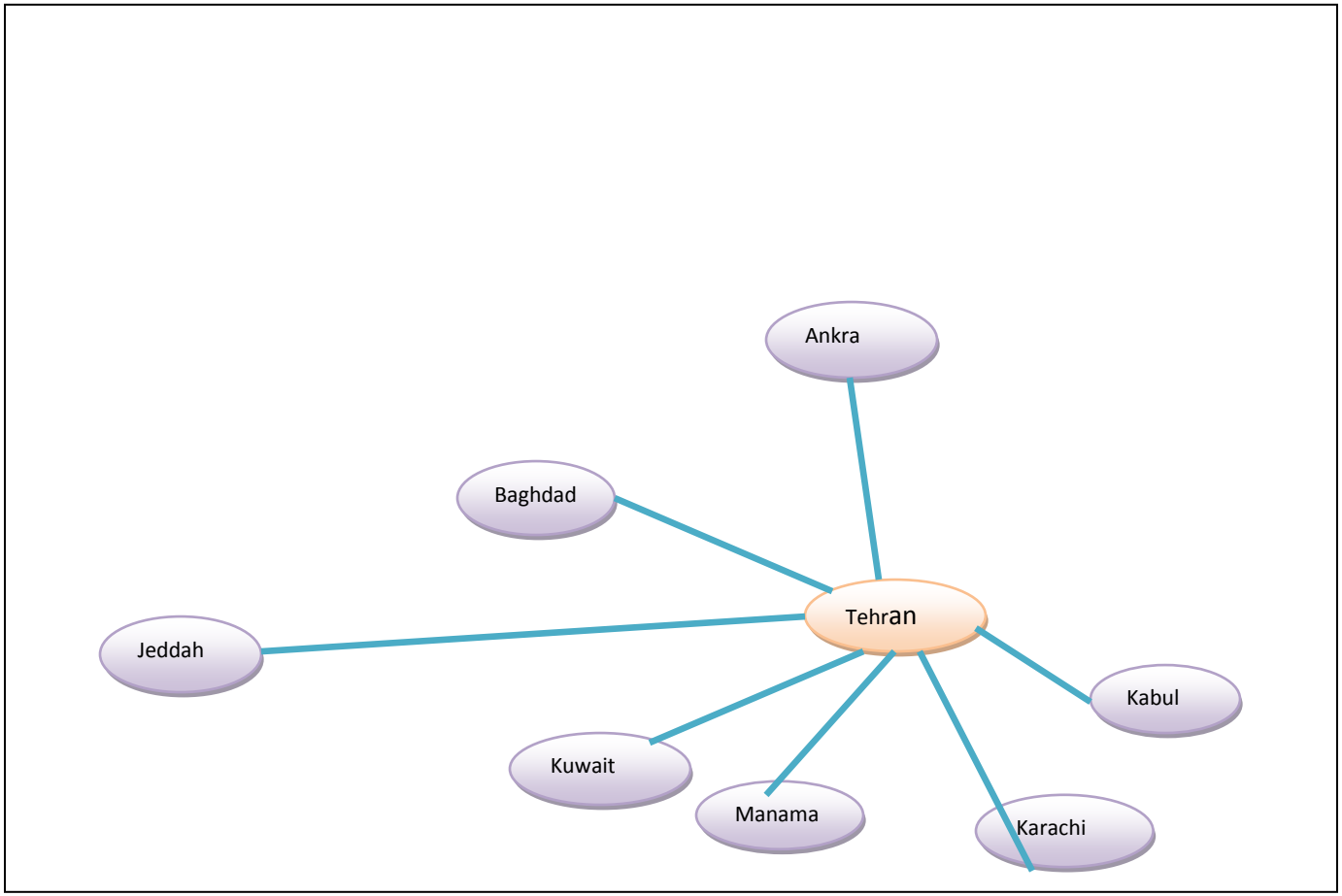
State Saudi Arabia(Jeddah)

State	Speed		IP Address	Net Mask	Router Type	IP.V	
Cairo	128k	Leased line	192.168.12.0	255.255.255.0	Motorola Vangurd 6455	IPV4	AMHS,Voice
Amman	64k	Leased line	192.168.12.0	255.255.255.0	Motorola Vangurd 6455	IPV4	AMHS,Voice
Muscat	64k	Leased line	192.168.12.0	255.255.255.0	Cisco 2811	IPV4	AFTN,Voice
Manama	64k	Leased line	TBD	TBD	Motorola Vangurd 6435	IPV4	CIDIN,Voice



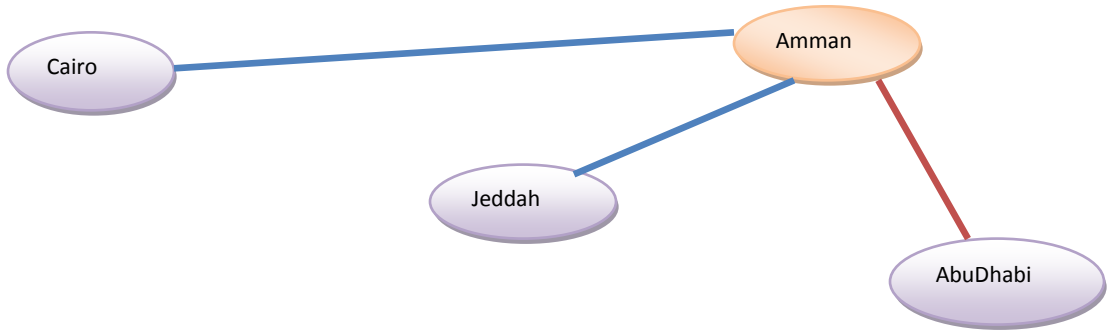
State IRAN(Tehran)

State	Speed		IP Address	Net Mask	Router Type	IP.V	
Manama	64k	MPLS	172.16.10.0	255.255.255.0	Cisco2811	IPV4	AFTN,Voice
Baghdad	32k	V-SAT	TBD	TBD	Cisco2811	IPV4	AFTN,Voice
Ankra	64k	MPLS	172.16.13.0	255.255.255.0	Cisco2811	IPV4	AFTN,Voice
Kabul	32k	V-SAT	TBD	TBD	Cisco2811	IPV4	AFTN,Voice
Karachi	64k	MPLS	172.16.11.0	255.255.255.0	Cisco2811	IPV4	AFTN,Voice
Kuwait	64k	MPLS	172.16.12.0	255.255.255.0	Cisco2811	IPV4	AFTN,Voice



State Jordan(Amman)

State	Speed		IP Address	Net Mask	Router Type	IP.V	
Cairo	64k	Leased line	10.10.10.1	255.255.255.0	Vanguard	IPV4	AMHS,Voice
Jeddah	64k	Leased line	10.10.10.1	255.255.255.0	Vanguard	IPV4	AMHS,Voice
Abu dhabi	2M	Public internet	TBD	TBD	Cisco 5510	IPV4	AMHS



State Iraq

State	Speed		IP Address	Net Mask	Router Type	IP.V	

Iraq did not submit -IP network Survey

State Kuwait

State	Speed		IP Address	Net Mask	Router Type	IP.V	

Kuwait did not submit -IP network Survey

State Oman

State	Speed		IP Address	Net Mask	Router Type	IP.V	

Oman did not submit -IP network Survey

State Qatar

State	Speed		IP Address	Net Mask	Router Type	IP.V	

Qatar did not submit -IP network Survey

State Syria

State	Speed		IP Address	Net Mask	Router Type	IP.V	

Syria did not submit -IP network Survey

State UAE

State	Speed		IP Address	Net Mask	Router Type	IP.V	

UAE did not submit -IP network Survey

State Yemen

State	Speed		IP Address	Net Mask	Router Type	IP.V	

Yemen did not submit -IP network Survey

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Appendix 3C to the Report on Agenda Item 3

MID IP NETWORK SURVEY

Introduction

This survey has been redeveloped while analyzing the previous version. The purpose is for collecting information about the existing IP infrastructure between the states in-order to come with a unified IP scheme plan for the MID-Region IP network.

General Information:

State:	……..		
Does IP network existing in place?			
❑ Yes ❑ No			
Is Aviation systems connected together over IP?			
❑ Yes ❑ No			
Who to contact if more details or clarification is required?			
Name:	…….		
Title:	…….		
Email:	…….		
Telephone:	……	Fax:	……

Link Specific Information:

Please fill the following form **for each link** between you state and neighboring state within MID-Region:

1	Connection From:	State: ……. Location: ……
2	Connection To:	State: ……. Location: ……
3	Service Provider:	
4	Link Speed:	…… Kbps
5	Link Type:	❑ Leased Circuit ❑ Frame-relay ❑ V-SAT ❑ MPLS ❑ Other ……
6	IP version:	❑ IPv4 ❑ IPv6
7	IP Subnet:	❑ 10.__.__.__ Netmask: ___.___.___.___ ❑ 172.__.__.__ Netmask: ___.___.___.___ ❑ 192.168.__.__ Netmask: ___.___.___.___ ❑ Other: ……. Netmask: ___.___.___.___
8	Router / other	Manufacturer: ……..... Model: …….
9	Router Interfaces Supported*:	❑ Async Serial ❑ Sync Serial ❑ Ethernet ❑ Other: ……
	Router Interfaces Implemented	❑ Async Serial ❑ Sync Serial ❑ Ethernet ❑ Other: ……
10	Supported Routing Protocols*:	❑ RIP ❑ OSPF ❑ BGP ❑ IS-IS ❑ Other: ……..
	Supported Routing Implemented	❑ RIP ❑ OSPF ❑ BGP ❑ IS-IS ❑ Other: ……..
11	Supported Voice	❑ SIP ❑ H.323 ❑ Other: …….

	Signaling on router*:	
	Supported Voice Implemented	❑ SIP ❑ H.323 ❑ Other: …….
12	Data Applications in use*:	❑ AFTN/CIDIN ❑ AMHS ❑ OLDI/AIDC ❑ Other: ……..
13	Voice Applications in use*:	❑ ATC Voice ❑ VHF Voice ❑ Other Voice: ……
14	Data end user interface:	❑ Serial ❑ IP based (Answer Below) ❑ Other: …….
15	Security measures between LAN and WAN*:	❑ Single-firewall (Type: ……) ❑ IPS (Type: ……..) ❑ Dual-firewall (Types: ……..…...)
16	Voice end user interface*:	❑ FXS/FXO ❑ ISDN ❑ VoIP ❑ Other: ……..
	Optional cost in USD	
	Additional Info	

* Choose all that apply

CNS SG/4
Appendix 3D to the Report on Agenda Item 3

ATN/IPS WG TASK LIST

No	Description	Deliverables	Target date	Responsibility
1	Review of implementation problems and develop coordinated solutions	Updated the information in the ATN Router and AMHS planning tables and the implementation status		Members
2	Coordinate/compile the regional implementation schedule	maintain the AMHS Implementation Plan		ATN-IPS WG
3	Monitor Implementation			ATN-IPS WG
4	Development of Interim Database for routing tables	Database	AIRAC	Jordan/
5	MID - AMC			ATN-IPS Jordan
6	MID ATN AMHS will adopt IPv4 address assignment proposed by as an interim measure and will transit to IPv6 after the related implementation issues are resolved. This approach will be based on point-to-point IP network	Guidance Doc on IPv4 addressing plan to be developed		Egypt Haitham/ Lebanon/Mohammed Saad
7	facilitate implementation of VoIP in MID	develop the required guidance	July 2012	Mohammed (Bahrain)
8	develop a list of the documents which are need for MID-ATN Implementation	List of documents	Sep 2011	All
9	IP Network plan Analysis/requirement/financial/design		15 Sep 2011	Abdulla / Mona / Yasser
10	Proposal from PTT for IP network for the region		15/sep 2011	Mohammed (Bahrain)
11	Coordination for presentation from suppliers		1qtr 2012	Mohammed (Bahrain)

ATN/IPS WORKING GROUP TOR

1. Terms of Reference (TOR)

1.1 The Terms of Reference of the ATN/IPS Working Group (ATN/IPS WG) are:

a) To promote regionally harmonized and agreed approach to transition planning to ATN in order for MID States to work collaboratively in developing their future transition arrangements towards the ATM system envisioned in the Global ATM Operational Concept; and

b) address regional planning and implementation issues, related to AFTN/CIDIN/AMHS and networking issues including the usage of the public internet and development of MID IP NET standards

1.2 In order to meet the Terms of Reference, the ATN/IPS WG shall:

a) Follow up on public Internet usage in the MID Region and document all Internet usage with particular attention to the safety/security of the data exchanged over the public internet;

b) development of the ATN planning and implementation document to be main source for planning and implementation guidance;

c) review and analyze the MID Region AFTN/CIDIN/AMHS plans and make suggestion for the improvement in accordance with the new development in the MID Region and coordinate the AMHS implementation;

d) develop MID IP Network common specification and implementation guidance;

e) develop AMHS implementation plan for the MID and related AMC implementation related materials;

f) develop task list for the work programme and provide updates to CNS SG; and

g) Provide the necessary support for the implementation of the IPS in the MID Region.

2. Composition

ATN/IPS Group will be composed of experts nominated by MIDANPIRG Provider States.

Other representatives, who could contribute to the activity of the Group, could be invited to participate as observers.

CNS SG/4
Appendix 3F to the Report on Agenda Item 3

Meeting on additional functions for MID Region in the EUR-AMC

Objective: To discuss the possibilities of providing full AMC Service or support the ICAO MID Region as requested by the Regional Director of the ICAO Cairo Office.

Participants:

Mr. Yuksel Eyuboglu, EUROCONTROL

Mr. Dimitris Apsouris, EUROCONTROL

Mr. Yaser Ziad JORDAN

Mrs. Muna Annaddaf, JORDAN

Meeting Venue: EUROCONTROL HQ, Brussels

Meeting Date: 5th July, 2011

Agenda:

1. Welcome and Introduction.
2. Approval of Agenda.
3. Presentation of ATS activities in MID Region and EUR/NAT Region.
4. Discussion on the requirements for Network Management Center for MID Region.
5. Identifications of options concerning possible EUROCONTROL support.
6. Recommendation on the way forward.
7. AOB

Discussion:

1. Under Agenda Item 3, the AMHS implementation activities in both EUR/NAT and MID regions were presented briefly.

2. Concerning item 4, with respect to the network management requirements of the MID Region, EUROCONTROL was informed that the MID Region needs one additional function (Routing Management) not the full AMC service. The Routing Management Function is currently provided only to the EUR/NAT States.

3. Under agenda item 5 possible options were discussed to satisfy the needs of the MID Region as follows:

3.1 Provision of AMC Routing Management Function to the MID Region. This option is considered short term, easy to implement and no modification will be required in the AMC. Only additional AMC operational effort will be required to carry out the routing management function for MID Region. It is estimated that this effort would be approximately 50k€ per year. The current AMC operator contract will be renewed in the last quarter of 2011. This option can be included in that contract.

3.2 Modification of AMC, so that each region manages its own data. Major modification would be needed for the AMC architecture, including modification of the functions, procedures, documents, training materials and the AMC application. This is considered the most complex solution and may take 1 or 1.5 year to implement. In this option since each region manages its own data no additional AMC operator costs required for Europe, however there would be additional development and implementation costs. The related development and implementation costs for this option could be estimated by EUROCONTROL if this option is selected.

3.3 Supporting the MID Region to develop its own AMC.
This is a long term option; EUROCONTROL will be able to provide development, implementation and operational support on request. This includes:

- Support / Interpretation of ATS Messaging Management Manual,
- Support / Interpretation of AMC Implementation Specification,
- Support for development of MID Region AMC Application,
- Setting up of the AMC infrastructure, including LAN/WAN and Application Server, Database Server, Web Server, firewalls etc…
- Support for setting up the organization including the steering group and technical support group,
- Possible provision of AMC application with or without source code,
- Support for development of synchronization functions and procedures between the regions.
- Training the AMC operators and the users.
- etc...

4. under agenda item 6,

Action 1: it was decided that EUROCONTROL will provide more information concerning the contents, time scales and costs especially for option 3.

Action 2: In parallel, the MID Region, via Cairo Office Regional Director (preferably ICAO HQ), will send an official request to the DG of EUROCONTROL indicating the option(s) they intend to implement.

5. Next meeting is not planned; the work will be carried out by e-mail or teleconference if required.

REPORT ON AGENDA ITEM 4: REVIEW AND UPDATE OF AFTN/CIDIN DIRECTORY AND CNS PART OF MID BASIC ANP AND FASID (DOC 9708)

4.1 The meeting recalled that States were encouraged to continue using high speed circuits between MID States centers using the state of the art digital technology and keep pace for implementing these high speed digital circuits links that will facilitate the transition to ATN. Accordingly, MIDANPIRG/11 adopted Conclusion 11/57: *Digital High Speed Links.*

4.2 Based on MIDANPIRG agreement that conclusions of general nature and whose status of implementation would be "Ongoing" for many years are more suitable for inclusion in the Air Navigation Plan hence the above conclusion to be included in the introduction part of part IV FASID. Accordingly, ICAO MID Regional Office included the above conclusion in the amendment proposal to the CNS Part of the MID FASID that was approved on 14 July 2010.

4.3 The meeting noted that the CNS SG meetings were of the opinion that the process of updating the AFTN/CIDIN directory during the CNS SG meetings is not practical and time consuming; therefore it was agreed that any future updates be forwarded to ICAO MID Regional Office in order to maintain the directory updated.

4.4 The meeting further noted that many AMHS implementations are going on in the ICAO MID Region, in order to support these implementations, ICAO MID Regional office with the support from EUROCONTROL conducted AMC training for the MID States, consequently many AMHS systems are now operational in the MID Region which is considered as pioneer in the AMHS implementation.

4.5 During the AMC training it was noted that there is a facility to store/update the full AFTN/CIDIN directory in the AMC system and with the knowledge now gained in using the AMC systems, MID States could utilize this function which is actually handled by the AMC operator.

4.6 The Introduction of AMHS and the implementation of new circuits make the manual maintenance of the routing directory difficult and complicated. In Europe this function is done by AMC operator with the aid of routing software where the AMC operator would have a complete view of the network; in addition AMC has a function utilized to create an optimum routing table and this function can be used by the MID Region but require authorization from EUROCONTROL as this function has not been provided to the External com centre.

4.7 Based on the above, MIDANPIRG/12 endorsed to use AMC system for updating and maintaining the MID Region AFTN/CIDIN directory and agreed on the following Conclusion 12/44:

CONCLUSION 12/44: UPDATING THE AFTN/CIDIN DIRECTORY

That,

a) ICAO MID Regional office request Authorization from EUROCONTOL to provide the AMC routing function to the MID Region; and

b) MID States are urged to keep the AMC systems updated with the complete AFTN/CIDIN directory.

4.8 ICAO MID Regional Office requested EUROCONTROL to provide the additional functions to the MID Region. However, it was noted that additional workload on AMC will be required and after several exchange of correspondence and a meeting resulted that the way forward for the MID Region will be that ICAO MID Region establish its own MID AMC. The details were discussed under Agenda Item 3.

4.9 The meeting updated the MID AFTN/CIDIN directory as at **Appendix 4A** to the Report on Agenda Item 4 and agreed that the ICAO MID Regional office coordinate directly with Jordan for the population of the MID AFTN/CIDIN directory in the MID AMC when operational, and also post the directory in the ICAO MID Forum with restricted access. Accordingly the meeting agreed to the following Draft Conclusion:

DRAFT CONCLUSION 4/7: MID AFTN/CIDIN DIRECTORY

That, ICAO MD Regional Office:

a) take necessary steps with Jordan to populate the MID AFTN/CIDIN Directory in the MID AMC; and

b) post the MID AFTN/CIDIN Directory in the ICAO MID Forum.

4.10 The meeting was apprised on the current version of the MID Basic ANP and FASID as being a planning document and need not necessarily reflect the existing facilities and services. However, the meeting reviewed and updated the current version of Part IV of the MID Basic ANP with the updates from States as at **Appendix 4B** to the Report on Agenda Item 4. Furthermore the meeting was of the view that full review to be considered during the CNS/ATM/IC SG/6 meeting, taking into consideration the States plans and the recent advancement in many fields of air navigation system especially in the CNS area, to reflect the global developments and current regional requirements.

CNS SG/4
Appendix 4A to the Report on Agenda Item 4

INTERNATIONAL CIVIL AVIATION ORGANIZATION
MIDDLE EAST OFFICE

Routing Directory for AFTN and CIDIN Centres in the MID Region

Version 0.5 -October 2011

CNS SG/4
Appendix 4B to the Report on Agenda Item 4

MID FASID - CNS **E 4-0-1**

Part IV

COMMUNICATIONS - NAVIGATION - SURVEILLANCE (CNS)

1. Introduction

1.1 The standards, Recommended Practices and Procedures to be applied are as listed in Part IV - CNS of the basic MID ANP. The material in this Part complements that contained in Part I - BORPC of the MID ANP and should be taken into consideration in the overall planning processes for the MID Region.

1.2 This Part contains a detailed description/list of the facilities and/or services to be provided to fulfill the basic requirements of the Plan and are as agreed between the provider and user States concerned. Such agreement indicates a commitment on the part of the State(s) concerned to implement the requirement(s) specified. This element of the FASID, in conjunction with the MID Basic ANP, is kept under constant review by the MIDANPIRG in accordance with its schedule of management, in consultation with user and provider States and with the assistance of the ICAO Middle East Regional Office, Cairo.

1.3 States concerned should take urgent action to implement the main COM centres and trunk circuits of AFTN plan described in FASID Table CNS 1A, and implement/promulgate, as soon as practicable, the tributary centres and circuits of the AFTN plan in co-ordination with the States responsible for the corresponding main COM centres

1.4 States, as a matter of urgency should take action to implement the ATS direct speech plan. Adequate backup facility shall be provided to insure the continuity of the circuit. (FASID Table CNS 1D)

1.5 Where other than dedicated bilateral links are used by the MID-ATN Network, the priority of implementation, should ensure high availability, in restoration of service and appropriate levels of security.

1.6 States are encouraged to deploy digital and high-speed links, as part of overall improvement of current ground-to-ground communications and provision of an infrastructure that would facilitate the transition to ATN

1.7 States should implement ATN routers and communication links in accordance with ATN Plan Table CNS 1C – ATN Plan.

1.8 taking into account that the use of global communications, navigation and surveillance systems is based on assigning exclusive aircraft addresses composed of 24-bit for ACAS, ELT, SSR Mode S, and ATN with VDL, AMSS and other functionality, MID States to apply the procedure established by ICAO to identify aircraft assigned 24-bit aircraft addresses in accordance with Annex 10,

Volume III, Part I, Chapter 9, Global plan for the allocation, assignment and application of aircraft addresses which has the list of assigned addresses to MID States.

2. Table of contents

2.3.1 Table CNS 4 - Surveillance Systems

Appendix A to table CNS 4 shows the allocated IC code for the Mode S Radar.

Chart CNS 4 - Radar facilities

TABLE CNS 1A - RATIONALIZED AFTN PLAN FOR MID REGION

(All circuits should be implemented using LTT)

EXPLANATION OF THE TABLE

Column:

1 The AFTN Centers/Stations of individual State are listed alphabetically. Each circuit appears twice in the table.

2 Category of circuit

M – Main trunk circuit connecting Main AFTN communication centers.
T – Tributary circuit connecting Main AFTN center and tributary center.
S – AFTN circuit connecting an AFTN Station to an AFTN center.

3 and **7** Type of circuit provided

LTT/a – Landline teletypewriter, analogue (eg. cable, microwave)
LTT/d – Landline teletypewriter, digital (eg. cable, microwave)
LDD/a – Landline data circuit, analogue (eg. cable, microwave)
LDD/d – Landline data circuit, digital (eg. cable, microwave)
SAT/ad – Satellite link, with/ a for analogue or d for digital

4 and **8** Circuit signaling speed, current or planned in bits/s

5 and **9** Circuit protocols, current or planned

6 and **10** Data transfer code (syntax), current or planned.

ITA-2 – International Telegraph alphabet No.2 (5-unit Baudot code).
IA-5 – International Alphabet No.5 (ICAO 7-unit code)
CBI – Code and Byte Independency (ATN compliant)

11 Target date of implementation TBD – To be determined

12 Remarks , VPN (Virtual Private Network)

Table CNS 1A – AFTN Plan

State/Station	Cat	Current				Planned				Target date of implementation	Remarks
		Type	Signaling Speed	Protocol	Code	Type	Signaling Speed	Protocol	Code		
1	2	3	4	5	6	7	8	9	10	11	12
BAHRAIN											
BAHRAIN	M										
ABU DHABI	M		64 – 9.6 kbps	CIDIN	IA-5			AMHS	CBI	3rd QTR 2012	
BEIRUT	T		9600 bps	CIDIN	IA-5	SAT/d					Bahrain ready
DOHA	M		64 – 9.6 kbps	None	IA-5						
JEDDAH	T		64 – 9.6 kbps	CIDIN	IA-5			AMHS	CBI	3rd QTR 2012	
KABUL	M		--								
KUWAIT	M		64 – 9.6 kbps	None	IA-5						
MUSCAT	M		~~300 baud~~ 9.6kbps	None	IA-5		64k bps			3rd QTR 2012	
SINGAPORE	M		9600 bps	None	IA-5		64k bps	AMHS	CBI	3rd QTR 2012	
TEHRAN	M		64 – 9.6 kbps	None	IA-5						
EGYPT											
CAIRO	M										
AMMAN	M		64/9.6	None	IA-5					2010	
ATHENS	T		64/9.6	CIDIN	IA-5					2010	
BEN GURION	M		64/9.6	None	IA-5					2010	
BEIRUT	M		9600	CIDIN	IA-5					2010	
JEDDAH	T		128/9.6	CIDIN	IA-5		128 K			2010	
KHARTOUM	M		9600	None	IA-5					2010	
NAIROBI	M		9600	None	IA-5					2010	
TUNIS	M		64/9.6	None	IA-5					2010	Backup
TRIPOLI	M		64/19.2	None	IA-5						
TRIPOLI	M		9600	None	IA-5					2010	
DAMASCUS	M		64/9.6	None	IA-5						

State/Station	Cat	Current				Planned				Target date of implementation	Remarks
		Type	Signaling Speed	Protocol	Code	Type	Signaling Speed	Protocol	Code		
1	2	3	4	5	6	7	8	9	10	11	12
IRAN TEHRAN BAHRAIN KABUL KUWAIT ABU-DHABI	 M T M		 64 Kbps - 64 Kbps	 None None	 IA-5 IA-5	 SAT/d					Bahrain ready
IRAQ BAGHDAD AMMAN BEIRUT	 T T		 - -	 None None	 IA-5 IA-5						
JORDAN AMMAN BAGHDAD BEIRUT BEN GURION CAIRO DAMASCUS JEDDAH ABU DHABI	 T M T M T M T	 Lease Line VPN	 - - 1200 64 K 64/19.2 64/19.2 2MB	 - - None None None None AMHS	 - - IA-5 AMHS IA-5 ITA-2	 VSAT LL	 - - 64 K	 AMHS AMHS		 2012 Circuit not ops 2012	 PUBLIC INTERNET

State/Station	Cat	Current				Planned				Target date of implementation	Remarks
		Type	Signaling Speed	Protocol	Code	Type	Signaling Speed	Protocol	Code		
1	2	3	4	5	6	7	8	9	10	11	12
KUWAIT											
KUWAIT											
BAHRAIN	M	LDD/d	64/9.6 bps	None	I A-5						
DAMASCUS	T	LDD/a	50 BD	None	ITA-2	LDD/d	64/9.6 kbps		IA-5	July 2012	In progress
BEIRUT	M	LDD/a	100 baud	None	ITA-2	LDD/d	64/9.6 kbps		IA-5	July 2012	In progress
DOHA	M	LDD/a	64/9.6 bps	None	IA- 5						
(EUR)	-										
KARACHI	M	LDD/d	2.4 K	None	ITA-2 ~~5~~						
TEHRAN	M	LDD/d	64/9.6 baud	None	ITA-2 ~~5~~						
BAGHDAD	T	SAT/ad	9.6 bps	None	ITA-2 ~~5~~						
LEBANON											
BEIRUT											
AMMAN	M		-	-	-					2012	
BAGHDAD	T		-	None	-						
BAHRAIN	M		9600	CIDIN	IA-5						
CAIRO	M		9600	CIDIN	IA-5						
DAMASCUS	T		2 x 50 bd	None	ITA-2						
JEDDAH	M		9600	CIDIN	~~ITA-2~~						
KUWAIT	M		100 BD	None	ITA-2						
NICOSIA	M		9600	CIDIN	IA-5						
OMAN											
MUSCAT											
ABU DHABI	T		9600	AMHS							
BAHRAIN	M		300 BD	None	IA-5		9600	AMHS		2012	
MUMBAI	M		9600	None	ITA-5			AMHS		2012	
JEDDAH	M		9600	None	IA-5			AMHS		2012	
SANA'A	T		100 BD	None	ITA-2		9600	IA-5		2012	

State/Station	Cat	Current				Planned				Target date of implementation	Remarks
		Type	Signaling Speed	Protocol	Code	Type	Signaling Speed	Protocol	Code		
1	2	3	4	5	6	7	8	9	10	11	12
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		9600			2012	
SANA'A	T		9600	None	IA-5						
AMMAN											
SYRIA											
DAMASCUS											
ATHENS	M		2 X 50	None	ITA-2		9600 bps			2012	
AMMAN	T		64/9.6	None			9600 bps			2012	
BEIRUT	M		2 X 50	None	ITA-2		9600 bps			2012	
CAIRO	M		50 BD	None	ITA-2		9600 bps			2012	
KUWAIT	M		50BD	None	ITA-2		9600 bps			2012	
TEHRAN	T		50BD	None	ITA-2		9600 bps			2012	

State/Station	Cat	Current				Planned				Target date of implementation	Remarks
		Type	Signaling Speed	Protocol	Code	Type	Signaling Speed	Protocol	Code		
1	2	3	4	5	6	7	8	9	10	11	12
UAE											
ABU DHABI											
BAHRAIN	M	LDD/d	64 – 9.6 Kbps	CIDIN	IA-5			AMHS	CBI		
AMMAN	T	LDD/d	2 MB bps	AMHS							Secured VPN
MUSCAT	M	LDD/d	9600 bps	AMHS	IA-5						
QATAR	T	LDD/d	9600 bps	AMHS	IA-5						
TEHRAN	M	LTT/a	100 bps	None	IA-5	SAT/ad	9.6kbps	AMHS	CBI		
YEMEN											
SANA'A											
JEDDAH	M		9600	None	IA-5						
MUSCAT	M		100bps	None	IA-5		9.6kbps			2012	

MID FASID – CNS 1B -

TABLE CNS 1B

MID Aeronautical Message Handling System (AHMS) Implementation Plan

EXPLANATION OF THE TABLE

Column

1 *Name of State*

2 *Date of installation of AMHS – Aeronautical Message Handling System*

3 *Date of operation of AMHS – Aeronautical Message Handling System*

4 *MTA- Message Transfer Agent application*

5 *AFTN/AMHS Gateway*

6 *ATS Message UA-User Agent*

7 *ATS service level*
Basic
Extended

8 *Protocol (IPS, ATN)*
Dual Stack
IPS
OSI

9 *Remarks*

EXPLICATION DU TABLEAU

(To be completed by HQ)

Notes:

- *The MID Region shall use the Europe EUR AMHS Manual EUR Doc 020 and all its Appendices for the implementation of AMHS*
- *Gateways and Interregional connection will be as agreed.*

4-CNS 1B-2 MID FASID – CNS 1B

State	Installation	Operation	MTA Name	AFTN/AMHS Gateway	ATS Message UA	ATS service level	Protocol (IPS, ATN)	Remarks
1	2	3	4	5	6	7	8	9
Bahrain	2009	2011	MTA-OBBI-1	Y	Y	Extended	Dual Stack	Support IPv4 only
Egypt	2008	2011	MTA-HECA-1	Y	N	Extended	Dual Stack	Support IPv4 only
Iran	-	-	-	-	-	-	-	-
Iraq	-	-	-	-	-	-	-	-
~~Israel~~	-	-	-	-	-	-	-	-
Jordan	2008	2010	MTA-OJAM-1	Y	Y	Extended	Dual Stack	Support IPv4 only
Kuwait		-	MTA-OKBK-1	Y	Y	Extended		Support IPv4 only
Lebanon	-	-	-	-	-	-	-	-
Oman	2008	2009	MTA-OOMS-1	Y	Y	Extended		Support IPv4 only
Qatar		-	MTA-OTBD-1	Y	Y			Support IPv4 only
Saudi	2008	2011	MTA-OEJN-1	Y	Y	Extended	Dual Stack	Support IPv4 only
Syria	-	-	-	-	-	-	-	-
UAE	2006	2009	MTA-OMAE-1	Y	Y	Basic		Support IPv4 only
Yemen	-	-	-	-	-	-	-	-

Appendix A to CNS 1B MID Region AMHS addresses

State	**AMHS Address Specification**							
State Name	**Nationality Letters or Designator**	**Country-name attribute**	**ADMD-name attribute**	**PRMD-name attribute**	**Addressing scheme**	**ATN Directory naming-context**	**Organization-name (for CAAS only) single value or reference to the CAAS Table**	**Comments**
Bahrain	OB	XX	ICAO	OB	CAAS		see Table OB	confirmed by SL
Egypt	HE	XX	ICAO	HE	CAAS		HECA	confirmed by SL
Iran (Islamic Republic of)	OI	XX	ICAO	OI	XF			confirmed by SL
Iraq	OR	XX	ICAO	OR	XF			
Israel	LL	XX	ICAO	LL	XF			
Jordan	OJ	XX	ICAO	OJ	CAAS		OJAC	confirmed by SL
Kuwait	OK	XX	ICAO	OK	XF			
Lebanon	OL	XX	ICAO	OL	XF			
Oman	OO	XX	ICAO	OO	XF			
Qatar	OT	XX	ICAO	OT	XF			
Saudi Arabia	OE	XX	ICAO	OE	XF			confirmed by SL
Syrian Arab Republic	OS	XX	ICAO	OS	XF			
UAE	OM	XX	ICAO	OM	~~XF~~ CAAS		OMAE	confirmed by SL
Yemen	OY	XX	ICAO	OY	XF			

TABLE CNS 1C - AERONAUTICAL TELECOMMUNICATION NETWORK

EXPLANATION OF THE TABLE

Column :

1 Name of the States/stations or locations of an ATN Routing Domain

2 ATN applications in end systems (ES) of the State shown in column **1**

AIDC – ATS Inter-facility Data Communication

AMHS – Aeronautical Message Handling System

Note : AMHS/S denotes an AMHS server

3 ATN router type to be implemented at the location shown in Column **1**
BBIS – Backbone Boundary Intermediate System
BIS -- Boundary Intermediate System (router) performing Inter Domain Routing Protocol (IDRP)
IS -- Intermediate System (router) without IDRP

4 ATN Routing Domain Address Prefix

5 AFTN/AMHS gateway to be implemented at the location shown in column **1**

6 List of States routers to be connected with router of column **3**

7 The means of connecting the routers of columns **6** and **3**
DIR- Leased direct circuit

8 Date of implementation of the ATN facilities and applications, listed in columns **2**, **3** and **5**

9 Remarks

EXPLICATION DU TABLEAU
(To be completed by HQ)

TABLE CNS 1C - ATN PLAN

STATE/CENTERS	ATN APPLICATIONS	ATN ROUTER TYPE	ATN RD ADDRESS PREFIX	AFTN/AMHS GATEWAY	CONNECTED WITH ROUTER OF	VIA	IMPLEMENTATION DATE	REMARKS
1	2	3	4	5	6	7	8	9
Bahrain **Bahrain**	AMHS/S AIDC	**BIS**		**X**	**ASIA/PAC** Oman,Saudi Arabia Kuwait,Lebanon Iran, Afganistan Qatar,UAE			
EGYPT **Cairo**	AMHS/S AIDC	**BIS**		**X**	**AFI, EUR** Israel, Jordan, Lebanon, Athena Saudi Arabia			
IRAN **Tehran**	AMHS/S AIDC	**BIS**		**X**	Kuwait, Bahrain Afganistan			
IRAQ **Baghdad**	AMHS	IS			Jordan, Lebanon			
~~ISRAEL **Ben Gurion**~~	~~AMHS~~	~~IS~~			~~Jordan, Egypt~~			
JORDAN **Amman**	AMHS/S AIDC	**BIS**		**X**	Egypt,Israel Lebanon,Iraq,Syria			
KUWAIT **Kuwait**	AMHS/S AIDC	**BIS**		**X**	**EUR**, Pakistan, Iran,Qatar,Bahrain, Lebanon			
LEBANON **Beirut**	AMHS/S AIDC	**BIS**		**X**	**EUR** Jordan,Syria Iraq,Kuwait,Bahrain Saudi Arabia,Egypt			
OMAN **Muscat~~/Seeb~~**	AMHS/S AIDC	**BIS**		**X**	**ASIA/PAC** Yemen, Bahrain, UAE, Saudi Arabia			
QATAR **Doha**	AMHS AIDC	IS			Kuwait, Bahrain			
SAUDI ARABIA **Jeddah**	AMHS/S AIDC	**BIS**		**X**	**AFI** Egypt, Lebanon Bahrain,Oman Yemen			

STATE/CENTERS	ATN APPLICATIONS	ATN ROUTER TYPE	ATN RD ADDRESS PREFIX	AFTN/AMHS GATEWAY	CONNECTED WITH ROUTER OF	VIA	IMPLEMENTATION DATE	REMARKS
1	2	3	4	5	6	7	8	9
SYRIA **Damascus**	AMHS	IS			Jordan, Lebanon			
U.A.E **Abu Dhabi**	AMHS/SAIDC	**BIS**		**X**	Bahrain,Oman, Qatar, Jordan, Tehran,Jeddah			Jeddah under test
YEMEN **Sana'a**	AMHS	IS			Oman, Saudi Arabia			

TABLE CNS1C-new

TABLE CNS 1D C ATS DIRECT SPEECH CAPABILITY TO LINK ADJACENT FIC/ACC AND ATS UNITS LOCATED OUTSIDE THE CONTROL AREAS OF THESE FIC OR ACC OR BETWEEN TWR FOR MID REGION

EXPLANATION OF THE TABLE

Column

1 & 2 Terminal stations of the circuits are listed alphabetically by the Terminal I station in country order.

3 A - indicates ATS requirement for voice communication which should be established within 15 seconds.
D - indicates requirement for instantaneous communications.

4 Type of service specified:

LTF - landline telephone (landline, cable UHF, VHF, satellite).
RTF - radiotelephone

5 DIR - indicates that the circuit shown in Terminal I and II is a direct circuit.
SW C indicates that a direct circuit does not exist and that the requirement is to be provided by switching via the switching centre(s) indicated in column 6.
IDD - International direct dialing by public switch telephone network

6 Location of switching centre(s)

7 Status of Implementation. Following codes are used in this column:

a) I - if the circuit is implemented
b) No indication or mark if the circuit is not implemented and its implementation data is unknown
c) If the circuit is not implemented but its implementation date is available, this date is indicated in brackets.

8 Remarks
*Note.*C *All circuits should be implemented using LTF in MID Region.*

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS BESOINS ATS DE COMMUNICATIONS VOCALES REQUISITOS ATS PARA COMUNICACIONES ORALES				CIRCUIT CIRCUITO		STATUS OF IMPLEMENTATION ESTADO DE IMMPLANTACION	REMARKS OBSERVATIONS OBSERVACIONES
TERMINAL I TÊTE DE LIGNE I ESTACIÓN TERMINAL I	**TERMINAL II TÊTE DE LIGNE II ESTACIÓN TERMINAL II**	**TYPE TIPO**	**SERVICE SERVICIO**	**DIR/SW**	**TO BE SWITCHED VIA COMMUTATION VIA CONMUTACIÓN POR**		
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
BAHRAIN							
Bahrain	Emirates ACC	A	LTF	DIR		I	3 LINES
	Dammam	A	LTF	DIR		I	3 LINES
	Doha	A	LTF	DIR		I	3 LINES
	Jeddah	A	LTF	DIR		I	3 LINES
	Kuwait	A	LTF	DIR		I	1 LINE
	Muscat	A	LTF	DIR		I	1 LINE
	Riyadh	A	LTF	DIR		I	2 LINES
	~~Shiraz~~	~~A~~	~~LTF~~				
	Tehran	A	LTF	DIR		I	1 LINE
EGYPT							
Cairo	Amman	A	LTF	DIR		I	
	Athens	A	LTF	DIR		I	
	Jeddah	A	LTF	DIR		I	
	Khartoum	A	LTF				
	Nicosia	A	LTF	DIR		I	
	Tel Aviv	A	LTF	DIR		I	
	Tripoli	A	LTF	DIR		I	
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			
Tehran	Emirates ACC	A	LTF	DIR		I	1I
	Ankara	A	LTF	DIR		I	
	Ashgabat	A	LTF	DIR		I	
	Baghdad	A	LTF				
	Bahrain	A	LTF	DIR		I	
	Baku	A	LTF	DIR		I	
	Basrah	A	LTF				
	Doha	A	LTF	DIR		I	

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS BESOINS ATS DE COMMUNICATIONS VOCALES REQUISITOS ATS PARA COMUNICACIONES ORALES				CIRCUIT CIRCUITO		STATUS OF IMPLEMENTATION ESTADO DE IMMPLANTACION	REMARKS OBSERVATIONS OBSERVACIONES
TERMINAL I TÊTE DE LIGNE I ESTACIÓN TERMINAL I	**TERMINAL II TÊTE DE LIGNE II ESTACIÓN TERMINAL II**	**TYPE TIPO**	**SERVICE SERVICIO**	**DIR/SW**	**TO BE SWITCHED VIA COMMUTATION VIA CONMUTACIÓN POR**		
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
	Kabul	A	LTF				
	Karachi	A	LTF	DIR		I	
	Kuwait	A	LTF	DIR		I	
	Muscat	A	LTF	DIR		I	
	Shiraz	A	LTF	DIR		I	
	Yerevan/Zvartnots	A	LTF	DIR			
IRAQ							
Baghdad	Amman	A	LTF				
	Ankara	A	LTF				
	Basrah	A	LTF				
	Damascus	A	LTF				
	Jeddah	A	LTF				
	Kuwait	A	LTF				
	Mosul	A	LTF				
	Tehran	A	LTF				
Basrah	Abadan	A	LTF				
	Baghdad	A	LTF				
	Kuwait	A	LTF				
	Shiraz	A	LTF				
	Tehran	A	LTF				
Mosul	Baghdad	A	LTF				
~~**ISRAEL**~~							
~~Tel Aviv~~	~~Amman~~	~~A~~	~~LTF~~				
	~~Cairo~~	~~A~~	~~LTF~~				
	~~Nicosia~~	~~A~~	~~LTF~~				

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS BESOINS ATS DE COMMUNICATIONS VOCALES REQUISITOS ATS PARA COMUNICACIONES ORALES				CIRCUIT CIRCUITO		STATUS OF IMPLEMENTATION ESTADO DE IMMPLANTACION	REMARKS OBSERVATIONS OBSERVACIONES
TERMINAL I TÊTE DE LIGNE I ESTACIÓN TERMINAL I	TERMINAL II TÊTE DE LIGNE II ESTACIÓN TERMINAL II	TYPE TIPO	SERVICE SERVICIO	DIR/SW	TO BE SWITCHED VIA COMMUTATION VIA CONMUTACIÓN POR		
1	2	3	4	5	6	7	8
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		I	
	Basrah	A	LTF				
	Jeddah	A	LTF	DIR		I	
	Shiraz	A	LTF	DIR		I	
	Tehran	A	LTF	DIR		I	
LEBANON							
Beirut	Ankara	A	LTF	DIR		I	
	Damascus	A	LTF	DIR		I	
	Nicosia	A	LTF	DIR		I	
OMAN							
Muscat	Emirates ACC	A	LTF	DIR		I	
	Bahrain	A	LTF	DIR		I	
	Mumbai	A	LTF	DIR		I	
	Jeddah	A	LTF	DIR		I	
	Karachi	A	LTF	DIR		I	
	Salalah	A	LTF	DIR		I	
	Sana'a	A	LTF	DIR		I	
	Tehran	A	LTF	DIR		I	
Salalah	Muscat	A	LTF				
QATAR							
Doha	Emirates ACC	A	LTF	DIR		I	1I + 1
	Bahrain	A	LTF	DIR		I	
	Shiraz	A	LTF	DIR		I	
	Tehran	A	LTF	DIR		I	
SAUDI ARABIA							

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS BESOINS ATS DE COMMUNICATIONS VOCALES REQUISITOS ATS PARA COMUNICACIONES ORALES				CIRCUIT CIRCUITO		STATUS OF IMPLEMENTATION ESTADO DE IMMPLANTACION	REMARKS OBSERVATIONS OBSERVACIONES
TERMINAL I TÊTE DE LIGNE I ESTACIÓN TERMINAL I	TERMINAL II TÊTE DE LIGNE II ESTACIÓN TERMINAL II	TYPE TIPO	SERVICE SERVICIO	DIR/SW	TO BE SWITCHED VIA COMMUTATION VIA CONMUTACIÓN POR		
1	2	3	4	5	6	7	8
Dammam	Bahrain	A	LTF	DIR		I	
	Jeddah	A	LTF	DIR		I	
	Riyadh	A	LTF	DIR		I	
Jeddah	Addis Ababa	A	LTF				
	Amman	A	LTF	DIR		I	
	Asmara	A	LTF				
	Baghdad	A	LTF				
	Bahrain	A	LTF	DIR		I	
	Cairo	A	LTF	DIR		I	
	Dammam	A	LTF	DIR		I	
	Khartoum	A	LTF				
	Kuwait	A	LTF	DIR		I	
	Muscat	A	LTF	DIR		I	
	Riyadh	A	LTF	DIR		I	
	Sana'a	A	LTF	SW	Via Bahrain	I	
Riyadh	Bahrain	A	LTF	DIR		I	
	Jeddah	A	LTF	DIR		I	
	Dammam	A	LTF	DIR		I	
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		I	
	Nicosia	A	LTF				

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS BESOINS ATS DE COMMUNICATIONS VOCALES REQUISITOS ATS PARA COMUNICACIONES ORALES				CIRCUIT CIRCUITO		STATUS OF IMPLEMENTATION ESTADO DE IMMPLANTACION	REMARKS OBSERVATIONS OBSERVACIONES
TERMINAL I TÊTE DE LIGNE I ESTACIÓN TERMINAL I	**TERMINAL II TÊTE DE LIGNE II ESTACIÓN TERMINAL II**	**TYPE TIPO**	**SERVICE SERVICIO**	**DIR/SW**	**TO BE SWITCHED VIA COMMUTATION VIA CONMUTACIÓN POR**		
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
UNITED ARAB EMIRATES							
Emirates ACC	Abu Dhabi	A	LTF	DIR		I	21
	Al Ain	A	LTF	SW/DIR		I	
	Bahrain	A	LTF	DIR		I	
	Doha	A	LTF	DIR		I	
	Dubai	A	LTF	DIR		I	
	Muscat	A	LTF	DIR		I	
	Tehran	A	LTF	DIR		I	
	Fujariah	A	LTF	DIR		I	
	Ras Al Khaimah	A	LTF	DIR		I	
	Sharjah	A	LTF	DIR		I	
Abu Dhabi	Emirates ACC	A	LTF	SW		I	21
	Al Ain	A	LTF	DIR		I	21
	Dubai	A	LTF	SW		I	21
Al Ain	Emirates ACC	A	LTF	SW		I	21
	Abu Dhabi	A	LTF	DIR		I	21
	Dubai	A	LTF	SW		I	21
Dubai	Emirates ACC	A	LTF	DIR		I	2I + 1
	Abu Dhabi	A	LTF	DIR		I	2I
	Al Ain	A	LTF	SW		I	1I
	Fujairah	A	LTF	DIR		I	1I
	Ras Al Khaimah	A	LTF	DIR		I	1I
	Sharjah	A	LTF	DIR		I	3I
Fujairah	Ras Al Khaimah	A	LTF	DIR		I	1I
	Emirates ACC	A	LTF	DIR		I	1I
Ras Al Khaimah	Emirates ACC	A	LTF	DIR		I	1I
	Dubai						
Sharjah	Emirates ACC						
	Dubai	A	LTF	DIR		I	31

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS BESOINS ATS DE COMMUNICATIONS VOCALES REQUISITOS ATS PARA COMUNICACIONES ORALES				CIRCUIT CIRCUITO		STATUS OF IMPLEMENTATION ESTADO DE IMMPLANTACION	REMARKS OBSERVATIONS OBSERVACIONES
TERMINAL I TÊTE DE LIGNE I ESTACIÓN TERMINAL I	TERMINAL II TÊTE DE LIGNE II ESTACIÓN TERMINAL II	TYPE TIPO	SERVICE SERVICIO	DIR/SW	TO BE SWITCHED VIA COMMUTATION VIA CONMUTACIÓN POR		
1	2	3	4	5	6	7	8
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	I	
	Mogadishu	A	LTF	DIR			
	Muscat	A	LTF			I	
	Riyan	A	LTF				

TABLE CNS 2 C AERONAUTICAL MOBILE SERVICE

EXPLANATION OF THE TABLE

Column

1 The name of the State and the locations within the same where the service is provided.

2 The required services or functions are provided. Suitable abbreviations for these services or functions are listed below.

ACC-L	Area control service for flights up to FL 250
ACC-SR-I	Area radar control service up to FL 250
ACC-SR-U	Area radar control service up to FL 450
ACC-U	Area control service up to FL 450
AFIS	Aerodrome flight information services
APP-L	Approach control service for flights below FL 120
APP-I	Approach control service for flights below FL 250
APP-PAR	Precision approach radar service up to FL 40
APP-SR-I	Surveillance radar approach control service up to FL 250
APP-SR-L	Surveillance radar approach control service up to FL 120
APP-SR-U	Surveillance radar approach control service up to FL 450
APP-U	Approach control service for flights up to FL 450
ATIS	Automatic terminal information service
D-ATIS	Data link-automatic terminal information service.
CLRD	Clearance delivery
FIS	Flight information service
VHF-ER GP	VHF-Extended range Facility providing VHF or HF en-route general purpose system (GPS) communication. These facilities provide air-ground radiotelephony for all categories of messages listed in Annex 10, Volume II, 5.1.8. This

	system of communication is normally indirect, i.e. exchanged through the intermediary of a third person who is usually a communicator at an aeronautical slation.
SMC	Surface movement control up to limits of aerodrome

Country and location	Service or function	VHF voice	VHF data	HF voice	HF data	Satellite voice	Satellite data	Mode S	Remarks
1	2	3	4	5	6	7	8	9	10
BAHRAIN									
OBBB BAHRAIN FIR	ACC-SR-U ACC-SR-I VOLMET	~~2~~ 6 1 1		6					 150
OBBI BAHRAIN/Bahrain Intl	APP-SR-I TWR SMC D-ATIS	~~1~~ 2 1 2 1							80 25 AD (GP) 150
EGYPT									
HEAX ALEXANDRIA/Alexandria Intl	TWR	1							25
HEBA ALEXANDRIA/Borg El Arab Intl	TWR APP-SR-I ACC-SR-U	1 1 1							25 60 150
HESN ASWAN/Aswan Intl	TWR APP-SR-I ACC-SR-U	1 1 1							25 60 150
HECC CAIRO FIR	ACC-U- ER ACC-SR-U-ER ACC-SR-I-ER VOLMET	4 6 2 1							 ER ER ER (100)
HECA CAIRO/Cairo Intl	APP-SR-I TWR SMC ATIS	3 3 1 1							80 25 AD 150
HEAR EL ARISH/El Arish Intl.	TWR APP-SR-I ACC-SR-U	1 1 1							25 60 150
HEGN HURGHADA/Hurghada Intl	TWR APP-SR-I ACC-SR-U SMC	1 1 1 1							25 60 150 AD
HELX LUXOR/Luxor Intl	TWR APP-SR-I ACC-SR-U SMC	1 1 1 1							25 60 150 AD
HESH SHARM EL SHEIKH/Sharm El Sheikh Intl	TWR APP-SR-I ACC-SR-U	1 1 1							25 60 150
HESC ST. CATHERINE/St. Catherine Intl	TWR	1							25

Country and location	Service or function	VHF voice	VHF data	HF voice	HF data	Satellite voice	Satellite data	Mode S	Remarks
1	2	3	4	5	6	7	8	9	10
HETB TABA/Taba Intl	TWR APP-SR-I ACC-SR-U	1 1 1							25 60 150
IRAN, ISLAMIC REPUBLIC OF									
OIAA ABADAN	TWR SMC ATIS	1 1 1							25 AD 150
OIAW AHWAZ	APP-I TWR SMC ATIS	1 1 1 1							75 25 AD 150
OIKB BANDAR ABBASS/Bandar Abbass	APP-I TWR SMC ATIS	1 1 1 1							75 25 AD 150
OIBB BUSHEHR	APP-I TWR SMC ATIS	1 1 1 1							75 25 AD 150
OIFM ESFAHAN/Shahid Beheshti	APP-SR-I TWR SMC ATIS	1 1 1 1							75 25 AD 150
OIBK KISH ISLAND OISL LAR	TWR SMC ATIS TWR SMC	1 1 1 1 1							25 AD 150 25 AD
OIMM MASHHAD/Shahid Hashemi Nejad Inlt.	APP-SR-I TWR SMC ATIS	1 1 1 1							75 25 AD 150
OIKR RAFSANJAN	TWR SMC ATIS	1 1 1							25 AD 150
OIGG RASHT	TWR SMC ATIS	1 1 1							25 AD 150
OINZ SARI	TWR SMC ATIS	1 1 1							25 AD 150

Country and location	Service or function	VHF voice	VHF data	HF voice	HF data	Satellite voice	Satellite data	Mode S	Remarks
1	2	3	4	5	6	7	8	9	10
OISX SHIRAZ	ACC-SR-U FIS-U VOLMET	18 1 1		MID1 MID2					ER 250
OISS SHIRAZ/ Shahid Dastghaib Intl.	APP-SR-I TWR SMC ATIS	1 1 1 1							75 25 AD 150
OITT TABRIZ/Tabriz	APP-SR-I TWR SMC ATIS	1 1 1 1							75 25 AD 150
OIIX TEHRAN	ACC-SR-U FIS-U VOLMET	24 1 1		MID1 MID2					250
OIIE TEHRAN/Iman Khomaini Intl	APP-SR-I TWR SMC ATIS	1 1 1 1							75 25 AD 150
OIII TEHRAN/Mehrabad Intl	APP-SR-I TWR SMC ATIS	1 1 1 1							75 25 AD 150
OIYY YAZD	TWR SMC ATIS	1 1 1							25 AD 150
OIZH ZAHEDAN/ Zahedan Intl	APP-I TWR SMC ATIS	1 1 1 1							75 25 AD 150
IRAQ ORBS BAGHDAD	ACC-U	2							2 FIRs
ORBI BAGHDAD/Baghdad Intl	APP-SR-U APP-U TWR SMC ATIS	2 1 1 2 1							100 100 25 AD 150
ORMM BASRAH	ACC-U ACC-SR-U	1 4							150 150
ORMM BASRAH/Basrah Intl	APP-SR-U	1							100

Country and location	Service or function	VHF voice	VHF data	HF voice	HF data	Satellite voice	Satellite data	Mode S	Remarks
1	2	3	4	5	6	7	8	9	10
	TWR SMC ATIS	1 2 1							25 AD 150
ORER ERBIL/Erbil Intl									
ORSU SULAYMANIYAH/Sulaymaniyah Intl									
ORNI AL NAJAF/Al najaf Intl									
~~**ISRAEL**~~ ~~LLET ELIAT/Eliat Intl~~	~~APP-L~~ ~~TWR~~ ~~ATIS~~	~~1~~ ~~1~~ ~~1~~							~~50~~ ~~25~~ ~~150~~
~~LLOV OVDA/Ovda Intl~~	~~APP-SR-L~~ ~~TWR~~	~~1~~ ~~1~~							~~50~~ ~~25~~
~~LLTA TEL-AVIV~~	~~ACC-SR-U~~ ~~ACC-SR-I~~ ~~ACC-SR-L~~	~~2~~ ~~3~~ ~~2~~							~~150~~ ~~100~~ ~~50~~
~~LLBG TEL-AVIV/Ben Gurion Intl~~	~~APP-SR-I~~ ~~APP-SR-I~~ ~~APP-SR-L~~ ~~APP-L~~ ~~TWR~~ ~~SMC~~ ~~ATIS~~	~~1~~ ~~1~~ ~~1~~ ~~1~~ ~~1~~ ~~1~~ ~~1~~							~~100~~ ~~TMA~~ ~~50~~ ~~50~~ ~~25~~ ~~AD~~ ~~150~~
JORDAN OJAC AMMAN	ACC-SR-U ACC-SR-I ACC-U	3 3 3							180 80 FIR
OJAM AMMAN/Marka Intl	TWR SMC	1 1							25 AD
OJAI AMMAN/Queen Alia	APP-L TWR SMC ATIS	1 1 1 1							50 25 AD 150
OJAQ AQABA/Aqaba Intl.	APP-SR-I TWR SMC	2 1 1							75 25 AD
KUWAIT OKAC KUWAIT	ACC-SR-U	2							200
OKBK KUWAIT/Kuwait Intl	APP-SR-I TWR SMC	2 1 2							100 25 AD

Country and location	Service or function	VHF voice	VHF data	HF voice	HF data	Satellite voice	Satellite data	Mode S	Remarks
1	2	3	4	5	6	7	8	9	10
LEBANON OLBB BEIRUT	ACC-U ACC-SR-I ACC-SR-U	2 1 1							CTA 75 75
OLBA BEIRUT/ R. B. H - Beirut Intl	APP-L APP-I APP-SR-I APP-SR-L VOLMET TWR SMC ATIS	1 1 1 1 1 1 1 1							75 75 75 50 FIR 25 AD 150
OLKA KLELATE/Rene Mouawad	APP TWR SMC	1 1 1							50 25 AD
OMAN OOMM MUSCAT	ACC-SR-U FIS-L VOLMET	2 1 2							FIR 240 FIR
OOMS MUSCAT/Muscat	APP-SR-I TWR SMC ATIS	2 1 1 1							75 25 AD 150
OOSA SALALAH/Salalah	APP-SR-I TWR SMC ATIS	2 1 1 1							75 25 AD 150
QATAR OTBD DOHA/Doha Intl	APP-SR-I TWR SMC ATIS	2 1 1 1							75 25 AD 150
OTHH DOHA/New Doha Intl (Future – 2010)									
SAUDI ARABIA OEDF DAMMAM/King Fahd Intl	APP-SR-U APP-SR-I TWR SMC ATIS	1 2 1 2 1							150 75 25 AD(CD) 150
OEJD JEDDAH	ACC-U ACC-SR-U	1 16							FIR FIR (ER
OEJN JEDDAH/King AbdulAziz Intl	APP-SR-U APP-SR-I TWR SMC ATIS	1 2 2 3 1							150 75 25 AD(CD) 150

Country and location	Service or function	VHF voice	VHF data	HF voice	HF data	Satellite voice	Satellite data	Mode S	Remarks
1	2	3	4	5	6	7	8	9	10
OEMA MADINAH/Prince Mohamed Bin Abdulaziz Intl	APP-I APP-L TWR	1 2 1							50 75 25
	SMC ATIS	1 11							AD 150
OERK RIYADH/King Khalid Intl	APP-SR-U APP-SR-I TWR SMC ATIS	2 2 2 3 1							150 75 25 AD(CD) 150
SYRIAN ARAB REPUBLIC OSAP ALEPPO/Aleppo Intl.	APP-L TWR	1 1							50 25
OSIT DAMASCUS	FIS-U ACC-U	1 2							FIR FIR
OSDI DAMASCUS/Damascus Intl	APP-SR-U APP-U TWR SMC	1 2 1 1							80 150 25 AD
OSLK BASSEL AL-ASSAD/Lattakia	APP-L TWR	1 1							50 25
UNITED ARAB EMIRATES OMAE ABU DHABI	ACC-SR-U APP-L	~~5~~ 20 2							FIR
OMAA ABU DHABI/Abu Dhabi Intl	APP-SR-I TWR SMC ATIS	2 1 1 1							75 25 AD 150
OMDB DUBAI/Dubai Intl	APP-SR-I TWR SMC ATIS	2 1 1 1							75 25 AD 150
OMDW DUBAI /Al Maktoum									
OMFJ FUJAIRAH/Fujairah Intl	APP-L TWR	1 1							50 25
OMSJ SHARJAH/Sharjah Intl	APP-L TWR	1 1							50 25
OMAL AL AIN/Al Ain Intl	APP-L TWR	1 1							50 25

Country and location	Service or function	VHF voice	VHF data	HF voice	HF data	Satellite voice	Satellite data	Mode S	Remarks
1	2	3	4	5	6	7	8	9	10
YEMEN OYAA ADEN/Aden Intl	 APP-U TWR SMC	 1 1 1							 150 25 AD
OYHD HODEIDAH/Hodeidah	 APP-U TWR SMC	 1 1 1							 150 25 AD
OYAR MUKALLA Mukalla	 APP-U TWR SMC	 1 1 1							 150 25 AD
OYSC SANA'A	ACC-SR-U ACC-SR-I	1 1							400 200
OYSN SANA'A/Sanaa Intl	APP-SR-U APP-SR-I TWR SMC ATIS	1 1 1 1 1							150 75 25 AD 150
OYTZ TAIZ/Ganad	TWR SMC	1 1							25 AD

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TABLE CNS 3 C **RADIO NAVIGATION AIDS (MID REGION)**
TABLA CNS 3 C **AYUDAS PARA LA RADIONAVEGACIÓN (REGIÓN MID)**

EXPLANATION OF THE TABLE

Column

1 Name of the country, city and aerodrome and, for en-route aids, the location of the installation.

2 The designator number and runway type:

NPA C non-precision approach
PA-1 C precision approach runway, Category I
PA-2 C precision approach runway, Category II
PA-3 C precision approach runway, Category III

3 The functions carried out by the aids appear in columns 4 to 8 and 10 to 12:

A/L C Approach and landing
T C Terminal
E C En-route

4 ILS C Instrument landing system. Roman numeral I and II indicate the acting category of the ILS, I, II or III. (I) indicates that the facility is implemented

The letter "D" indicates a DME requirement to serve as a substitute for a marker beacon component of an ILS

Note.- Indication of category refers to the standard of facility performance to be achieved and maintained in accordance with pertinent specifications in ICAO Annex 10 and not to the specifications of the ILS equipment itself, which are not necessarily the same.

An asterisk (*) *indicates that the ILS requires a Category II signal quality, but without reliability and availability provided by redundant equipment and automatic changeover.*

5 Radio beacon localizer, be it associated with an ILS or to be used as an approach aid to an aerodrome.

6 Radiotelemetrical equipment. When an "X" appears in column 6 in line with the VOR in column 7, this indicates the need that the DME be installed at a common site with the VOR.

7 VOR VHF omnidirectional radio range.

8 NDB – Non Directional Beacon

9 The distance and altitude to which signal protection of the VOR or VOR/DME are required, indicated in nautical miles (NM) and in thousands of feet.

10, 11, 12 GNSS-global navigation satellite system (includes GBAS and SBAS).

LNAV lateral Navigation using GNSS

LNAV/VNAV Lateral with Vertical Navigation

GBAS (ground-based augmentation system) implementation planned to be used in precision approach and landing CATI,
CATII, CAT III.

SBAS (Satellite-based augmentation system) implementation planned to be used for route navigation, for terminal, for non precision approach and landing. An “X” indicates service availability,; exact location of installation will be determined.

Note.- GPS receiver is under standard rules and ABAS (aircraft-based augmentation system)

13 **Remarks**

Note.- Columns 5 to 12 use the following symbols:

X- Required but not implemented
XI- Required and implemented

TABLE CNS 3

Station	RWY Type	Function	ILS	L	DME	VOR	NDB	Coverage	GNSS			REMARKS OBSERVACIONES
									GPS	LNAV	LNAV/VNAV	
1	2	3	4	5	6	7	8	9	10	11	12	13
BAHRAIN												
BAHRAIN/Bahrain Intl	12R NPA 30L NPA				X I X I	X I X I						
	12L PA ~~2~~ 1 30R PA ~~2~~ 1	A/L A/L	II (I) II (I)	X	XI XI	XI XI		300/45		I I		
EGYPT												
EL-ARISH/ El-Arish Int'l	16 NPA 34 NPA	A/L			XI	XI		150/45				
ASYUT/ Asyut Int'l	13 NPA 31 NPA	A/L E			XI	XI		200/45		I I		
ALEXANDRIA/ Alexandria Intl	04 PA 1 22 NPA 18 NPA 36 NPA	A/L E	I*		XI XI	XI XI	XI	100/45 150/45		I I		
ALEXANDRIA/ Borg El Arab Int'l	32 PA 1 14 NPA	A/L T	I* (I) D	X	XI	XI	XI	100/45		I		
CAIRO/ Almaza Int.	18 NPA 36 NPA 05 NINST 23 NINST	A/L					XI	25/45				

Station	RWY Type	Function	ILS	L	DME	VOR	NDB	Coverage	GNSS			REMARKS OBSERVACIONES
									GPS	LNAV	LNAV/VNAV	
1	2	3	4	5	6	7	8	9	10	11	12	13
CAIRO/Cairo Intl	05R PA 2 23R PA 2	A/L A/L	II II(I)	X X	XI	XI		150/45		I I		
	23L PA 2 05L PA 2	A/L A/L T E	II (I) II (I)	X X	XI	XI		200/45		I		
	23C PA 05C PA									I I		
	16 NPA 34 NPA											
HURGHADA/ Hurghada Intl	16 NPA 34 PA 2	A/L T E	I*(I)		XI XI	XI XI		100/45		I I		
LUXOR/ Luxor Intl	02 NPA 20 PA 1	A/L T E	I* (I)		XI XI	XI XI		150/45		I I		
MARSA ALAM/ Marsa Alam Int'l	15 NPA 33 NPA	A/L			XI	XI		150/45				
SHARK EL OWEINAT/ Shark El Oweinat Int'l	01 NPA 19 NPA	L					XI	100/45				
PORT –SAID/ Port –Said Int'l	10 NPA 28 NPA	L			XI	XI		200/45				
ST. CATHERINE/ St. Catherine Intl	17 NPA 35 NINST	L					XI	150/45				
SHARM EL SHEIKH/ Sharm El Sheikh Intl	04L PA1 22R NPA	A/L T E	I (II)	X	XI XI	XI XI	XI	100/45 200/50		I I		
	04R NPA 22L NPA									I I		
ASWAN/ Aswan Intl	17 PA1 35 PA1	A/L T E	II	X	XI XI	XI XI		150/45		I I		

Station	RWY Type	Function	ILS	L	DME	VOR	NDB	Coverage	GNSS			REMARKS OBSERVACIONES
									GPS	LNAV	LNAV/VNAV	
1	2	3	4	5	6	7	8	9	10	11	12	13
TABA/ Taba Int'l	04 NPA 22 NPA	A/L T			X	XI	XI	150/45 100/45		I I		
IRAN, ISLAMIC REPUBLIC OF												
ABADAN	32L PA 1	A/L E	I* (I)		XI	XI		200/45				
AHWAZ	30 PA 1	A/L E	I* (I)		XI	XI		300/45				
ARDABIL	~~31~~ 33 PA 1	A/L E	I* (I)		XI	XI		200/45				
ASALOYEH	30 PA 1	A/L E	I*		XI	XI		300/45				
BANDAR ABBAS/Intl	21L PA1	A/L E	I* (I)		XI	XI		200/45				
BANDAR LENGEH	NPA	A/L E			XI	XI		200/45				
BANDAR MAHSHAHR / MAHSHAHR	NPA	A/L E			XI	XI		300/45				
BIRJAND		E			XI	XI		300/50				
BOJNORD	NINST	E			XI	XI		150/45				
BUSHEHR	30 PA2	A/L E	I*		XI	XI		300/45				
CHAH BAHAR / KONARAK	NPA	A/L E			XI	XI		200/45				
DARBAND		E			XI	XI		300/45				
DEH-NAMAK		E			XI	XI		300/45				
ESFAHAN / Shahid Beheshti Intl	26R PA 1	A/L E	I*(I)		XI	XI		300/45				
HAMADAN	NPA	A/L E			XI	XI		200/45				

Station	RWY Type	Function	ILS	L	DME	VOR	NDB	Coverage	GNSS			REMARKS OBSERVACIONES
									GPS	LNAV	LNAV/VNAV	
1	2	3	4	5	6	7	8	9	10	11	12	13
ILAM	NPA	A/L E			XI	XI		300/45				
IRAN-SHAHR	NPA	A/L E			X	X		300/45				
JAM/TOHID	NPA	A/L			XI	XI		300/45				
KARAJ / PAYAM	NPA	A/L			XI	XI		200/45				
KERMAN	34 PA1	A/L E	I*(I)		XI	XI		200/45				
KERMANSHAH / Shahid Ashrafi Esfahani	29 PA1	A/L E	I* (I)		XI	XI		300/45				
KHARK ISLAND /Khark	NPA	A/L E			XI	XI		300/45				
KHORAM ABAD	29 PA 1	A/L E	I*		XI	XI		200/45				
KISH ISLAND	NPA	A/L E			XI	XI		200/45				
MALAYER		E			XI	XI		300/45				
MASHHAD / Shahid Hashemi Nejad Intl	31R PA1	A/L E	I* (I)		XI	XI		300/45				
NOSHAHR	NPA	A/L E			X	X		200/45				
OMIDIYEH	NPA	A/L			XI	XI		200/45				
RASHT	27 PA 1	A/L E	I* (I)		XI	XI		300/45				
SABZEVAR	NPA	A/L E			XI	XI		300/45				
ANARAK		E			XI	XI		300/45				
SANANDAJ	NPA	A/L E			XI	XI		200/45				
SARI/Dashte-Naz	NPA	A/L E			XI	XI		300/45				

Station	RWY Type	Function	ILS	L	DME	VOR	NDB	Coverage	GNSS			REMARKS OBSERVACIONES
									GPS	LNAV	LNAV/VNAV	
1	2	3	4	5	6	7	8	9	10	11	12	13
SAVEH		E			XI	X		300/45				
SHIRAZ / Shahid Dastghaib Intl	29L PA 1	A/L E	I* (I)		XI	XI		300/45		I		
SIRJAN	NPA	A/L E			XI	XI		200/45				
TABRIZ Intl	30R PA 1	A/L E	I* (I)		XI	XI		200/45				
TEHRAN/Imam Khomaini Intl	29R PA 2	A/L	II* (I)		XI	XI		300/45				
TEHRAN/Mehrabad Intl	29L PA 1	A/L E	I* (I)	XI	XI	XI		300/45		I		
UROMIYEH	21 PA1	A/L E	I* (I)		XI	XI		200/45				
YAZD / Shahid Sadooghi	NPA	A/L E			XI	XI		300/45				
ZAHEDAN	35 PA1	A/L E	I* (I)		XI	XI		200/45				
ZANJAN	NPA	E			XI	XI	XI	200/45				
IRAQ												
AIN ZALAH		E			X	X		100/50				
BAGHDAD/ Baghdad Int'l	NINST NINST NINST NINST	A/L A/L A/L A/L E	II (I) II (I) II (I) II (I)	X X X X	X X X X X	X X X X X		200/45	XI XI			
BASRAH/Intl		A/L A/L E	II (I) II (I)	X X	X X	X X		300/45				

Station	RWY Type	Function	ILS	L	DME	VOR	NDB	Coverage	GNSS			REMARKS OBSERVACIONES
									GPS	LNAV	LNAV/VNAV	
1	2	3	4	5	6	7	8	9	10	11	12	13
HASHIMIYA		E			X	X		200/45				
(HADITHA)		E			X	X		100/50				
MANDALY		E										
MOSUL	PA 1	A/L		X	X	X			XI XI			
SAMARA		E			X	X		200/45				
HAWIJA		E			X	X		100/50				
SHATRA		E			X	X		100/50				
~~**ISRAEL**~~												
~~ELAT/Elat~~	~~03 NPA~~ ~~21 NINST~~	~~A/L~~ ~~E~~			~~XI~~ ~~XI~~ ~~X~~	~~XI~~ ~~XI~~ ~~X~~		~~300/45~~				
~~HAIFA/Haifa~~	~~16 NINST~~ ~~34 NINST~~											
~~JERUSALEM/Atarot~~	~~12 NINST~~ ~~30 PA 1~~	~~A/L~~ ~~A/L~~	~~I*~~									
~~METZADA~~		~~E~~			~~X~~	~~X~~		~~150/45~~				
~~NATANIA~~		~~E~~			~~X~~	~~X~~		~~150/45~~				
~~OVDA/Intl~~	~~20R NPA~~ ~~02L NINST~~	~~A/L~~	~~I~~		~~X~~	~~X~~		~~150/50~~		~~XI~~		

Station	RWY Type	Function	ILS	L	DME	VOR	NDB	Coverage	GNSS			REMARKS OBSERVACIONES
									GPS	LNAV	LNAV/VNAV	
1	2	3	4	5	6	7	8	9	10	11	12	13
~~TEL AVIV/Ben Gurion~~	~~03 NPA~~ ~~21 NINST~~ ~~08 NINST~~ ~~26 PA 1~~ ~~12 PA 1~~ ~~30 NPA~~	 ~~A/L~~ ~~A/L~~ ~~A/L~~ ~~E~~ ~~E~~	 ~~I* (I)~~ ~~I* (I)~~	 ~~X~~ ~~X~~	~~XI~~ ~~XI~~ ~~XI~~ ~~XI~~ ~~XI~~ ~~XI~~	~~XI~~ ~~XI~~ ~~XI~~ ~~XI~~ ~~XI~~ ~~X~~ ~~X~~		 ~~150/50~~ ~~200/50~~		 ~~I~~ ~~I~~		
~~TEL AVIV/Sde-Dov~~	~~03 NINST~~ ~~21 NINST~~	~~A/L~~ ~~A/L~~										
~~ZOFAR~~		~~E~~			~~X~~	~~X~~		~~150/45~~				
JORDAN												
AMMAN/MARKA	24 PA 1 06 NPA	A/L A/L	I (I)	XI X	XI	XI	XI	 175/37.5				
AMMAN/Queen Alia	08R NPA 26L PA 2 08L PA 2 26R PA 2	A/L A/L A/L A/L	X II(I) II(I) II(I)	X XI XI XI	X XI XI XI	 XI XI	XI XI XI XI			~~I~~ X ~~I~~ X ~~I~~ X ~~I~~ X	~~I~~ X ~~I~~ X ~~I~~ X ~~I~~ X	
AQABA/ king Hussein	01 PA 1	A/L E	I(I)	XI	XI	XI	X	200/50 200/50		~~I~~	~~I~~	
METSA		E			X	X		150/50				
QATRANEH		E			XI	XI		100/50				
KUWAIT												
KUWAIT/Intl	15R PA 2 33L PA 2 15L PA 2 33R PA 2	A/L A/L A/L A/L T E	II (I) II (I) II (I) II (I)	XI XI	XI XI XI XI XI XI	 XI XI		 300/50 300/50		I I I I		

Station	RWY Type	Function	ILS	L	DME	VOR	NDB	Coverage	GNSS			REMARKS OBSERVACIONES
									GPS	LNAV	LNAV/VNAV	
1	2	3	4	5	6	7	8	9	10	11	12	13
LEBANON												
BEIRUT/Beirut Intl	16 PA 1 17 PA 1 03 PA 1 21 PA1	A/L A/L A/L AL	I* (I) D I* (I) D I* (I) D I* (I) D	X X X X	X I X I X I X I					I I I I		
CHEKKA		E			Xi	XI		150/50				
KHALDE		E/T			Xi	XI		150/50				
BOD		E/T					XI	150				
BAB		E/T					XI	150				
OMAN												
HAIMA		E			X I	X I		200/45				
IZKI		E			X I	X I		200/45				
MARMUL	14 NPA 32 NPA										I I	
MUSCAT/ Intl	08 PA 1 26 PA 1 E	A/L A/L E	I* (I) D I* (I) D		X I X I X I	 X I		 200/45				
SALALAH/Salalah Intl	07 NPA 25 PA 1 E	A/L A/L E	 I* (I) D		~~X I~~ X I X I	~~X I~~ ~~X I~~ X I		 200/45				
SUR		E			X I	X I		200/45				
QATAR												
DOHA/Doha Intl	16 NPA 34 PA 1 E	A/L A/L E	 I* (I)	 X	X X X	X X X		 300/45		 I I		

Station	RWY Type	Function	ILS	L	DME	VOR	NDB	Coverage	GNSS			REMARKS OBSERVACIONES
									GPS	LNAV	LNAV/VNAV	
1	2	3	4	5	6	7	8	9	10	11	12	13
SAUDI ARABIA												
AL JOUF	10 NPA	A/L			XI	XI						
	28 NPA	A/L			XI	XI						
	28 PA 1	A/L	I*		XI	XI						
		T			X	X		300/50				
AL SHIGAR		E			XI	XI		300/50				
ARAR	10 NPA	A/L			XI	XI				I		
	28 NPA	A/L			XI	XI				I		
		T			X	X						
		E			XI	XI		300/50				
BAHA	07 NPA	A/L			XI	XI				I		
	25 NPA	A/L			XI	XI				I		
	25 NPA	A/L		X								
	25 PA 1	A/L	I*		XI	XI						
		T			X	X		300/50				
BIR DURB		E			X	X		300/50				
BISHA	18 NPA	A/L			XI	XI				I		
	36 NPA	A/L			XI	XI						
	18 PA1	A/L	I*		X							
		T			X	X						
		E			X	X		300/50				
BOPAN		E			XI	XI		300/50				
DAFINAH		E			XI	XI		300/50				
DAMMAM (King Fahad Intl)	16L PA 1	A/L	I (I)		XI	XI						
	34R PA 1	A/L	I (I)		XI	XI						
	16R PA 1	A/L	I (I)		XI	XI						
	34L PA 1	A/L	I (I)		XI	XI						
		T			XI	XI						
		E			XI	XI		300/50				

Station	RWY Type	Function	ILS	L	DME	VOR	NDB	Coverage	GNSS			REMARKS OBSERVACIONES
									GPS	LNAV	LNAV/VNAV	
1	2	3	4	5	6	7	8	9	10	11	12	13
GASSIM	15 NPA	A/L			XI	XI						
	33 NPA	A/L			XI	XI						
	15 PA 1	A/L	I*		X							
		T			X	X						
		E			X	X		300/50				
					I							
GURIAT	10 NPA	A/L			XI	XI						
	28 NPA	A/L		X								
	28 NPA	A/L			XI	X						
		T			X	X						
		E			X	X		300/50				
HAFR AL-BATIN	16 NPA	A/L			XI	XI						
	34 NPA	A/L			XI	XI						
		T			X	X						
		E			XI	XI		300/50				
HAIL	18 NPA	A/L			XI	XI						
	36 NPA	A/L			XI	XI						
	18 PA 1	A/L	I *		X							
		T			X	X						
		E			X	X		300/50				
HALAIFA		E			XI	XI		300/50				
JEDDAH/King Abdul Aziz Intl	16R PA 2	A/L	II (I)		XI	XI				I		
	34L PA 2	A/L	II (I)		XI	XI				I		
	16L PA 1	A/L	I* (I)		XI	XI				I		
	34R PA 1	A/L	I* (I)		XI	XI				I		
	16C PA 2	A/L	II (I)		XI	XI				I		
	34C PA2	A/L	II (I)		XI	XI				I		
		T			XI	XI						
		E			XI	XI		300/50				
JUBAIL	17 NPA	A/L				X						
	35 NPA	A/L				X						
	35 PA 1	A/L	I*		X							
		T			X			300/50				

Station	RWY Type	Function	ILS	L	DME	VOR	NDB	Coverage	GNSS			REMARKS OBSERVACIONES
									GPS	LNAV	LNAV/VNAV	
1	2	3	4	5	6	7	8	9	10	11	12	13
MADINAH/Prince	17 PA 1	A/L	I*		XI	XI						
Mohammad Bin Abdulaziz	35 PA 1	A/L	I*	X	XI	XI						
	36 PA 1	A/L	I*	X	XI	XI						
	18 NPA	A/L			XI	XI						
		T			XI	XI						
		E			XI	XI		300/50				
MAGALA		E			XI	XI		300/50				
RABIGH		E			XI	XI		300/50				
						I						
RAFHA	11 NPA	A/L			XI	XI						
	29 NPA	A/L			XI	XI						
		T			X	X						
		E			XI	XI		300/50				
RAGHBA		E			XI	XI		300/50				
RIYADH/King Khalid Intl	15L PA 1	A/L	I* (I)		XI	XI						
	33R PA 1	A/L	I* (I)		XI	XI						
	15R PA 1	A/L	I* (I)		XI	XI						
	33L PA 1	A/L	I* (I)		XI	XI						
		T			XI	XI						
		E			XI	XI		300/50				
TURAIF	10 NPA	A/L			XI	XI						
	28 NPA	A/L			XI	XI						
		T			X	X						
		E			XI	XI		300/50				
WADI AL-DAWASIR	10 NPA	A/L			XI	XI				I		
	28 NPA	A/L			XI	XI				I		
	10 PA 1	A/L	I*		XI							
		T			X	X						
		E			XI	XI		300/50				
WEDJH	15 NPA	A/L			XI	XI						
	33 NPA	A/L			XI	XI				I		
	33 NPA	A/L		X								
	33 PA 1	A/L	I*									
		T			X	X						
		E			XI	XI		300/50				

Station	RWY Type	Function	ILS	L	DME	VOR	NDB	Coverage	GNSS			REMARKS OBSERVACIONES
									GPS	LNAV	LNAV/VNAV	
1	2	3	4	5	6	7	8	9	10	11	12	13
YENBO	10 NPA 28 NPA 28 PA 1	A/L A/L A/L T E	 I* 	 	XI XI XI X XI	XI XI X XI	 	 300/50	 	 I I 	 	
SYRIAN ARAB REPUBLIC												
ALEPPO/Neirab	27 ~~N~~ PA2	A/L E	 	X 	 	X X	 	 150/50	 	 	 	
DAMASCUS/Intl	05L ~~N~~PA2 23R PA ~~1~~ 2 05R ~~N~~PA2	A/L A/L A/L E	 I* (I) 	 X 	X X X X	X X X X	 	 150/50	 	 	 	
KARIATAIN		E			X	X		150/50				
LATAKIA/Bassel -Al- Assad	17 NPA	A/L		X	X	X						
TANF		E				X		160/40				
UNITED ARAB EMIRATES												
ABU DHABI/Abu Dhabi Intl	13 PA 1 31 PA 3	A/L A/L E	I* (I) III (I) 	 	X I X I X I	X I X I X I	 	 300/45	 	I I 	 	
AL AIN/Al Ain Intl	01 PA 1 19 NPA	A/L A/L E	I*	 	X I X I X I	X I X I X I	 	 300/45	 	 	 	

Station	RWY Type	Function	ILS	L	DME	VOR	NDB	Coverage	GNSS			REMARKS OBSERVACIONES
									GPS	LNAV	LNAV/VNAV	
1	2	3	4	5	6	7	8	9	10	11	12	13
DUBAI/Dubai Intl	12L PA 3	A/L	III (I)		X I	X I				I		
	30R PA 3	A/L	III (I)		X I	X I				I		
	12R PA 2	A/L	II (I)		X I	X I						
	30L PA 2	A/L	II (I)		X I	X I						
		E			X I	X I		300/45				
FUJAIRAH/Fujairah Intl	11 NPA	A/L			X I	X I				I		
	29 PA 1	A/L	I* (I)		X I	X I				I		
		T			X I	X I		40/25				
RAS AL KHAIMAH/Ras al Khaimah Intl	16 NPA	A/L		X	X I	X I						
	34 PA 1	A/L	I* (I)	X								
SHARJAH/Sharjah Intl	12 NPA	A/L			X I	X				I		
	30 PA 1	A/L	I* (I)	X I	X I	X				I		
		E				X I		300/45				
YEMEN												
ADEN/Intl	08 NPA	A/L			X	X						
	26 PA 1	A/L	I* (I)	X	X	X						
		E			X	X		300/50				
AL-GHAIDAH		E			X	X		300/50				
HODEIDAH	03 NPA	A/L		X	X	X						
	21 NPA	A/L		X	X	X						
		E			X	X		200/45		I		
MUKALALA/Intl	06 NPA	A/L			X	X						
	24 NPA	A/L			X	X						
		E			X	X		300/50				
SANA'A/Intl	18 PA 1	A/L	I* (I)	X	X	X I						
	36 NPA	A/L			X	X I						
		E			X	X I		200/45				

Station	RWY Type	Function	ILS	L	DME	VOR	NDB	Coverage	GNSS			REMARKS OBSERVACIONES
									GPS	LNAV	LNAV/VNAV	
1	2	3	4	5	6	7	8	9	10	11	12	13
SIYUN		E			X	X		150/45				
TAIZ/Intl	01 NPA 19 NPA	A/L A/L E		X X	X X X	X X X		200/45				

Table CNS 4 - SURVEILLANCE SYSTEMS

EXPLANATION OF THE TABLE

Column

1 Name of country and location of the facility or FIR

2 Geographical area

3 Air Traffic Services Units served by the facility or FIR

4 PSR - Primary Surveillance Radar

5 Coverage of Primary Surveillance Radar in nautical miles

6 Coverage of Primary Surveillance Radar and Modes implemented will be indicated within Brackets, namely Modes A, C & S

7 Coverage of Secondary Surveillance radar in nautical miles

8 ADS-B- Automatic Dependent Surveillance Broadcast *

9 ADS-C - Automatic Dependent Surveillance Contract

10 SMR- Surface Movement Radar

11 PRM - Precision Runway Monitor

12 Multirateration

13 Remarks

Note:
The following codes are used in columns 4,6,8-12

I - Required and implemented for column 6,
I stands for implementation using conventional SSR while
MI stands for implementation using Monopulse SSR

X- Required but implementation status not determined

N - Required but not implemented

A - Existing facility provided to supplement or substitute the requirement

F - Future Plan

< - Year planned commissioning year to be used as appropriate in conjunction with AF@ & AN@

> - Year planned decommissioning year to be used as appropriate in conjunction with AA@ & AI@.

• *Under development*

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TABLE CNS 4- SURVEILLANCE SYSTEMS

Country/Location	GA	ATS Units Served	PSR	Coverage of SSR (NM	SSR (A/C/S)	Coverage of SSR (NM)	ADS-B	ADS-C	SMR	PRM	Remarks
1	2	3	4	5	6	7	8	9	10	11	12
BAHRAIN											
Bahrain		Bahrain ACC Bahrain APP Bahrain ACC Bahrain APP	I	80	MI(A/C) F(A/C/S)	250 250					Mode S will be implemented in 2012
EGYPT											
Cairo		Cairo ACC Cairo APP Cairo APP/TMA	I I F<2002	200 70 60	MI(A/C) I(A/C) MF (A/C)	250 100 250					Mode S Implemented In Four Airports
Hurghada		Hurghada ACC Hurghada ACC Hurghada APP	I I I	 60	MI(A/C) MI(A/C)	250 250					
Mersa Matruh		Mersa Matruh ACC			MI(A/C)	250					
Aswan		Aswan ACC Aswan ACC Aswan APP	I F<2002 <2002	 60	MI(A/C) MF(A/C)	250 250					
Asyut		Asyut ACC		250	MI(A/C)	250					
Luxor		Luxor ACC Luxor APP	 I	 60	MI(A/C)	250					
Sharm El Sheikh		Sharm El Sheikh ACC Sharm El Sheikh APP	 I	 60	MI(A/C)	250					
Borg El Arab		Borg El Arab ACC Borg El Arab APP	 F<2002	 60	F (A/C) < 2002	250					
El Arish		El Arish ACC El Arish APP	 F<2002	 60	F (A/C) < 2002	250					
Taba		Taba ACC Taba APP	 F<2002	 60	F (A/C) < 2002	250					

Country/Location	GA	ATS Units Served	PSR	Coverage of SSR (NM	SSR (A/C/S)	Coverage of SSR (NM)	ADS-B	ADS-C	SMR	PRM	Remarks
1	2	3	4	5	6	7	8	9	10	11	12
IRAN											
Shiraz		Shiraz APP	I	80	I (A/C/S)	250					
Tehran / Mehrabad		Mehrabad APP	I	80	I (A/C/S)	250					
Ahwaz		Tehran ACC			MI(A/C/S) < 2000	250					
Iran Shahr		Tehran ACC			F (A/C/S) < 2002	250					
Jiroft		Tehran ACC			MI(A/C/S) < 2001	250					
Lar		Tehran ACC			MI(A/C/S) < 2001	250					
Mashhad		Tehran ACC			MI(A/C/S) < 2001	250					
Draz-now (Gorgan)		Tehran ACC			MI(A/C/S) < 2002	250					
Tabas		Tehran ACC			MI(A/C/S) < 2002	250					
Tabriz		Tehran ACC			MI(A/C/S) < 2000	250					
Tehran/Kushke Bazm		Tehran ACC			MI(A/C/S) < 1999	250					ADS-A installed and available in Tehran ACC
Zanjan		Tehran ACC			MI(A/C/S) < 2001	250					
IRAQ											
Baghdad		Baghdad APP	I	60	~~I~~MI(A/C)	250					Mode S is planed
Basrah		Basrah ACC Basrah APP	I	80	MI(A/C/S) I	250					In Baghdad

Country/Location	GA	ATS Units Served	PSR	Coverage of SSR (NM	SSR (A/C/S)	Coverage of SSR (NM)	ADS-B	ADS-C	SMR	PRM	Remarks
1	2	3	4	5	6	7	8	9	10	11	12
~~ISRAEL~~											
~~Tel Aviv~~		~~Tel Aviv ACC~~ ~~Ben Gurion APP~~	~~I~~ ~~I~~		~~I~~ ~~I~~						
JORDAN											
Amman		Amman ACC	I	80	MI(A/C/)	250					
KUWAIT											
Kuwait		Kuwait ACC	I	80	MI(A/C/)	250					
LEBANON											Implemented Mode S
Beirut		Beirut ACC Beirut APP Beirut TWR	I	60	MI(A/C/)	250					
OMAN											
Muscat		Muscat ACC Muscat APP	I	100	I	250					
Salalah		Salalah ACC Salalah APP	I	100	I	250					
Jaalan Bani Bu Ali		Muscat ACC			I	250					
Wudam Al-Sahil		Muscat ACC			I	250					
Ras Al-Hadd		Muscat ACC			I	250					
Duqm		Muscat ACC			I	250					
Qiroon Hayreeti		Muscat ACC			I	250					
QATAR											
Doha		Doha ACC Doha APP	I		I						
SAUDI ARABIA											
Abha		Jeddah ACC			I	200					}
Afif		Jeddah ACC			I	200					} KSA is providing
AL Kharj		Jeddah ACC			I	200					} radar coverage } to all KSA
Badanah		Jeddah ACC			I	200					} airspace } (Jeddah FIR),
Dammam		Dammam APP	I	100	MI	200					} with the } exception of the
Dhahran		Jeddah ACC			I	200					} “Empty Quarter”

Country/Location	GA	ATS Units Served	PSR	Coverage of SSR (NM	SSR (A/C/S)	Coverage of SSR (NM)	ADS-B	ADS-C	SMR	PRM	Remarks
1	2	3	4	5	6	7	8	9	10	11	12
Hail		Jeddah ACC			I	200					Mode S will be implemented
Jeddah		Jeddah APP	I	100	I	200					
Nariya		Jeddah ACC			I	200					
Qaisumah		Jeddah ACC			I	200					
Raffina		Jeddah ACC			I	200					
Raghdan		Jeddah ACC			I	200					
Riyadh		Riyadh APP	I	100	MI	200					
Salbuk		Jeddah ACC			I	200					
Sharurah		Jeddah ACC			I	200					
Sulayel		Jeddah ACC			I	200					
Tabuk		Jeddah ACC			I	200					
Taif		Jeddah ACC			I	200					
Turaif		Jeddah ACC			I	200					
Wejh		Jeddah ACC			I	200					
SYRIA											
Damascus		Damascus ACC			I						
UNITED ARAB EMIRATES											
Abu Dhabi		Emirates ACC Bahrain ACC			MI(A/C)	200					
Abu Dhabi		Abu Dhabi APP Emirates ACC			AF<2001	200					Replacement MSSR
Abu Dhabi		Abu Dhabi APP Abu Dhabi TWR	AF2004 AF2003	125					X		Replacement PSR
Al Ain		Al Ain APP	AF2004	80		200					

Country/Location	GA	ATS Units Served	PSR	Coverage of SSR (NM	SSR (A/C/S)	Coverage of SSR (NM)	ADS-B	ADS-C	SMR	PRM	Remarks
1	2	3	4	5	6	7	8	9	10	11	12
		Abu Dhabi APP Emirates ACC									
Dubai		Dubai APP Emirates ACC Dubai TWR	I	80	MI(A/C)	150			I		
Dubai		Emirates ACC Dubai APP			AF<2004	250					New project
Emirates ACC		Emirates ACC					I				MLAT/WAN installed
Fujairah		Fujairah APP			MI(A/C)	250					
Ras Al Khaimah		Ras Al Khaimah APP Emirates ACC	I	80	X / S						
Sharjah		Emirates ACC Dubai APP Ras Al Khaimah APP		256	A/C	256	I				
Tarif		Emirates ACC ~~Bahrain ACC~~ ~~Muscat ACC~~ Abu Dhabi APP			F(A/C) <2001	240					New project
Yasat Al Safli Qseewrah Umm Al Quwain Al Yahar		Emirates ACC					I				
YEMEN											
Aden Mukalla Sana'a		Aden APP Mukalla APP Sana'a APP	F		I(A/C) I(A/C) I(A/C)						

Code Allocation Status for Bahrain

MODE S Interrogator Code Allocations as of 06 May 2010 (Cycle 10)

Mode S Station		ALLOCATED CODE			OPERATOR	REFERENCE/REMARKS
		II	SI	Effective Date		
BAHRAIN						

Code Allocation Status for Egypt

MODE S Interrogator Code Allocations as of 06 May 2010 (Cycle 10)

Mode S Station		ALLOCATED CODE			OPERATOR	REFERENCE/REMARKS
		II	SI	Effective Date		
EGYPT						
Aswan ERR		02		ad hoc 17/03/2009	NANSC	MICA/ALLOC461
Asyut ERR		03		ad hoc 17/03/2009	NANSC	MICA/ALLOC462
Cairo ERR		11		ICAC 12 7/04/2011	NANSC	MICA/ALLOC630
Hurghada ERR		05		ad hoc 17/03/2009	NANSC	MICA/ALLOC464
Mersa Matruh ERR		06		ad hoc 17/03/2009	NANSC	MICA/ALLOC465

Code Allocation Status for Iran

MODE S Interrogator Code Allocations as of 06 May 2010 (Cycle 10)

Mode S Station		ALLOCATED CODE			OPERATOR	REFERENCE/REMARKS
		II	SI	Effective Date		
IRAN						

Code Allocation Status for Iraq

MODE S Interrogator Code Allocations as of 06 May 2010 (Cycle 10)

Mode S Station		ALLOCATED CODE			OPERATOR	REFERENCE/REMARKS
		II	SI	Effective Date		
IRAQ						

Code Allocation Status for Jordan

MODE S Interrogator Code Allocations as of 06 May 2010 (Cycle 10)

Mode S Station		ALLOCATED CODE			OPERATOR	REFERENCE/REMARKS
		II	SI	Effective Date		
JORDAN						

Code Allocation Status for Kuwait

MODE S Interrogator Code Allocations as of 06 May 2010 (Cycle 10)

Mode S Station		ALLOCATED CODE			OPERATOR	REFERENCE/REMARKS
		II	SI	Effective Date		
KUWAIT						

Code Allocation Status for Lebanon

MODE S Interrogator Code Allocations as of 06 May 2010 (Cycle 10)

Mode S Station		ALLOCATED CODE			OPERATOR	REFERENCE/REMARKS
		II	SI	Effective Date		
LEBANON						
Baysour		02		23/04/2009	DGCA	MICA/ALLOC467

Code Allocation Status for Oman

MODE S Interrogator Code Allocations as of 06 May 2010 (Cycle 10)

Mode S Station		ALLOCATED CODE			OPERATOR	REFERENCE/REMARKS
		II	SI	Effective Date		
OMAN						
Muscat		11		Ad-hoc, 29/06/2010	DGMAN	MICA/ALLOC615

Code Allocation Status for Qatar

MODE S Interrogator Code Allocations as of 06 May 2010 (Cycle 10)

Mode S Station		ALLOCATED CODE			OPERATOR	REFERENCE/REMARKS
		II	SI	Effective Date		
QATAR						

Code Allocation Status for Saudi Arabia

MODE S Interrogator Code Allocations as of 06 May 2010 (Cycle 10)

Mode S Station		ALLOCATED CODE			OPERATOR	REFERENCE/REMARKS
		II	SI	Effective Date		
SAUDI-ARABIA						
Madinah		04		Ad-hoc, 17/03/2010	GACA	MICA/ALLOC529
Rafha		05		Ad-hoc, 17/03/2010	GACA	MICA/ALLOC530
Turaif		10		Ad-hoc, 17/03/2010	GACA	MICA/ALLOC531
Al-Jouf		08		ICAC 11,21/10/2010	GACA	MICA/ALLOC567
Al-Wejah		01		ICAC 11,21/10/2010	GACA	MICA/ALLOC568
Gassim		03		ICAC 11,21/10/2010	GACA	MICA/ALLOC569
Hail		02		ICAC 11,21/10/2010	GACA	MICA/ALLOC570
KAIA		08		ICAC 11,21/10/2010	GACA	MICA/ALLOC571
TABUK		06		ICAC 11,21/10/2010	GACA	MICA/ALLOC572
ABHA		02		ICAC 12,07/04/2011	GACA	MICA/ALLOC631
BAHA		06		ICAC 12,07/04/2011	GACA	MICA/ALLOC632

KFIA		**08**		**ICAC 12,07/04/2011**	**GACA**	**MICA/ALLOC633**
KKIA		**01**		**ICAC 12,07/04/2011**	**GACA**	**MICA/ALLOC634**
QAISUMAH		**06**		**ICAC 12,07/04/2011**	**GACA**	**MICA/ALLOC635**
SODA		**11**		**ICAC 12,07/04/2011**	**GACA**	**MICA/ALLOC636**
Training Station		**09**		**Ad-hoc, 02/03/2011**	**GACA**	**MICA/ALLOC644**
AFIF		**10**		**ICAC 13,22/09/2011**	**GACA**	**MICA/ALLOC674**
HARAD		**11**		**ICAC 13,22/09/2011**	**GACA**	**MICA/ALLOC675**
Khayber		**07**		**ICAC 13,22/09/2011**	**GACA**	**MICA/ALLOC676**
Sharurah		**08**		**ICAC 13,22/09/2011**	**GACA**	**MICA/ALLOC677**
Shaybah		**07**		**ICAC 13,22/09/2011**	**GACA**	**MICA/ALLOC678**
Wadi Al-Dawasir		**07**		**ICAC 13,22/09/2011**	**GACA**	**MICA/ALLOC679**

Code Allocation Status for Syria
MODE S Interrogator Code Allocations as of 06 May 2010 (Cycle 10)

Mode S Station		**ALLOCATED CODE**			**OPERATOR**	**REFERENCE/REMARKS**
		II	**SI**	**Effective Date**		
SYRIA						

Code Allocation Status for UAE
MODE S Interrogator Code Allocations as of 06 May 2010 (Cycle 10)

Mode S Station		**ALLOCATED CODE**			**OPERATOR**	**REFERENCE/REMARKS**
		II	**SI**	**Effective Date**		
EMIRATES						

Code Allocation Status for Yemen
MODE S Interrogator Code Allocations as of 06 May 2010 (Cycle 10)

Mode S Station		**ALLOCATED CODE**			**OPERATOR**	**REFERENCE/REMARKS**
		II	**SI**	**Effective Date**		
YEMEN						

REPORT ON AGENDA ITEM 5: Developments in CNS Field in MID Region

Mode S IC Code Allocation Issues in the MID Region

5.1 The meeting noted that MIDANPIRG/12 meeting was apprised on ICAO provisions on the assignment of interrogation codes (IC) being subject to Regional Air Navigation Agreements. Furthermore, ICAO MID Region is an interface with AFI, EUR and APAC Regions. Consequently, the allocation of IC codes requires coordination with these Regions and within the MID Region.

5.2 The meeting noted that the acquisition of Mode S radar installations by Air Navigation Service Providers (ANSPs) and Military Authorities in European Region has focused attention on the need to establish a single European interrogator code allocation mechanism. Consequently European Region through EUROCONTROL has created Mode S IC Co-ordination Group (MICoG) and Civil/Military SSR Environment Liaison Group (CIMSEL) also developed a software (MICA) application for this purpose.

5.3 Furthermore, MIDANPIRG/12 meeting noted that the centralized Mode S IC Allocation mechanism in Europe is handled by MICoG, where the MICoG members act as the contact points between the Mode S IC Allocation Cell and the State Authority applying for interrogator codes. MICoG provide regular reports to EANPG.

5.4 The meeting noted that European region has a large number of operational mode S radars as a result some MID States experienced IC code conflicts. Accordingly MIDANPIRG/12 was informed that ICAO MID Regional Office carried out coordination processes with European Region through the MICoG and the MICA application for the allocation of the IC codes for MID States.

5.5 Based on the above MIDANPIRG/12 meeting agreed that ICAO MID Regional Office should continue the same process through MICoG, where ICAO MID Regional Office acts as the focal point. MIDANPIRG/12 meeting requested ICAO MID Regional Office to formalize the process of IC code allocation for the ICAO MID region with EUROCONTROL.

5.6 Accordingly, ICAOMID Regional office carried out the several communications for the formalization process with EUROCONTROL and obtained an official agreement that MICA cell provide the ICAO MID Region at the same time as the standard twice-yearly allocation cycle for mode S radars in the EUR Region, the coordinated listing of interrogator codes and radar coverage maps for mode S radars in the MID Region, also agreed that the MICA application extended to ICAO MID Region.

5.7 The meeting agreed that in order to improve the efficiency of the interrogator code allocation process. Operators of mode S radar from the MID Region should be given appropriate access to the MICA web application. Accordingly, all MID States operating or planning to operate mode S radar are requested to assign a Focal Point per State. The meeting further agreed on the following process:

a) MID State to assign focal point and send details to ICAO MID Regional Office;

b) the assigned focal point to self-register on the EUROCONTROL OneSkyOnline portal (the link is provided here below): https://extranet.eurocontrol.int/http://was.eurocontrol.int/elsh/registerNewUserForApplication.do?eurocontrolresourceid=circa

c) ICAO MID Regional office will coordinate with EUROCONTROL so that the States focal points be given MICA application access;

d) the registered focal points will be requested to use the MICA web as required to fill new requests or amendment required for the IC code allocations;

e) the registered focal points will also be requested to monitor the allocations assigned in the MICA application and coordinate internally within the State.

5.8 The meeting was apprised of the document laying down recommendations and requirements for an efficient support of the MICA cell to the allocation of IC by the ICAO MID office which is in a draft form and is under review, it will be circulated to MID States and then posted on the ICAO MID forum.

5.9 Based on the above the meeting agreed to the following Draft Conclusion:

DRAFT CONCLUSION 4/8: MID MODE S IC ALLOCATION PROCESS

That,

a) MID States be urged to assign Mode S IC focal points and send to ICAO MID Regional office; and

b) the MID States Mode S IC focal points to:

i) *register in the appropriate EUROCONTROL website;*

ii) *fill new requests or amendments required for the IC code allocations; and*

iii) *follow-up the allocations assigned in the MICA application and coordinate internally within the State and report back..*

5.10 The meeting reviewed the current list of assigned IC for the MID States Mode S radars is at which is part of the MID FASID Table as at **Appendix 4B** to the report on Agenda Item 4, the listing will be incorporated in the new documents that will be published electronically by ICAO MID Regional Office. The meeting was informed on the two process of IC code allocations the normal and the adhoc process.

5.11 The meeting was apprised on the following developments:

- Bahrain will be commissioning two new modes S radars in January 2012 and there plans for ADS-B and multirateration (MLAT) system;
- Egypt are in the process of installing MLAT system in few months;
- Jordan will have mode S radar and new automation systems ready by end 2011;
- Saudi Arabia have twenty three mode S radars constellation some of which are already operational and others are in the process to be installed and commissioned;
- UAE is planning to install additional mode S radars by end 2012.

Supporting ICAO Position to WRC 12

5.12 ITU Word Radio communication Conference (WRC) provides a platform for the States and the industry to develop a consensus on the utilization of radio frequency spectrum. Next conference is scheduled in January/February 2012 and ICAO has circulated its position on the WRC-12 Agenda Items of critical interest to civil aviation.

5.13 The meeting recalled that ICAO position on WRC 12 was circulated through ICAO State Letter E 3/5-09/61 dated 30 June 2009. MIDANPIRG, through Conclusion 12/43 urged the States to include ICAO position on WRC-12 in their States position to the extent possible and provide the necessary support to ICAO position at the WRC 12. ICAO Assembly through its Resolution A36-25 urged the States and the International Organizations to provide full support for ICAO position in their State and Regional positions for presentation to WRC 12.

5.14 The meeting noted that Aeronautical Communication Panel (ACP) Working Group F, in its

Twenty Fourth meeting held 21-25 March 2011, reviewed ICAO position for WRC 12 and recommended updates based on the developments that have taken place.

5.15 The updated ICAO position on WRC-12 Agenda Items of critical interest to civil aviation was approved by ICAO Council at the third meeting of its 193rd Session on 15 June 2011 and was circulated in State Letter E 3/5-11/59 dated 22 July 2011.

5.16 The meeting recalled that Frequency Spectrum is a limited resource which is in demand by all States and Organizations. It was noted that it is becoming commercial commodity, and can bring lot of revenue to States. The Telecommunication Authorities have now realized this and started to utilize it.

5.17 The meeting was informed about WRC 12 Meeting which is scheduled to be held in Geneva 23 January – 17 February 2012. The meeting noted that all WRC meetings are preceded by a Conference Pre Meeting (CPM) which is normally held one year before the WRC. CPM will represent the best information on technical, operational and regulatory/procedural issues relevant to the WRC agenda available at the time of its preparation and should provide a good basis for discussions at the Conference.

5.18 The meeting noted that the report of the CPM will be used as the basis of all the discussions during the WRC Meeting. WRC 12 Agenda Items have been distributed into 6 different chapters:

CHAPTER 1 – MARITIME AND AERONAUTICAL ISSUES
CHAPTER 2 – RADIOLOCATION AND AMATEUR ISSUES
CHAPTER 3 – FIXED, MOBILE AND BROADCASTING ISSUES
CHAPTER 4 – SCIENCE ISSUES
CHAPTER 5 – SATELLITE ISSUES
CHAPTER 6 – FUTURE WORK PROGRAMME AND OTHER ISSUES

EACH CHAPTER WILL HAVE AGENDA ITEMS WHICH ARE RELATED TO IT.

5.19 During the CPM these agenda items are discussed in length and methods to satisfy them proposed, it is normal practice to have several methods suggested by different organizations tabled during the meeting. These methods are then put in CPM Report. States then have to select the best method to satisfy their position and this is then discussed within the ITU Groupings such as ASMG (Arab Spectrum Management Group). These Groupings will take their position to the WRC meeting and usually they are shared between them.

5.20 The meeting noted that ICAO attends WRC meeting as an observer. Accordingly, it is very important for all Civil Aviation Authorities work hard to convince the Telecommunication Authorities in their States to support ICAO position during WRC meetings.

5.21 The meeting urged MID States to use ICAO position when addressing this issue with their corresponding Telecommunication Authorities on an urgent basis as States and ITU Groupings are now taking their final position prior to the WRC 12 Meeting. It was noted that the ASMG Group is having their last meeting prior to the WRC 12 from 1to 5 October 2011. Furthermore the meeting noted that Bahrain, Egypt, Oman and Saudi Arabia are working very closely with their Telecommunication Authorities to support ICAO Position. However it was also noted that Gulf Cooperation Council (GCC) States position is not in total agreement with ICAO position, where 3 issues are not supporting ICAO position. Accordingly, the meeting agreed that GCC ANS committee to address the matter on urgent basis in their upcoming meeting and request full support to the ICAO position.

5.22 The meeting noted that Oman, will participate in ASMG meeting (…) and will provide the necessary support to ICAO position. The meeting also urged MID States to delete their name from the foot notes affecting the aviation spectrum.

5.23 The meeting noted that the WRC-12 conference will be held before the MIDANPIRG/13 meeting. Accordingly, the meeting agreed to the following draft conclusion for which ICAO MID Regional Office may take appropriate action as follow up to the CNS SG/4 meeting.

DRAFT CONCLUSION 4/9: SUPPORT ICAO POSITION TO WRC 12

That, MID States be urged to,

a) include ICAO Position on WRC-12 in their State Position to the extent possible

b) support Civil Aviation Authorities, aviation spectrum experts to participate actively in the national and regional level activities related to WRC-12 including ITU study groups to support ICAO Position;

c) support Civil Aviation Authorities, aviation spectrum experts to participate in WRC-12 and coordinate with the ICAO delegation to the conference; and

d) use the methods suggested for the WRC12 Meeting in addressing the ICAO position

DRAFT CONCLUSION 4/10: UPDATED ICAO POSITION

That, MID States be urged to support updated ICAO Position on WRC-12 Agenda Items of critical interest to civil aviation.

MID Surveillance issues

5.24 MIDANPIRG/12 meeting noted that many emerging surveillance technologies had been included in the ICAO provisions and are being implemented worldwide and in the MID Region, some of which are not a straight foreword implementation and require considerable knowledge on systems and procedures for their implementations. Accordingly, MIDANPIRG/12 meeting agreed to *Conclusion 12/45: MID Surveillance Workshop*.

5.25 Based on the above the MID Surveillance Workshop was successfully hosted by the General Authority of Civil Aviation (GACA) in Jeddah, Saudi Arabia, (08-10 May 2011). The workshop was attended by a total of 68 participants from 6 States and 2 International Organizations. Airbus, Boeing and EUROCONTROL participated as presenters through WebEx, were life online presentation were conducted followed by questions and answers session.

5.26 The meeting noted that the workshop was conducted with an objective to provide States in the Middle East Region, with a better understanding of evolving aeronautical surveillance and the new technologies to enhance situational awareness. The objective also included the development of MID Region Surveillance strategy and the time lines for the ADS-B implementation.

5.27 The meeting may further wish to note that the presentations and discussions covered mainly the following topics:

- Evolution of aeronautical surveillance
- Surveillance part of the MID REGION ANP FASID
- Radar Performance and Comparison of aeronautical surveillance Systems.
- User Surveillance Requirements
- MID States activities on surveillance
- Mode S coordination issues
- Multilateration and its use and requirement

- Solution and roadmap of FANS and ADS-B on the airbus family fleet
- SESAR and Nextgen requirement and the new advances on the situational awareness in cockpit
- ADS-B Out & ATSAW Deployment in Europe
- Boeing ADS-B Out and Regulatory Mandates in different Region.

5.28 The workshop discussed in detail Mode S coordination issues including a live demonstration on the MICA application used by EUROPE AND MID, where the participant had good understanding of the different capabilities available in the MICA web tool, the IC allocation cycle along with IC code conflict reporting and resolution screen.

5.29 The workshop was presented with practical examples on the Multilateration, its use and requirement. Presentations also covered the solution and roadmap of FANS and ADS-B and the Mode S Enhanced Surveillance (EHS) mandate in Europe to fulfill the SESAR and Nextgen requirement were highlighted. Furthermore the workshop noted that ADS-B Out, Airborne Traffic Situational AWareness (ATSAW) deployment in Europe is progressing under Surveillance Performance & Interoperability Implementing (SPI IR) mandate.

5.30 The meeting noted that the workshop received presentation from the two major aircraft manufacturers and got better understanding of their plans and the future equipage planning. Especially on ADS, and ADS-B mandates in different parts of the world including Australia, Hong Kong, Singapore, other Asia Pacific Regulatory Agencies, Nav Canada, EURCONTROL/ESA draft rule and the USA.

5.31 The workshop further noted that ICAO is addressing through the ASTAF (Airborne Surveillance Task Force) advanced situational awareness issues, where the mission of the task force is to develop a manual on Airborne Surveillance, covering the implementation of airborne surveillance and the initial applications, implemented by manufacturers over the next 3-5 years along with other related material.

5.32 The meeting reviewed and updated the MID Region Surveillance Strategy that was developed by the MID Surveillance workshop as at **Appendix 5A** to the Report on Agenda Item 5. Accordingly, the meeting agreed to the following Draft Conclusion:

DRAFT CONCLUSION 4/11: MID REGION SURVEILLANCE STRATEGY

*That, the MID Region Surveillance strategy be adopted as at **Appendix 5A** to the Report on Agenda Item 5.*

5.33 The meeting discussed the action list that was developed by the MID Surveillance workshop and noted that the first two actions are under progress by appropriate ICAO bodies. With regard to aircraft equipage survey, the meeting reviewed the "Surveillance Aircraft Equipage Survey" that was developed by IATA and agreed that IATA will check the possibility to share the survey and its results information with their users and provides an update during CNS/ATM/IC SG/6. It was noted that CANSO are conducting comprehensive survey which will be completed by November 2011. Accordingly, the meeting requested ICAO MID Regional office to check with CANSO the possibility of sharing survey information along with the possibility of storing the data in a common database.

5.34 The meeting noted the benefits of exchanging surveillance data that will enable greater efficiencies for airlines operating across boundaries by providing increased capacity, reduced workload, and enhance safety. In this regard the meetings recalled that, PANS ATM DOC 4444 para 8.1.5 indicates *States should, to the extent possible, facilitate the sharing of information derived from ATS surveillance systems in order to extend and improve surveillance coverage in adjacent control areas.*

5.35 The meeting further recalled MIDANPIRG/12 meeting views for a programme on

surveillance data information sharing to be carried out by all MID States in order to significantly reduce surveillance gaps. In this regard MIDANPIRG/12 meeting agreed to the revised Regional PFF for the ATS surveillance data exchange and agreed to *Conclusion 12/46: Exchange of Surveillance data.*

5.36 The meeting noted that as a follow-up to the above conclusion ICAO MID Regional office sent State letter AN 7/5.9–11/025 dated 16 February 2011 and the following States provided replies:

- Bahrain implemented the exchange of surveillance data with Kuwait since 2009, and with Qatar, Bahrain has made request to Saudi Arabia and UAE to implement the exchange of surveillance data, Bahrain has been providing UAE with the surveillance data since 2003;
- Jordan is not exchanging surveillance data, however it will be implemented when the new ATM system is commissioned at the end of the year;
- Oman is presently seeking approvals for the exchange of surveillance data with other states from appropriate authorities; and
- UAE are exchanging surveillance with Qatar

5.37 The meeting noted IATA request on enhancement of the surveillance data exchange especially during the economic crises to enhance safety and efficiency with no huge investments. Accordingly, the meeting agreed to continue encouraging the exchange of the surveillance data.

5.38 The meeting recalled that MIDANPIRG/10 encouraged States, in collaboration with the airspace users to develop and implement an ADS-B trials programme and MIDANPIRG/11 under conclusion 11/69 agreed on a Regional Strategy for the implementation of ADS-B. MIDANPIRG/12 supported the development of a harmonized plan for the ADS-B implementation for the MID Region based on the strategy adopted by MIDANPIRG/11. Accordingly, MID Surveillance workshop developed draft Surveillance strategy including time lines for ADS-B out implementation.

5.39 The meeting noted that MIDANPIRG/12 reiterated MIDANPIRG/11 conclusion 11/69 and considered that the MID Region Strategy for the Implementation of ADS-B being valid. However, with the recent development the meeting reviewed and updated the MID Region Strategy for the Implementation of ADS-B as at **Appendix 5B** to the Report on Agenda Item 5 and agreed to the following draft conclusion:

CONCLUSION 4/12: MID REGION STRATEGY FOR THE IMPLEMENTATION OF ADS-B

*That, the MID Region Strategy for the implementation of ADS-B to be amended as at **Appendix 5B** to the Report on Agenda Item 5.5.*

5.40 The meeting was briefed on ICAO initiatives for operational enhancements and noted that Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration using -AIDC-is possible since the required procedures exist and experience from other regions can be a useful reference. Furthermore, technology is available and is implemented in Flight Data Processing and could use the ground network standard AFTN-AMHS or ATN also there are no specific airborne requirements. In this regard the meeting was presented with a draft Interface Control Document for the MID region based on the other regions documents. The meeting was in consensus that an educational seminar is required before the mandate in the Region.

5.41 The meeting recalled amendment 85 to annex 10, where MIDANPIRG/12 meeting urged MID States to strictly adhere to the 24-bit aircraft addresses allocated to their States as listed in Annex 10, Volume III, Part I, Chapter 9, Table 9-1 (allocation of aircraft addresses to States). Furthermore, the MIDANPIRG/12 meeting encouraged MID States to allocate the 24 bit address to all aircraft registered in their State with the principle that, at any one time, no address shall be assigned to more than one aircraft.

5.42 The meeting noted that the above requirement is already included in the MID FASID Doc 9708. Furthermore, MIDANPIRG/12 meeting urged MID States to maintain databases for all the 24bit

aircraft address allocation pertaining to their States and send the assigned allocations to ICAO MID Regional Office and MID RMA for inclusion in their databases as soon possible. Accordingly, the meeting agreed to the following Draft Conclusion noting that MID RMA supports the idea:

DRAFT CONCLUSION 4/13: ALLOCATION OF 24 BIT AIRCRAFT ADDRESS

That, MID States be urged to:

a) allocate 24 bit aircraft address according to Annex 10, Volume III, Part I, Chapter 9, Table 9-1 (allocation of aircraft addresses to States);

b) send the allocation list to ICAO MID Regional Office and MID RMA by 30 March 2012; and

c) provide ICAO MID Regional Office and MID RMA with regular updates to the allocation list.

ICAO New Flight Plan Format (INFPL)

5.43 The meeting noted that MIDANPIRG/12, reviewed the progress achieved and difficulties faced by other ICAO regions during the implementation of INFPL provisions, which were posted on the FITS. In this regard, the MIDANPIRG/12 meeting urged MID States to use FITS system and post any issue encountered in the implementation of INFPL in FITS.

5.44 It was also noted that ICAO MID Regional Office sent State letter AN 6/2B – 11/027 dated 16 February 2011, requesting MID States to provide update on MIDANPIRG/12 *conclusions 12/51 INFPL Implementation difficulties and conclusion 12/53: Questionnaire on the Status of INFPL implementation* including, completed impact study, any difficulties being encountered or anticipated, provide National Performance Framework Form (PFF).

5.45 Based on the above the meeting noted that at the time of INFPL SG/3 meeting only 7 States (Bahrain, Egypt, Iran, Jordan, Libya, Oman, Qatar and Saudi Arabia) provided the replies which were analyzed by the Regional Office as at **Appendix 5C** to the Report on Agenda Item 5.

5.46 MIDANPIRG/12 recognized that the implementation of ICAO new FPL format is a substantial task and requires from States to secure a budget for the implementation of the new FPL Format Project. In addition States were urged to develop the technical requirements related to the upgrade of their ATC systems to comply with the new FPL format provisions and to initiate the necessary negotiations with vendors as soon as possible. Accordingly, the meeting reiterated MIDANPIRG/12 Conclusion:

CONCLUSION 12/52: ICAO NEW FLIGHT PLAN FORMAT IMPLEMENTATION

That, MID States be urged to:

a) secure necessary budget for the implementation of the ICAO New FPL Format;
b) initiate necessary negotiation with their ATC systems manufacturers/ vendors for the implementation of necessary hardware/software changes, as soon as possible;

c) develop National PFF related to the ICAO new FPL format project with clearly established milestones with timelines; and

d) take all necessary measures to comply with the applicability date of 15 November 2012.

5.47 The meeting was updated on the advanced INFPL Implementation Seminar held in Cairo, 19-21 June 2011, where it was highlighted that even manual flight plan system requires an upgrade even though it may only involve procedural changes training and documents. Accordingly, the INFPL SG/3 meeting updated the Regional Performance Framework Form (PFF) as at **Appendix 5D** to the Report on Agenda Item 5 and urged MID States to develop and update their own National PFF.

5.48 Noting the requirement for harmonizing the implementation of Amendment No. 1 to the Fifteenth Edition of the Procedures for Air Navigation Services — Air Traffic Management (PANS-ATM, Doc 4444. MIDANPIRG/12 meeting agreed to the MID Region Strategy for Implementation of the ICAO New Flight Plan Format and associated ATS messages under conclusion 12/54. Accordingly INFPL SG/3 meeting had a thorough review of the MID Region Strategy for the implementation of the INFPL and developed revised version of the Strategy as at **Appendix 5E** to the Report on Agenda Item 5 and agreed to the following Draft conclusion *3/2: Revised Strategy for the Implementation of INFPL*

5.49 The INFPL SG/3 meeting noted the consequences of non-compliance with the implementation of INFPL on the target date 15 November 2012 where major impacts on the whole aviation community would be observed, examples are provided at **Appendix 5F** to the Report on Agenda Item 5. In this regard, the INFPL SG/3 meeting urged MID States to carefully look into the training needs of ATC, airline operators and end users for the successful implementation of the INFPL.

5.50 The meeting was apprised that on 27 September 2010 Memorandum of Cooperation (MOC) between ICAO and ACAC was signed. In the implementation plan for the MOC it has been agreed that ACAC and ICAO would hold a joint INFPL workshop before the February 2012. Accordingly, the meeting encouraged all MID States and concerned organization to participate actively in the workshop

Global Air Navigation Industry Symposium (GANIS)

5.51 The meeting noted that ICAO organized Global Air Navigation Industry Symposium (GANIS) from 20 to 23 September 2011 in Montreal which is in preparation for Twelfth Air Navigation Conference (AN-Conf/12) scheduled between 19 to 30 November 2012 in Montreal. GANIS is an effort to facilitate greater integration and harmonization of air navigation system improvement programmes of States and service providers. The Symposium, while emphasizing the need for global harmonization, identified ways and means to ensure interoperability, to maximize utilization of available and emerging technologies and to support an ongoing global discussion.

5.52 ICAO developed an approach to achieve this objective in the form of a series of “aviation system block upgrades” (ASBU). The block upgrades initiative will be formalized at the Twelfth Air Navigation Conference, in November 2012. It will be included into the Global Air Navigation Plan (GANP). The Global Air Navigation Industry Symposium, in September 2011, allowed industry partners as well as States to gain insight, provide feedback where *Such feedback can be provided on-line at* *http://www2.icao.int/en/GANIS/Lists/EFeedback/NewForm.aspx or by email.***GANIS@icao.int** using the standard form.

MID Region Surveillance Strategy

- Share experience and trial results in new surveillance technologies;
- Minimize reliance on position reporting, particularly voice reporting & Primary Radar;
- Maximize contiguous coverage and use of ADS-B on major routes/terminal areas;
- Make full use of SSR Mode 'S' capabilities, reduce reliance on 4 digit octal code;
- Make use of ADS-C when ADS-B, SSR or multilateration not supported;
- Encourage Multilateration for surface, terminal & area surveillance;
- Improve safety through sharing ATS surveillance data across FIR boundaries;
- Broaden scope of cooperation between ANSPs and Stakeholders;
- Acknowledge the development of other Regions and should consider incremental introduction of new surveillance technologies;
- Increase use of Aircraft Derived Data; and
- The MID Region ADS-B implementation times line set for 2017.

MID REGION STRATEGY FOR THE IMPLEMENTATION OF AUTOMATIC DEPENDENT SURVEILLANCE-BROADCAST (ADS-B)

Considering the:

a) ICAO strategic objectives;
b) ICAO Business Plan;
c) Global Air Traffic Management Operational Concept;
d) revised Global Air Navigation Plan and associated GPIs;
e) outcome of the 11th Air Navigation Conference; and

Recognizing that:

i) the implementation of data-link surveillance technologies is an evolutionary process, but which has significant potential for safety and cost-effectiveness; and
ii) implementation of ADS-B is in support of various Global Plan Initiatives;

The MID Region strategy for the implementation of ADS-B is detailed below:

A) the MID Region ADS-B implementation plan should:

1) be evolutionary and consistent with the Global Air Navigation Plan taking into consideration associated MID Region priorities;

2) when cost/benefit models warrant it, prioritize implementation in areas where there is no radar coverage surveillance, followed by areas where implementation would otherwise bring capacity and operational efficiencies;

3) ensure that implementation of ADS-B is harmonized, compatible and interoperable with respect to operational procedures, supporting data link and ATM applications;

4) 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;

5) be implemented following successful trial programmes with regards to safety and operational feasibility, taking into account studies and implementation experiences from other ICAO Regions;

6) be implemented in close collaboration with users;

7) The proportions of equipped aircrafts are also critical for the ADS-B deployment, for which it is required to periodically provide, at least, the following information: number of equipped aircrafts operating in the concern airspace, number and name of the airlines that have equipped aircrafts for ADS-B, type of equipped aircrafts, categorization of the accuracy/integrity data available in the aircrafts;

8) The ADS-B deployment should be associated at early stages in coordination with the States/Regional/International Organizations responsible for the control of adjacent areas, and the correspondent ICAO Regional Office, establishing a plan in the potential areas of ADS-B data sharing, aimed at a coordinated, harmonious and interoperable implementation;

9) Each State/Regional/International Organization should investigate and report their own Administration's policy in respect to the ADS-B data sharing with their neighbours and from cooperative goals;

10) The ADS-B data sharing plan should be based selecting centres by pairs and analyzing the benefits and formulating proposals for the ADS-B use for each pair of centre/city with the purpose to improve the surveillance capacity;

11) Likewise, it is necessary to consider implementing surveillance solutions for surface movement control by the implementation of ADS-B; and

12) The implementation would be in conformity with the SARPs, ICAO guidelines and the MIDANPIRG conclusions and according to MID Surveillance Strategy where the time line for implementation is set for 2017.

B) The implementation would require aircraft equipped with avionics compliant with either:

i) Version 0 ES as specified in Annex 10, volume IV, Chapter 3, paragraph 3.1.2.8.6 (up to and including amendment 83 to annex 10) and chapter 2 of draft technical Provisions for Mode S services and extended Squitter (ICAO Doc 9871) to be used till at least 2020, or

ii) Version 1 ES as specified in chapter 3 draft Technical Provisions for Node S Services and Extended Squitter (ICAO Doc 9871) Equivalent to DO260A.

C) Implementation should be monitored to ensure collaborative development and alignment with the MID Region projects and relevant elements of the GPIs.

CNS SG/4
Appendix 5C to the Report on Agenda Item 5

QUESTIONNAIRE ANALYSIS

State	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Bahrain								
Egypt	No	Yes	Not yet	Yes	Yes	Yes	Yes	Not yet under development
Iran	Yes there are problems (120+training)	Yes as mentioned in Q1	No under development	Yes	Yes no doubts	Yes	Yes	Not yet under development
Iraq								
Jordan	No problems	Yes	Yes under development	Yes fully understand	Yes fully understand	Yes	Yes, and understand fully the impact	Defined action plan WP11
Kuwait								
Lebanon								
Libya	No problems	Yes	No under development	--	Yes	Yes	Yes	Under development
Oman	No	Yes	Yes under development		Yes	Yes	Yes	Under development
Qatar	No Problem	Yes	Yes under development	Yes	Yes	Yes	Yes	Under development
Saudi Arabia	No problems at this time	As it applies to ATM system	Yes will have Dual	Yes	Yes and will have dual functionality	Yes	Yes *expect additional automation and procedural impact*	Under development
Sudan								
Syria								
UAE								
Yemen								

Q1- *In your compliance to the changes in Amendment 1, is there any part of Amendment 1 in which your State identifies any major problem to comply?*
Q2- Has your State considered the accommodation of the 120 hour filing provision outlined in Amendment 1?
Q3- Have you considered a strategy for transitioning NEW FPL and related messages to the PRESENT/EXISTING format?
Q4- Do you know about the regional actions defined in MID Regional Strategy for implementation of this amendment?
Q5- Do you understand the phased transition approach?
Q6- Do you intend to comply with the dates contained in Phase 2 (transition) of the approach (i.e., you plan to be ready to begin accepting NEW format FPLs and related messages between 1 April and 30 June 2012)?
Q7- Have you considered the automation and/or procedural impacts involved in the implementation of Amendment 1?
Q8- Has your State defined an action plan for carrying out the different aspects of this implementation?

CNS SG/4
Appendix 5D to the Report on Agenda Item 5

IMPLEMENTATION OF THE NEW ICAO FPL FORM	
Benefits	
Environment	• reductions in fuel consumption and CO_2 emission utilizing proper flight planning and aircraft capabilities are known in advance to ANSP
Efficiency	• ability of air navigation service providers to make maximum use of aircraft capabilities • ability of aircraft to conduct flights more closely to their preferred trajectories • facilitate utilization of advanced technologies thereby increasing efficiency • optimized demand and capacity balancing through the efficient exchange of information
Safety	• enhance safety by use of modern capabilities onboard aircraft
KPI	• status of implementation of ICAO new FPL provisions • status of updates in the FITS
Proposed Metrics:	• number of States meeting the deadline for implementation of the ICAO new FPL provisions • number of States providing the focal points and initiated impact studies

Strategy
Short term (2010-2012)
Medium term (2013 - 2016)

ATM OC COMPONENTS	TASKS	TIMEFRAME START-END	RESPONSIBILITY	STATUS
SDM	• Planning and implementation of transition elements	2009-2012	INFPL SG	valid
	• States to assign focal points and form and internal nucleus team	2009 - 2010	States	valid
	• ensure that enabling regulatory (regulations procedures, AIP etc..) provisions are developed	2009- 2012	States	valid
	• ensure that the automation and software requirements of local systems are fully adaptable to the changes envisaged in the new FPL form	2009 - 2012	States	valid
	• ensure that issues related to the ability of all system to pass information correctly and to correctly identify the order in which messages are received, to ensure that misinterpretation of data does not occur	2009- 2012	States	valid
	• analyze each individual data item within the various fields of the new flight plan form, comparing the current values and the new values to verify any problems with regard to applicability of service provided by the facility itself or downstream units	2009 – 2011	INFPL SG States	valid

Strategy ***Short term (2010-2012)*** ***Medium term (2013 - 2016)***				
ATM OC COMPONENTS	**TASKS**	**TIMEFRAME START-END**	**RESPONSIBILITY**	**STATUS**
	• ensure that there are no individual State peculiarities or deviations from the flight plan provisions	2009- 2012	States	valid
	• ensure that the accepting ATS Reporting Office accepts and disseminates all aircraft capabilities and flight intent to all the downstream ACCs as prescribed by the PANS-ATM provisions	2009 – 2012	INFPL SG States	valid
	• plan the transition arrangements to ensure that the changes from the current to the new ICAO FPL form occur in a timely and seamless manner and with no loss of service	2009-2012	States INFPL SG	valid
	• in order to reduce the chance of double indications it is important that any State having published a specific requirement(s) which are now addressed by the amendment should withdraw those requirements in sufficient time to ensure that aircraft operators and flight plan service providers, after 15 November 2012, use only the new flight plan indications.	2009- 2012	States	valid
	• internal testing	2009 – June 2012	States	valid
	• external testing and transition into operation	1 April to 30 June 2012	States	valid
	• airspace users validation and filling of NEW FPLs if appropriate	1 July to 14 November 2012	States and users	valid
	• Plan and ensure the training of relevant stakeholders (air traffic controllers, etc)	2009 - 2012	States	valid
	• develop and make available, guidance material for users, including but not limited to ANSP personnel	2009 - 2011	INFPL SG	valid

Strategy ***Short term (2010-2012)*** ***Medium term (2013 - 2016)***				
ATM OC COMPONENTS	**TASKS**	**TIMEFRAME START-END**	**RESPONSIBILITY**	**STATUS**
	• establish and enhance as appropriate a central depository (FITS) in order to track the implementation status	Ongoing	ICAO	Completed
	• inform the ICAO regional offices on an ongoing basis	Ongoing- Dec 2012	States	Valid
linkage to GPIs	GPI/18 Aeronautical Information			

MID REGION
STRATEGY FOR THE IMPLEMENTATION OF
ICAO NEW FLIGHT PLAN FORMAT AND SUPPORTING ATS MESSAGES

Recognizing that:

1) Dynamic information management will assemble the best possible integrated picture of the historical, real-time and planned or foreseen future state of the ATM situation and provide the basis for improved decision making by all ATM community members, further more for the ATM system to operate at its full potential, pertinent information will be available when and where required;

2) The *Global Air Traffic Management Operational Concept* (Doc 9854) requires information management arrangements that provide accredited, quality-assured and timely information to be used to support ATM operations and will use globally harmonized information attributes;

3) ATM Requirement 87 in the *Manual of Air Traffic Management System Requirements* (Doc 9882) provides that 4-D trajectories be used for traffic synchronization applications to meet ATM system performance targets, explaining that automation in the air and on the ground will be used fully in order to create an efficient and safe flow of traffic for all phases of flight;

4) The amended ICAO Flight Plan and associated ATS Message formats contained in Amendment 1 to the Fifteenth Edition of the PANS ATM (Doc 4444, applicable 15 November 2012) have been formulated to meet the needs of aircraft with advanced capabilities and the evolving requirements of automated air traffic management systems, while taking into account compatibility with existing systems, human factors, training, and cost;

5) The ICAO new flight plan Format introduces considerable changes related, inter-alia, to Performance Based Navigation (PBN), Automatic Dependent Surveillance - Broadcast (ADS-B) and Global Navigation Satellite Systems (GNSS), while maintaining a high degree of commonality with the existing flight plan format;

6) The complexities inherent in automated computer systems preclude the adoption of a single regional transition date and transitions to the new flight plan provisions will therefore occur throughout the declared transition period;

7) The risk of not updating all MID States automated systems as planned and before the implementation date of 15 November 2012; and

8) The risk of all users simultaneously commencing “NEW” on the common implementation date without proper testing with the States.

The MID Region implementation of Amendment 1 to the PANS-ATM shall:

1) Ensure that all States and airspace users implement the full provisions of Amendment 1 to PANS-ATM 15th Edition with applicability date of 15 November 2012, not just selected aspects of the provisions;

2) Acknowledge that States not implementing the full provisions of Amendment 1 are obligated to publish the non compliance in State AIP as a ‘significant difference’ well in advance of the 15

November 2012 applicability date and will be included on the MIDANPIRG List of Deficiencies in the CNS/ATM Fields; and

3) Ensure that, from 15 November 2012, all States and airspace users accept and disseminate 'NEW' flight plan and associated ATS message formats only and capabilities for 'PRESENT' flight plan provisions are discontinued.

The MID Regional transition to the PANS-ATM Amendment 1 provisions shall:

1) Comply with the guidance provided by ICAO as described in the ICAO guidance material in State Letter AN 13/2.1-09/9, dated 6 February 2009; titled "Guidance for implementation of flight plan information to support Amendment 1 of the Procedures for Air Navigation Services — Air Traffic Management, Fifteenth Edition (PANS-ATM, DOC 4444)";

2) States must ensure coordination with adjacent States for testing and transition and inform other interested stakeholders as appropriate;

3) Ensure that the INFPL SG undertakes coordination to facilitate harmonization with implementations in neighboring regions;

4) Eliminate or minimize State specific constraints and, if constraints continued to be ~~are~~ identified as necessary, implementation of such constraints should be agreed on a regional basis or sub regional basis in preference to an individual State basis;

5) Declare a preparation transition period from 1 January 2012 until 14 November 2012, comprising;

- Before 31 March 2012 - ANSPs software delivery and internal testing,
- 1 April to 30 June 2012 – ANSPs external testing and
- 1 July to 14 November 2012 – airspace users testing;

6) Encourage ANSPs and airspace users to coordinate appropriate implementation methodologies in order to ensure that migration to 'NEW' could be done without problems on the agreed and declared implementation date;

7) Encourage States and users to immediately commence preparations to implement Amendment 1 provisions preferably not later than declared preparation period and report progress to the INFPL SG periodic meetings;

8) States Implementing NEW Format should have the capability to process both PRESENT and NEW formats;

9) MID States shall not support PRESENT format after 15 November 2012;

10) Strategic Support Teams (SST) to be identified and resourced to support those States who are behind the regional Implementation Plan, and;

11) Establish State and Regional coordination cells. Guidelines will be provided to align with the joint ICAO and IATA management center in ICAO HQ Montreal planned around the applicability date.

ICAO Flight Plan changes by 15 November 2012

The consequences of States not meeting the deadline

There will be confusion in the aviation sector in those States which are not ready to accept the NEW Flight Plan format on 15 November 2012.

1 To FPL filers and Agencies

1.1 Aircraft will miss slot times

1.2 Airspace User dispatch staff or agencies will be overwhelmed with rejected flight plans

1.3 Airspace User dispatch staff or agencies will be overwhelmed with re-submitting acceptably modified flight plans

2 To Airspace Users

2.1 Airspace users may choose to take an alternate route via an ANSP which can make use of their aircraft capabilities and so deliver efficiencies expected by that Airspace User

2.2 Aircraft will be denied the most efficient flight profiles associated with their performance based navigation.

3 To Air Traffic Controllers

3.1 Controllers may be presented with a flight at a boundary for which there is no flight plan

3.2 Controllers may feel pressured to manually submit a limited flight plan online in order to accept a flight

3.3 Increased coordination of aircraft from one FIR to another

3.4 Controllers may have to maintain control of an aircraft in their airspace if an adjacent FIR refuses to accept a flight.

3.5 Increased workload due to communications and excessive coordination requirements

4 To Aircrew

4.1 Aircrew may be overloaded by having to file Flight Plan modifications en route.

4.2 Aircraft will be delayed

4.3 Aircraft likely to be subject to holding if airport gates have not been vacated due to departing aircraft missing their slots

5 To ANSPs

5.1 ANSP staff may be overloaded by having to manually enter flight Plans which have been rejected by the automated system.

5.2 ANSPs may lose revenue from aircraft not using their FIR facilities.

6 Safety

6.1 Manual modifications to flight plan data either by filers, ATC staff or aircrew could lead to incorrect data being transmitted or detail lost altogether.

6.2 Credible corruption of flight plan data could occur due to a mix of NEW and Present flight plan content after the 15th November deadline.

6.3 Pilots may have to enter flight Plan data manually into the FMS if Flight Plan is rejected by ATC thus introducing a greater risk of error.

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

6.1 The meeting noted that the DGCA-MID/1 meeting (Abu Dhabi, UAE, 22-24 March 2011) noted the concerns expressed by the various ICAO organs including the Council, the Air Navigation Commission (ANC) and MIDANPIRG on the serious impact the long standing deficiencies have on safety.

6.2 The meeting recalled that MIDANPIRG/12 (Amman, Jordan, 17-21 October 2010) noted with concern, that in many cases, two (2) or three (3) rationale for the non-elimination of deficiencies are reflected in the MID Air Navigation Deficiency Database (MANDD) (i.e.: F, H and O or F, H and S), which does not provide an accurate result, when carrying out an analysis related to the root-causes for non-elimination of deficiencies. Accordingly, the meeting agreed that, to the extent possible, it is preferable to reflect in the MANDD only the major factor/rationale for the non-elimination of the concerned deficiency.

6.3 The DGCA-MID/1 meeting noted that MIDANPIRG/12 underlined that the lack of sufficient number of qualified technical staff is the highest contributing factor for the non-elimination of the safety deficiencies in the MID Region (both air navigation deficiencies and USOAP findings). The meeting noted that as part of the ICAO MID Regional Office Work Programme, Seminars, Workshops and Training Courses are being organized in the MID Region based on needs identified within the framework of MIDANPIRG or by ICAO (HQ and Regional Office). Nevertheless, the meeting recognized that more effort should be put in the training of technical staff and re-iterated MIDANPIRG/12 recommendations and Conclusion on the subject, including, the call for States to organize at the National Level Seminars, Workshop and Training courses, in coordination with and with the support of the ICAO MID Regional Office, in order to touch a larger number of staff from the State.

6.4 The meeting recalled also that MIDANPIRG/12 recognized 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. Accordingly, the meeting urged User Organizations (IATA and IFALPA) to use the online facility offered by MANDD to submit requests for additions, updates, and the elimination of Air Navigation Deficiencies.

6.5 The meeting further recalled that MIDANPIRG/12 through Conclusion 12/47 agreed that the "Percentage of air navigation deficiencies priority "U" eliminated", should be used as one Metric (MID Metric 6) for performance monitoring of the air navigation systems in the MID Region; and requested the MIDANPIRG subsidiary bodies to monitor the Metrics related to their work programmes and develop associated performance targets.

6.6 The meeting noted that Jordan has been for a long time trying hard to ensure the aeronautical information flow to ascertain the safe and orderly flow of traffic, Amman main worry is about the difficulty to handle traffic massages to and from Europe through the northern Area of the region and its diversions, in all cases and situations, traffic cannot expect any delay or returns due the very narrow area for manoeuvring traffic. In this regard Jordan sent an official letter requesting implementation of Amman-Beirut AFTN circuit since June, 2010.

6.7 Jordan informed the meeting that Lebanon has a concern about routing of certain area that would be contained in some AFTN messages originated/addressed by/to the Amman COM center. Consequently, and to ensure the flow of traffic and its aeronautical information, a new international AFTN circuit has been recently established between the Amman COM center and the Nicosia COM center on bilaterally basis to make sure that AFTN messages are not lost or misplaced.

6.8 Based on above, Jordan requested the deletion of the deficiency. However the meeting had concern on this deletion without the presence of Lebanon. Accordingly the meeting agreed that the remarks column in the deficiency to clearly show that Jordan is ready.

6.9 The meeting reviewed list of deficiencies in the CNS field agreed that all updates to the deficiencies to be done online through MANDD and the updated list of deficiencies in the CNS field as generated from MANDD on 7 October 2011 is at **Appendix 6A** to the Report on Agenda Item 6.

Deficiencies in the CNS field

BAHRAIN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date first reported	Remarks/ Rationale for non-elimination		Facilities/ Services	Executing body	Date of completetion	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	O	Follow-up the matter with IATA concerning Afghanistan VSAT are available and now checking compatibility	Afghanistan Bahrain	Dec 2011	A

Deficiencies in the CNS field

IRAN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date first reported	Remarks/ Rationale for non-elimination		Facilities/ Services	Executing body	Date of completetion	Priority for action
1	AFTN Rationalized Plan (LIM MID RAN Rec 6/6, 6/9 and MIDANPIRG/4 Conclusion 4/19)	Afghanistan-Iran-Kabul-Tehran AFTN Circuit	The circuit is not yet implemented	Oct 1998	VSAT network to be implemented	S	Iran advised that they are ready	Afghanistan Iran	Dec 2011	A

Deficiencies in the CNS field

IRAQ

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date first reported	Remarks/ Rationale for non-elimination		Facilities/ Services	Executing body	Date of completetion	Priority for action
1	AFTN usage (LIM MID RAN Rec 6/2)	Baghdad AFTN Center	Circuit Loading Statistics	May 1995	Monthly statistics should be sent to MID Office	S	Refers to ICAO fax ref. F.ME 165 reminding States to send data to ICAO Office	Iraq	Dec 2011	B
2	ATS Direct Speech circuit	Iraq - Syria	ATS Direct speech circuit between adjacent centers is needed	Oct 2008	New reported	O	Iraq Advise they can provide VSAT	Iraq and Syria	Dec 2011	U
3	MID FASID	Baghdad DME	DME not installed	Jan 2009	Newly reported	O	Iraq advised that all NAV AIDs will be installed according to the master plan	Iraq	Dec 2011	U
4	MID FASID	Baghdad VOR	VOR not installed	Jan 2009	Newly Reported	O	Iraq advised that all NAV AIDs will be installed according to the master plan	Iraq	Dec 2011	U
5	ATS Direct Speech circuit	Iraq - Jordan	ATS Direct speech circuit between adjacent centers is needed	Jan 2009	newly reported	O	Iraq advised they can provide VSAT	Iraq and Jordan	Dec 2011	U

Deficiencies in the CNS field

JORDAN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date first reported	Remarks/ Rationale for non-elimination		Facilities/ Services	Executing body	Date of completetion	Priority for action
1	AFTN Rationalized Plan (LIM MID RAN Rec 6/6, 6/9 and MIDANPIRG/4 Conclusion 4/19)	Jordan-Lebanon-Amman-Beirut AFTN Circuit	The circuit is not yet implemented	Oct 1998	Jordan is ready to implement the circuit and already sent official letter to Lebanon in June 2010	S	Jordan is aleady co-ordinating with Lebanon	Jordan - Lebanon	Dec 2011	A
2	ATS Direct Speech circuit	Iraq - Jordan	ATS Direct speech circuit between adjacent centers is needed	Jan 2009	Newly reported	O	Iraq advise they can provide VSAT	Iraq - Jordan	Dec 2011	U

Deficiencies in the CNS field

KUWAIT

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date first reported	Remarks/ Rationale for non-elimination		Facilities/ Services	Executing body	Date of completetion	Priority for action
1	AFTN usage (LIM MID RAN Rec 6/2)	Kuwait AFTN Center	Circuit Loading Statistics	May 1995	Monthly statistics should be sent to MID Office	O	Refer to ICAO fax ref. F.ME 165 reminding States to send data to Regional Office	Kuwait	Dec 2011	B
2	AFTN Main Circuits (LIM MID RAN Rec10/5)	Lebanon-Kuwait-Beirut – Kuwait AFTN Circuit	The circuit is implemented on 100 bauds	Oct 1999	The circuit is operating on 100 baud needs to be upgraded to meet new requirements	O	Kuwait is ready to upgrade to higher speed according to the readiness in Lebanon	Kuwait Beirut	Dec 2011	B

Deficiencies in the CNS field

LEBANON

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date first reported	Remarks/ Rationale for non-elimination		Facilities/ Services	Executing body	Date of completetion	Priority for action
1	AFTN Rationalized Plan (LIM MID RAN Rec 6/6, 6/9 and MIDANPIRG/4 Conclusion 4/19)	Jordan-Lebanon Amman-Beirut AFTN Circuit	The circuit is not yet implemented	Oct 1998	Lebanon is geeting ready to implement the circuit	S	If problem persist, another alternative should be proposed in the MID AFTN Plan	Jordan Lebanon	Dec 2011	A
2	AFTN Main Circuits (LIM MID RAN Rec10/5	Lebanon – Kuwait Beirut – Kuwait AFTN Circuit	The circuit is implemented on 100 bauds	Oct 1999	The circuit is operating on 100 baud needs to be upgraded to meet new requirements	O	Kuwait ready for upgrade to higer speed digital circuit	Kuwait Lebanon	Dec 2011	B

Deficiencies in the CNS field OMAN										
Item No	**Identification**		**Deficiencies**				**Corrective Action**			
	Requirement	**Facilities / Services**	**Description**	**Date first reported**	**Remarks / Rationale for non-elimination**		**Facilities / Services**	**Executing body**	**Date of completetion**	**Priority for action**
1	Direct Speech circuit (LIM MID RAN)	Oman - Yemen	Direct Speech circuit is required	Oct 1998	under Implementation	O	Oman confirm they are ready also advised that Yemen will be ready and cdirect speech circuit will be operational in few weeks	Oman - Yemen	Dec 2010	A

Deficiencies in the CNS field

QATAR

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date first reported	Remarks/ Rationale for non-elimination		Facilities/ Services	Executing body	Date of completetion	Priority for action
1	AFTN usage (LIM MID RAN Rec 6/2)	Doha AFTN Center	Circuit Loading Statistics	May 1995	Refer to ICAO fax ref. F.ME 165 reminding States to send data to Regional Office	H	Data should be sent to ICAO Office	Qatar	Dec 2011	B

Deficiencies in the CNS field

SAUDI ARABIA

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date first reported	Remarks/ Rationale for non-elimination		Facilities/ Services	Executing body	Date of completetion	Priority for action
1	AFTN usage (LIM MID RAN Rec 6/2)	Jeddah AFTN Center	Circuit Loading Statistics	May 1995	Refer to ICAO fax ref. F.ME 165 reminding States to send data to Regional Office.	O	New software has been implemented.	Saudi Arabia	Dec 2011	B

Deficiencies in the CNS field

SYRIA

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date first reported	Remarks/ Rationale for non-elimination		Facilities/ Services	Executing body	Date of completetion	Priority for action
1	ATS Direct SPeech circuit	Syria - IRAQ	Direct Speech circuit required between Syria and Iraq	Oct 2008	-	O	Iraq advise they are ready to provide VSAT for the implementation	Syria-Iraq	Dec 2011	U

Deficiencies in the CNS field UAE										
Item No	**Identification**		**Deficiencies**				**Corrective Action**			
	Requirement	**Facilities / Services**	**Description**	**Date first reported**	**Remarks / Rationale for non-elimination**		**Facilities / Services**	**Executing body**	**Date of completetion**	**Priority for action**
1	~~VOR designator SHJ~~	~~VOR~~	~~Changed VOR designator from SHJ to SHR causing duplication with IRAN NDB~~	~~Dec 2009~~	~~UAE CCAA are looking into the matter~~	~~O~~	~~Change to the correct designator which is SHJ~~	~~UAE CCAA~~	~~Jan 2011~~	~~U~~

Deficiencies in the CNS field

YEMEN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date first reported	Remarks/ Rationale for non-elimination		Facilities/ Services	Executing body	Date of completetion	Priority for action
1	Direct SPeech Circuit with Adjacent center Djibouti	Yemen - Djibouti	requirement for a Direct SPeech Circuit with Adjacent center Djibouti	Oct 1998	-	O	Establishment fo direct speech circuit between Yemen and Djibouti	Yemen - Djibouti	Dec 2011	A
2	Direct SPeech Circuit with Adjacent center India	Yemen - India	Direct SPeech Circuit with Adjacent center India	Oct 1998	-	O	Establishments of a Direct SPeech Circuit with Adjacent center in India	Yemen - India	Dec 2011	A
3	Direct SPeech Circuit with Adjacent center Oman	Yemen - Oman	Requirement for a Direct SPeech Circuit with Adjacent center Oman	Oct 1998	-	FHO	Establish a direct Speech Circuit with Adjacent center Oman	Yemen - Oman	Dec 2010	A
4	Direct SPeech Circuit with Adjacent center with Eritrea and Somalia	Yemen - Eritrea , Somalia	requirement for a direct Speech Circuit with Adjacent center in Eritrea and Somalia	Oct 1998	-	FHSO	Establishment of direct Speech Circuit with Adjacent center in Eritrea and Somalia	Yemen - Eritrea , Somalia	Dec 2011	A

REPORT ON AGENDA ITEM 7: CNS PERFORMANCE OBJECTIVE FOR MID REGION

7.1 The meeting recalled that data collection, processing, storage and reporting are fundamental to the performance-based approach and forms part of performance monitoring and management.

7.2 The meeting further recalled the following definitions:

a) *Performance Objective:* objectives defined to satisfy ATM community expectations;

b) *Performance Indicator:* Current/past performance, expected future performance as well as actual progress in achieving performance objectives is quantitatively expressed by means of performance indicators (also called Key Performance Indicators, or KPIs);

c) *Performance target*: Performance targets are closely associated with performance indicators: they represent the values of performance indicators that need to be reached or exceeded to fully achieve performance objective; and

d) *Metrics:* determine which data needs to be collected to calculate values of performance indicators. Metrics are challenging and expensive to collect; therefore it is important to keep them "SMART" (Specific, Measurable, Achievable, Realistic & Time-bound) and easy to measure.

7.3 The meeting noted that MIDANPIRG/12 (Amman, Jordan, 17-21 October 2010) developed the following Conclusions related performance monitoring of the air navigation systems in the MID Region:

CONCLUSION 12/47: MID REGION PERFORMANCE METRICS

That:

a) the following MID Region Metrics be adopted for performance monitoring of the air navigation systems:

MID Metric 1: Number of accidents per 1,000 000 departures;

MID Metric 2: Percentage of certified international aerodromes;

MID Metric 3: Number of Runway incursions and excursions per year;

MID Metric 4: Number of States reporting necessary data to the MIDRMA on regular basis and in a timely manner;

MID Metric 5: The overall collision risk in MID RVSM airspace;

MID Metric 6: *Percentage of air navigation deficiencies priority "U" eliminated;*

MID Metric 7: *Percentage of instrument Runway ends with RNP/RNAV approach procedure; and*

MID Metric 8: *Percentage of en-route PBN routes implemented in accordance with the regional PBN plan.*

b) the MIDANPIRG subsidiary bodies monitor the Metrics related to their work programmes; develop associated performance targets and provide feed-back to MIDANPIRG.

CONCLUSION 12/48: DATA COLLECTION FOR MID REGION PERFORMANCE METRICS

That, States be invited to:

a) incorporate the agreed MID Region Performance Metrics into their National performance monitoring process;

b) collect and process relevant data necessary for performance monitoring of the air navigation systems to support the regional Metrics adopted by MIDANPIRG; and

c) submit this data to the ICAO MID Regional Office on a regular basis.

7.4 The meeting further noted that ICAO MID Regional Office sent a State letter AN 7/26.1-11/121 dated 24 May 201, requesting MID States to take all necessary measures to implement the provisions of the above MIDANPIRG/12 Conclusions and provide ICAO MID Regional Office, on regular basis, with relevant data necessary for performance monitoring of the air navigation systems to support the regional Metrics adopted by MIDANPIRG and to allow the MIDANPIRG subsidiary bodies to monitor the Metrics related to their work programmes and develop associated performance targets. No replies were received from MID State, except an acknowledgment was received.

7.5 In accordance with MIDANPIRG/11 Conclusion 11/70 – "*Regional Performance Framework*", and taking into consideration the outcome of the different MIDANPIRG subsidiary bodies, the MIDANPIRG/12 meeting reviewed the Regional PFFs related to AGA, AIM, ATM and CNS, as updated by the CNS/ATM/IC SG/5 meeting. It was recognized that the revised Regional PFFs, are much more mature than the previous version. However, it was underlined that the Regional PFFs could be further improved, giving that users provide their needs and expectations and States develop/update their National PFFs and report relevant data necessary for performance monitoring of the air navigation systems, as required.

7.6 Taking into consideration the developments in the CNS field, where it was noted that the implementation of ATN Ground-Ground network using AMHS, the support that MID States are providing to the ICAO Position for WRC 12 and the advancement in the situational awareness domain, the meeting reviewed and updated the CNS Performance Framework Forms (PFF) as at **Appendix 7A** to the Report on Agenda Item 7.

7.7 meeting reviewed and agreed that KPIs/Metrics need to be revised accordingly the meeting agreed to the following CNS performance monitoring in the MID Region:

- number MID States of aviation experts participate in WRC-12 (five States)
- number of States deleted their State name from the foot notes affecting aviation spectrum (4 States have footnotes)
- number of States coordinated with TRA to support the ICAO position (five States)
- number of States participate in the development of the ATN plan ATN/IPS (Six States)
- number of States follow the implementation ATN Plan (Five States)
- number of States Implemented data links
- number of report on trails and demo on GNSS (1 State)
- number of States Participate in the development of MID Surveillance Road map (Six States)
- number of States sharing Radar (Three States)
- number of deficiency Priority "U" related to the CNS field (Six Deficiencies)

7.8 Based on the above, the meeting urged States to develop/update their National CNS PFFs in order to ensure their alignment with and support to the regional CNS performance objectives and forward their inputs and National PFFs to the ICAO MID Office prior to 15 December 2011 for review by the CNS/ATM/IC SG/6 meeting.

7.9 The meeting was informed that ICAO aassisted by IATA, CANSO EUROCONTROL and other international organizations, developed the ICAO Fuel Savings Estimated Tool (IFSET) and guidance material to help States measure their fuel savings resulting from national or regional improvement. Furthermore an ATM Measurement Task Force (ATM/M TF) will be established that will be reporting to the CNS/ATM/IC Sub-Group, to analyze the environmental benefits resulting from the improvements to the air navigation systems. As a first step, it is proposed that the ATM/M TF should be focusing on the following proposed three target projects/operational improvements:

- ☐ improved Airport Accessibility;
- ☐ improved operations through enhanced En-Route trajectories; and
- ☐ improved flexibility and efficiency in Decent Profiles (PBN/CDO)

CNS SG/4
Appendix 7A to the Report on Agenda Item 7

CNS PERFORMANCE OBJECTIVES

REGIONAL PERFORMANCE OBJECTIVES RADIO SPECTRUM MANAGEMENT AND PROCESSES TO PROTECT THE AERONAUTICAL SPECTRUM	
Benefits	
Environment	• Supports ATM for the optimized use of technologies to reduce effect on environmnet
Efficiency	• proper administration the allocated aviation spectrum • resolve air Space communications
Safety	• availability of spectrum for safety systems and communication
KPI	• satisfactory results of the WRC-12 • current Aviation Frequency spectrum is protected to extent possible • availability Frequency Spectrum for Future Aeronautical utilization • status of deletion of footnotes affecting aviation spectrum
Proposed Metrics:	• number of aviation experts participate in WRC-12 • number of States deleted their State name from the foot notes affecting aviation spectrum • number of States coordinated with TRA to support the ICAO position

Strategy
Short term (2010-2012)
Medium term (2013 - 2016)

ATM OC COMPONENTS	**TASKS**	**TIMEFRAME START-END**	**RESPONSIBILITY**	**STATUS**
AOM, AUO, ATMSDM	• implement frequency spectrum management tool	2008-2012	ICAO States	valid
	• harmonize Regional coordination for the protection of the aviation spectrum at WRC-12, and beyond	2008-2012	ICAO, CNS SG States	valid
	• promote the awareness of Participation of Civil Aviation Experts in State's delegation to ITU WRC Meetings	2007-2012	ICAO CNS SG	valid
	• Civil Aviation Spectrum experts attend WRC-12 and be part of their National delegation and inform ICAO MID Office	Feb 2012	States	valid
	• disseminate ICAO policy statements of requirements for aeronautical radio frequency spectrum for WRC-12	2009-2011	ICAO	complete
	• deletion of MID States name from footnote affecting Aviation spectrum and inform ICAO Mid Regional Office	2007- 2012	States	valid

Strategy ***Short term (2010-2012)*** ***Medium term (2013 - 2016)***				
ATM OC COMPONENTS	**TASKS**	**TIMEFRAME START-END**	**RESPONSIBILITY**	**STATUS**
	• coordination with National TRA for the support of the ICAO position and inclusion in State position to the extent possible and inform ICAO MID regional office	2007- 2012	States	valid
	• ICAO attend WRC-12 to provide necessary support to the delegation for the support of the aviation spectrum	Feb 2012	ICAO	valid
	• organize workshop for the Regional support to ICAO position	Sep 2010	ICAO	complete
	• attend Regional Workshop along with the National TRA	Sep 2010	States	complete
	• increase awareness and Ensure frequency Spectrum availability for future aviation needs	Ongoing	ICAO/States	valid
Linkage to GPIs	GPI-23: Aeronautical radio spectrum			

REGIONAL PERFORMANCE OBJECTIVE IMPROVEMENT OF COMMUNICATION INFRASTRUCTURE RELATED TO ATN IMPLEMENTATION	
Benefits	
Environment	• Air Ground ATN communication improve air space usage thus benefiting the environment
Efficiency	• improvement in operational efficiency • better coordination using more reliable networks
Safety	• improved safety by having related information on time
KPI	• status of the development of the Regional Plan • status of the development of the test procedures for the
Proposed Metrics:	• number of States participate in the development of the plan • number of States follow the implementation Plan

Strategy Short term (2010-2012) Medium term (2013-2016)				
ATM OC COMPONENTS	**TASKS**	**TIMEFRAME START-END**	**RESPONSIBILITY**	**STATUS**
AO, TS, CM, AUO	• develop Regional ATN Planning document	2008-2012	ATN/IPS WG	valid
	• review of ATN implementation issues and develop coordinated solutions	2009-2012	ATN/IPS WG and CNS SG	valid
	• develop conformance procedures and check list for AMHS	2009-2011	ATN/IPS WG and CNS SG	Completed
	• develop information Security policy and Guidance	2009-2011	ATN/IPS WG and CNS SG	valid
	• coordinate and monitor implementation to be harmonized and interoperable globally	On going	ATN/ IPS WG and CNS SG	valid
	• implement agreed G-G ATN application and report to ICAO MID Regional Office	On going	States	valid
	• monitor and report deficiencies to support the agreed MID METRICS	2011-2012	ATN/IPS WG and CNS SG	Valid
	• support other MIDANPIRG Subsidiary bodies for CNS infrastructure requirement	2008-2016	ATN/IPS WG and CNS SG	Valid

REGIONAL PERFORMANCE OBJECTIVES IMPLEMENTING ADVANCED TECHNOLOGIES TO SUPPORT DATA LINK SERVICES	
Benefits	
Efficiency	• improvement in operational efficiency • better coordination • efficient use of frequency spectrum
Safety	• improved safety
KPI	• status of infrastructure survey • status of data links implementation
Proposed Metric	• number of States reply to infrastructure survey • number of States Implemented data links

Strategy
Short term (2010-2012)
Medium term (2013-2016)

ATM OC COMPONENTS	TASKS	TIMEFRAME START-END	RESPONSIBILITY	STATUS
AO, TS, CM, AUO DCB, ATMSDM	• identify requirement and harmonize implementation plan to ensure interoperability between States and Regions	2010-2012	CNS/ATM/IC SG CNS SG	valid
	• technical audit of available supporting infrastructure	2010-2012	CNSATM/IC SG	valid
	• implement available technologies that bring immediate benefits (D-ATIS, CPDLC, ADS-C, ADS-B) and inform ICAO MID Regional Office	2011-2012	States , user	valid
	• monitor and report deficiencies to support agreed MID Metrics	On going	All MIDANPIRG Subsidiary bodies	valid
Linkage to GPIs	GPI-22: Communications Infrastructure GPI-17: Data Link Application			

REGIONAL PERFORMANCE OBJECTIVES IMPLEMENTATION OF GNSS IN THE MID REGION	
Benefits	
Environment	• supports the implementation of PBN which in turn bring benefits to environment
Efficiency	• optimal use of advanced technologies • optimization of infrastructure • operational efficiency
Safety	• reduced navigational errors • additional navigational capabilities brings more safety
KPI	• alignment of GNSS Implementation strategy with PBN • status of Implementation of GNSS
Proposed Metrics:	• number of States Implemented GNSS • number of report on trails and demo on GNSS

Strategy
Short term (2010-2012)
Medium term (2013-2016)

ATM OC COMPONENTS	**TASKS**	**TIMEFRAME START-END**	**RESPONSIBILITY**	**STATUS**
AO, TS, CM, AUO AOM,	• carry out GNSS trials, demonstrations and test beds; inform ICAO MID Regional Office	2008-2012	States, ICAO	valid
	• determine the most appropriate augmentation system for the MID Region	2009-2012	PBN/GNSS TF CNS/ATM/IC CNS SG	valid
	• define required infrastructure according to regional PBN implementation plan	2010-2012	PBN/GNSS TF CNS/ATM/IC CNS SG	valid
	• implement required infrastructure and/or procedures and inform ICAO MID Regional Office	2009-2012	States	valid
	• monitor implementation progress	2009-2012	PBN/GNSS TF	valid
	• monitor and report deficiencies to support agreed MID METRICS	On going	All MIDANPIRG Subsidiary bodies	valid
Linkage to GPIs	GPI-21: Navigation Systems GPI-9: Situational Awareness			

REGIONAL PERFORMANCE OBJECTIVES IMPROVE SURVEILLANCE INFRASTRUCTURE/ EXCHANGE OF SURVEILLANCE DATA	
Benefits	
Environment	• Sharing surveillance data will benefit the user for optimum flight routes bringing reductions in fuel consumption and CO_2 emission
Efficiency	• optimal use of advanced technologies • optimization of infrastructure • operational Efficiency • ability of aircraft to conduct flight more closely to preferred trajectories • increase in airspace capacity
Safety	• reduced separation • reduce controller work load
KPI	• status of the surveillance roadmap • status of surveillance data sharing
Proposed Metrics:	• number of States Participate in the development of MID Surveillance Road map • number of States sharing Radar

Strategy Short term (2010-2012) Medium term (2013 - 2016)				
ATM OC COMPONENTS	**TASKS**	**TIMEFRAME START-END**	**RESPONSIBILITY**	**STATUS**
AOM, AUO, ATMSDM	• prepare Plan for introduction of new surveillance systems	2011-2012	States, ICAO PBN/GNSS TF CNS/ATM/IC CNS SG	valid
	• determine the most appropriate surveillance for each States supporting the PBN regional Plan	2009-2012	States CNS/ATM/IC	valid
	• organize workshop for developing MID surveillance roadmap	2009-2011	ICAO	completed
	• MID States participate actively in the workshop to reach its objective	2011	States	completed
	• follow up on the Regional Surveillance systems in MID Regional ANP and FASID	2008-2012	CNS SG	valid
	• monitor and report deficiencies In order to support agreed MID Metrics	On going	ATN/IPS WG and CNS SG	valid

Strategy* *Short term (2010-2012)* *Medium term (2013 - 2016)				
ATM OC COMPONENTS	**TASKS**	**TIMEFRAME START-END**	**RESPONSIBILITY**	**STATUS**
	• No objection letter between states concerned for sharing Surveillance data	2010-2012	States	valid
	• identify format of RDPS Data	2010-2012	States / CNS SG and CNS/ATM/IC	Valid
	• follow up on the Regional Surveillance systems in MID Regional ANP and FASID	2008-2012	CNS SG	valid
Linkage to GPIs	GPI-9: Situational Awareness			

REPORT ON AGENDA ITEM 8: FUTURE WORK PROGRAMME

8.1 The meeting recalled that, in accordance with the ICAO business planning process, all work of the PIRGs would have to be justified and based on clearly established performance objectives in support of the ICAO Strategic Objectives. Consequently all TOR of PIRGs are being revised in order to ensure that resources were more appropriately directed and that all work, including that of the Secretariat, is in support of the business plan. Accordingly, MIDANPIRG subsidiary bodies should review their TOR taking into consideration the ICAO Business plan and the requirements for performance monitoring.

8.2 In accordance with the MIDANPIRG Procedural Handbook, the Sub Group is expected to review and update its Terms of Reference and Work Programme and to decide on the dates and venue of its next meeting.

8.3 Taking into consideration the development in the CNS field, the meeting reviewed and updated the Terms of Reference (TOR) as at **Appendix 8A** to the Report on Agenda Item 8. Accordingly, the meeting agreed to the following Draft Decision:

DRAFT DECISION 4/14: TERMS OF REFERENCE OF THE CNS SUB-GROUP

*That, the revised Terms of Reference (TOR) for the CNS SG be updated as at **Appendix 8A** to the Report on Agenda Item 8.*

8.4 The meeting was informed that MIDANPIRG/13 will be held in (15-19 April 2012); accordingly the meeting agreed that the CNS SG/5 be held in last quarter 2012. The venue will be Cairo, unless a State is willing to host the meeting

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COMMUNICATION, NAVIGATION AND SURVEILLANCE SUB-GROUP (CNS SG) OF THE MID REGION

1. Terms of Reference

1.1 The terms of reference of the CNS Sub-Group are:

a) Ensure the continuing and coherent development of the MID Regional Air Navigation Plan in the fields of aeronautical communications, navigation and surveillance (CNS), including the development of CNS elements of the MID CNS/ATM Implementation Plan in the light of new developments, in harmony with the ICAO Global Air Navigation Plan (Doc 9750) and the plans for adjacent regions;

b) Review and identify any deficiencies that impede the implementation or provision of efficient CNS services in the MID Region and recommend correction actions;

c) Make specific recommendations aimed at improving CNS services through the use of existing procedures and facilities or, through modernization programmes and evolutionary introduction of new procedures or technologies based on operational requirements;

d) Review and identify inter regional or any co-ordination issues in the fields of CNS and recommend actions to address those issues; and

e) Monitor and encourage CNS systems research and development, trial and demonstrations in the fields of CNS and facilitate the transfer of this information and expertise between MID States, including studies on institutional arrangement for the implementation of the CNS system in MID Region

1.2 In order to meet the Terms of Reference, the CNS SG shall:

a) Survey and update of CNS deficiencies in the MID Region on a regular basis and focus on surveys and information from users such as IATA and IFALPA;

b) To follow-up the developments of ICAO position regarding future ITU World Radio Communication (WRC) Conferences and their preparatory meetings, and urge States to support ICAO Position at WRC, and encourage States for the proper utilization of the spectrum;

c) Develop ATN Plan for MID region and assist in its Implementation;

d) Develop Surveillance Plan and Strategy for the MID region in Coordination with other subgroups to support MID Region Performance Objectives;

e) Review and update ATN/IPS WG TOR and task list and encourage harmonized and coordinated implementation plans;

f) Introduction of data link usage to support the ATC at flight level 290 by 2010;

g) Develop MID CNS Regional Performance Framework Forms supported by detailed action plans and assist in measurement of agreed MID Metric;

h) Provide the necessary expertise to other MIDANPIRG subgroups task forces on issues related to CNS and infrastructure and coordinate requirements with these groups; and

i) Assist and encourage States groups to foster implementation of the CNS infrastructure and procedures.

2. Composition

2.1 The Sub-Group is composed of:

a) MIDANPIRG Member States;

b) concerned International/Regional Organizations as observers; and

c) additional representatives from Industry may be invited on ad hoc basis, as observers, when required.

REPORT ON AGENDA ITEM 9: ANY OTHER BUSINESS

9.1 Nothing has been discussed under this Agenda Item.

CNS SG/4
Attachment A to the Report

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