INTERNATIONAL CIVIL AVIATION ORGANIZATION

REPORT OF THE SIXTH MEETING OF THE MIDDLE EAST AIR NAVIGATION PLANNING AND IMPLEMENTATION REGIONAL GROUP

MIDANPIRG/6

(Cairo, 10-14 September 2000)

The views expressed in this Report should be taken as those of the Regional Planning and Implementation Group and not of the Organization. This Report will, however, be submitted to the ICAO Council and any formal action taken will be published in due course as a Supplement to the Report.

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

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PART I - HISTORY OF THE MEETING

1. PLACE AND DURATION

1.1 The Sixth Meeting of the Middle East Air Navigation Planning and Implementation Regional Group (MIDANPIRG/6, was held in Cairo, at the Meridien (Heliopolis) Hotel, from 10-14 September 2000.

2. OPENING

2.1 The meeting observed one-minute silence in respect of the victims of the Egypt Air flight 990 incident of 31October 1999 and the recent Gulf Air flight 072 crash of 23 August 2000.

2.2 Mr. A. Zerhouni, ICAO Regional Director, warmly welcomed all the delegates to Cairo and wished the meeting every success in its deliberations. He delivered a brief communication on the course of action since MIDANPIRG/5 till to date.

2.3 Mr. V. Zubkov, Chief of Regional Affairs Office (ICAO HQ, Montreal) address the meeting on the general ICAO policy on Inter-Regional and Global Strategies. He stressed also the need of close follow-up of the Shortcomings and Deficiencies as a significant contributor to the aviation safety.

2.4 Mr. M. Alawi acting Chairman of MIDANPIRG welcomed and thanked for the support he received during his mandate and wishing full success to MIDANIRG/6 meeting.

3. ATTENDANCE

3.1 The meeting was attended by a total of eighty-eight participants which included delegates from fifteen States and four International Organizations. The list of participants is at page 5-21

4. OFFICERS AND SECRETARIAT

4.1 Mr. A. Zerhouni, ICAO Middle East Regional Director acted as the secretary of the Meeting, assisted by Mr. M. Khonji Deputy Regional Director, and the following ICAO Regional Officers

Mr. R. Vitali	-	Regional Officer, Communications, Navigation and Surveillance
Mr. N. Karppinen	-	Regional Officer, Air Traffic Management
Mr. M. Traore	-	Regional Officer, Communications, Navigation and Surveillance
Dr. V. Subramanian	-	Regional Officer, Aerodrome and Ground Aids
Mr. M.E.B. Zarroug	-	Air Transport Officer
Mr. O. Nyborg	-	Associate Expert, Technical Co-operation

4.2 The meeting was also assisted by Mr. V. D. Zubkov, Chief Regional Affairs Office and Mr. H. V. Sudarshan, Regional Affairs Officer from ICAO HQ, Montreal.

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 - Election of Chairman and Vice-Chairman of MIDANPIRG and adoption of the Provisional Agenda.

Agenda Item 2 - Review of action taken by the ANC and the Council on the report of MIDANPIRG/5.

Agenda Item 3 - Latest developments in the Air Navigation field.

Agenda Item 4 - Middle East Air Navigation issues:

4.1 ATM/AIS/SAR
4.2 CNS
4.3 CNS/ATM
4.4 MET
4.5 AOP
4.6 MID ANP/FASID
4.7 Other Related Matters

Agenda Item 5 - Shortcomings and deficiencies in the Air Navigation field.

Agenda Item 6 - Review of outstanding Conclusions and Decisions of MIDANPIRG and development of the future Work Programme.

Agenda Item 7 - Any other business.

7. CONCLUSION AND DECISIONS DEFINITION

7.1 The MIDANPIRG records its actions in the form of Conclusions and Decisions with the following significance:

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

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

8. LIST OF CONCLUSIONS AND DECISIONS

CONCLUSION 6/1:	UNIFORM FORMAT FOR THE REPORTING OF WGS-84 IMPLEMENTATION
CONCLUSION 6/2-	REVISED TERMS OF REFERENCE OF MIDANPIRG
DECISION 6/3-	FOLLOW-UP OF ICAO POSITION WITH REGARD TO FUTURE WRC CONFERENCES
CONCLUSION 6/4-	CIVIL AVIATION AUTHORITIES SUPPORT OF ICAO POSITION
CONCLUSION 6/5-	CIVIL AVIATION REPRESENTATIVES PARTICIPATION IN ITU WRC ACTIVITIES
CONCLUSION 6/6 -	SUPPORT FOR TRAFFIC FORECASTING ACTIVITIES
CONCLUSION 6/7 -	MANDATORY CARRIAGE AND OPERATION OF ACAS II IN THE MID REGION
CONCLUSION 6/8 -	PLANNING FOR CONGESTION REDUCTION MEASURES IN THE MID REGION
CONCLUSION 6/9 -	ESTABLISHMENT OF A MID RVSM TASK FORCE
CONCLUSION 6/10 -	TARGET DATE FOR THE INTRODUCTION OF RVSM IN THE MID REGION
CONCLUSION 6/11 -	OBJECTIVE OF THE REGIONAL ATS INCIDENT ANALYSIS SYSTEM
CONCLUSION 6/12-	AMENDMENT OF TABLE COM1A (AFTN MID) DESIGNATED CIRCUITS REQUIRED FOR INTERNATIONAL OPERATIONS UNTIL THE RECOMMENDED FACILITIES ARE OPERATING SATISFACTORY
CONCLUSION 6/13-	INITIAL PLAN FOR THE GROUND PORTION OF THE ATN IN THE MID REGION
DECISION 6/14-	TARGET DATE FOR THE APPROVAL OF GNSS AS A SUPPLEMENTAL MEANS NAVIGATION SYSTEM IN THE MID REGION
CONCLUSION 6/15-	IMPLEMENTATION OF GNSS FOR EN-ROUTE AND NON-PRECISION APPROACH
DECISION 6/16-	FURTHER WORK REQUIRED FOR GNSS IMPLEMENTATION
CONCLUSION 6/17-	PRIORITY ROUTES FOR THE INTRODUCTION OF RNP 5
CONCLUSION 6/18 -	IMPLEMENTATION OF NAVIGATION ERROR MONITORING
CONCLUSION 6/19 -	DEVELOPMENT OF AIRWORTHINESS AND OPERATIONAL APPROVAL PROCEDURES FOR RNP 5
CONCLUSION 6/20-	NOTIFICATION OF INTENTION TO INTRODUCE RNP 5 ROUTES
CONCLUSION 6/21-	ANNOTATION OF RNP REQUIREMENTS ON CHARTS

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CONCLUSION 6/22 -	TRAFFIC FORECASTING REQUIREMENTS FOR CNS/ATM PLANNING
CONCLUSION 6/23 -	SUB-REGIONAL APPROACH TO CNS/ATM IMPLEMENTATION
DECISION 6/24 -	FINANCING OF CNS/ATM IMPLEMENTATION
DECISION 6/25 -	DEVELOPMENT OF REGIONAL CNS/ATM TRAINING REQUIREMENTS
CONCLUSION 6/26 -	ADOPTION OF THE CNS/ATM PLAN FOR THE MIDDLE EAST REGION
DECISION 6/27-	NEW TITLE AND REVISED TERM OF REFERENCE FOR THE CNS/ATM SUB-GROUP
CONCLUSION 6/28 -	ENVIRONMENTAL BENEFITS OF CNS/ATM SYSTEMS
CONCLUSION 6/29 -	SADIS OPERATIONAL FOCAL POINT IN USER STATES
CONCLUSION 6/30-	AIRPORT CERTIFICATION
DECISION 6/31	MIDDLE EAST BASIC ANP AND FASID
CONCLUSION 6/32-	TRAFFIC FORECASTING ACTIVITIES
CONCLUSION 6/33-	AOP FACILITIES AND SERVICES
CONCLUSION 6/34-	MONITORING AND FOLLOW-UP OF CORRECTIVE ACTIONS TO ALLEVIATE SHORTCOMINGS AND DEFICIENCIES.
DECISION 6/35-	TABLE OF SHORTCOMINGS AND DEFICIENCIES

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MIDANPIRG/6
Report on Agenda Item 1

PART II - REPORT ON AGENDA ITEMS

REPORT ON AGENDA ITEM 1: ELECTION OF CHAIRMAN ON AND VICE-CHAIRMAN OF MIDANPIRG & ADOPTION OF THE PROVISIONAL AGENDA

Election of the Chairman

1.1 Mr. Abdullah Bin Nasser Al-Harthy, Superintendent, Air Traffic Services, Directorate General of Civil Aviation & Meteorology, Oman was proposed by the member of Jordan supported by Saudi Arabia, Iran, Egypt and other members as new Chairman of MIDANPIRG.

1.2 The meeting elected Mr. Abdullah Bin Nasser Al-Harthy as Chairman of MIDANPIRG

Election of the First-Vice Chairman

1.3 Mr. M. Al-Alawi, member from Saudi Arabia would continue to serve as the First Vice-Chairman of MIDANPIRG

Election of the Second-Vice Chairman

1.4 Mr. Gholam Abbas Aramesh, Deputy Administrator for Operations from Islamic Republic of Iran was elected as Second Vice-Chairman proposed by Lebanon and supported by Bahrain and Egypt.

Adoption of the Provisional Agenda

1.5 The meeting reviewed the Provisional Agenda, and adopted it as reproduced in Para. 6 of the History of the Meeting.

REPORT ON AGENDA ITEM 2: REVIEW OF ACTION TAKEN BY THE ANC AND THE COUNCIL ON THE REPORT OF MIDANPIRG/5.

2.1 The meeting was presented with actions taken by the Air Navigation Commission and the Council during their review and approval of the Report of the Fifth Meeting of the Middle East Air Navigation Planning and Implementation Regional Group (MIDANPIRG/5) held in Amman, Jordan, from 27 November to 03 December 1998.The meeting noted the specific actions taken by the ANC and the Council as contained in **Appendix 2A** to the report on Agenda Item 2. In this connection, the meeting expressed with appreciation the guidance provided by the ANC and the Council.

SPECIFIC ACTION TAKEN BY THE AIR NAVIGATION COMMISSION AND/OR COUNCIL ON THE CONCLUSIONS/DECISIONS OF MIDANPIRG/5 MEETING

REPORT REFERENCE		ACTION BY COUNCIL/ANC	CONCLUSION /DECISION TITLE AND PROPOSED ACTION
CONCLUSION/ DECISION NO.	Page		
5/16	3-12	C	**SADIS Cost Allocation and Recovery (SCAR) Scheme** Noted the conclusion and requested the Secretary General to take the necessary action.
5/18	3-13	ANC	**Implementation of interregional satellite test-bed (ISTB) for the MID Region** Noted the decision, emphasized the need for interregional coordination, and recommended that such experience be followed and considered by other regions to promote an awareness of the results of that experience.
5/21	3-15	ANC	**Guidance material on the implementation of RNP/RNAV in the Middle East Region** Noted the conclusion in relation to RNP/RNAV implementation plan of the region.
5/25	4-1	C	**Reporting and analysis of ATS incidents** Approved the conclusion and requested the Secretary General to take timely action.
5/32	9-1	C	**National Y2K contingency planning teams** Noted the conclusion in relation to the Y2K date change problem and urged all States which had not yet done so to accord a high priority to this important task, as well as publish appropriate aeronautical information, per Assembly Resolution A32-10, by July 1999 as to their level of compliance.

REPORT ON AGENDA ITEM 3: LATEST DEVELOPMENTS IN THE AIR NAVIGATION FIELD

Report on technical and operational developments related to CNS/ATM system

3.1 The meeting was presented with an overview of the technical and operational developments related to CNS/ATM systems that took place in 1999 and up to April 2000. The meeting among other things noted the following:

a) Development of Global Air Navigation Plan for CNS/ATM Systems.

b) Summary of work of ICAO=s Planning and Implementation Regional Groups (PIRGs).

c) CNS/ATM implementation status survey

d) Development status of Standards and Recommended Practices (SARPs) and guidance material available in **Appendix 3A** to the report on Agenda Item 3.

e) Work programme of various panels and study groups engaged in CNS/ATM related activities available in **Appendix 3B** to the report on Agenda Item 3.

3.2 During the discussion on the developments of data links, the meeting decided to refer to AFS /ATN Task Force to study the suitability of various VDL modes and their application in MID region

Review of WGS-84 Requirements and Reporting Methods

3.3 It was recalled that implementation of WGS-84 worldwide was made mandatory with applicability date of 1 January 1998. In order to monitor its implementation, regular status reports were being presented to various PIRG meetings, ALLPIRG, the ANC and the Council for their review. During such a review of the global implementation of WGS-84 held in June of this year by the Air Navigation Commission, it was noted that, although some progress had been made since the last report reviewed, the format of reporting was inadequate as it was not clear to what level the different States have implemented WGS-84. It should be noted that a large part of the initial work has already been completed by most States; however, the reporting of WGS 84 implementation was not standard and it was therefore very difficult to assess the overall status of implementation.

3.4 In view of the above, the group was informed that the ANC, to ensure a global standard in reporting the status of implementation of WGS-84, called upon the States and PIRGs to develop respective standard tables that would reflect all the detailed information on WGS-84 implementation, similar to that adopted by the CAR/SAM/3 RAN Meeting and to review them on a periodic basis. This in turn would facilitate the reporting of a detailed, up-to-date, global implementation of WGS-84 to ALLPIRG, the ANC and the Council.

3.5 The meeting reviewed the uniform format for the reporting of WGS-84 implementation presented by the Secretariat. After some discussion the meeting adopted the uniform format in **Appendix 3C** to the report on Agenda Item 3. Accordingly, the following Conclusion was developed:

CONCLUSION 6/1- UNIFORM FORMAT FOR THE REPORTING OF WGS-84 IMPLEMENTATION

That the table available at the **Appendix 3C** of the report on Agenda Item 3 be adopted as a uniform format for reporting of WGS-84 implementation.

Results of the ALLPIRG/3 meeting - Follow-up actions to be taken by the MIDANPIRG

3.6 The meeting was informed of the results of the ALLPIRG/3 Meeting that was held in Montreal from 6 to 8 April 1999 to review the progress of implementation of the CNS/ATM systems in ICAO Regions and to advise the ICAO Council on related matters as appropriate.

3.7 The meeting noted that the ICAO Council had reviewed the ALLPIRG/3 Report on 11 June 1999, taking into account the comments of the Air Navigation Commission, and approved the ALLPIRG/3 report. As a follow-up, the MIDANPIRG, as well as other planning and implementation regional groups (PIRGs) were to take certain follow-up actions on the conclusions of ALLPIRG/3.

3.8 The meeting noted those conclusions or parts thereof that did not require any specific action by MIDANPIRG. In regard to Conclusion 3/7 (Addition to Terms of Reference of PIRGs), the meeting noted that the ALLPIRG/3 considered the question of attracting financial institutions to support the implementation of CNS/ATM systems. It was recognized that cost/benefit analysis and the preparation of business cases taking into account the environmental benefits of the new systems would be required for this purpose and that the PIRGs are better placed to undertake these tasks.

3.9 The ALLPIRG/3 meeting concluded that, while safety and technical issues will continue to of economic and environmental assessments should be given due attention, particularly in the evaluation of different implementation options. The guidelines for regional air navigation plans already encompass financial aspects, notably as regards multinational facilities and services, and hence the PIRGs already have implicit authority to consider financial matters. However, the TOR of the PIRGs do not explicitly mention the economic considerations. The ALLPIRG/3 meeting, therefore, felt that there would be value in including appropriate text in the TOR and formulated Conclusion 3/7.

3.10 The meeting reviewed the Draft Revised TOR of MIDANPIRG presented by the Secretariat. After some discussion the meeting adopted the Revised TOR in **Appendix 3D** to the report on Agenda Item 3. Accordingly, the following Conclusion was formulated:

CONCLUSION 6/2- REVISED TERMS OF REFERENCE OF MIDANPIRG

That, the Revised Terms of Reference of MIDANPIRG in **Appendix 3D** which includes financial considerations in planning and implementation of air navigation facilities, with due regard to the primacy of safety, be adopted.

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ITU World Radio-Communication Conferences

Preparation and results of the ITU WRC 2000

3.11 The meeting noted CNS/ATM SG/4 meeting Conclusion 4/7:Support for the ICAO position at the ITU WRC2000 and noticed with satisfaction that the aviation participation was substantial at the Istanbul meeting, about 120 aviation experts participated in the various delegations of ITU Member States and Observers. This is a significant improvement in comparison with the previous conferences.

3.12
since the bands occupied by aviation are highly attractive to commercial users, the civil aviation community should remain vigilant in defending frequency bands allocated for aeronautical use.

Preparation for the WRC 2003

3.13 Significant ICAO preparatory activities have already started with the AMCP WG-F meeting in Berlin in August 2000. The Working Group-F conducted a detailed analysis of the outcome of the WRC 2000 and proposed a preliminary ICAO draft position to WRC 2003. The draftdocument is attached as **Appendix 3E** to the report on Agenda Item 3.

3.14 The meeting noted that the AMCP proposed furthermore a strategy for establishment and -communications Conferences.

3.15 The preliminary draft ICAO position will, after initial review by the ANC in November 2000, be sent to States for comments. These comments will be reviewed by the ANC in May 2001 and a consolidated ICAO position will be forwarded by the ANC to the Council for approval in June 2001. After approval by the Council, the ICAO position will be submitted to States for use in their national co-ordination process in which the national telecommunication agencies are involved

3.16 The meeting was informed on the involvement of Regional Offices in the development of ICAO position in view to incorporating specific regional requirements and also to support ICAO position in the regional telecommunications organisations; the next regional telecommunications meeting is planned in Alexandria, 17-19 October 2000.

3.17 A working paper was presented by Kuwait with a view to raising MIDANPIRG awareness on this important subject.

3.18 The meeting noted that the new trends (increased role of private sector and sharing with non aeronautical services) in spectrum management may affect the availability of adequate and protected spectrum for aviation community

3.19 Taking into account the need of securing adequate radio frequency spectrum allocations to guarantee the safety of air navigation, the meeting reached the following Decision as proposed by Kuwait:

DECISION 6/3- FOLLOW-UP OF ICAO POSITION WITH REGARD TO FUTURE WRC CONFERENCES

That, the COM/MET SG be tasked with following up the development in ICAO position with regard to the future WRC conferences and its preparatory meetings, and highlighting that position to the MID States.

3.20 In the light of the above paragraphs, the meeting adopted the following Conclusions as proposed by Kuwait:

CONCLUSION 6/4- CIVIL AVIATION AUTHORITIES SUPPORT OF ICAO POSITION

That, all MID States Civil Aviation Authorities use the ICAO coordinated aeronautical position regarding the future WRC conferences in their national discussions with the radio regulatory authorities when developing proposals for submission by their Administrations to the ITU conferences.

CONCLUSION 6/5- CIVIL AVIATION REPRESENTATIVES PARTICIPATION IN ITU WRC ACTIVITIES

That, all MID States Civil Aviation Authorities, request their appropriate ministries to assign aviation experts to participate in their national delegation to the future ITU conferences in order to brief the delegations at these ITU conferences with ICAO position and to support that position.

DEVELOPMENT STATUS OF SARPS AND GUIDANCE MATERIAL RELATED TO CNS/ATM SYSTEMS

MAIN FIELD		ELEMENTS	SARPS/PANS		GUIDANCE MATERIAL	
			TARGET COMPLETION DATE[1]	STATUS	TARGET COMPLETION DATE[2]	STATUS
A T M	A T M	Global air traffic management requirements	2005	Annexes 2 and 11 SARPs and PANS-RAC procedures under development.	2000	Operational concept of global ATM being defined as part of updated global plan.
		Interoperability and functional integration of flight operations, ATS, ATFM and tactical ASM	2005	Annexes 2 and 11 SARPs and PANS-RAC procedures under development.		
		Required total system performance (RTSP)	2005	Draft policy statement under development.		
		ATM requirements for communications, navigation and surveillance	2002	Annexes 2, 6 and 11 SARPs and PANS-RAC procedures under development.		
	A S M	Airspace infrastructure planning	**C**	**C**	Completed	*Manual on Airspace Planning Methodology for the Determination of Separation Minima* (Doc 9689) published.
		RNP and RNAV for en-route operations	Completed	Annex 11 SARPs and PANS-RAC procedures adopted by Council in 1998.	Completed	Update of the *Manual on Required Navigation Performance (RNP)* (Doc 9613) completed. Second edition published.

1) final action by the Air Navigation Commission
2) approved by the Secretary General

MAIN FIELD		ELEMENTS	SARPS/PANS		GUIDANCE MATERIAL	
			TARGET COMPLETION DATE[1]	STATUS	TARGET COMPLETION DATE[2]	STATUS
ATM	ATS	Separation between aircraft	2000	PANS-RAC procedures approved by Council in 1998; further amendment to Annexes 2, 6, 11 and PANS-RAC under development.	2000	Amendment to *Air Traffic Services Planning Manual* (Doc 9426) to be developed. Amendment to the *Manual on Implementation of a 300 m (1 000 ft) Vertical Separation Minimum between FL 290 and FL 410* (Doc 9574) completed. Additional guidance is under development for the Manual on APM (Doc 9689).
		ATS (uplink of MET data)	2001	Annex 3 SARPs and PANS-RAC procedures concerning D-ATIS and D-VOLMET being developed with the assistance of the METLINKSG.	**C**	**C**
		ATS (uplink of SIGMET information in graphical format)	2004	Initial Annex 3 SARPs specifying the code to be used for graphical SIGMETs being developed with the assistance of the METLINKSG.	—	—
		WAFS planning and implementation (final phase)	2004	Annex 3 SARPs for global WAFS SIGWX forecasts in binary format (BUFR code) for direct transmission to airline and ATM computers being developed with the assistance of WAFSSG.		
		ATS applications for air-ground data links	2003	Annex 11 SARPs and PANS-RAC procedures were developed.	Completed	The *Manual of Air Traffic Services Data Link Applications* (Doc 9694) published and dispatched in second quarter 1999. Additional guidance is under development.

1) final action by the Air Navigation Commission
2) approved by the Secretary General

MAIN FIELD	ELEMENTS	SARPS/PANS		GUIDANCE MATERIAL	
		TARGET COMPLETION DATE[1]	STATUS	TARGET COMPLETION DATE[2]	STATUS
	Data interchange between automated ATS systems	2002	Annex 11 SARPs and PANS-RAC procedures under development.		
	ILS/MLS/GNSS [3)] operations	2001	PANS procedures under review.		
ATFM	ATFM systems and procedures	2005	Annexes 2 and 11 SARPs and PANS-RAC procedures to be developed.	2000	ATFM part of the ATM operational concept under development.
CNS/ATM	Human Factors	2000	HF-related SARPs were developed and incorporated in Annexes 10 and 11. Further, HF-related requirements are being developed for PANS-OPS.	2000	A chapter on Human Factors issues was developed and included in the *Manual of Air Traffic Services Data Link Applications* (Doc 9694). A manual containing HF guidelines on ATM systems has been developed.
	Human Resource Planning and Training			2000	The human resource planning guidance material is under development. A potential approach and format for regional training planning was developed. Regional training guidance was incorporated into the CAR/SAM Basic ANP, General Planning aspects.
2000[1)]	VHF digital link (Modes 3 and 4)	2000	Mode 4 validation commenced in 1997. Mode 3 validation started in 1998.		Being developed by AMCP.

1) final action by the Air Navigation Commission
2) approved by the Secretary General

3) OCP is developing PAN-OPS criteria for SBAS/GBAS
Data interchange between automated ATS systems

MAIN FIELD	ELEMENTS	SARPS/PANS		GUIDANCE MATERIAL	
		TARGET COMPLETION DATE[1]	STATUS	TARGET COMPLETION DATE[2]	STATUS
COM (cont'd)	AMSS	1999	Amendment to SARPs recommended by AMCP/6.	Completed	Amendment recommended by AMCP/6.
NAV	RNP/RNAV (en-route)	Completed	Adopted/approved by Council in 1994 (Annexes 2, 4, 6, 11, 15 and PANS-RAC).	Completed	Guidance material for RNP1 operations under development.
		C	**C**	Completed	The *Manual on Airspace Planning Methodology for the Determination of Separation Minima* (Doc 9689) published in 1998.
	RNP (terminal area, approach, landing, departure)	Completed	Recommended by AWOP/16 and adopted by the Council in 1999.	Completed	Developed by AWOP, in parallel with SARPs.
	WGS-84	Completed	Adopted by Council in 1994, 1995, 1997 and 1998.	Completed	*WGS-84 Manual*, (Doc 9674) and Amendment 1 issued.
			Annexes 4, 11, 14 (both volumes) and 15 updated, provisions applicable from 1 January 1998.		
	Aeronautical data bases	2000	SARPs for the standard conceptual information model required for the provision of electronic aeronautical information, electronic charts display in the cockpit, provision of electronic terrain data and exchange of electronic aeronautical data initiated at the AIS/MAP/98 Divisional Meeting, are being developed by the Secretariat with the assistance of AISMAPSG and ADMSG.	2003	To be developed by the Secretariat with the assistance of AISMAPSG and ADMSG.

1) final action by the Air Navigation Commission
2) approved by the Secretary General

MAIN FIELD	ELEMENTS	SARPS/PANS		GUIDANCE MATERIAL	
		TARGET COMPLETION DATE[1]	STATUS	TARGET COMPLETION DATE[2]	STATUS
NAV (cont'd)	GNSS performance criteria to support operational requirements	2001	Draft material was developed at the GNSSP/3 (12 to 23 April 1999).	2001	Developed by GNSSP in parallel with SARPs.
	SARPs for the mid-term use of existing satellite navigation systems with augmentation sub-systems	2001	Draft SARPs were recommended by GNSSP/3.	2001	Developed by GNSSP in parallel with SARPs.
	SARPs in support of longer-term satellite navigation systems	2000	Guidance on the long-term GNSS was developed by GNSSP/3 (21 to 23 April 1999).	C	C
SUR	Surveillance system specifications for ADS-B	2001	Surveillance enhancements (ANC Task No. CNS-9601) being developed by SICASP.	2000	
	SSR procedures	1999	Update of Annex 11 and PANS-RAC.	Completed	
	ADS procedures	2001	Annex 11 SARPs and PANS-RAC procedures being developed by the ADSP.	Completed	*Manual of ATS Data Link Applications* (Doc 9694) published and dispatched in second quarter 1999.
	ADS-B and equivalent	On-going	Being developed by ADSP and SICASP.	On-going	Amendment to the *Manual of ATS Data Link Applications* (Doc 9694) to be developed.

1) final action by the Air Navigation Commission
2) approved by the Secretary General

MAIN FIELD	ELEMENTS	SARPS/PANS		GUIDANCE MATERIAL	
		TARGET COMPLETION DATE[1]	STATUS	TARGET COMPLETION DATE[2]	STATUS
	ADS: inclusion of turbulence reporting	2001	Annex 3 SARPs and PANS-RAC turbulence reporting procedures based on the eddy dissipation rate being developed with the assistance of METLINKSG.		

LEGEND

ATM	C	Air traffic management	COM	C	Communications
ADS	C	Automatic dependent surveillance	GNSS	C	Global navigation satellite system
ADS-B	C	ADS broadcast	NAV	C	Navigation
AIS	C	Aeronautical information services	RNAV	C	Area navigation
ASM	C	Airspace management	RNP	C	Required navigation performance
ATFM	C	Air traffic flow management	SSR	C	Secondary surveillance radar
ATN	C	Aeronautical telecommunication network	SUR	C	Surveillance
ATS	C	Air traffic services	WAFS	C	World area forecast system
CNS	C	Communications, navigation, and surveillance	WGS	C	World geodetic system

1) final action by the Air Navigation Commission
2) approved by the Secretary General

PANELS AND STUDY GROUPS INVOLVED IN CNS/ATM-RELATED ACTIVITIES

PANEL/STUDY GROUP	WORK PROGRAMME			
	TASKS	TITLE	TARGET COMPLETION DATE	STATUS (PROGRESS IN 1998-1999)
ADSP	ATM-9506	Automatic dependent surveillance (ADS) systems and procedures	Completed 2000 and beyond	Guidance material was completed on issues related to CNS/ATM transition and the potential for accommodating existing systems and was presented to the ANC and dispatched to States. Work continued on draft SARPs, procedures and guidance material relating to the use of ADS, CPDLC and other data link applications.
	ATM-9202	Global air traffic management	2000 and beyond	The development of the concept of required communication performance was progressed and ground work was prepared for an operational concept and operational requirements for the use of a system to increase aircraft situational awareness and airborne separation assurance.
	ATM-9102	ATS applications for air-ground data links	2001	The issue of CNS/ATM transition and the potential for accommodating existing systems was also progressed.
	ATM-9103	Data interchange between automated ATS systems	2001	
	ATM-9201	Update of provisions concerning the use of radar	1999	
AMCP	CNS-7002	Aeronautical electromagnetic spectrum	Ongoing	AMCP began work on spectrum protection tasks inherited from the disbanded FMSG.
	CNS-8702	Aeronautical mobile satellite air-ground data link (AMSS subnetwork)	2000	Work on upgrades to the AMSS SARPs was approaching completion. Work on the development of acceptability criteria and SARPs for next-generation satellite systems began.
	CNS-9102	VHF air-ground digital link (VDL subnetwork)	2000	Validation of the draft SARPs for VDL Modes 3 and 4 continued.
	CNS-9603	Air-ground data link to support navigation and surveillance applications	2000	
	CNS-9602	High frequency data link (HFDL)	1999	Work on the HFDL SARPs was completed.

PANEL/STUDY GROUP	WORK PROGRAMME			
	TASKS	TITLE	TARGET COMPLETION DATE	STATUS (PROGRESS IN 1998-1999)
ATMCP	ATM-9501	**Required total system performance**	**2001**	**Second meeting of ATMCP Working Group was held in September 1999. Progress is being made on operational concept document.**
	ATM-9202	Global air traffic management	**2001 and beyond**	
	ATM-9510	Interoperability and functional integration of flight operations, ATS, ATFM and tactical ASM	2001	
	ATM-9505	Airspace infrastructure planning	2001	
ATNP	CNS-7001	AFS systems planning studies	Completed	First package of ATN SARPs already in place; second package will be finalized by ATNP/3 during 7 to 18 February 2000.
	CNS-8101	AFTN procedures and message format	2000	
	CNS-9403	Aeronautical telecommunication network (ATN)	2000	
	CNS-9901	AFS procedures	2000	
AWOP	CNS-6901	Microwave landing system (MLS)	1998 (completed)	The ANC agreed (148-14) to suspend the activities of AWOP.
	CNS-9501	Performance requirements for non-visual to approach departure operations	1998 (completed)	

PANEL/STUDY GROUP	WORK PROGRAMME			
	TASKS	TITLE	TARGET COMPLETION DATE	STATUS (PROGRESS IN 1998-1999)
GNSSP	CNS-9401	Global navigation satellite system (GNSS)	2000	First set of SARPs recommended at GNSSP/3 Meeting, 12 to 23 April 1999.
	CNS-7002	Aeronautical electromagnetic spectrum	Ongoing task	
OCP				PANS-OPS arrival and departure criteria for RNAV and basic GNSS has been developed.
	OPS-8502	Flight procedures and obstacle clearance criteria based on GNSS & RNP systems	2001	
RGCSP	ATM-8505	Required navigation performance and area navigation for en-route operations	2000	Route spacings based on RNAV and RNP 1, a global target level of safety and the effects of GNSS on aircraft separation continued to be studied. Guidance material was developed for inclusion in the *Manual on Airspace Methodology for the Determination of Separation Minima* (Doc 9689).
	ATM-6301	Separation between aircraft	2000 and beyond	Developments of proposals were advanced for the amendment of SARPs and PANS concerning reduced separation minima including: lateral distance-based intersecting track separation; 30 NM lateral and longitudinal separation to be presented to RGCSP/10. The reduction of longitudinal separation to below 10 minutes is under development. Amendments to SARPS and PANS for separation is under development and will be presented to RGCSP/10. The implementation of RVSM is continuing to be under review and the revision to the *Manual on Implementation of a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive* (Doc 9574) is completed.
SICASP	CNS-7901	Collision avoidance systems	2001	Work is concentrating on surveillance enhancements and ADS-B while monitoring ACAS and Mode S implementation in the States. SARPs for ADS-B on Mode S link are envisaged for SICASP/7 (11 to 22 September 1999 tentative). Activities on ASAS are being progressed with the preparation of a manual on ASAS to be presented at SICASP/7.
	CNS-9601	Surveillance enhancements (ADS-broadcast)	2001	
	CNS-9701	Airborne separation assurance system (ASAS)	2001	
ADMSG	AIS-9401	Aeronautical data bases	2002	Evaluation and validation of the SICIM and FAA/EUROCONTROL AICM/AIXM were initiated at the first meeting in November 1999; further work in 2000 - 01.

PANEL/STUDY GROUP	WORK PROGRAMME			
	TASKS	TITLE	TARGET COMPLETION DATE	STATUS (PROGRESS IN 1998-1999)
AISMAPSG	AIS-9401	Aeronautical data bases	2000	Amendment 29 to Annex 15 introduced aeronautical data base requirements including the quality system, data integrity and protection and publication resolutions. At the 3rd meeting (December 1999) work continued on tasks AIS-9801 and AIS-9802. The group will continue work in 2000.
	AIS-9801	Electronic aeronautical charts for cockpit display	2003	
	AIS-9802	Electronic terrain data	2003	
	AIS-9806	Electronic exchange of aeronautical information	2002	
AVSSSG	CNS-7001	AFS systems planning studies	2000	The second meeting of AVSSSG was held in Montreal in October 1999. SARPs and guidance material on ATS voice networks are being developed.
HFSG	PEL-9001	Flight safety and human factors	2000	Review of SARPs on CNS/ATM, to ensure that Human Factors are properly taken into consideration. SARPs submitted to the Council during the periodic cycles of revision of the relevant Annexes. Further, HF-related requirements are to be included in PANS-RAC under development.
HRPTSG	PEL-9601	Regional human resource planning and training needs	2000	The first draft of the Human Resource Development Manual is under development. An initial version of a computer programme designed to indicate how CNS/ATM technologies affect job profiles and the consequential human resource planning and training requirements was developed.
METLINKSG	MET-9101	Amendment to Annex 3 concerning automated air-reporting	2001	Amendment 72 to Annex 3 being developed including the details of the turbulence index to be reported.
	MET-9301	Future requirements for the uplink of OPMET information to aircraft in flight	2001	Amendment 72 to Annex 3 being developed including the meteorological specifications (templates) for D-ATIS and D-VOLMET.
	MET-9602	SIGMET information in graphical format	2004	Amendment 72 being developed including the specification of the numerical code to be used for the dissemination and uplink of graphical SIGMETs.
TRNSG	CNS-9402	Testing of radio navigation aids	2000	First and second meetings of the study group produced a revised version of Doc 8071, Volume I, *Manual on testing of ground-based radio navigation systems* (replacing former Volumes I and II).
	CNS-9401	Global navigation satellite system (GNSS)	2000	

PANEL/STUDY GROUP	WORK PROGRAMME			
	TASKS	TITLE	TARGET COMPLETION DATE	STATUS (PROGRESS IN 1998-1999)
WAFSSG	MET-8802	WAFS planning and implementation	2001	Amendment 72 to Annex 3 being developed to include global WAFS SIGWX forecasts in binary format (BUFR) code for direct transmission to airline and ATM computers.

LEGEND

ANC Panels

ADSP	**C**	Automatic Dependent Surveillance Panel
AMCP	**C**	Aeronautical Mobile Communications Panel
ATMCP	**C**	Air Traffic Management Operational Concept Panel
ATNP	**C**	Aeronautical Telecommunication Network Panel
AWOP	**C**	All Weather Operations Panel
GNSSP	**C**	Global Navigation Satellite System Panel
OCP	**C**	Obstacle Clearance Panel
RGCSP	**C**	Review of the General Concept of Separation Panel
SICASP	**C**	Secondary Surveillance Radar Improvements and Collision Avoidance Systems Panel

Study Groups

ADMSG	**C**	Aeronautical Data Modelling Study Group
AISMAPSG	**C**	Aeronautical Information and Charts Study Group
AVSSSG	**C**	ATS Voice Switching/Signalling Systems Study Group
HFSG	**C**	Flight Safety and Human Factors Study Group
HRPTSG	**C**	Human Resource Planning and Training Study Group
METLINKSG	**C**	Meteorological Information Data Link Study Group
TRNSG	**C**	Testing of Radio Navaids Study Group
WAFSSG	**C**	World Area Forecast System Study Group

MIDANPIRG/6
Appendix 3C to the Report on Agenda Item 3

STATUS OF WGS-84 IMPLEMENTATION

EXPLANATION OF THE TABLE

Column

1 Name of the State, territory or aerodrome for which WGS-84 coordinates are required with the designation of the aerodrome use:

RS	international scheduled air transport, regular use
RNS	international non-scheduled air transport, regular use
RG	international general aviation, regular use
AS	international scheduled air transport, alternate use

2 Runway designation numbers

3 Type of each of the runways to be provided. The types of runways, as defined in Annex 14, Volume 1, Chapter I, are:

NINST	non-instrument runway;
NPA	non-precision approach runway
PA1	precision approach runway, Category I;
PA2	precision approach runway, Category II;
PA3	precision approach runway, Category III.

4 Requirement for the WGS-84 coordinates for FIR, indicated by the expected date of
nted.

5 Requirement for the WGS-84 coordinates for Enroute points, indicated by the expected date

6 Requirement for the WGS-84 coordinates for the Terminal Area, indicated by the expected date of impl

7 Requirement for the WGS-84 coordinates for the Approach points, indicated by the expected

8 Requirement for the WGS-84 coordinates for runways, indicated by the expected date of

9 Requirement for the WGS-84 coordinates for Aerodrome/Heliport points (e.g. aerodrome/heliport reference point, taxiway, parking position, etc.), indicated by the expected d

10
if already implemented.

11 Requirement for the WGS-84 Quality System, indicated by the expected date of

12 Requirement for publication of WGS-84 coordinates in the AIP indicated by the expected date

13 Remarks

STATE, TERRITORY OR AERODROME FOR WHICH WGS-84 IS REQUIRED			WGS-84 IMPLEMENTATION									REMARKS
CITY/AERODROME/	RWY No	RWY TYPE	FIR	ENR	TMA CTA CTZ	APP	RWY	AD/ HEL	GUND	QUALITY SYSTEM	AIP	
1	2	3	4	5	6	7	8	9	10	11	12	13

MIDANPIRG/6
Appendix 3D to the Report on Agenda Item 3

REVISED TERMS OF REFERENCE OF THE MIDANPIRG

1 **The objectives of the Group are to:**

a) ensure the continuous and coherent development of the MID Regional Plan as a whole taking into consideration the effect of such development on the Regional Plans of adjacent regions; and

b) identify specific problems in the air navigation field and propose, in appropriate for, action aimed at solving these problems.

c) establish the costs and benefits of various implementation options and the need to facilitate financing of preferred options in planning and implementation of air navigation facilities, with due regard to the primacy of safety.

2 **In order to meet these objectives the Group shall:**

a) keep under review, and propose when necessary, the target dates for implementation of facilities, services and procedures to ensure the co-ordinated development of the Air Navigation System in the MID Region;

b) assist the ICAO Regional Offices providing services in the MID Region, in their assigned task of fostering implementation of the MID Regional Air Navigation Plan;

c) review any shortcomings in the MID Regional Air Navigation System and develop recommendations for remedial action;

d) originate and co-ordinate, as necessary, amendments to the MID Regional Air Navigation Plan;

e) monitor new developments in the air navigation field and develop proposals to meet the requirements resulting from these developments in a timely and evolutionary manner;

f) keep under review the Statement of Basic Operational Requirements and Planning Criteria and recommend to the Air Navigation Commission such changes to them as may be required in the light of developments mentioned in e)

g) Use an appropriate mechanism to prepare cost/benefit analyses and business cases, and provide related guidance material in support of

invite financial institutions, as required on a consultative basis and at a time it considers appropriate in the planning process, to participate in this work.

MIDANPIRG/6

Appendix 3E to the Report on Agenda Item 3

AMCP WORKING GROUP F

DRAFT ICAO POSITION FOR THE ITU WRC-2003

(Berlin, Germany, August 2000)

SUMMARY

This document reviews the agenda for the ITU WRC-2003, discusses points of aeronautical interest and provides the ICAO Position for each agenda item.

The ICAO position aims at securing availability of radio frequency spectrum to meet civil aviation requirements for current and future safety-of-flight applications. In particular, it stresses that safety considerations dictate that exclusive frequency bands must be allocated to highly critical aeronautical systems and that adequate protection against harmful interference must be ensured.

Support of the ICAO position by Contracting States is required to ensure that the position is supported by the WRC-2003 and that aviation requirements are met**.**

CONTENTS

1 Introduction

2 Spectrum requirements for international civil aviation

3 Civil Aeronautical aspects on the agenda for WRC-2003

Annexes:

A	**Explanatory notes on important issues for use in aeronautical discussions.**	(To be developed)
B	**Agenda for ITU WRC 2003**	(To be added)
C	**Agenda for ITU WRC-2006**	(To be added)
D	**Assembly Resolution A32-13**	(To be added)

1 INTRODUCTION

1.1. This document contains proposals by the Air Navigation Commission for the internationally agreed ICAO Position on issues of interest to international civil aviation to be decided at the ITU World Radiocommunication Conference WRC-2003.

1.2. General information and ICAO policy on radio frequency spectrum requirements for civil aviation is contained in the Handbook on Radio Frequency Spectrum Requirements for Civil Aviation including Statement of Approved ICAO Policies (Doc 9718, 2nd edition).

2 SPECTRUM REQUIREMENTS FOR INTERNATIONAL CIVIL AVIATION

2.1 The safety of air operations is vitally dependent on the availability of communications and navigation services that are reliable and free from harmful interference. Future strategies, based on an increased use of space-based systems, have been agreed as international civil aviation policy through the principles established in the ICAO communications, navigation, and surveillance/air traffic management (CNS/ATM) systems (*Statement of ICAO policy on CNS/ATM systems implementation and operation*, approved by Council (141/13) on 9 March 1994, refers). The associated high integrity and availability requirements demand special conditions to avoid harmful interference to these systems. Article S4.10 requires that ITU Member States recognize that the safety aspects of radionavigation and other safety services require special measures to ensure their freedom from harmful interference; it is necessary therefore to take this factor into account in the assignment and use of frequencies.

2.2. The radio frequency spectrum needs for civil aviation arising from the growth in air transport are stable, and the current allocations appear capable of meeting currently known requirements for the future. The sharing of aeronautical radio services with non-aeronautical services must be considered with extreme care. Sharing conditions need to be thoroughly proven before they can be applied. Where sharing is difficult, exclusive allocations, with a view to preserve the integrity of aeronautical services, need to be secured. Introduction of new -mainly data link oriented- technology may result in a need for additional spectrum for aviation. This is a matter to be addressed at post 2003 conferences

3 AERONAUTICAL ASPECTS ON THE AGENDA FOR WRC-2003

Notes: 1. All of the items appearing on the agenda for WRC-2003 are mentioned below. Only items which contain matters of concern to international civil aviation are addressed with a statement of the ICAO Position.

2 Items marked with an asterisk indicate that background information is provided at the Annex

WRC-2003 Agenda Item 1.1 *: Requests from administrations to delete their country footnotes or to have their country name deleted from footnotes, if no longer required, in accordance with Resolution 26 (Rev.WRC-97);

Allocations to the aeronautical mobile service and the aeronautical radionavigation service are generally made for all world regions and normally on an exclusive, or an agreed sharing, basis. These principles reflect the global process of standardization within ICAO for the promotion of safety and to support the global interoperability of radiocommunication and radionavigation equipment used in civil aircraft. In some instances, country footnotes allocate spectrum in a country to other radio services as an addition to the aeronautical service in the table of allocations. Such allocations can be made on a primary or secondary basis. Their use is generally not recommended on safety grounds, and precludes full and unconstrained use of the band by the aeronautical service itself. Furthermore, this practice leads to an inefficient use of available frequencies by both services, particularly when the associated radio systems have differing technical characteristics, and when no international recommendations on sharing have been agreed.

For safety and efficiency reasons, the following footnotes should therefore be deleted:

a. Frequency bands used for ILS (Localizer, Glide Path and Marker beacon)

In these bands footnotes **S5.181, S5.197, S5.259** allow for the introduction of the mobile service when these bands are no longer required for the aeronautical radionavigation service.

In 1995, the ICAO Special Communications/Operations Divisional Meeting agreed to the continuation of the use of ILS for the foreseeable future and, as a result, access to these bands by the mobile service is not feasible since no acceptable sharing criteria that secure the protection of ILS can be established.

In addition, recently, the need to use the band 108 - 117.975 for global navigation satellite system (GNSS) ground-based augmentation systems (GBAS) has emerged and relevant frequency planning criteria are under development by the GNSS Panel. (See also WRC-2003 Agenda Item Resolves 1.28).

These footnotes should now be deleted since they do not represent a realistic expectation and may create an undesirable precedent for introducing a new service in spectrum used for aeronautical safety critical operations (including final approach and landing).

ICAO Position on WRC-2003 Agenda Item 1.1

To support deletion of footnotes S5.181, S5.197, S5.259, as access to these bands by the mobile service is not feasible and could create the potential for interference to important radionavigation systems used by aircraft at final approach and landing.

74.8-75.2	AERONAUTICAL RADIONAVIGATION S5.180 ~~S5.181~~

S5.180 The frequency 75 MHz is assigned to marker beacons. Administrations shall refrain from assigning frequencies close to the limits of the guardband to stations of other services which, because of their power or geographical position, might cause harmful interference or otherwise place a constraint on marker beacons.

Every effort should be made to improve further the characteristics of airborne receivers and to limit the power of transmitting stations close to the limits 74.8 MHz and 75.2 MHz.

~~**S5.181** *Additional allocation:* in Egypt, Israel, Japan, and Syria, the band 74.8-75.2 MHz is also allocated to the mobile service on a secondary basis, subject to agreement obtained under No. **S9.21**. In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of the procedure invoked under No. **S9.21**.~~

108-117.975	AERONAUTICAL RADIONAVIGATION ~~S5.197~~

~~**S5.197** *Additional allocation:* in Japan, Pakistan and Syria, the band 108-111.975 MHz is also allocated to the mobile service on a secondary basis, subject to agreement obtained under No. **S9.21**. In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of the procedures invoked under No. **S9.21**.~~

328.6-335.4	AERONAUTICAL RADIONAVIGATION S5.258 ~~S5.259~~

S5.258 The use of the band 328.6-335.4 MHz by the aeronautical radionavigation service is limited to Instrument Landing Systems (glide path).

~~**S5.259** *Additional allocation:* in Egypt, Israel, Japan, and Syria, the band 328.6-335.4 MHz is also allocated to the mobile service on a secondary basis, subject to agreement obtained under No. **S9.21**. In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of the procedure invoked under No. **S9.21**.~~

b. Frequency band 117.975 - 137 MHz, used for air-ground communications (voice and data)

In this band footnotes **S5.203 and S5.203A** allocate the meteorological satellite service (until 1 January 2002) and the fixed and mobile, except aeronautical mobile service until 1 January 2005, all on a secondary basis.

The band 136-137 MHz was allocated to the Aeronautical Mobile (R) Service on a primary basis by the WARC-79. The introduction of the Aeronautical Mobile (R) Service could take place as from 1 January 1990 in order to enable other users to vacate this band. However, some services are continued to operate well beyond 1990.

Since 1990 in Europe and since 1995 in North America, this band has been put into use by the Aeronautical Mobile (R) Service. The meteorological satellite service is susceptible to interference from the AMS(R)S service. Continuing use of the band by the meteorological satellite service as appearing in footnote S5.203 prohibits the unrestrained use of the band by the Aeronautical Mobile (R) Service. In a situation of frequency congestion and saturation arising from increasing air traffic needs frequencies in this band are necessary to allow the expansions expected in the oncoming future. Introduction of air-ground data link is concentrated in this sub-band. The band is already heavily used in Europe, thus restricting seriously the operations of the meteorological satellite service in that area. Increased use of this band in North America and other parts of the

world further restraints the operations in the meteorological satellite service. Aircraft have been equipped with the new tuning range for considerable time, but are constrained in their operations by a lack of access in some areas. Deletion of this footnote has become an operational necessity to ensure availability oof spectrum for safety communications and to provide for an expanding service requirement.

Similarly are the difficulties with footnote S5.203A and the expiry date of this provision should not be extended beyond 2005. At the WRC 2006 this footnote should also be deleted.

ICAO Position on WRC-2003 Agenda Item 1.1

To support deletion of S5.203 at WRC-2003 and no change to S5.203A to enable full use of the band 136-137 MHz for AM(R)S communications.

117.975-137	AERONAUTICAL MOBILE (R) S5.111 S5.198 S5.199 S5.200 S5.201 S5.202 ~~S5.203~~ NOC S5.203A S5.203B

~~**S5.203** In the band 136-137 MHz, existing operational meteorological satellites may continue to operate, under the conditions defined in No. **S4.4** with respect to the aeronautical mobile service, until 1 January 2002. Administrations shall not authorize new frequency assignments in this band to stations in the meteorological-satellite service. (WRC-97)~~

NOC

S5.203A *Additional allocation:* in Israel, Mauritania, Qatar and Zimbabwe, the band 136-137 MHz is also allocated to the fixed and mobile, except aeronautical mobile (R), services on a secondary basis until 1 January 2005. (WRC-97)

c. Frequency band 1559 - 1610 MHz used for elements of the ICAO Global Navigation Satellite System (GLONASS, GPS and augmentation systems)

In this band footnotes **S5.355A** and **S5.359A** allow the operation of the fixed service on a primary basis until 1 January 2005 (1 January 2010 in some countries) and on a secondary basis until 1 January 2015. This band is allocated, on a worldwide primary basis, to the Aeronautical Radionavigation Service and to the Radionavigation Satellite Service, and accommodates various significant elements of RNSS. The band already supports operation of two prime components of the ICAO Global Navigation Satellite System (GNSS), i.e. GLONASS and GPS, in the process of being developed as ICAO Standards Other new systems such as the European Galileo RNSS system are under consideration.

Studies undertaken in preparation for WRC-2000 indicate that a geographical separation distance exceeding line of sight (in the order of 400 Km) between aircraft using GNSS and stations of the fixed service is required to ensure safe operation of GNSS. This is a very severe restriction, which can prohibit the safe use of GNSS over wide areas around any fixed service installation. To compensate for these restrictions, retention of current terrestrial radionavigation systems by aviation may be needed, leading to further inefficient use of available spectrum. More importantly, harmful interference situations can arise leading to disruption to GNSS, affecting the safety of aircraft in flight.

The WRC-2000 agreement to terminate primary use in 2005 (2010) and all use in 2015 still constitutes a severe and unacceptable constraint on the safe and effective use of GNSS in some areas of the world for many years, preventing firm planning and the release of terrestrial systems.

Use of these bands by the fixed service has the potential to seriously delay the global implementation of GNSS and the continued operation of fixed service in this band is viewed with serious concern. It is recommended that deletion of these footnotes will be effective as from 2005 at the latest.

ICAO Position on WRC-2003 Agenda Item 1.1

To support the cessation of all fixed services in the band 1559-1610 MHz as of 2005 in order to remove the interference caused by the fixed service to essential aeronautical radionavigation functions and to permit the full utilization of GNSS services to aircraft on a global basis.

1 559-1 610	AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) S5.329A S5.341 S5.363 S5.355A S5.359A

S5.355A *Additional allocation:* in Bahrain, Bangladesh, Congo, Egypt, Eritrea, Iraq, Israel, Jordan, Kuwait, Lebanon, Malta, Morocco, Qatar, Syria, Somalia, Sudan, Chad, Togo and Yemen, the band 1 559-1 610 MHz is also allocated to the fixed service on a secondary basis until 1 January 20055~~15~~. After this date the fixed service will cease to operate in this band.~~, at which time this allocation shall no longer be valid. Administrations are urged to take all practicable steps to protect the radionavigation-satellite service and not authorize new frequency assignments to fixed-service systems in this band.~~

S5.359A *Additional allocation:* The band 1 559-1 610 MHz is also allocated to the fixed service on a primary basis until 1 January 2005 in Germany, Armenia, Azerbaijan, Belarus, Benin, Bosnia and Herzegovina, Bulgaria, Spain, France, Gabon, Georgia, Greece, Guinea, Guinea-Bissau, Hungary, Kazakstan, Latvia, Lithuania, Moldova, Mongolia, Nigeria, Uganda, Uzbekistan, Pakistan, Poland, Kyrgyzstan, the Dem. Peop
Tajikistan, Tanzania, Turkmenistan and Ukraine, ~~and until 1 January 2010 in~~ Saudi Arabia, Cameroon, Jordan, Kuwait, Lebanon, Libya, Mali, Morocco, Mauritania, Syria and Tunisia. After thisese date~~s~~, the fixed service will cease to operate in this band. ~~may continue to operate on a secondary basis until 1 January 2015, at which time this allocation shall no longer be valid. Administrations are urged to take all practicable steps to protect the radionavigation-satellite service and the aeronautical radionavigation service and not authorize new frequency assignments to fixed-service systems in this band.~~

d. Frequency band 4200 - 4400 MHz, used for airborne radio altimeter.

In this band footnote **S5.439** allows the operation of the fixed service on a secondary basis.

The band 4200-4400 MHz is reserved for use by radio altimeter systems (S5.438) . These systems are a critical element in the precision landing of aircraft under automatic guidance conditions. Interference from fixed service has the potential to affect the safety of such operations. Deletion of this footnote is recommended.

ICAO Position on WRC-2003 Agenda Item 1.1

To support deletion of footnote and S5.439 as a measure to protect safety-critical operation of radio altimeters in the band 4200-4400 MHz.

4 200-4 400	AERONAUTICAL RADIONAVIGATION S5.438 ~~S5.439~~ S5.440

S5.438 Use of the band 4 200-4 400 MHz by the aeronautical radionavigation service is reserved exclusively for radio altimeters installed on board aircraft and for the associated transponders on the ground. However, passive sensing in the earth exploration-satellite and space research services may be authorized in this band on a secondary basis (no protection is provided by the radio altimeters).

~~**S5.439** *Additional allocation:* in Iran (Islamic Republic of) and Libya, the band 4 200-4 400 MHz is also allocated to the fixed service on a secondary basis.~~

WRC-2003 Agenda Item 1.2: No impact on aeronautical radio services has been identified.

WRC-2003 Agenda Item 1.3: To consider identification of globally/regionally harmonized bands, to the extent practicable, for the implementation of future advanced solutions to meet the needs of public protection agencies, including those dealing with emergency situations and disaster relief, and to make regulatory provisions, as necessary, taking into account Resolution [GT PLEN-2/5] (WRC-2000);

Harmonized world wide aeronautical frequencies have been identified in Article S5 and Appendix S13 for use in emergency and in search and rescue situations, and for communications between aircraft and other mobile units. Detailed operational procedures for these emergency and search and rescue situations have been established both in ITU and ICAO.

Certain frequencies or frequency bands may be identified for use by public protection agencies in support for major emergency situations and disaster relief under conditions, yet to be established. Collaboration with aviation authorities is essential to ensure the most appropriate application of certain aeronautical frequencies that will be identified in the context of this requirement, and to evaluate any repercussions on their prime use for safety of flight.

ICAO Position on WRC-2003 Agenda Item 1.3

Assist in the identification of frequencies and bands for use in the situations envisaged, provided that the use is in accordance with the provisions in the Radio Regulations, and does not cause interference to operational aeronautical radio services. In particular, current ICAO Search And Rescue (SAR) procedures should not be affected.

WRC-2003 Agenda Item 1.4: To consider the results of studies related to Resolution 114 (WRC-95), dealing with the use of the band 5 091-5 150 MHz by the fixed-satellite service (Earth-to-space) (limited to non-GSO MSS feeder links), and review the allocations to the aeronautical radionavigation service and the fixed-satellite service in the band 5 091-5 150 MHz;

Resolution 114 (WRC-95) calls, inter alia, for a review of allocations to both the aeronautical radionavigation service and the fixed-satellite service in this band. ICAO is specifically invited to further review the detailed spectrum requirements and planning for international standard aeronautical radionavigation systems in the band. This band is reserved for satisfying requirements for assignments to MLS which can not be satisfied in the band 5030 - 5091 MHz. In accordance with S5.444 the international standard microwave landing system (MLS) has precedence over other uses in the band 5 030-5 150 MHz.

Footnote S5.444A permits use of the band 5 091 5 150 MHz by the fixed satellite service on a primary basis until 1 January 2010, subject to the overriding requirements of S5.444 to protect requirements for MLS assignments and to not causing interference to the aeronautical radionavigation service. After 1 January 2010, the fixed satellite service are expected to revert to a secondary status. Sharing between the two services in this band is not feasible. ITU-R Recommendation No S.1342 specifies the separation distance required to protect MLS services in the band 5 030-5 090 MHz from this FSS use.

In accordance with *resolves 1* of Res.114, ICAO has developed a procedure to establish the spectrum requirements for MLS and other potential aeronautical applications, in order to support the future allocation requirement for the band 5 091- 5 150 MHz. The results will be available around end 2001. This procedure incorporates:

- A renewal of the MLS requirements by States
- Review of the operational requirements of MLS (Ref. Annex 10 -Vol. 1)
- Replanning of MLS assignments to establish spectrum requirements.
- Identification of future spectrum requirements for other aeronautical systems
- Presentation and discussion of results in ICAO
- Presentation of results to ITU

ICAO Position on WRC-2003 Agenda Item 1.4

No change to footnote S5.444 and S5.444A.

Further material will be presented when the studies referenced are completed.

4 800-5 830 MHz

Allocation to services		
Region 1	**Region 2**	**Region 3**
5 000-5 150	AERONAUTICAL RADIONAVIGATION S5.367 S5.444 S5.444A S5.444B S5.444C	

S5.444 The band 5 030-5 150 MHz is to be used for the operation of the international standard system (microwave landing system) for precision approach and landing. The requirements of this system shall take precedence over other uses of this band. For the use of this band, No. **S5.444A** and Resolution **114 (WRC-95)** apply.

S5.444A *Additional allocation:* the band 5 091-5 150 MHz is also allocated to the fixed-satellite service (Earth-to-space) on a primary basis. This allocation is limited to feeder links of non-geostationary mobile-satellite systems and is subject to coordination under No. **S9.11A**.

In the band 5 091-5 150 MHz, the following conditions also apply:

prior to 1 January 2010, the use of the band 5 091-5 150 MHz by feeder links of non-geostationary-satellite systems in the mobile-satellite service shall be made in accordance with Resolution **114 (WRC-95)**;

prior to 1 January 2010, the requirements of existing and planned international standard systems for the aeronautical radionavigation service which cannot be met in the 5 000-5 091 MHz band, shall take precedence over other uses of this band;

after 1 January 2008, no new assignments shall be made to stations providing feeder links of non-geostationary mobile-satellite systems;

after 1 January 2010, the fixed-satellite service will become secondary to the aeronautical radionavigation service.

S5.444B *Additional allocation:* The band 5 000-5 010 MHz is also allocated to the radionavigation-satellite service (Earth-to-space) on a primary basis. See Resolution **[COM5/15] (WRC-2000)**.

S5.444C *Additional allocation:* The band 5 010-5 030 MHz is also allocated to the radionavigation-satellite service (space-to-Earth) (space-to-space) on a primary basis. In order not to cause harmful interference to the microwave landing system operating above 5 030 MHz, the aggregate power flux-density face in the band 5 030-5 150 MHz by all the space stations within any radionavigation-satellite service system (space-to-Earth) operating in the band 5 010-5 030 MHz shall not exceed 124.5 dB(W/m^2) in a 150 kHz band. In order not to cause harmful interference to the radio astronomy service in the band 4 990-5 000 MHz, the aggregate power flux-density produced in the 4 990-5 000 MHz band by all the space stations within any RNSS (space-to-Earth) system operating in the 5 010-5 030 MHz band shall not exceed the provisional value of 171 dB(W/m^2) in a 10 MHz band at any radio astronomy observatory site for more than 2% of the time. For the use of this band, Resolution **[COM5/16] (WRC-2000)** applies.

WRC-2003 Agenda Item 1.5*: To consider, in accordance with Resolution [GT PLEN-2/1] (WRC-2000), regulatory provisions and spectrum requirements for new and additional allocations to the mobile, fixed, Earth exploration-satellite and space research services, and to review the status of the radiolocation service in the frequency range 5 150-5 725 MHz, with a view to upgrading it, taking into account the results of ITU-R studies;

The ARNS band at 5 350 5 470 MHz supports the operation of airborne radar systems in accordance with S5.449. This includes airborne radar systems for the detection of adverse weather conditions which provides important information for the safe flight of aircraft. Many aeronautical administrations mandate the carriage of this equipment.

The ongoing protection of the aeronautical radionavigation service needs to be assured. The operation of radiolocation systems in the same band must be on a non-interference basis and conform to the conditions recommended by the relevant ITU-R studies. The radiolocation service must also accept interference from the ARNS service without any possibility of protection.

ICAO Position on WRC-2003 Agenda Item 1.5

Accept the upgrading of the radiolocation service to primary status in the band 5 350 5 470 MHz only on the express condition that no interference be caused to the ARNS service operating in accordance with S5.449, and that no protection be required from the ARNS to the radiolocation service, as agreed between administrations taking account of relevant ITU-R Recommendations.

No further changes to the allocations to the bands 5350 - 5470 MHz.

4 800-5 830 MHz

Allocation to services		
Region 1	**Region 2**	**Region 3**
5 350-5 460	EARTH EXPLORATION-SATELLITE (active) S5.448B AERONAUTICAL RADIONAVIGATION S5.449 ~~Radiolocation~~ RADIOLOCATION S5.AAA	
5 460-5 470	RADIONAVIGATION S5.449 ~~Radiolocation~~ RADIOLOCATION S5.AAA	

S5.448B The earth exploration-satellite (active) service operating in the band 5 350-5 460 MHz shall not cause harmful interference to, or constrain the use and development of, the aeronautical radionavigation service. (WRC-97)

S5.449 The use of the band 5 350-5 470 MHz by the aeronautical radionavigation service is limited to airborne radars and associated airborne beacons.

S5.AAA The Radiolocation service shall not cause harmful interference to the Aeronautical Radionavigation Service and the Radionavigation Service nor claim protection from these services.

WRC-2003 Agenda Item 1.6: To consider regulatory measures to protect feeder links (Earth-to-space) for the mobile-satellite service which operate in the band 5 150-5 250 MHz, taking into account the latest ITU-R Recommendations (for example, Recommendations ITU-R S.1426, ITU-R S.427 and ITU-R M.1454);

The band 5 150 - 5 250 MHz was originally allocated to the aeronautical radionavigation service on a primary exclusive basis. The allocation was made (in 1945-1947) to meet the spectrum requirements foreseen at that time for the candidate microwave landing system.

As a consequence of the later addition of other services to the band, notably the fixed-satellite service (Earth-space) and the mobile service, there is now very little scope for safe and interference-free use of the band by any ARNS systems.

Moreover, retention of the ARNS allocation creates the erroneous impression that the band is still available for use by ARNS. Since international civil aviation no longer has a requirement for this band, deletion of the ARNS allocation in the band 5 150-5 250 MHz is recommended.

ICAO Position for WRC-2003 Agenda Item 1.6

Not to oppose the deletion of the allocation to the aeronautical radionavigation service in the band 5 150 5 250 MHz on the grounds that, due to use by a number of other radio services, it can no longer support the safe and interference-free operation of navigation systems for civil aviation.

WRC-2003 Agenda Item 1.7: No impact on aeronautical radio services has been identified.

WRC-2003 Agenda Item 1.8: To consider issues related to unwanted emissions:

1.8.1 consideration of the results of studies regarding the boundary between spurious and out-of-band emissions, with a view to including the boundary in Appendix S3;

1.8.2 consideration of the results of studies, and proposal of any regulatory measures regarding the protection of passive services from unwanted emissions, in particular from space service transmissions, in response to recommends 5 and 6 of Recommendation 66 (Rev.WRC-2000);

Any amendments to the limits for unwanted emissions contained in Appendix S3 should not invalidate those in ICAO documents required for conformity with international civil aviation requirements.

In particular attention should be paid to recommends 5 and recommends 6 of recommendation 66, stipulating:

*5 study those frequency bands and instances where, for technical or operational reasons, more stringent spurious emission limits than the general limits in Appendix **S3** may be required to protect safety services and passive services such as radio astronomy, and the impact on all concerned services of implementing or not implementing such limits;*

6 study those frequency bands and instances where, for technical or operational reasons, out-of-band limits may be required to protect safety services and passive services such as radio astronomy, and the impact on all concerned services of implementing or not implementing such limits;

Progress of the work on this matter in ITU R study group 1 is monitored.

ICAO Position on WRC-2003 Agenda Item 1.8

Any revisions to the values contained in Appendix S3 to the Radio Regulations, or other regulatory provisions on unwanted emissions, should not invalidate the values for aeronautical radio systems, as expressed in ICAO Annex 10, and other relevant aeronautical documents.

[To be reviewed later consequent to further work of ICAO and ITU-R SG1]

WRC 2003 Agenda Item 1.9: To consider Appendix S13 and Resolution 331 (Rev.WRC-97) with a view to their deletion and, if appropriate, to consider related changes to Chapter SVII and other provisions of the Radio Regulations, as necessary, taking into account the continued transition to and introduction of the Global Maritime Distress and Safety System (GMDSS);

Appendix S13 to the Radio Regulations addresses non-GMDSS distress and safety communications, and contains important provisions for aeronautical radio services, which are applicable to the aeronautical mobile (R) and aeronautical mobile-satellite (R) services. These provisions have been carefully harmonized with those applying to aircraft emergencies as contained In ICAO Annexes.

Before any changes are made to this appropriate arrangement, it must be ensured that valuable provisions affecting the safety of aircraft, including aircraft emergency situations, are not affected. In this regard it should be noted that the GMDSS has essentially been set up for maritime purposes, and is applicable primarily in the maritime segment of mobile operations.

ICAO Position on WRC-2003 Agenda Item 1.9

Any proposed changes to Appendix S13 and related changes to Chapter SVII must be considered carefully against the requirements of the aeronautical mobile (R) service, and applicable ICAO Annexes.

WRC-2003 Agenda item 1.10

No impact on aeronautical radio services has been identified.

WRC-2003 Agenda Item 1.11 To consider possible extension of the allocation to the mobile-satellite service (Earth-to-space) on a secondary basis in the band 14-14.5 GHz to permit operation of the aeronautical mobile-satellite service as stipulated in Resolution 216 (Rev.WRC-2000);

This extension of the present secondary allocation to include the aeronautical mobile satellite service as addressed in Res. 216 (Rev. WRC-2000) addresses non-safety communications with aircraft, and will not form part of the aeronautical mobile satellite (R) service since a secondary allocation is not acceptable for any aeronautical safety-of-life service. The latter is governed by S43.1 which defines the conditions for communications relating to safety and regularity of flight between aircraft and ground.

The modification under consideration can be supported on the basis that the service has the potential to promote the general efficiency of aircraft operations.

ICAO Position on WRC-2003 Agenda Item 1.11

Provide support where applicable to the extension of this allocation to include the aeronautical mobile satellite service.

11.7-14.25 GHz

Allocation to services		
Region 1	**Region 2**	**Region 3**
14-14.25	FIXED-SATELLITE (Earth-to-space) S5.484A S5.506 RADIONAVIGATION S5.504 Mobile-satellite (Earth-to-space) ~~except aeronautical mobile-satellite~~ Space research S5.505	
14.25-14.3	FIXED-SATELLITE (Earth-to-space) S5.484A S5.506 RADIONAVIGATION S5.504 Mobile-satellite (Earth-to-space) ~~except aeronautical mobile-satellite~~ Space research S5.505 S5.508 S5.509	
14.3-14.4 FIXED FIXED-SATELLITE (Earth-to-space) S5.484A S5.506 MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) ~~except aeronautical mobile-satellite~~ Radionavigation-satellite	**14.3-14.4** FIXED-SATELLITE (Earth-to-space) S5.484A S5.506 Mobile-satellite (Earth-to-space) ~~except aeronautical mobile-satellite~~ Radionavigation-satellite	**14.3-14.4** FIXED FIXED-SATELLITE (Earth-to-space) S5.484A S5.506 MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) ~~except aeronautical mobile-satellite~~ Radionavigation-satellite
14.4-14.47	FIXED FIXED-SATELLITE (Earth-to-space) S5.484A S5.506 MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) ~~except aeronautical mobile-satellite~~ Space research (space-to-Earth)	
14.47-14.5	FIXED FIXED-SATELLITE (Earth-to-space) S5.484A S5.506 MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) ~~except aeronautical mobile-satellite~~ Radio astronomy S5.149	

S43.1 Frequencies in any band allocated to the aeronautical mobile (R) service and the aeronautical mobile-satellite (R) service are reserved for communications relating to safety and regularity of flight between any aircraft and those aeronautical stations and aeronautical earth stations primarily concerned with flight along national or international civil air routes.

WRC-2003 Agenda Items 1.12 and 1.13: No impact on aeronautical radio services has been identified.

WRC-2003 Agenda Item1.14* : To consider measures to address harmful interference in the bands allocated to the maritime mobile and aeronautical mobile (R) services, taking into account Resolutions 207 (Rev.WRC-2000) and [COM5/12] (WRC-2000), and to review the frequency and channel arrangements in the maritime MF and HF bands concerning the use of new digital technology, also taking into account Resolution 347 (WRC-97);

Resolution 207(Rev.WRC-2000), and Resolution [COM5/12] (WRC-2000) contain provisions and measures to combat the growing concern of aviation and maritime authorities over the increased interference to operational distress and safety communications caused by unauthorized (illegal) transmissions. Interference to safety communications with aircraft in these bands in some areas of the world is now a matter of very serious concern to civil aviation authorities, and to airlines operating in those areas.

WRC-2000 has identified possible actions by administrations, and studies by ITU-R, to reduce the effects of interference. ITU-R studies on this subject are under way.

International civil aviation fully supports the development of measures to strengthen the Radio Regulations, as feasible, and their application by administrations to avoid the occurrence of safety infringing events and to lead to the eventual cessation of these transmissions.

Increased use of HF data link, in particular for ATC communications, as standardized in ICAO, would also provide means to overcome interference caused by these unauthorized transmissions. HFDL is currently extensively available and mainly used for AOC communications

Technical solutions, solely aimed at mitigating the effects of interference, and involving changes to aircraft equipment must however be carefully assessed by civil aviation as to their affect on internationally agreed standards, and to their practical effectiveness in both the short and the long term.

ICAO Position on WRC-2003 Agenda Item 1.14

To support regulatory provisions, actions by administrations, and the implementation of recommended measures and techniques, aimed at reducing this threat to the safety of air operations.

WRC-2003 Agenda Item1.15*: To review the results of studies concerning the radionavigation-satellite service in accordance with Resolutions [COM5/16] (WRC-2000), [COM5/19] (WRC-2000) and [COM5/20] (WRC-2000);

Resolution [COM 5/19] (WRC-2000) relates to the introduction of the radionavigation-satellite service (space - Earth) in the band 1 164 1 215 MHz (S5.328A refers). The band is globally allocated on a primary basis to the aeronautical radionavigation service and currently intensively used by DME.

Resolution [COM 5/20] (WRC-2000) relates, inter alia, to the introduction of the radionavigation-satellite service (space-Earth) in the band 1215 1 300 MHz. The band is globally allocated on a primary basis to the radiolocation service and in several countries, to the aeronautical radionavigation service or the radionavigation service. It is currently used by long-range primary radars.

Both Resolutions call for ITU-R studies on the technical, operational, and regulatory aspects of the new allocations. ICAO has been specifically invited to participate in the work, because of the great importance of these bands to international civil aviation.

ICAO is currently studying, within the GNSS and AMCP Panels, the appropriate value of power flux density (pfd) limit and other relevant aspects of the protection of DME in the band 1164-1215 MHz, with a view to presenting contributions to the ITU-R studies under Res. COM5/19. Noting a) of the Resolution highlights the ICAO finding indicating that a provisional pfd value should be in the range of -115 - to - 119 dB(W/m^2) in any 1 MHz in the band for the aggregate of all RNSS systems. The findings will be refined further in the ICAO work.

The band 1215-1300 MHz is in intensive use for important radionavigation aids to aircraft (see S5.331 and S5.334). In this band a pfd limit has not been agreed in either principle, or in value. It is a firmly held view in international civil aviation that a pfd limit is necessary to give protection to radionavigation systems employed to establish and maintain separation between aircraft in busy airspace.

ICAO Position on WRC-2003 Agenda Item 1.15

To support an appropriate value for a pfd limit for the aggregated interference of all RNSS systems in the band 1 164 - 1 215 MHz, as a necessary protection for aeronautical DME systems currently in operation, and to support the incorporation of the agreed pfd limit within an adequate regulatory framework having full mandatory force

To support the need for a pfd limit for RNSS in the band 1215-1300 MHz as a necessary protection for important radionavigation systems providing safe separation to aircraft in flight in busy airspace, and to support the incorporation of the agreed pfd limit within an adequate regulatory framework having full mandatory force.

890-1 350 MHz

Allocation to services		
Region 1	**Region 2**	**Region 3**
960-1 215	AERONAUTICAL RADIONAVIGATION S5.328 S5.328A	
1 215-1 240	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) S5.329 S5.329A SPACE RESEARCH (active) S5.330 S5.331 S5.332	
1 240-1 260	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) S5.329 S5.329A SPACE RESEARCH (active) Amateur S5.330 S5.331 S5.332 S5.334 S5.335	
1 260-1 300	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) S5.329 S5.329A SPACE RESEARCH (active) Amateur S5.282 S5.330 S5.331 S5.335A S5.334 S5.335	

S5.328 The use of the band 960-1 215 MHz by the aeronautical radionavigation service is reserved on a worldwide basis for the operation and development of airborne electronic aids to air navigation and any directly associated ground-based facilities.

S5.328A *Additional allocation:* the band 1 164-1 215 MHz is also allocated to the radionavigation-satellite service (space-to-Earth) (space-to-space) on a primary basis. The aggregate power flux-density produced by all the space stations of all radionavigation-
exceed the provisional value of -115 dB(W/m^2) in any 1 MHz band for all angles of arrival. Stations in the radionavigation-satellite service shall not cause harmful interference to, nor claim protection from, stations of the aeronautical-radionavigation service. The provisions of Resolution **[COM5/19] (WRC-2000)** apply.

S5.329 Use of the radionavigation-satellite service in the band 1 215-1 300 MHz shall be subject to the condition that no harmful interference is caused to, and no protection is claimed from, the radionavigation service authorized under No. **S5.331**. See also Resolution **[COM5/20] (WRC-2000)**.

S5.329A Use of systems in the radionavigation-satellite service (space-to-space) operating in the bands 1 215-1 300 MHz and 1 559-1 610 MHz is not intended to provide safety service applications, and shall not impose any additional constraints on other systems or services operating in accordance with the Table of Frequency Allocations.

S5.330 *Additional allocation:* in Angola, Saudi Arabia, Bahrain, Bangladesh, Cameroon, China, the United Arab Emirates, Eritrea, Ethiopia, Guyana, India, Indonesia, the Islamic Republic of Iran, Iraq, Israel, Japan, Jordan, Kuwait, Lebanon, Libya, Morocco, Mozambique, Nepal, Nigeria, Pakistan, the Philippines, Qatar, Syria, Somalia, Sudan, Sri Lanka, Chad, Togo and Yemen, the band 1 215-1 300 MHz is also allocated to the fixed and mobile services on a primary basis. (WRC-97)

S5.331 *Additional allocation:* in Algeria, Germany, Austria, Bahrain, Belgium, Benin, Bosnia and Herzegovina, Burundi, Cameroon, China, Croatia, Denmark, the United Arab Emirates, France, Greece, India, Iran (Islamic Republic of), Iraq, Kenya, The Former Yugoslav Republic of Macedonia, Liechtenstein, Luxembourg, Mali, Mauritania, Norway, Oman, the Netherlands, Portugal, Qatar, Senegal, Slovenia, Somalia, Sudan, Sri Lanka, Sweden, Switzerland, Turkey and Yugoslavia, the band 1 215-1 300 MHz is also allocated to the radionavigation service on a primary basis.

S5.332 In the band 1 215-1 260 MHz, active spaceborne sensors in the earth exploration-satellite and space research services shall not cause harmful interference to, claim protection from, or otherwise impose constraints on operation or development of the radiolocation service, the radionavigation-satellite service and other services allocated on a primary basis.

S5.333 (SUP - WRC-97)

S5.334 *Additional allocation:* in Canada and the United States, the bands 1 240-1 300 MHz and 1 350-1 370 MHz are also allocated to the aeronautical radionavigation service on a primary basis.

S5.335 In Canada and the United States in the band 1 240-1 300 MHz, active spaceborne sensors in the earth exploration-satellite and space research services shall not cause interference to, claim protection from, or otherwise impose constraints on operation or development of the aeronautical radionavigation service. (WRC-97)

S5.335A In the band 1 260-1 300 MHz, active spaceborne sensors in the Earth exploration-satellite and space research services shall not cause harmful interference to, claim protection from, or otherwise impose constraints on operation or development of the radiolocation service and other services allocated by footnotes on a primary basis.

WRC-2003 Agenda Item 1.16: To consider allocations on a worldwide basis for feeder links in bands around 1.4 GHz to the non-GSO MSS with service links operating below 1 GHz, taking into account the results of ITU-R studies conducted in response to Resolution 127 (Rev.WRC-2000), provided that due recognition is given to the passive services, taking into account No. S5.340;

The bands identified in the *considerings* of Resolution 127 (Rev. WRC-2000) are used by aeronautical radio services. Studies on sharing between MSS feeder links and the aeronautical radionavigation service in other band have resulted in constraints on the development of both services.

Any suggestions that the search for spectrum for these links should include aeronautical bands must be preceded by technical studies which take into account present and future aeronautical and undertaken jointly by the services concerned and agreed as acceptable by civil aviation,

ICAO Position on WRC-2003 Agenda Item 1.16

Any suggestions for the sharing of aeronautical bands with NGSO feeder links under this Agenda Item can only be considered on the basis of agreed studies, which take into account the present and expected future use of the band by aviation, and the constraints applied to this use.

1 350-1 525 MHz

Allocation to services		
Region 1	**Region 2**	**Region 3**
1 350-1 400 FIXED MOBILE RADIOLOCATION S5.149 S5.338 S5.339	**1 350-1 400** RADIOLOCATION S5.149 S5.334 S5.339	
1 400-1 427	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) S5.340 S5.341	

S5.334 *Additional allocation:* in Canada and the United States, the bands 1 240-1 300 MHz and 1 350-1 370 MHz are also allocated to the aeronautical radionavigation service on a primary basis.

WRC-2003 Agenda Item 1.17: To consider upgrading the allocation to the radiolocation service in the frequency range 2 900-3 100 MHz to primary;

This band is heavily utilized by civil aviation radionavigation for ground based primary surveillance radar. The upgrading of radiolocation services to a primary status should only be made on the basis of no protection from and no interference to current and future aeronautical radionavigation systems, operating in accordance with the regulations.

ICAO Position on WRC-2003 Agenda Item 1.17

Any upgrading of the radiolocation service to primary status in bands allocated to aeronautical services must ensure the provision of adequate measures to continued protection of aeronautical services, present and future. In particular, the allocation should be made on the conditions of non-interference to, and no protection from, the radionavigation service.

2 700-4 800 MHz

Allocation to services		
Region 1	**Region 2**	**Region 3**
2 900-3 100	RADIONAVIGATION S5.426 ~~Radiolocation~~ RADIOLOCATION S5.BBB S5.425 S5.427	

S5.423 In the band 2 700-2 900 MHz, ground-based radars used for meteorological purposes are authorized to operate on a basis of equality with stations of the aeronautical radionavigation service.

S5.424 *Additional allocation:* in Canada, the band 2 850-2 900 MHz is also allocated to the maritime radionavigation service, on a primary basis, for use by shore-based radars.

S5.425 In the band 2 900-3 100 MHz, the use of the shipborne interrogator-transponder system (SIT) shall be confined to the sub-band 2 930 -2 950 MHz.

S5.426 The use of the band 2 900-3 100 MHz by the aeronautical radionavigation service is limited to ground-based radars.

5.427 In the bands 2 900-3 100 MHz and 9 300-9 500 MHz, the response from radar transponders shall not be capable of being confused with the response from radar beacons (racons) and shall not cause interference to ship or aeronautical radars in the radionavigation service, having regard, however, to No. **S4.9**.

S5.BBB The Radiolocation Service shall not cause harmful interference nor claim protection from the Aeronautical Radionavigation Service and the Radionavigation Service

WRC-2003 Agenda Item 1.18: No impact on aeronautical radio services has been identified.

WRC-2003 Agenda Item 1.19 : No impact on aeronautical radio services has been identified.

WRC-2003 Agenda Item 1.20: To consider additional allocations on a worldwide basis for the non-GSO MSS with service links operating below 1 GHz, in accordance with Resolution 214 (Rev.WRC-2000);

The spectrum below 1 GHz contains a number of important aeronautical and radionavigation bands, where the main aeronautical terrestrial radio services for communication and navigation which support air operations are located. All of these bands are under considerable pressure to provide for the future growth of air traffic in the years ahead.

The main aeronautical VHF communications band at 117.975 - 137 MHz supports all of the short- and medium-range safety communications between aircraft ant ground over continental airspace, and at airports, and will continue for the foreseeable future to provide this function. Essential aeronautical radionavigation systems operate at 75 MHz, 108 to 117 975 MHz, 328.6 to 335.4 MHz, 406 - 406.1 MHz and 960 to 1 215 MHz. All of these bands are forecast to be required for the foreseeable future.

ICAO POSITION ON WRC-2003 AGENDA ITEM 1.20

Maintain all aeronautical allocations below 1 GHz without change and taking account of the ICAO position on Agenda Item 1.1 in regard to S5.181, S5.197 and S5.259.

WRC-2003 Agenda Item 1.21: No impact on aeronautical radio services has been identified.

WRC-2003 Agenda Item 1.22 *: To consider progress of ITU-R studies concerning future development of IMT-2000 and systems beyond IMT-2000, in accordance with Resolution [GT PLEN-2/3] (WRC-2000);

Proposals may be developed aimed at accommodating the mobile service providing the terrestrial elements of IMT-2000 in bands currently allocated to the aeronautical radionavigation and radiolocation service between 2 700 MHz and 3 400 MHz. These bands are heavily used for air traffic control radar surveillance functions and to meet other important national requirements. Some operational functions carried out with these systems cannot be replaced with any other present or expected future system.

Existing studies have indicated that there is no possibility for practical sharing arrangements between these aeronautical radar stations and terrestrial (land) mobile service. Therefore, any proposal for introducing the mobile service in these bands is not acceptable. Any further studies on sharing must take into account the full technical and operational envelope of the use of radar at airports and be accepted and endorsed by the civil aviation authorities responsible for their operation.

A full study on the present use of this band by radar stations and on future requirements is necessary to determine whether any removal of these to higher frequency bands is possible and practicable. The requirement for airport and TMA primary radar coverage is foreseen to remain. Removal of radar stations from the band 2 700 - 2 900 MHz into the band 2 900 - 3 400 MHz would be extremely difficult if not impossible due to the requirements for large bandwidth for modern radar stations. It would also require major redesign and reconstruction effort to make the required frequency changes to many radar systems, leading to extensive disruption to services required 24 hours a day at busy airports.

Congestion is increasing at many major airports around the world, and many will reach saturation levels within this decade. The preservation of safety demands reliable and interference-free radar systems for monitoring and providing separation between aircraft in the landing phase of their operation. Hence, the requirement for airport and TMA primary radar coverage is foreseen to main at all major airports in Europe, in North America, and elsewhere where a high traffic density situation applies, for all of the foreseeable future.

In the ASIA/PACIFIC region, a number of civil aviation authorities have indicated that the band 2 700 - 2 900 MHz is their preferred band for primary ATC and airport surveillance radar.

ICAO Position on WRC-2003 Agenda Item 1.22

To oppose any proposed new allocation to the mobile service or other services, in bands between 2 700 and 3 400 MHz which are allocated or used by aeronautical radionavigation services, as no rigorous and comprehensive compatibility studies have yet been accepted by international civil aviation. Such studies must take account of all the technical and operational aspects related to the use of these systems at major airports throughout the world for vital separation and monitoring of aircraft preparing to land. The case for sharing on any basis must also be supported by an analysis which is satisfying the ICAO safety requirements.

WRC-2003 Agenda Items 1.23 to 1.27 : No impact on aeronautical radio services has been identified.

WRC-203 Agenda Item 1.28*: To permit the use of the band 108-117.975 MHz for the transmission of radionavigation satellite differential correction signals by ICAO standard ground-based systems;

A new aviation requirement has emerged for the transmission of augmentation data for GNSS, to be used by aircraft receivers to improve the stringent accuracy and integrity requirements of GNSS. These ground-based augmentation systems (including GBAS and GRAS) are planned to operate in the frequency range 112 - 117.975 MHz, which is allocated to the aeronautical radionavigation service. It has been argued that GBAS and GRAS do not fall within the definition for a radionavigation service (i.e. using the property of the propagation characteristics of radio waves) and that an amendment to the allocation of this band is required. Compatibility between GBAS/GRAS will be secured through appropriate amendments to Annex 10

Compatibility with FM broadcast services in the band 87.5-108 MHz would be assured through conformity with ITU-R Recommendation IS.1009.

ICAO Position for WRC-2003 Agenda Item 1.28

Support an allocation permitting the use of the band 108-117.975 MHz for the transmission of ICAO standard GNSS augmentation systems

Ensure conformity with ITU-R Recommendation IS.1009 regarding compatibility with the FM broadcast services in the band 87.5-108 MHz

75.2-137.175 MHz

Allocation to services		
Region 1	**Region 2**	**Region 3**
108-117.975	AERONAUTICAL RADIONAVIGATION ~~S5.197~~ S5.CCC	

~~**S5.197** *Additional allocation:* in Japan, Pakistan and Syria, the band 108-111.975 MHz is also allocated to the mobile service on a secondary basis, subject to agreement obtained under No. **S9.21**. In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of the procedures invoked under No. **S9.21**.~~ (See also agenda item 1.1.)

S5.CCC The band 108 - 117.975 is also allocated to the Aeronautical Mobile (R) Service and limited for the transmission of ground-based signals that provide supplemental navigational data for the radio navigation satellite service by ICAO standardized systems.

WRC-2003 Agenda Items 1.29 and 1.30: No impact on aeronautical radio services has been identified.

WRC- 2003 Agenda Item 1.31*: To consider the additional allocations to the mobile-satellite service in the 1-3 GHz band, in accordance with Resolutions [COM5/29] (WRC-2000) and [COM5/30] (WRC-2000);

Resolutions [COM5/29](WRC-2000) and [COM5/30](WRC-2000) address the need for studies of sharing between MSS and other specified services in order to identify spectrum for future MSS expansions. The demand stated in these Resolutions is for 2 times 123 MHz by 2005, and 2 times 145 MHz by 2010. The Resolutions identify specific bands (1518 - 1525 MHz and 1683 - 1690 MHz) in the general area of the existing MSS allocations at 1.5/1.6 GHz., but any bands in the 1-3GHz spectrum may be examined if there is a failure to find bands where satisfactory sharing with existing services is not possible.

It is noted that the band between 1429 and 1535 MHz in some countries in Region 1 and 1435 - 1535 in Region 2 is used by the Aeronautical Mobile Service for aeronautical radiotelemetry purposes. (In France, the use of the band 2 310-2 360 MHz by the aeronautical mobile service for telemetry has priority over other uses by the mobile service (ref. footnote S5.395)).

The band 1559-1610 MHz, allocated to the RNSS service and planned to be used extensively for GNSS services by civil aviation, has been specifically excluded from the sharing examination in both Resolutions. This exclusion is fully supported by international civil aviation.

Other bands of aeronautical interest in the 1-3 GHz band include the aeronautical radio navigation service bands at 960 - 1 215 MHz, 1 559 - 1 610 MHz, and 2 700-2 900 MHz, and mobile satellite service bands at 1.5/1.6 GHz. The process of global standardization through ICAO Standards applies in these bands, which are extensively used and are planned for even greater use as air traffic expands in the future. Civil aviation foresees little scope for sharing with other services in any of these bands without prejudicing the short, and longer, term security and viability of air transport services around the world.

ICAO Position on WRC-2003 Agenda Item 1.31

Support no change to the RNSS allocation at 1559-1610 MHz, required for GNSS services to civil aircraft, on the basis that studies have proven that sharing with MSS is not feasible.

Oppose proposals for an allocation to the mobile satellite service in any of the ARNS bands between 1 and 3 GHz until a full consideration of the aviation use, and sharing studies where appropriate, have been completed and satisfy ICAO requirements.

Support the protection of aeronautical telemetry applications and their continued use in the band 1425 - 1535 MHz.

WRC-2003 Agenda Items 1.32 to 1.34: No impact on aeronautical radio services has been identified.

WRC-2003 Agenda Item 2: To examine the revised ITU-R Recommendations incorporated by reference in the Radio Regulations communicated by the Radiocommunication Assembly, in accordance with Resolution 28 (Rev.WRC-2000), and to decide whether or not to update the corresponding references in the Radio Regulations, in accordance with principles contained in the Annex to Resolution 27 (Rev.WRC-2000);

At this point, no ITU-R recommendations referring exclusively to aeronautical radio services and incorporated by reference in the ITU Radio Regulations have been identified.

Provision RR S34.1 of the ITU Radio Regulations specifies that ELT signals on 406.0 MHz or in the band 1 645.5 - 1 646.5 MHz shall be in accordance with relevant ITU-R Recommendations (see Resolution 27 (WRC-95)).

ICAO Position on WRC-2003 Agenda Item 2

To support the policy of linked reference in respect of RR S34.1 for ELTs.

WRC Agenda Item 3: To consider such consequential changes and amendments to the Radio Regulations as may be necessitated by the decisions of the conference;

No action is possible on this Item at this stage.

WRC Agenda Item 4: In accordance with Resolution 95 (Rev.WRC-2000), to review the resolutions and recommendations of previous conferences with a view to their possible revision, replacement or abrogation;

WRC-2003 Agenda Items 5 and 6: No impact on aeronautical radio services has been identified.

WRC Agenda item 7.2: to recommend to the Council items for inclusion in the agenda for the next WRC, and to give its views on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences, taking into account Resolution [GT PLEN-2/6] (WRC-2000),

Under this agenda item the following subjects are mentioned:

1. Removal of footnote S5.203A

2. To consider the results of ITU-R studies undertaken in accordance with Res. GTPLEN-2/6 of WC-2000 aand to take appropriate action to ensure inclusion of relevant items on the agenda of WRC-2006.

Note: Contributions to relevant ITU-R studies to support aeronauitcal interests is necessary

s regulations concerning the access of the aeronautical mobile satellite (R) service in the 1.5 - 1.6 GHz bands

(Other items to be adressed later)

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Annex to ICAO Position for WRC-2003

Explanatory Notes on Important Aviation Items

To be added later

RESOLUTION [GT PLEN-2/4] (WRC-2000)

Agenda for the 2003 World Radiocommunication Conference

The World Radiocommunication Conference (Istanbul, 2000),

considering

a) that, in accordance with No. 118 of the Convention, the general scope of the agenda for a world radiocommunication conference should be established four to six years in advance and a final agenda shall be established by the Council two years before the conference;

b) Article 13 of the Constitution relating to the competence and scheduling of world radiocommunication conferences and Article 7 of the Convention relating to their agendas;

c) the relevant resolutions and recommendations of previous world administrative radio conferences (WARCs) and world radiocommunication conferences (WRCs),

recognizing

a) that this conference has identified a number of urgent issues requiring further examination by WRC-03;

b) that, in preparing this agenda, many items proposed by administrations could not be included and have had to be deferred to future conference agendas,

resolves

to recommend to the Council that a world radiocommunication conference be held in 2003 for a period of four weeks, with the following agenda:

1 on the basis of proposals from administrations and the Report of the Conference Preparatory Meeting, taking account of the results of WRC-2000, and with due regard to the requirements of existing and future services in the bands under consideration, to consider and take appropriate action with respect to the following items:

1.1 requests from administrations to delete their country footnotes or to have their country name deleted from footnotes, if no longer required, in accordance with Resolution **26 (Rev.WRC-97)**;

1.2 to review and take action, as required, on No. **S5.134** and related Resolutions **517 (Rev.WRC-97)** and **537 (WRC-97)** and Recommendations **515 (Rev.WRC-97)**, **517 (Rev.WRC-2000)**, **519 (WARC-92)** and Appendix **S11**, in the light of the studies and actions set out therein, having particular regard to the advancement of new modulation techniques, including digital techniques, capable of providing an optimum balance between sound quality, bandwidth and circuit reliability in the use of the HF bands allocated to the broadcasting service;

1.3 to consider identification of globally/regionally harmonized bands, to the extent practicable, for the implementation of future advanced solutions to meet the needs of public protection agencies, including those dealing with emergency situations and disaster relief, and to make regulatory provisions, as necessary, taking into account Resolution **[GT PLEN-2/5] (WRC-2000)**;

1.4 to consider the results of studies related to Resolution **114 (WRC-95)**, dealing with the use of the band 5 091-5 150 MHz by the fixed-satellite service (Earth-to-space) (limited to non-GSO MSS feeder links), and review the allocations to the aeronautical radionavigation service and the fixed-satellite service in the band 5 091-5 150 MHz;

1.5 to consider, in accordance with Resolution **[GT PLEN-2/1] (WRC-2000)**, regulatory provisions and spectrum requirements for new and additional allocations to the mobile, fixed, Earth exploration-satellite and space research services, and to review the status of the radiolocation service in the frequency range 5 150-5 725 MHz, with a view to upgrading it, taking into account the results of ITU-R studies;

1.6 to consider regulatory measures to protect feeder links (Earth-to-space) for the mobile-satellite service which operate in the band 5 150-5 250 MHz, taking into account the latest ITU-R Recommendations (for example, Recommendations ITU-R S.1426, ITU-R S.427 and ITU-R M.1454);

1.7 to consider issues concerning the amateur and amateur-satellite services:

1.7.1 possible revision of Article **S25**;

1.7.2 review of the provisions of Article **S19** concerning the formation of call signs in the amateur services in order to provide flexibility for administrations;

1.7.3 review of the terms and definitions of Article **S1** to the extent required as a consequence of changes made in Article **S25**;

1.8 to consider issues related to unwanted emissions:

1.8.1 consideration of the results of studies regarding the boundary between spurious and out-of-band emissions, with a view to including the boundary in Appendix **S3**;

1.8.2 consideration of the results of studies, and proposal of any regulatory measures regarding the protection of passive services from unwanted emissions, in particular from space service transmissions, in response to *recommends* 5 and 6 of Recommendation **66 (Rev.WRC-2000)**;

1.9 to consider Appendix **S13** and Resolution **331 (Rev.WRC-97)** with a view to their deletion and, if appropriate, to consider related changes to Chapter SVII and other provisions of the Radio Regulations, as necessary, taking into account the continued transition to and introduction of the Global Maritime Distress and Safety System (GMDSS);

1.10 to consider the results of studies, and take necessary actions, relating to:

1.10.1 exhaustion of the maritime mobile service identity numbering resource (Resolution **344 (WRC-97)**);

1.10.2 shore-to-ship distress communication priorities (Resolution **348 (WRC-97)**);

1.11 to consider possible extension of the allocation to the mobile-satellite service (Earth-to-space) on a secondary basis in the band 14-14.5 GHz to permit operation of the aeronautical mobile-satellite service as stipulated in Resolution **216 (Rev.WRC-2000)**;

1.12 to consider allocations and regulatory issues related to the space science services in accordance with Resolution **723 (Rev.WRC-2000)** and to review all Earth exploration-satellite service and space research service allocations between 35 and 38 GHz, taking into account Resolution **[COM5/1] (WRC-2000)**;

1.13 to consider regulatory provisions and possible identification of existing frequency allocations for services which may be used by high altitude platform stations, taking into account No. **S5.5RRR** and the results of the ITU-R studies conducted in accordance with Resolutions **122 (Rev.WRC-2000)** and **[COM5/14] (WRC-2000)**;

1.14 to consider measures to address harmful interference in the bands allocated to the maritime mobile and aeronautical mobile (R) services, taking into account Resolutions **207 (Rev.WRC-2000)** and **[COM5/12] (WRC-2000)**, and to review the frequency and channel arrangements in the maritime MF and HF bands concerning the use of new digital technology, also taking into account Resolution **347 (WRC-97)**;

1.15 to review the results of studies concerning the radionavigation-satellite service in accordance with Resolutions **[COM5/16] (WRC-2000)**, **[COM5/19] (WRC-2000)** and **[COM5/20] (WRC-2000)**;

1.16 to consider allocations on a worldwide basis for feeder links in bands around 1.4 GHz to the non-GSO MSS with service links operating below 1 GHz, taking into account the results of ITU-R studies conducted in response to Resolution **127 (Rev.WRC-2000)**, provided that due recognition is given to the passive services, taking into account No. **S5.340**;

1.17 to consider upgrading the allocation to the radiolocation service in the frequency range 2 900-3 100 MHz to primary;

1.18 to consider a primary allocation to the fixed service in the band 17.3-17.7 GHz for Region 1, taking into account the primary allocations to various services in all three Regions;

1.19 to consider regulatory provisions to avoid misapplication of the non-GSO FSS single-entry limits in Article **S22** based on the results of ITU-R studies carried out in accordance with Resolution **[COM5/2] (WRC-2000)**;

1.20 to consider additional allocations on a worldwide basis for the non-GSO MSS with service links operating below 1 GHz, in accordance with Resolution **214 (Rev.WRC-2000)**;

1.21 to consider progress of the ITU-R studies concerning the technical and regulatory requirements of terrestrial wireless interactive multimedia applications, in accordance with Resolution **[GT PLEN-2/2] (WRC-2000)**, with a view to facilitating global harmonization;

1.22 to consider progress of ITU-R studies concerning future development of IMT-2000 and systems beyond IMT-2000, in accordance with Resolution **[GT PLEN-2/3] (WRC-2000)**;

1.23 to consider realignment of the allocations to the amateur, amateur-satellite and broadcasting services around 7 MHz on a worldwide basis, taking into account Recommendation **718 (WARC-92)**;

1.24 to review the usage of the band 13.75-14 GHz, in accordance with Resolution **[COM5/10] (WRC-2000)**, with a view to addressing sharing conditions;

1.25 to consider regulatory provisions and possible identification of spectrum above [17.8 GHz] [19.7 GHz] for high-density systems in the fixed-satellite service;

1.26 to consider the provisions under which earth stations located on board vessels could operate in fixed-satellite service networks, taking into account the ITU-R studies in response to Resolution **[COM4/3] (WRC-2000)**;

1.27 to review, in accordance with Resolutions **[GT PLEN-1/1] (WRC-2000)** and **[GT PLEN-1/3 (WRC-2000)]**, the ITU-R studies requested in those resolutions, and modify, as appropriate, the relevant regulatory procedures and associated sharing criteria contained in Appendices **S30** and **S30A** and in the associated provisions;

1.28 to permit the use of the band 108-117.975 MHz for the transmission of radionavigation satellite differential correction signals by ICAO standard ground-based systems;

1.29 to consider the results of studies related to Resolutions **[COM5/3] (WRC-2000)** and **[COM5/23] (WRC-2000)** dealing with sharing between non-GSO and GSO systems;

1.30 to consider possible changes to the procedures for the advance publication, coordination and notification of satellite networks in response to Resolution **86** (Minneapolis, 1998);

1.31 to consider the additional allocations to the mobile-satellite service in the 1-3 GHz band, in accordance with Resolutions **[COM5/29] (WRC-2000)** and **[COM5/30] (WRC-2000)**;

1.32 to consider technical and regulatory provisions concerning the band 37.5-

1.33 43.5 GHz, in accordance with Resolutions **128 (Rev.WRC-2000)** and **[COM5/28] (WRC-2000)**;

1.33 to review and revise technical, operational and regulatory provisions, including provisional limits in relation to the operation of high altitude platform stations within IMT-2000 in the bands referred to in No. **S5.BBB**, in response to Resolution **[COM5/13] (WRC-2000)**;

1.34 to review the results of studies in response to Resolution **[COM4/6] (WRC-2000)** concerning threshold limits for non-GSO BSS (sound) in the band 2 630-2 655 MHz, and to take actions as required;

2 to examine the revised ITU-R Recommendations incorporated by reference in the Radio Regulations communicated by the Radiocomm

unication Assembly, in accordance with Resolution **28 (Rev.WRC-2000)**, and to decide whether or not to update the corresponding references in the Radio Regulations, in accordance with principles contained in the Annex to Resolution **27 (Rev.WRC-2000)**;

3 to consider such consequential changes and amendments to the Radio Regulations as may be necessitated by the decisions of the conference;

4 in accordance with Resolution **95 (Rev.WRC-2000)**, to review the resolutions and recommendations of previous conferences with a view to their possible revision, replacement or abrogation;

5 to review, and take appropriate action on, the report from the Radiocommunication Assembly submitted in accordance with Nos. 135 and 136 of the Convention;

6 to identify those items requiring urgent action by the radiocommunication study groups in preparation for the next world radiocommunication conference;

7 in accordance with Article 7 of the Convention:

7.1 to consider and approve the Report of the Director of the Radiocommunication Bureau on the activities of the Radiocommunication Sector since WRC-2000, including on any difficulties or inconsistencies encountered in the application of the Radio Regulations, and action in response to Resolution **80** (Minneapolis, 1998);

7.2 to recommend to the Council items for inclusion in the agenda for the next WRC, and to give its views on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences, taking into account Resolution **[GT PLEN-2/6] (WRC-2000)**,

further resolves

8 to recommend to the Council that additional budgetary and conference resources be provided so that the following items can be included in this agenda for WRC-03:

8.1 to examine the adequacy of the frequency allocations for HF broadcasting from about 4 MHz to 10 MHz, taking into account the seasonal planning procedures adopted by WRC-97;

8.2 to consider the regulatory and technical provisions for satellite networks using highly elliptical orbits;

8.3 to consider provision of up to 6 MHz of frequency spectrum to the Earth exploration-satellite service (active) in the frequency band 420-470 MHz, in accordance with Resolution **727 (Rev.WRC-2000)**;

8.4 to examine the spectrum requirements in the fixed-satellite service bands below 17 GHz for telemetry, tracking and telecommand of fixed-satellite service networks operating with service links in the frequency bands above 17 GHz,

invites the Council

to finalize the agenda and arrange for the convening of WRC-03, and to initiate as soon as possible the necessary consultation with Member States,

instructs the Director of the Radiocommunication Bureau

to make the necessary arrangements to convene meetings of the Conference Preparatory Meeting and to prepare a report to WRC-03,

instructs the Secretary-General

to communicate this resolution to international and regional organizations concerned.

REPORT ON AGENDA ITEM 4.1: MIDDLE EAST AIR NAVIGATION ISSUES- ATM/AIS/SAR

Implementation of the MID ATS Route Network

4.1.1 The meeting first considered the outcomes of the fourth meeting of the ATM/AIS/SAR Sub-Group, and noted that the status of implementation of the ATS routes listed in Table ATS-1 of the MID Air Navigation Plan (Doc 9708) had been reviewed by that meeting. The current status of implementation is:

Fully implemented	51
Partly implemented	21
Not implemented	17
Total	89

4.1.2 ANP amendment proposal MID 99/1 - ATS, which had been circulated to States on 21 July 1999, had proposed amendments to some of these routes. The meeting was advised that the outstanding issues relating to this amendment proposal had been resolved, and had been forwarded to ICAO headquarters for approval by the Council.

4.1.3 The meeting was also advised that the sub-group had supported the need for a MID/EUR co-ordination meeting to be held to discuss harmonization and implementation of ATS routes linking the two regions. The meeting was informed of the process of establishing a new Inter-regional co-ordination body called the Europe-Middle East ATM Co-ordination Bureau (EMAC) between Civil Aviation Authorities of European and Middle East States. The meeting noted that Rationalization of the ATS route network in the Eastern Mediterranean area is one of the priority tasks identified for EMAC, so this would provide a mechanism for addressing the route structure in the Eastern Mediterranean area. It also agreed that the existing South West Asia ATS Coordinating Group (SWACG) would be the appropriate body to address harmonization of the route network between Eastern European States and the Middle East.

Implementation of ICAO requirements in the AIS/MAP fields

4.1.4 The ATM/AIS/SAR SG/4 meeting reviewed the results of surveys undertaken by the Regional Office to determine the status of implementation of WGS-84, and the production of required ICAO Charts by States of the MID Region. The details of the States which have not yet fully implemented these requirements were incorporated in the table of Air Navigation Shortcomings and Deficiencies in the AIS field.

4.1.5 During the discussion on the status of ICAO chart production, it was noted that the responsibilities for the production of the World Aeronautical Chart (WAC) in the new MID ANP (Doc 9708) were different from those in the former MID/ASIA ANP, which had now been superseded. These changes had been made at the ASIA/PAC RAN 3 meeting, held in Bangkok in 1993. There were some discrepancies between the WACs listed as required by certain States, and the requirements in the MID ANP. It was also noted that the MID ANP did not now assign any responsibility for the production of WACs 2548, 2563 and 2670. It was agreed that the responsibility for production of WACs should be reviewed by the next meeting of the ATS/AIS/SAR Sub-Group.

Development of a data base to support regional planning and ATFM activities

4.1.6 The meeting recalled that MIDANPIRG/5, in decision 5/5, had tasked the ATM/AIS/SAR Sub-group to:

a) evaluate the extent to which the data from the Traffic Forecasting group is meeting its planning needs, and

b) advise MIDANPIRG/6 of any additional requirements which may require either a modification of the information being produced by the Traffic forecasting group, or the establishment of a separate data base.

4.1.7 The Sub-Group meeting was presented with information on the activities of the Middle East Region Traffic Forecasting Group (MER TFG), examples of the types of forecasts produced so far, and details of the data being collected. It noted that the MER TFG was still in the process of developing its capability to produce forecasts. Until this capability was fully developed, the forecasts would be produced at ICAO Headquarters on the basis of requirements specified by the MER TFG.

4.1.8 The Sub-Group proposed two additional items, which, while not required for the forecasting process, would provide useful information for planning. It was recognized that for airspace planning, it would be useful to know the navigation capability of aircraft operating on particular routes, and in particular, whether the aircraft was RNAV equipped. It would be useful to have information on the number of FANS 1/A equipped aircraft operating in the region. As this information could be determined from Field 10 of the FPL message, (ADS capability being used as an indicator of FANS 1/A aircraft) it was agreed that it should be possible for States to provide this as part of the data they submit to the TFG.

4.1.9 This proposal was further discussed by the CNS/ATM SG/4 meeting, which proposed some additional items. The consolidated proposal, resulting from the discussion of both Sub-Groups, is contained in Conclusion 6/22, under Agenda Item 4.3.

4.1.10 The Sub-Group had also raised some questions about the type of expertise required by the TFG, and was advised that the group should contain both people with an ATC background, and people with economics and forecasting qualifications. Some states indicated that as there were few people in the region with forecasting experience, it would be helpful if ICAO could organize more Traffic Forecasting Workshops. The meeting agreed that this would be desirable.

CONCLUSION 6/6 - SUPPORT FOR TRAFFIC FORECASTING ACTIVITIES

That,

- Considering the importance of relevant traffic forecasts for the efficient planning of the air navigation system
- Noting the work done by the Middle East Regional Traffic Forecasting Group and the support it received from the secretariat in preparing preliminary forecasts of aircraft movements to, from, across and within the Middle East region,

- Further noting the need to facilitate the efficient functioning of the Middle East Regional Traffic forecasting Group

a) States be urged to ensure that their respective nominees to the membership of the Middle East Regional Traffic Forecasting Group have the necessary traffic forecasting expertise and that both Air Transport and ATC Officers be represented in the Group.

b) ICAO be requested to organize workshops and other relevant training sessions for the members of the Group with a view to enhancing the efficiency of its work.

Mandatory carriage of ACAS II in the MID Region

4.1.11 MIDANPIRG/5, in Decision 5/6, tasked the ATM/AIS/SAR Sub-Group to investigate whether there is a need to introduce ACAS II in the MID Region in advance of 2003 (this being the date specified in Annex 6 for global implementation), and to report its findings to MIDANPIRG/6.

4.1.12 The meeting was advised that ICAO was encouraging States which could do so to introduce ACAS requirements earlier than 2003. The African, Asia/Pacific and European regions all require carriage of ACAS II according to the following schedule:

- From 1 January 2000, all civil fixed-wing turbine-engined aircraft having a maximum take-off mass in excess 15,000 kg or approved passenger seating configuration of more than 30.
- From 1 January 2005, all civil fixed-wing turbine-engined aircraft having a maximum take-off mass in excess of 5,700 kg or approved passenger seating configuration of more than 19.

4.1.13 It was noted that because of the introduction of ACAS requirements in adjoining States, the majority of aircraft operating on flights to and from airports outside the MID region were required to carry ACAS II by 1 January 2000. The ATM/AIS/SAR sub-group had proposed that ACAS II carriage and operation should be mandatory in the MID Region for aircraft having a maximum take-off mass in excess 15,000 kg or approved passenger seating configuration of more than 30 from 1 July 2001. It was recognized that with MIDANPIRG/6 now being held later than originally planned, this would not provide a troduction of the requirement according to the timetable proposed by the sub-group, because of the enhancement to safety it provided.

4.1.14 One State indicated that it preferred not to introduce the requirement for ACAS II until 2003, in accordance with Annex 6. It was noted that in the statement encouraging earlier introduction of ACAS II, ICAO had indicated that even where a regional decision to mandate ACAS was taken, it would still be possible for individual States to indicate, by NOTAM or by publication in their AIP, that carriage of ACAS was not mandatory within their FIR, and that this would not require the filing of a difference with ICAO. The meeting then agreed to the following Conclusion:

CONCLUSION 6/7- MANDATORY CARRIAGE AND OPERATION OF ACAS II IN THE MID REGION

That ACAS II shall be carried and operated in the MID Region by all aircraft which meet the following criteria:

a) With effect from 1 July 2001, all civil fixed-wing turbine-engined aircraft having a maximum take-off mass in excess 15,000 kg or approved passenger seating configuration of more than 30.

b) With effect from 1 January 2005, all civil fixed-wing turbine-engined aircraft having a maximum take-off mass in excess of 5,700 kg or approved passenger seating configuration of more than 19.

c) Each State should issue an AIC as soon as possible, indicating the intent to introduce mandatory ACAS II requirements.

d) States, which do not agree to implementation prior to the date, specified in part I of Annex 6, paragraph 6.18, may publish by NOTAM or in their respective AIP that there is no requirement for ACAS equipage in their sovereign airspace. Such States are not required to file a difference with ICAO.

4.1.15 The meeting noted that to implement ACAS II within the MID Region, it would be necessary to amend both the EUR and MID/ASIS sections of Regional Supplementary Procedures (Doc 7030). It was agreed that MIDANPIRG act as the originator for the amendment proposals.

4.1.16 The ATM/AIS/SAR Sub Group did not recommend any exemptions from these requirements. In both Europe and Asia, it has been necessary to issue exemptions for continued use of TCAS version 6.04a, because of problems with the availability of TCAS version 7 (which is the version compliant with the ACAS II SARPS in Annex 10). The transition period during which these exemptions apply was to expire on 31 March 2001. The observer from Eurocontrol indicated that this was a firm date. No further extensions would be granted.

4.1.17 The meeting agreed that with an implementation date of 1 July 2001, there should be no requirement for exemptions in the MID Region.

Evaluation of RVSM and other options for reducing congestion in the MID region

4.1.18 MIDANPIRG/5, in Decision 5/3, had tasked the ATM/AIS/SAR Sub-Group to investigate how an evaluation of the relative merits of RVSM and other methods of reducing congestion, such as changes to the route structure (including the introduction of RNP) or the introduction of improved surveillance capability, could be undertaken using resources available within the region.

4.1.19 The Sub-Group had discussed the relative merits of the various options, and noted that the benefits were not necessarily identical, therefore the most appropriate measure for alleviation of congestion could be different in different parts of the Region. In particular, the Sub-Group was of the view that in those areas of high-density traffic within the region where radar surveillance was not available, the introduction of radar should be the highest priority, as this could provide greater increases in capacity than either RNP routes or RVSM.

4.1.20 The meeting agreed that improved radar surveillance, RNP routes and RVSM were complementary measures, all of which would have application in different circumstances.

CONCLUSION 6/8 - PLANNING FOR CONGESTION REDUCTION MEASURES IN THE MID REGION

That,

- recognizing there are areas in the MID region carrying high density traffic where radar surveillance is not available;

- recognizing that the introduction of both RVSM and RNP would contribute to the reduction of congestion in the region, and that it will be necessary to implement both in the long term; and

- recognizing also that RNP is an option which can be implemented in the short term, whereas the introduction of RVSM will require a long and expensive implementation process;

the planning for measures to reduce congestion in the MID region should be based on the following principles.

a) Radar surveillance should be provided in areas of high traffic density where it is not yet currently available.

b) RNP routes and airspace should be introduced as soon as possible in those areas where this would contribute to reduction of congestion.

c) Plans for the introduction of RVSM should be harmonized with the plans for its introduction in neighboring regions, and in particular, should take into account the plans for its introduction in the western part of the Asia/Pacific region;

d) Planning for the introduction of RVSM should be commenced three years in advance of the intended implementation date.

4.1.21 The meeting noted that the planning for the introduction of RNP routes had already commenced, and that this would be discussed further under agenda item 4.3.

European RVSM and its interface with the MID Region

4.1.22 The meeting was given a presentation by the observer from EUROCONTROL describing the European RVSM program. The meeting expressed its appreciation to EUROCONTROL for the presentation, which had given a comprehensive overview of the scope and complexity of the RVSM implementation process.

4.1.23 The meeting noted that it had been necessary to undertake some re-organization of air routes, particularly in transition areas. Since the European RVSM program had assumed that the MID Region not be implementing RVSM until after the date for Europe, some of this air route re-organization could affect MID States. The program included a number of real-time simulations, and one of these simulations was to evaluate options for the EUR/MID interface. The MID States involved in this interface had been invited to participate in the simulation.

4.1.24 The observer from EUROCONTROL also briefed the meeting on the height monitoring program, and the relation of this to the safety assessment. He pointed out that the safety assessment could only be based on height monitoring data collected from aircraft which complied with the RVSM MASPS (Minimum Aircraft System Performance Specification), so although it was not necessary to monitor all individual airframes for approval purposes, EUROCONTROL had requested operators to obtain their RVSM approvals by 31 March 2001, in order that sufficient data from MASPS compliant aircraft would be available.

4.1.25 The major risks to achieving RVSM implementation in Europe by the target date were seen as:

a) Insufficient number of approved aircraft to be monitored by March 2001.

b) Lack of plans from aircraft operators on their RVSM equipage.

c) The late development and completion of Letters of Agreement in the interface area with the EUR RVSM airspace.

d) Lack of coordination on new routes and airspace procedures in the interface area with the EUR RVSM airspace.

4.1.26 In view of the above, EUROCONTROL was requesting all States, including those of the MID Region, to:

a) Make all efforts to support aircraft operators in their States to modify their fleets for RVSM and to obtain RVSM approvals;

b) Encourage aircraft operators to submit their plans on RVSM equipage to the EUROCONTROL User Support cell;

c) Ensure that the required Letters of Agreement with adjacent RVSM States are coordinated and completed in time for RVSM implementation; and

d) Ensure that the necessary changes in the route structure and airspace procedures are agreed as a matter of priority to ensure the safe transition of flights from RVSM airspace to the non-RVSM area and vice versa.

The ASIA/PAC RVSM TF/8 meeting

4.1.27 The meeting reviewed the outcomes of the Asia/Pacific RVSM TF/8 meeting, held in Hong Kong from 28 August to 1 September 2000, which had been attended by officers from the MID Regional Office and one MID State.

4.1.28 RVSM had been required since 24 February 2000 in the majority of Pacific FIRs. Planning was under way for the FIRs of the Western Pacific and South China Sea. The target date for introduction of RVSM in this airspace was 21 February 2002. The meeting had also discussed a proposal that RVSM be introduced for the major Asia/Europe traffic flows south of the Himalayas, which would result in RVSM being implemented in the Asian FIRs adjoining the MID Region.

4.1.29 No final decision was taken at the meeting about the target date for the introduction of RVSM for these traffic flows south of the Himalayas. The meeting did agree to undertake a data collection exercise in all the Asian States involved in this traffic flow, in order to carry out a preliminary readiness assessment. The meeting recognized that the ideal situation for the extension of RVSM further westward would be a co-ordinated introduction of RVSM in the FIRs of the western part of the Asia/Pacific Region and the Middle East Region. This would not only maximize the benefits for operators, it would also reduce the number of areas where transitions to/from RVSM to conventional levels would be necessary. It therefore requested the Secretariat to examine the possibility of appropriate MID States participating in the planned data collections, and also participating in at least some of the future meetings of the Task Force with the aim of achieving a co-ordinated implementation of RVSM for all the airspace involved in the major traffic flow from Asia to Europe south of the Himalayas.

4.1.29.1 It was agreed that participation in the planned Asia/Pacific data collection should be considered by the first meeting of the planned MID RVSM Task Force, however it was considered that the extent to which a coordinated implementation would be possible will depend on the implementation date chosen for this traffic flow by the Asia/Pacific Region, as it was unlikely that the MID Region would be able to complete all the planning and implementation requirements by 21 February 2002.

4.1.30 The meeting was also advised that the Asia/Pacific Region would invite all MID States to a RVSM seminar, to be held in February 2001. The seminar would cover ATC operational issues, airworthiness and operational approval, safety assessment and monitoring, and training requirements. The Airspace Safety Analysis and Monitoring Work Group of the ASIA/PAC RVSM Task Force also indicated that they would be prepared to do the analysis for a preliminary readiness assessment for the MID Region if the MID States concerned could provide the data. The meeting expressed its appreciation for this initiative.

RVSM implementation in the MID Region

4.1.31 The meeting agreed that planning for RVSM should be commenced as soon as possible, and that the target date for implementation should be 2003, on a date to be determined once the planning process is sufficiently advance for an accurate estimate to be made.

4.1.32 The meeting then discussed the need for a cost-benefit analysis as part of the planning process. IATA proposed that for the MID Region, it should not be necessary to undertake a detailed and potentially expensive cost-benefit analysis, noting that by 2003, the majority of aircraft operating through the region would require RVSM approval because of the European and Asia/Pacific requirements, and experience in both the North Atlantic and the Pacific had shown that costs associated with RVSM could be recovered in a very short time

4.1.33 It was also noted that in addition to the cost to operators of meeting RVSM requirements, there were costs which would be incurred by the ATS providers during the implementation process. This would include the cost of establishing and operating a height monitoring agency, and could also include the cost of retaining consultants to perform the safety assessments. A mechanism for funding these costs would have to be found.

4.1.34 The meeting then agreed to the following two Conclusions.

CONCLUSION 6/9- ESTABLISHMENT OF A MID RVSM TASK FORCE

That,

a) a Middle East RVSM Task Force be established with Terms of Reference as set out in **Appendix 4.1A** to the report on Agenda Item 4.1;

b) membership of this task force should comprise all MID States and IATA as an observer;

c) States should ensure that persons nominated to participate in the RVSM Task Force have the requisite expertise in the fields of ATC, airworthiness, flight operations and if possible, the techniques involved in safety studies; and

d) States should also ensure that there is continuity, to the maximum extent possible, in the membership of their delegations to the task force meetings.

4.1.35 The meeting was advised that information on both the European and Asia/Pacific RVSM programs is available via the internet. The addresses for the respective web sites are:

Europe: www.eur-rvsm.com

Asia/Pacific www.faa.gov/ats/ato/rvsm1.htm

CONCLUSION 6/10- TARGET DATE FOR THE INTRODUCTION OF RVSM IN THE MID REGION

That the target date for introduction of RVSM in the MID Region should be 2003, on a date to be determined as the planning for implementation proceeds.

The ATS Incident Analysis Task Force

4.1.36 The ATS Incident Analysis Task Force was established by Decision 5/26 of MIDANPIRG/5. The first meeting of the Task Force took place in Cairo on 14 October 1999. The Task Force had been established to address the issues raised in Recommendation 2/31 of the LIM MID (COM/MET/RAC) RAN meeting held in 1996.

4.1.37 The Task Force had first considered the results of a survey to determine the status of compliance with LIM MID RAN Recommendation 2/31. The status of compliance, updated on the basis of further information provided by States since the meeting, is shown in **Appendix 4.1B** to the report on Agenda Item 4.1.

4.1.38 It was agreed that the reporting and investigation of incidents by States would provide the foundation for any system of incident analysis, and that monitoring of compliance with LIM MID RAN Recommendation 2/31 would therefore need to be an on-going task.

4.1.39 The Task Force reviewed available information about the ICAO Accident/Incident Data Report (ADREP) data base, and work currently in progress in Europe to develop a classification system for ATS incidents. This indicated that while the ADREP system provided a comprehensive data base of accidents, at present there was little reporting of incidents. It was also noted that the available range of classifications included only a small number of ATS-related items. These latter two factors would limit its usefulness as a source of information for ATS incident analysis.

4.1.40 The Task Force also considered available information concerning a program initiated by EUROCONTROL to develop an ATM incident analysis system to monitor incidents and identify system related deficiencies. The meeting was advised that there had been close co-ordination with ICAO during the development of the classifications to be used in this system, and that these would be incorporated in a new version of the ADREP system, to be called ADREP 2000.

4.1.41 The Task Force agreed that if the required information was to be available through the new ADREP 2000 system, this would be preferable to setting up a separate data base at the regional level. ADREP already provided the ability to query the data base to extract all occurrences which met specified criteria, so once the expanded coverage of ATS related incidents became available, it should be possible to generate a report of all relevant incidents in the MID region for any specified time period. This would then provide the base data for the incident analysis process. The meeting considered that the progress of the developments both in Europe, and with the ADREP 2000 system, should be monitored and assessed before any decision regarding the establishment of a separate regional data base was taken.

4.1.42 The MIDANPIRG/6 meeting was presented with information on further developments which had occurred in relation to incident reporting and analysis since the task Force meeting. This indicated that the development of the enhanced EUROCONTROL classification system was now complete, and that it would be incorporated in ADREP 2000. The development of software tools for use with the enhanced data base was well advanced, and ICAO was investigating the possibility of obtaining the European software for use in headquarters.

4.1.43 The meeting agreed that it appeared that the ADREP 2000 system would provide the data needed for a regional incident analysis system, provided that the a sufficiently high proportion of ATS related incidents were reported and recorded in the data base.

4.1.44 The task force had been specifically requested to develop objectives for the proposed ATS incident analysis system, and to make recommendations regarding the method of carrying out the eed to the following conclusion:

CONCLUSION 6/11- OBJECTIVE OF THE REGIONAL ATS INCIDENT ANALYSIS SYSTEM

That the objective of the regional ATS incident analysis system should be to provide information on the frequency and nature of ATS incidents occurring in the MID region,

a) for use by the Regional Office and MIDANPIRG as a means of identifying air navigation shortcomings and deficiencies in the region, and

b) for use by States of the region in taking corrective action to rectify shortcomings and deficiencies in the State, the on-going development of their ATS systems, and for educational purposes.

c) a decision on the exact nature of the data to be analysed and the reports to be produced should be deferred until more information is available on the details of the ADREP 2000 system, and the ATM incident analysis system being developed by EUROCONTROL.

4.1.45 It was agreed that the information to be presented to MIDANPIRG should be in summary form. This would include information such as the frequency of occurrence and geographical distribution of particular types of incidents, and graphical presentation of trends over time. It was noted that the use of a classification system of the type being proposed by EUROCONTROL and for ADREP 2000 would make the task of generating this summary information easier, however it would be necessary to do some form of statistical analysis of the data.

4.1.46 The Task Force had recommended that the task of carrying out the incident analysis should be assigned to a small group of experts who would support the MID Regional Office in preparing reports on the frequency and nature of ATS incidents in the region for submission to MIDANPIRG, and had noted that IATA should participate in this group.

4.1.47 The meeting endorsed this concept. However it considered that, in view of the fact that the negotiations between ICAO, EUROCONTROL and the European Union concerning the eventual nature of ADREP 2000 are still in progress, it would be premature to establish the small group proposed by the Task Force.

4.1.48 Since the ATM/AIS/SAR Sub Group has the responsibility for monitoring ATS shortcomings and deficiencies, and making recommendations for improving air traffic services in the region, it was agreed that it should be assigned the responsibility of monitoring further global developments in the field of ATS incident reporting and analysis, making further recommendations regarding the desired composition of the proposed group which would carry out the analysis of data at a regional level, and the timing of the establishment of the group.

4.1.49 The meeting also noted that the development of the methodology would be only one of a number of tasks. It would be particularly important to address the question of how to ensure a sufficiently high level of reporting of incidents. The need to investigate and classify incidents as well as accidents would add to the workload of State accident and incident investigation authorities, so full compliance with the reporting and investigation requirements could take some time to achieve.

Proposals relating to ATS routes

4.1.50 Yemen presented a proposal to the meeting for two new ATS routes, one for traffic from -East Africa. Both these routes would reduce flight times for the traffic concerned.

4.1.51 The meeting noted that these routes would provide benefits for the operators. Yemen was requested to submit a proposal for these routes to the next ATM/AIS/SAR Sub-Group meeting. IATA supported the concept of the routes, and indicated that they would refer the proposal to the Joint Route Development Group.

4.1.52 Saudi Arabia also indicated that it is considering the implementation of additional routes between Yemen and the Gulf.

4.1.53 IATA then presented a review of operations on the dual route system for European traffic which had been established through Jeddah, Amman and Damascus FIRs, noting that operators had been reluctant to plan via the new route because of the increased distance and operational restrictions. The presentation included alternative proposals for this airspace with less distance penalties such as DAKWE-DAMASCUS-ROTAK or ASHIGAR to join the Saudi Arabian airway network.

4.1.54 Lebanon indicated that they had already commenced negotiations with Syria concerning the re-opening of the route to Damascus via DAKWE, which was part of the IATA proposal.

4.1.55 The meeting noted that the planning of this dual route structure had been a State initiative, and had been done through a series of informal coordination meeting between the States concerned. It was therefore proposed that a similar approach would be the most appropriate way of addressing these concerns, and the States involved were requested to consider convening a further informal meeting, with participation of IATA and ICAO.

4.1.56 IATA then made a presentation to the meeting on the Route Optimization Project being undertaken by its Joint Route Development Group. This presentation included data on the time and fuel penalties for existing routes from the MID Region to South-East Asia compared to optimum routes. It also included information on new routes, which would allow flight profiles closer to optimum, for both MID/ASIA and ASIA/EUR flights.

4.1.57 The meeting agreed that these proposals would best be dealt with by the ATM/AIS/SAR Sub-Group, and requested IATA to present them to that Sub-

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MIDANPIRG/6
Appendix 4.1A to the Report on Agenda Item 4.1

TERMS OF REFERENCE FOR THE MID RVSM TASK FORCE

1. Develop a comprehensive implementation plan for RVSM in the MID Region, taking into account the requirements of the *Manual on Implementation of a 300 M (1000 ft) Vertical Separation Minimum between FL 290 and FL 410 Inclusive (Doc 9574)*, and the requirements of users.

2. Identify any areas within the MID Region where it may not be feasible to introduce RVSM in the initial implementation.

3. Determine the extent to which a cost-benefit analysis is required prior to implementation of RVSM.

3. Coordinate with the bodies responsible for the implementation of RVSM in adjacent Regions in order to harmonize implementation plans.

4. Develop guidance material for RVSM operations in the MID Region, taking into account existing guidance material which has been developed by other regions.

5 Address any other matters, as appropriate, which are relevant to the implementation of RVSM.

STATUS OF COMPLIANCE WITH LIM MID RAN REC 2/31

IN STATES COVERED BY THE MID ANP

State	Status
Afghanistan	Response not received
Bahrain	Fully complies
Egypt	Fully complies
Iran	ATS incident reporting procedures in AIP
Iraq	ATS incident reporting procedures in ATS documents, but not AIP. Otherwise complies.
Israel	Response not received
Jordan	Response not received
Kuwait	Fully complies
Lebanon	Fully complies
Oman	Fully complies
Qatar	Response not received
Saudi Arabia	Fully complies.
Syria	Fully complies
United Arab Emirates	Response not received
Yemen	Response not received

REPORT ON AGENDA ITEM 4.2: MIDDLE EAST AIR NAVIGATION ISSUES- CNS

Review the Report of AFS/ATN Task Force Fifth and Sixth meetings

Routing Directory

4.2.1 The meeting noted that the AFS/ATN TF/5 and AFS/ATN TF/6 meetings reviewed the MID AFTN Routing Directory and updated it. The meeting was given also given information related to the changes that occurred in the existing AFTN Plan:

- The deletion of Muscat/Singapore circuit
- The implementation of Kuwait/Doha circuit on 100 bauds
- The implementation of Tehran/Karachi circuit on 200 bauds
- The upgrading of Bahrain/Abu-Dhabi circuit to 2.4 kbps
- The upgrading of Kuwait/Beirut circuit to 200 bauds

4.2.2 The ICAO Middle Regional Office will further up-date the Routing Directory with the latest information received from States before publishing the next edition in the beginning of year 2001.

4.2.3 The meeting also noted Decision 5/2 of AFS/ATN TF/5: Amendment of the current AFTN Routing Directory for the MID Region and agreed to restate Conclusion 5/3 as follows:

CONCLUSION 6/12- AMENDMENT OF TABLE COM1A (AFTN MID) DESIGNATED CIRCUITS REQUIRED FOR INTERNATIONAL OPERATIONS UNTIL THE RECOMMENDED FACILITIES ARE OPERATING SATISFACTORY

That based on the progress made in the implementation of the Rationalized AFTN Plan for the MID Region, developed by the LIM MID (COM/MET/RAC) RAN meeting (1996) and, subsequently approved by the Council of ICAO, table COM 1A for the MID AFTN Plan be amended with a view to deleting the circuits therein which are no longer required

4.2.4 The updated chart of existing AFTN circuits for the MID Region is attached at **Appendix 4.2A** to the report on the Agenda Item 4.2.

4.2.5 The meeting agreed on the improvement of the existing AFTN Plan on the basis of statistics of circuit availability, transit time and circuit loading which will be centralized by the MID Office and presented to the next MIDANPIRG AFS/ATN TF/7 meeting for decision to be taken on deletion of circuits that will be considered useless, up-grading of circuits that are not giving satisfaction or adding new circuits if needed.

4.2.6 In this regard, the meeting urged States, as a matter of urgency, to send the statistics of circuit availability and Transit Time to the Regional Office, according to Recommendations 6/2 and 6/3 of LIM MID RAN.

4.2.7 The meeting was provided with information about the introduction of the VSAT system in the Region where the terrestrial links between airports and national telecommunications service providers are deficient. Since this solution seems attractive, the meeting encouraged States and MID Office to further study the cost effectiveness and the technical feasibility of the use of VSAT in order to improve the quality of aeronautical communications in the Region.

4.2.8 The meeting noted that IATA maintains its reservations made at LIM MID RAN meeting concerning the rationalized AFTN Plan in the MID Region.

Inter-Regional CIDIN Issues

4.2.9 The meeting noted the establishment of a coordinating body in the MID Region designated to manage the CIDIN matters with the relevant Working Groups of EANPG AFSG. Based on the progress made in the implementation of CIDIN in the MID Region, the AFS/ATN TF/6 meeting estimated that it was advisable to develop a CIDIN Routing Directory in the same case as AFTN, and reached *Decision 6/1:*

Guidelines for an Evolutionary Transition to the ground-to-ground element of ATN

4.2.10 Since it was noted that there is some interest in the Region to introduce the OLDI (On Line Data Interchange) for ATC communications, the AFS/ATN TF/6 meeting estimated the need to evaluate the situation and status of the OLDI protocol, which was accepted by many European States.

4.2.11 The meeting noted *Decision 6/2: ESTABLISHMENT OF THE GROUND-TO-GROUND ATN STUDY GROUP* proposed by the AFS/ATN TF/6 to establish a Study group in order to progress in the choice of the right applications (OLDI or AIDC):

4.2.12 The meeting also noted with interest the initial approach proposed by the AFS/ATN TF/6 to plan the implementation of ATN in the MID Region. To do so, the meeting agreed on the guiding principles for an evolutionary transition to the ground-to-ground of the ATN as shown in **Appendix 4.2B** to the report on Agenda Item 4.2.

4.2.13 Taking into account that Part IV of the draft MID FASID does not yet contain tables relating to the ground portion of the ATN in the MID Region, the meeting agreed to restate the Conclusion proposed by AFS/ATN TF/6 as follows:

CONCLUSION 6/13- INITIAL PLAN FOR THE GROUND PORTION OF THE ATN IN THE MID REGION

That, tables 1, 2, 3, 4 and 5 and the explanatory note constitute the initial plan for the ground portion of the ATN in the MID Region and be included in the FASID as shown in **Appendix 4.2C** to the report on Agenda Item 4.2.

Assignment of frequencies in the MID Region

4.2.14 The meeting noted that the LIM MID RAN meeting (Cairo, 7 17 January 1996) noted that VHF frequencies assignment for the MID region should be done in co-ordination with ICAO Middle East Regional Office, Cairo and that accordingly, the Middle East Regional Office began assigning the VHF frequencies in 1996 both for Navigation and Aeronautical Mobile Service for the States in the MID Region.

4.2.15 The meeting also noted that there were very few problems encountered during this period. But lately the MID Regional Office noticed that the Gulf Co-operation Council (GCC) Telecommunications Bureau which acts as coordinator for Gulf States was not following the required procedures. It was assigning the frequencies to some States and informing ICAO Regional Office afterwards. Some of the frequencies assigned were found to be inadequate. It was also noted that some States do not provide all the necessary information required for the assignment of frequencies (coordinates, type of service, etc..)

4.2.16 The procedures to be followed in by States (or the co-ordinating bodies acting for them) are the following:

a) Send a letter to the MID Office requesting the assignment of a frequency for a determined service. The letter should state the following information:
   - Location
   - Type of service
   - Protection and transmitting power
   - Geographical coordinates
   - Category (ICAO or National)
   - Operation

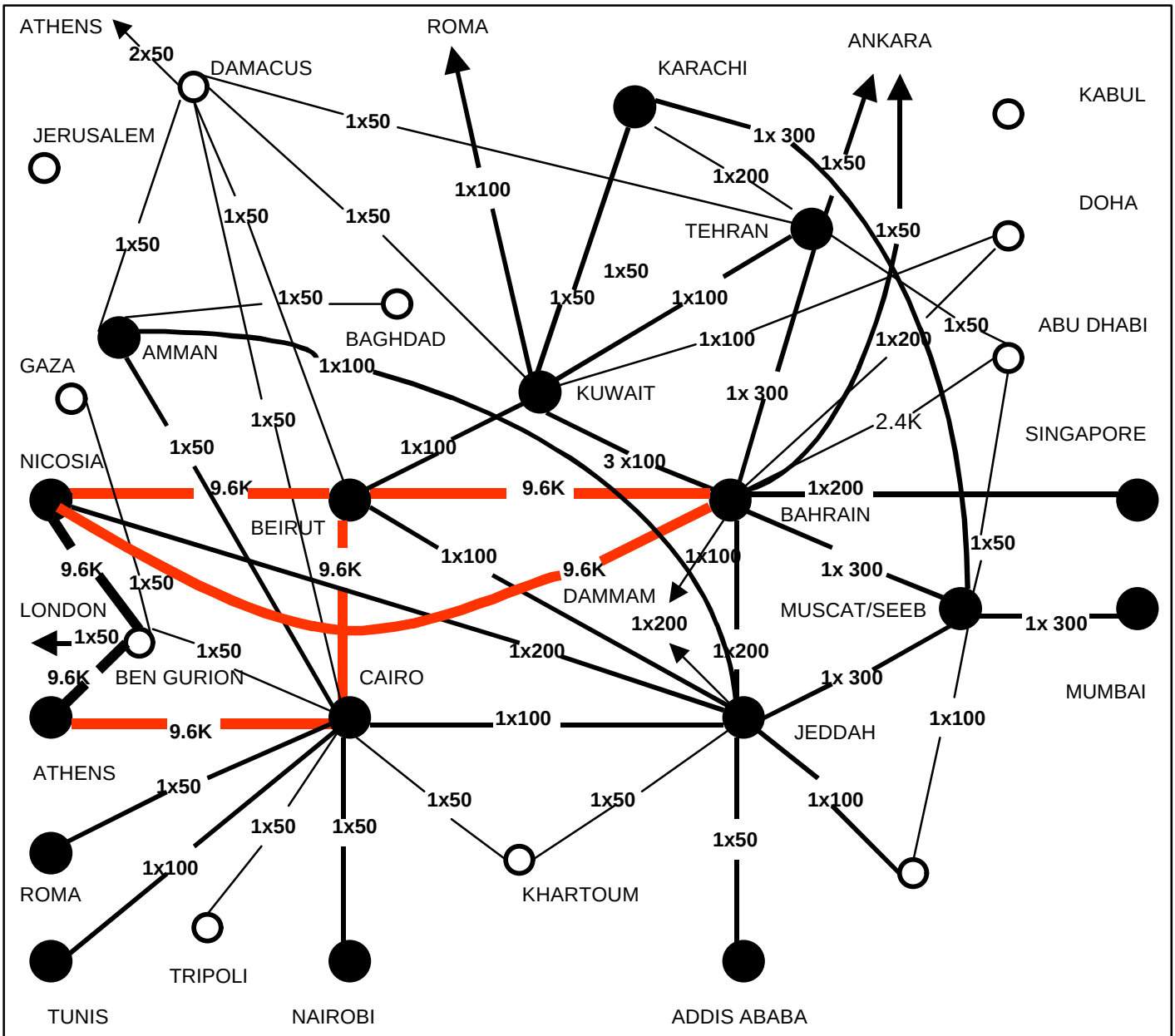
   The State may propose a frequency which it deems to be suitable.

b) When a frequency is assigned the State must inform the ICAO Office who publishes the list of frequencies where the State is listed giving all the above mentioned information. Additionally the State must inform the Middle East Office of its agreement and of the effective date of operation.

c) The State must also take the necessary measures relevant with its national administration in order to register the frequency with ITU.

4.2.17 The meeting agreed that the ICAO MID Office should remind the States of the Region to follow the procedures outlined in this report when requesting the assignment of VHF frequencies.

MIDANPIRG/6
Appendix 4.2A to the Report on Agenda Item 4.2



LEGEND	
MAIN AFTN COM CENTRE	●
TRIBUTARY AFTN COM CENTRE	○
CIDIN LINK	▬
MAIN CIRCUIT	─
TRIBUTARY CIRCUIT	┄

EXISTING AFTN PLAN FOR MID REGION SHOWING MAIN AFTN CENTRES AND TRIBUTARY CONNECTIONS

GUIDING PRINCIPLES FOR AN EVOLUTIONARY TRANSITION TO THE GROUND-TO-GROUND ELEMENT OF THE ATN

a) The ground part of the ATN would be implemented in an evolutionary and cost-effective manner.

b) The first phase of implementation should entail only ground-ground applications, specifically ATS message handling system (AMHS) and ATS inter-facility data communications (AIDC).

c) During the transition to the ATN, the current ATS data and voice communication systems should be improved as necessary, employing new technology to meet ANP operational requirements.

d) Routers could be interconnected by dedicated data circuit or by means of suitable digital networks that are either implemented or will be implemented in the MID Region.

e) The ground part of the ATN should be designed so as to facilitate smooth integration with the mobile sub-network of ATN in the future.

f) The topology of the ATN should be based on the ISO routing framework. As a first step, the administrative domains should be identified and the routing domains with each administrative domain be defined.

g) States/Organizations should agree on the implementation of router connections between ATN administrative routing domains. Routing policies should be established and implemented in a progressive manner.

h) States should establish, as soon as possible, adequate and well trained human resources who are qualified on current data communications and networking technologies in order to support ATN planning and implementation.

i) States should establish operational and engineering teams for ATN planning and implementation as part of the existing bodies dealing with the planning for domestic CNS/ATM systems implementation.

Accordingly, the ATN should be introduced in the MID Region as follows :

Phase One: AFTN Improvement

- Existing AFTN operations and network need to be examined taking into account the available infrastructure in order to introduce necessary improvement to the system. Improvement of AFTN will involve data integrity, reliability and speed by introducing digital communication circuits to replace the conventional low speed telegraphic circuits. It is essential to provide digital communications network that provides the infrastructure for the ground-to-ground element of the ATN.

Phase Two: Introduction of the ATN ground-to-ground applications & gateways

- During this phase, requirements for the introduction of ATS Message Handling system (AMHS) and ATS inter-facility data communication (AIDC) should be clearly defined. After AFTN systems upgrade and network improvements, the AMHS and AIDC implementation should take place. The AMHS can be implemented by using the gateway facility; (AMHS/AFTN Gateway & AMHS/CIDIN Gateway) this is to facilitate smooth transition to AMHS.

- The transition to use of the AFTN/ATN gateway should be also included in this phase. This involves the implementation of the AFTN/ATN gateways for connectivity between AFTN centres that are non-OSI compliant and ATN ground sub-network

- States that have AFTN/CIDIN capabilities in their centres and considering the introduction of the CIDIN/ATN/AMHS gateway should co-ordinate their planning for implementation. The specifications for CIDIN/AMHS gateway are expected to be published by the end of the year 2000.

Phase Three: Implementation of regional ATN ground-to-ground sub-network

- During this phase the implementation of the fully ATN compliant messaging environment and ATN routers shall be completed providing the ability for data exchange between OSI-compliant ATM processors. This should lead to the deployment of the full regional ATN ground-to-ground sub-network ready for the integration into the ATN air-to-ground sub-network.

- All the above activities need to be agreed between the States within the Middle East Region and have to be co-ordinated with the neighbouring regions to ensure improved inter-regional planning and compatibility with interfaced regions

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TABLE CNS 1B - AERONAUTICAL TELECOMMUNICATION NETWORK

EXPLANATION OF THE TABLE

Column:

1 Administrative-the name of the Administration, State or Organization responsible for management of the router

2 Location of Router-the name of location where the router is located

3 Type of Router
BBIS Backbone Boundary Intermediate System
BIS -- Boundary Intermediate System
IS -- Intermediate System

4 Address Prefix of Routing Domain

5 Target date of Implementation date of implementation of the router service

6 Type of routers interconnected

7 Type of Interconnection
Extra-Regional
Intra-regional
Inter-Domain
Backbone

8 Date of implementation of Interconnection

9 Location of AMHS-the name of location where the AMHS service is located

10 Type of AMHS

11 Type of AMHS interconnected

12 Date of implementation of the AMHS service

13 Location of AIDC the name of location where the AIDC service is located

14 AIDC connected to peer AIDC application

15 Date of implementation of the AIDC service

TABLE 1- Domains and Routers

Domain	Location for Router ID	Router Type	RD address prefix	Installation date
1	**2**	**3**	**4**	**5**

TABLE 2- Interconnections

Domain	Location for Router ID	IS connected to IS/BIS at	Type of Connection	Interconnection Installation date
1	**2**	**6**	**7**	**8**

TABLE 3- AMHS Applications

Domain	Location for AMHS ID	AMHS Type	AMHS connected to	AMHS Installation date
1	**9**	**10**	**11**	**12**

TABLE 4- AIDC Applications

Domain	Location for AMHS	Location for AIDC ID	AIDC connected to	AIDC Installation date
1	**9**	**13**	**14**	**15**

TABLE 5 - ATN Plan

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Domain	Location for Router ID	Router Type	RD address prefix	Router Installation date	IS connected to IS/BIS at	Type of Interconnection	Interconnection date
	9	**10**	**11**	**12**	**13**	**14**	**15**
	AMHS Location	AMHS Type	AMHS connected to	AMHS Installation date	AIDC ID	AIDC connected to	AIDC Installation date

REPORT ON AGENDA ITEM 4.3- MIDDLE EAST AIR NAVIGATION ISSUES- CNS/ATM

4.3.1 The GNSS Task Force also considered a number of airworthiness and flight operations issues relating to the implementation of GNSS. It was noted first that the MIDANPIRG/5 meeting had, in Conclusion 5/19 stated, inter alia, that a high priority should be given to the implementation of GNSS as a supplemental means of navigation in the Middle East Region. Although the information presented to the Task Force meeting indicated that a number of States in other regions had now approved GNSS as a primary means of navigation, the meeting considered that approval of GNSS as a supplemental means navigation system would still be the most appropriate initial step for the MID Region, as this would allow States and operators of the Region to gain experience with GNSS before approving it as a primary means.

Legislative and Regulatory Requirements

4.3.2 In most Middle East States, GNSS is not at present an approved means of navigation. Prior to the implementation of GNSS in the Region, it will therefore be necessary for all States which have not already addressed this issue to examine their legislation and regulations to identify introduce any changes which may be needed in order to authorize the use of GNSS as a means of navigation within their airspace.

4.3.3 There could be considerable variation in the nature of the amendments required, as this will depend on the structure of the legislation and regulations in each State.

Airworthiness and operational approval

4.3.4 The development and implementation of procedures for airworthiness and operational approval of GNSS is a State responsibility. The Task Force noted that there was no ICAO guidance material available for these approval procedures, however there were a number of examples available from States, which had already implemented GNSS. These could be used by MID States as a basis for development of their own approval procedures. Some reference material from other States was provided for the Task Force meeting, and the Regional Office had since distributed a more detailed list of reference documents to all MID States.

4.3.4.1 The U.A.E. advised that it had already obtained copies of a number of these documents, and had used them in the development of GPS non-precision approach procedures, which would be implemented as soon as pilot and ATC training was completed.

4.3.5 The meeting agreed that the approval of GNSS for en-route use, in particular, should be treated as high priority, because there were now a significant number of GPS equipped aircraft operating in the region. It was also pointed out that a number of aircraft, including some operated by airlines of the Middle East Region, were using GNSS as the means of meeting the BRNAV/RNP 5 requirements for operations to Europe. It was, nevertheless, considered that the target date then in the regional CNS/ATM plan was unrealistic, and the task force proposed a change to this. The MIDANPIRG/6 meeting agreed to this new target date, which is reflected in the following Decision:

DECISION 6/14 - TARGET DATE FOR THE APPROVAL OF GNSS AS A SUPPLEMENTAL MEANS NAVIGATION SYSTEM IN THE MID REGION

That

a) the regional target date for implementation of GNSS for en-route and non-precision approach, as shown in Table 10-1 of draft version 6 of the CNS/ATM Implementation Plan for the Middle East Region, should be amended to 2002; and

a) this target date should be reviewed by the next meeting of the GNSS Task Force in association with Decision 6/17, in order to confirm its feasibility, and to determine an AIRAC date for implementation.

4.3.6 The Task Force noted that ICAO Circular 267, Guidelines for the Introduction and Operational Approval of the Global Navigation Satellite System (GNSS), contained a recommended approach to GNSS implementation planning by States which included the setting up a multidisciplinary implementation team. It was agreed that it would be beneficial if all States adopted the approach outlined in this circular. The meeting then produced the following conclusion:

CONCLUSION 6/15- IMPLEMENTATION OF GNSS FOR EN-ROUTE AND NON-PRECISION APPROACH

That, recognizing that MIDANPIRG/5 Conclusion 5/19 placed a high priority on the implementation of GNSS as a supplemental means navigation system, all States which have not already done so be urged to:

a) identify regulatory and legislative changes which will be needed to authorize the use of GNSS as a supplemental means navigation system in their airspace for both en-route and non-precision approach;

b) establish multidisciplinary GNSS implementation teams, using section 6.10 of ICAO Circular 267, Guidelines for the Introduction and Operational Approval of the Global Navigation Satellite System (GNSS), as a guide; and

b) work towards the identification and implementation of all requirements for the introduction of GNSS as a supplemental means system for en-route navigation, and non-precision approach where required, by the end of 2001, taking into account user requirements.

4.3.7 It should be noted that while Decision 6/15 specifies only the year of intended implementation, the intention is that supplemental means GNSS should be introduced as early as possible in the year 2002. It is for this reason that States are urged to complete all the pre-requisites by the end of 2001.

4.3.8 While the implementation of GNSS as a supplemental means navigation system was seen as the highest priority, the meeting agreed that there was a need for a work program for the development of the requirements for GNSS beyond supplemental means. This work program would need to ensure that all the points in MIDANPIRG/5 Conclusion 5/19 were adequately addressed, and its development should be a task for the next meeting of the Task Force.

DECISION 6/16 FURTHER WORK REQUIRED FOR GNSS IMPLEMENTATION

That the GNSS Task Force be tasked to

a) develop a plan, with milestones, outlining the requirements needed to approve GNSS as a supplemental means navigation system in the MID Region and to eventually progress to primary means, including consideration of the need for monitoring, a means of alerting, RAIM prediction programs, WGS-84 implementation and institutional issues; and

b) identify the most efficient way to meet the above mentioned requirements in a regional framework.

Inter-Regional Satellite Test-Bed (ISTB) for MID Region

4.3.9 The meeting noted GNSS TF *Decision 2/3* : *Establishment of MID Region Action Group for Implementation of Inter-Regional Satellite Test-Bed (ISTB)* according to MIDANPIRG/5 *Decision 5/18: Implementation of Inter-Regional Satellite Test-Bed(ISTB) for the MID Region* assigning the GNSS Task Force to designate an Action Group to carry-out the tasks outlined in Appendix 3P to the MIDANPIRG/5 report.

4.3.10 The meeting also recorded the participation of two new members completing to eight experts the composition of the Action Group, the number of members was limited in order to make the work of the Action group more efficient.

4.3.11 The meeting agreed with the decision of GNSS TF/2 to start with the issues related only to ISTB, in order to get sufficient expertise and assess what benefits the MID region could gain from these trials

4.3.12 The meeting also noted, in the framework of European Commission Policy, the formal offer made by ENAV (Italy) to procure three EGNOS Test Bed reference stations for early SBAS trials in the MID region. Simulations will be performed by ESA to provide more information on the suitable locations of the above stations, on the basis of a preliminary plan to assure the EGNOS Test Bed service coverage; it is recalled that the objective of these trials is to reach the near CAT 1 accuracy requirements by EGNOS system in the MID Region.

4.3.13 The meeting was informed that the demonstrations and trials could be implemented at the end of year 2000 and could take about a week; before this period, the Action Group will meet in Cairo 30-31 October 2000, to better define the overall plan of the trials.

4.3.14 The meeting also noted that hosting Civil Aviation Authorities would sustain the operational costs in terms of human resources, suitable site, power supply, surveillance of the equipments, and logistic support.

4.3.15 The attention of the meeting was drawn on the fact that operation activities will be split into two main groups:

- running activities, related to the flight tests performance
- analysis activities, related to the post processing evaluation of the performance reached considering the proposed objectives

RNP/RNAV TF/4 meeting

4.3.16 The fourth meeting of the MIDANPIRG RNP/RNAV Task Force was held in Cairo from 6-8 June 2000. The main tasks for this meeting were to determine the priority routes for the initial introduction of RNP 5, finalize the arrangements for navigation error monitoring, and complete any other outstanding matters relating to the introduction of RNP 5.

4.3.17 The Task Force had first reviewed the results of a survey undertaken by the MID regional office to determine the status, within the States of the region, of development of procedures for issuing RNP 5 approvals to operators. The results of the survey can be summarized as follows:

Status of RNP 5 Approval Procedures	No of States
Approval procedures in place	7
Approval procedures under development	2
Development not yet commenced	3
Reply not received	3
Total	15
No. of operators to whom approvals had been issued	26

4.3.18 The Task Force had also raised the question of guidance material for RNP approval, noting that while general guidance relating to RNP was available in the Manual on Required Navigation Performance (RNP) (Doc 9613), there was no ICAO guidance material relating to airworthiness and operational approval for RNP operations. It was agreed that it would be desirable to have ICAO guidance material, and it was noted that the Review of the General Concept of Separation Panel (RGCSP) had commenced the development of this, however it was not expected that ICAO guidance material on this topic would be available prior to the planned introduction of the first RNP 5 routes in the MID region.

4.3.18.1 It was further noted that in the absence of ICAO guidance material, States could use the procedures developed by the European Joint Airworthiness Authority (JAA), and the United States Federal Aviation Administration (FAA) as guidance.

Identification of priority routes for the introduction of RNP 5

4.3.19 The meeting then proceeded to address the question of the priority routes for initial introduction of RNP 5. It was agreed that the recommended approach would be a progressive introduction of RNP 5 route by route basis, and that the meeting should confine itself to determining a minimum set of RNP 5 routes which would provide benefits for major traffic flows, however individual States which had a need to introduce RNP 5 requirements for all airspace within designated areas would still be able to do this.

4.3.20 The routes which will be designated as RNP 5, for the Phase 1 implementation are shown in the table in **Appendix 4.3A**, and in the chart in **Appendix 4.3B** to the report on Agenda Item 4.3.

4.3.21 In Phase 1 of implementation, there will be no reduction in track spacing based on RNP 5. With the exception of UR219 and A791/G462 (which are existing VOR/DME routes), the designated RNP routes are single routes. It was also agreed that in general, the designated routes should be declared RNP 5 only above FL 285. Where circumstances required it, a different lower limit could be specified provided that the appropriate coordination was undertaken with adjacent States.

CONCLUSION 6/17- PRIORITY ROUTES FOR THE INTRODUCTION OF RNP 5

That,

a) States concerned should implement RNP 5 on the routes listed in **Appendix 4.3A** to the report on Agenda Item 4.3, on 22 March 2001;

b) States may implement RNP 5 on additional routes on this date where further discussions indicate that this would be beneficial, noting in this regard the requirements of section 5 of the Middle East Implementation Plan for the Introduction of RNP/RNAV relating to advance notice and consultation with users;

c) On the designated routes or within designated airspace, the RNP 5 requirement should apply to all flights above FL 285, except where particular circumstances require the specification of a different lower limit; and

d) The proportion of RNP 5 approved aircraft operating in the region should be reviewed periodically, with a view to extending both area of applicability of RNP 5, and the level bands to which it applies.

4.3.22 In Phase 2 of implementation, consideration will be given to the introduction of additional routes, including one-way route systems. The Task Force agreed that the routes to be included in this next phase should be determined at its next meeting, and that the target date for Phase 2 should be March 2002. It was noted that Phase 2 could include not only additional routes, but also the introduction of reduced separation based on RNP 5. This would require the consideration of factors additional to those applicable to Phase 1, such as communications, safety analysis and route complexity. It would therefore be necessary for the Task Force to develop a work program to address these issues.

Establishment of a regional navigation error monitoring system

4.3.23 The Guidance Material on Implementation of RNP/RNAV in the Middle East Region. (contained in Appendix 3Q to the report of MIDANPIRG/5) requires the establishment of a system for monitoring navigation errors in airspace where RNP requirements are introduced.

4.3.24 The Task Force noted that, in order to implement these monitoring procedures, it would be necessary to:

a) establish Letters of Agreement (LOA) relating to monitoring between all the States involved, using the model in Attachment A of Appendix C of the Guidance Material;

b) establish a monitoring agency to collate and analyse the data obtained from the monitoring process;

c) define the designated monitoring points on which the estimation of error rates would be based; and

d) incorporate the monitoring procedures in local instructions for controllers, and ensure that staff are trained in the procedures.

4.3.25 It was noted that the United Arab Emirates offered, at the Task Force meeting, to provide the Central Monitoring Agency function for the region. This offer was accepted with appreciation by the meeting.

4.3.26 The Task Force had agreed on the details of the LOA, and it had been circulated to all the participating States prior to the MIDANPIRG/6 meeting for final approval. It was signed by four of the participating States during the meeting, and was to be circulated to the remaining States for their signatures by the Regional Office immediately following the meeting. The Task Force had also determined the monitoring points to be used for the routes included in the Phase 1 implementation.

CONCLUSION 6/18 - IMPLEMENTATION OF NAVIGATION ERROR MONITORING

That all States involved in the initial implementation of RNP 5 routes should ensure that:

a) the necessary mechanisms for the recording and notification of gross navigation errors, as described in Appendix C of the Guidance Material on Implementation of RNP/RNAV in the Middle East Region are put in place prior to 22 March 2001; and

b) all staff who will be involved in the monitoring process are given appropriate training prior to the same date.

4.3.27 The Task Force then conducted a review of the implementation checklist contained in the *Middle East Implementation Plan for the Introduction of RNP/RNAV*. This review indicated that the majority of items, which would be required for the Phase 1 implementation, had been satisfactorily addressed. In particular, it was noted that all the five States involved in Phase 1 had completed implementation of WGS-84 for en-route points. It was also agreed that, as there would be no reduction in separation minima, there would be no requirement to introduce new contingency procedures. However there was one item which would require further action. The survey of RNP approval had indicated that little more than half of the States of the Region had developed approval procedures or commenced their development. This would be an urgent issue for those States which had not yet begun development if their operators wished to fly on the designated RNP 5 routes.

CONCLUSION 6/19 - DEVELOPMENT OF AIRWORTHINESS AND OPERATIONAL APPROVAL PROCEDURES FOR RNP 5

That, noting that the issuing of airworthiness and operational approvals for RNP 5 is the responsibility of the State of Registry or State of the Operator:

a) All States which have not yet developed procedures for issuing RNP 5 approvals should assign the development of these procedures a high priority; and

b) The following documents may be used as guidance in the development of these procedures:

FAA Advisory Circular AC 90-96, Approval of U.S. operators and aircraft to operate under instrument flight rules in European airspace designated for Basic Area Navigation (BRNAV/RNP 5)

JAA Temporary Guidance Leaflet No. 2, Guidance material on airworthiness approval and operational criteria for the use of navigation systems in European airspace designated for Basic RNAV operations.

4.3.27.1 It should be noted that the FAA and JAA documents referred to above include GPS as one of the means of satisfying RNP 5 requirements.

4.3.28 The meeting also noted that while IATA had been involved in the planning process for RNP routes, there would still be a need for States to take more formal action to notify operators of their intent to introduce RNP 5 requirements.

CONCLUSION 6/20- NOTIFICATION OF INTENTION TO INTRODUCE RNP 5 ROUTES

That all States involved in the initial implementation of RNP 5 routes should, as soon as possible, issue an AIC notifying their intent to introduce RNP 5 requirements on these routes. These AICs should include the planned implementation date and the level band within which the requirement would apply.

4.3.29 Amendments to Regional Supplementary Procedures (Doc 7030) to introduce provisions relating to RNP 5, were drafted by the Task Force. It was agreed that these would be originated by the States involved in the Phase 1 implementation. These amendments were based on the existing procedures on the European section of Doc 7030.

4.3.30 The Task Force had also considered the method of annotating RNP requirements on charts. It was noted that there was as yet no guidance on this in the Aeronautical Chart Manual (Doc 8697). The meeting had been advised that this matter was under consideration by the AIS/MAP Study Group (AISMAPSG), and it was expected that guidance would be published in the next edition of Doc 8697, but it was not expected that this would be available until some time in 2001. The meeting was, however, presented with recommendations from the AIS/MAP section in ICAO headquarters concerning procedures which could be used in the interim.

4.3.31 The meeting agreed that these procedures should be adopted by States in order to provide uniformity within the Region, and agreed to the following Conclusion:

CONCLUSION 6/21- ANNOTATION OF RNP REQUIREMENTS ON CHARTS

That until such time as guidance material relating to the annotation of RNP requirements on charts is published in the Aeronautical Chart Manual (Doc 8697), the following procedures should be adopted by States of the MID Region:

a) Where an RNP requirement applies to all routes within the boundaries of some defined airspace, the chart should contain a conspicuous note indicating the RNP requirement, and the vertical limits within which it applies.

b) Where the RNP type is applicable only to individual routes or route segments, the RNP type should be indicated in association with the route designator in each applicable segment. Where the RNP requirement applies to all levels on the route, the RNP requirement should precede the vertical limits. Where the RNP requirement applies only to certain flight levels, the vertical limits for the route should be specified first, followed by the RNP requirement, followed by the vertical limits within which the RNP requirement applies.

4.3.33.1 **Appendix 4.3C** and **Appendix 4.3D** to the report on Agenda Item 4.3 show examples of these procedures.

4.3.34 During the review of actions required prior to implementation of RNP routes, The Task Force had noted that there were existing contingency procedures in the section 4.0 of the MID/ASIA/RAC Supplementary Procedures. It appeared that these procedures had been designed for use in oceanic airspace in the Asian region, but as no area of applicability had been specified, they would also apply within FIRs of the MID Region. Some of the procedures, in particular the requirement to divert 25 NM off track in certain circumstance where an emergency descent was necessary, would not be appropriate in this region.

4.3.35 The Secretariat advised that this matter had been discussed with the Asia/Pacific Regional Office, which would be originating an amendment to Regional Supplementary Procedures which would limit the application of these procedures to the appropriate FIRs in the Asia/Pacific Region.

CNS/ATM SG/4 Meeting Report Review

4.3.36 The meeting was presented with the summary report of the fourth meeting of CNS/ATM Sub-Group in which six Conclusions and one Decision were taken and submitted to MIDANPIRG for approval.

4.3.37 *Decision 5/34: Establishment of A MID Region Multinational Facilities and Services Task Force.* In conjunction with this Decision, the meeting was informed about the intention of the ICAO MID Regional Office to conduct a Special Implementation Project (SIP) for the MID Region targeting initially the GCC States i.e. Bahrain, Kuwait, Oman Saudi Arabia and UAE. It should be noted that the ICAO Council have approved the MID SIP. The meeting was also informed that the SIP Team would visit GCC States that have FIRs, and may also visit the GCC headquarters in Riyadh, Saudi Arabia.

4.3.38 In the same context LGS/ANS of Latvia, made a presentation to the meeting describing their approach to the management of multinational facilities and services. The meeting found the information provided very valuable for the implementation of SIP in the MID Region.

4.3.39 While reviewing the outcomes of the ATM/AIS/SAR and MER TFG/3 meetings relevant to CNS/ATM Planning and Implementation, the meeting considered conclusions from ATM/AIS/SAR meeting, and the implications for CNS/ATM planning were noted. In this regard the meeting agreed on the following Conclusions and Decisions as forwarded from the CNS/ATM SG/4 meeting:

CONCLUSION 6/22 - TRAFFIC FORECASTING REQUIREMENTS FOR CNS/ATM PLANNING

That in order to provide additional information for airspace planning activities, the Traffic Forecasting Group be requested to:

a) include the following additional items, for all flights, in the data collected and recorded in its data base:

i) Whether the aircraft is RNAV capable;

ii) Whether the aircraft is equipped with ADS and CPDLC, as indicated in field 10 of the ICAO FPL message; and

b) make provision in its forecasting procedures for forecasts relating to Haj traffic, as well as forecasts for normal scheduled flights; and

c) include forecasts for traffic overflying the region, as well as traffic landing at or departing from airports within the region, as soon as possible.

CONCLUSION 6/23 - SUB-REGIONAL APPROACH TO CNS/ATM IMPLEMENTATION

That,

recognizing the implementation of CNS/ATM in accordance with the Regional Plan is ultimately a State responsibility;

recognizing that the CNS/ATM environment should provide seamless transitions across national boundaries, and that the achievement of this will require co-ordination of State CNS/ATM implementation plans;

recognizing that some of the States with which co-ordination will be required will be States of adjacent ICAO Regions; and

recognizing also the importance of implementing joint financing mechanisms for the funding of CNS/ATM systems with applicability beyond the boundaries of any one State;

a) The planning for the introduction of CNS/ATM should be co-ordinated through informal sub-regional working groups;

b) Membership of a working group should include all those States within the sub-regional area under consideration; and

c) ICAO and IATA should participate in these working groups as observers.

DECISION 6/24 - FINANCING OF CNS/ATM IMPLEMENTATION

That, recognizing that the implementation of CNS/ATM will necessitate the establishment of mechanisms for the sharing of costs of facilities and services with applicability beyond the boundaries of any one State, the development of multinational financing arrangements, and the development of the section of the regional CNS/ATM plan relating to financial issues, should be afforded a high priority in the work program of MIDANPIRG and its supplementary bodies.

DECISION 6/25 - DEVELOPMENT OF REGIONAL CNS/ATM TRAINING REQUIREMENTS

That a CNS/ATM Training Task Force should be established, and tasked to develop a detailed statement of the CNS/ATM training requirements for the MID Region, for incorporation in the regional CNS/ATM plan.

CNS/ATM Regional Plan

4.3.40 The meeting was presented with the latest CNS/ATM Implementation Plan for the Middle East Region First Edition, September 2000 which was adopted and attached as **Appendix 4.3E** to the Report on Agenda Item 4.3. IATA presented their latest version of IATA/AACO User-Driven CNS/ATM Transition Plan for the Middle East Region.

4.3.41 The meeting noted that there were some inconsistencies in the timelines in the CNS/ATM Implementation Plan for the Middle East Region Draft Version 6, and, urged States that had not yet submitted their Plan and those who have updates, to submit them as soon as possible to the ICAO MID Regional Office in order to be incorporated in the next version of the CNS/ATM Implementation Plan for the Middle East Region. It was also noted that progressive application of the eleven steps process as indicated in the Global Plan, requires the harmonization of plans, within the MID Region and with neighbouring Regions.

4.3.42 Noting that the CNS/ATM Implementation Plan is a living document which is subject to regular updating, the meeting formulated the following Conclusion:

CONCLUSION 6/26 - ADOPTION OF THE CNS/ATM PLAN FOR THE MIDDLE EAST REGION

That, the CNS/ATM Implementation Plan for the Middle East Region First Edition September 2000 be adopted.

Change of Title and Revised terms of reference for the Middle East CNS/ATM Sub-Group (CNS/ATM SG)

4.3.43 The meeting was informed that in order for the CNS/ATM Sub-Group to properly progress towards focusing on the implementation of the CNS/ATM Systems, in coordination with providers, users and international organizations, the title of the Sub-Group and its terms of reference will have to be revised to incorporate such a change in the method of work by the Sub-Group. Moreover, it was suggested that, the new title of the CNS/ATM Sub-Group should be Communications, Navigation and Surveillance/Air Traffic Management/Implementation Coordination/ Sub-Group (CNS/ATM/IC/SG), revised terms of reference to incorporate this change is provided in **Appendix 4.3F** attached to the report on Agenda Item 4.3.

4.3.44 The meeting in connection with the above, agreed to the changes that were provided by the Secretariat as indicated in **Appendix 4.3F** attached to the report on Agenda Item 4.3 and consequently developed the following Decision:

DECISION 6/27- NEW TITLE AND REVISED TERM OF REFERENCE FOR THE CNS/ATM SUB-GROUP

That, the MIDANPIRG approves the new title CNS/ATM/IC/SG and the revised terms of reference as presented in **Appendix 4.3F** attached to the report on Agenda Item 4.3, in order to incorporate changes in the method of work by the Sub-Group, indicating the progress towards focusing on the implementation of the CNS/ATM Systems.

Environmental benefits associated with the implementation of CNS/ATM systems

4.3.45 The meeting noted that early implementation of CNS/ATM systems offers an effective

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Aviation Environmental Protection (CAEP), attention was drawn to the need to establish a common methodology to assess the environmental benefits of CNS/ATM systems, as a means of avoiding a proliferation of different methodologies. The CAEP also addressed the importance of having the environmental aspects included among the relevant considerations to be taken into account when defining the implementation of CNS/ATM systems, i.e. in the business cases.

4.3.46 The meeting noted that the final methodology for quantification of CNS/ATM Environmental benefits is expected to be presented to the fifth meeting of the CAEP (Montreal 6- 17 January 2001) for approval.

4.3.47 In light of the discussion, the meeting developed the following Conclusion:

CONCLUSION 6/28- ENVIRONMENTAL BENEFITS OF CNS/ATM SYSTEMS

That States take the environmental benefits, among other considerations, into account in the development of business cases for the implementation of CNS/ATM systems.

MIDANPIRG/6
Appendix 4.3A to the Report on Agenda Item 4.3

PRIORITY ROUTES FOR INITIAL INTRODUCTION OF RNP 5

1. JEDDAH R775 DANAK

2. CAIRO A411 SHM WEJH

3. PASOS G183 EL ARISH TABA NUWEIBA DCT NIMAR G662 HAIL G662 RIYADH DCT HAIMA

4. TURAIF UR219/R219 MAROB

5. AL SHIGAR G662 HAIL A791 KING FAHAHD G462 IZKI G462 SUR

6. SHARJAH DCT SHIRAZ DCT UROMIYEH DCT DASIS

7. SHIRAZ DCT ULDUZ

8. KAMAR DCT RASHT DCT DASIS

Note: 1. Precise alignment of these routes may be subject to change as coordination between States for detailed implementation planning proceeds.

2. Route No. 5 was proposed by IATA and is an existing parallel route to R 219.

MIDANPIRG/6
Appendix 4.3E to the Report on Agenda Item 4.3

INTERNATIONAL CIVIL AVIATION ORGANIZATION
Middle East Regional Office

CNS/ATM IMPLEMENTATION PLAN
FOR THE MIDDLE EAST REGION

FIRST EDITION - SEPTEMBER 2000

FOREWORD

This plan has been developed by the Middle East Air Navigation Planning and Implementation Regional Group (MIDANPIRG) and its subsidiary bodies. It should be read in conjunction with the ICAO *Global Air Navigation Plan for CNS/ATM Systems*.

The Global Plan describes the world-wide strategy for the transition to the CNS/ATM environment, and explains the planning principles to be adopted. Material presented in the Global Plan is not, in general, repeated here. Some extracts from the Global Plan have been included as appendices, where it was felt that having ready reference to the material in this document would be useful.

The first part of this plan, comprising chapters 1 to 6, address general principles and the characteristics of air traffic and ATS systems in the MID region. The second part, comprising chapters 7 to 12, presents the regional implementation plans and timescales for the introduction of the various elements of CNS/ATM in the MID Region.

The following topics are not, at this stage, included in this Regional Plan:

Meteorology

Aeronautical Information Services

Legal, Institutional and Financial issues

Cost-Benefit Analysis

For information on the above topics, refer to the appropriate section of the Global Plan. Region-specific information on these and other topics will be added in future versions of the plan, as appropriate. In particular, as action is taken to strengthen the expertise of the PIRGs in the legal, institutional and financial areas, it could be expected that regional plans relating to these aspects of CNS/ATM will be developed.

This plan has been developed within the general framework of the ICAO *Air Navigation Plan - Middle East Region, Doc 9708* (the MID ANP), which already contains information relating to the institutional and financial aspects of the provision of multi-national services and facilities.

The MID ANP is to be replaced by a new MID Basic ANP, and a MID Facilities and Services Document (FASID). As development of these new documents proceeds, appropriate information from this plan will be incorporated into these documents.

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GLOSSARY OF TERMS

AAC	Aeronautical Administrative Communication
AACO	Arab Air Carriers Organization
ABAS	Aircraft Based Augmentation System
ACARS	Aircraft Communications Addressing and Reporting System
ACAS	Airborne Collision Avoidance System
ACC	Area Control Centre
ADS	Automatic Dependent Surveillance
ADS B	Automatic Dependent Surveillance Broadcast
ADSP	Automatic Dependent Surveillance Panel
AFTN	Aeronautical Fixed Telecommunication Network
AIDC	ATS Inter-facility Data Communication
AIS	Aeronautical Information Services
ALLPIRG	Advisory Group and All Planning and Implementation Regional Group
AMCP	Aeronautical Mobile Communications Panel
AMHS	Aeronautical Message Handling System
AMS(R)S	Aeronautical Mobile-Satellite (R) Service
AMSS	Aeronautical Mobile-Satellite Service
ANC	Air Navigation Commission
AOC	Aeronautical Operational Control
APC	Aeronautical Passenger Communications
AR	Air Route Area
ARINC	Aeronautical Radio, Inc.
ASAS	Airborne Separation Assurance Systems
ASM	Airspace Management
A-SMGCS	Advanced Surface Movement Guidance and Control System
ATARSG	Automatic Air Reporting Study Group
ATC	Air Traffic Control
ATFM	Air Traffic Flow Management
ATIS	Automatic Terminal Information Service
ATM	Air Traffic Management
ATN	Aeronautical Telecommunication Network
ATNP	Aeronautical Telecommunication Network Panel
ATS	Air Traffic Services
ATSC	Air Traffic Services Communications
CNS	Communications, Navigation, and Surveillance
CNS/ATM	Communications, Navigation, and Surveillance/Air Traffic Management
CNS/ATM 1	An abbreviation which refers to CNS/ATM avionics and ground systems which are compliant with the first phase ATN SARPS.
COM/MET/RAC	Communications/Meteorology/Rules of the Air and Air Traffic Services
CPDLC	Controller/Pilot Data Link Communications
CSMA	Carrier Sense Multiple Access
DARP	Dynamic Air Route Planning
DCPC	Direct Controller-Pilot Communications
DGNSS	Differential Global Navigation Satellite System
DME	Distance Measuring Equipment

EGNOS	European Geostationary Navigation Overlay Service
EUROCONTROL	European Organisation for the Safety of Air Navigation
FAA	Federal Aviation Administration
FANS 1/A	An abbreviation which refers to CNS/ATM avionics and ground systems based on AEEC 622 protocols
FANS (Phase II)	Special Committee for the Monitoring and Co-ordination of Development and Transition Planning for the Future Air Navigation System
FIR	Flight Information Region
FMS	Flight Management System
FMU	Flow Management Unit
GBAS	Ground-Based Augmentation Systems
GES	Ground Earth Station
GIC	GNSS Integrity Channel
GLONASS	Global Orbiting Navigation Satellite System (Russian Federation)
GNSS	Global Navigation Satellite System
GNSSP	Global Navigation Satellite System Panel
GPS	Global Positioning System (United States)
HF	High Frequency
HMI	Human-Machine Interface
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
ILS	Instrument Landing System
INS	Inertial Navigation System
IRS	Inertial Reference System
ISO	International Organization for Standardization
ITU	International Telecommunication Union
LADGNSS	Local Area Differential GNSS
MET	Meteorological
MID	Middle East
MIDANPIRG	Middle East Air Navigation Planning and Implementation Regional Group
MLS	Microwave Landing System
MMI	Man-Machine Interface
MMR	Multi-mode receiver
MNT	Mach Number Technique
MNPS	Minimum Navigation Performance Specification
MODE S	Mode Select Transponder, Capable of Modes A & C (SSR & Data Link)
MSAS	Multi-Functional Transport Satellite-Based Augmentation System
MSAW	Minimum Safe Altitude Warning
N/A	Not Applicable
NAVAIDs	Aids to Air Navigation
NDB	Non-directional Radio Beacon
NM	Nautical Mile
NPA	Non-Precision Approach

OCP	Obstacle Clearance Panel
OSI	Open Systems Interconnection
PA	Precision approach
PANS-OPS	Procedures for Air Navigation Services Aircraft Operations
PDC	Pre-Departure Clearance
PIRGs	Planning and Implementation Regional Groups
R&D	Research and Development
RA	Resolution Advisory
RAIM	Receiver Autonomous Integrity Monitoring
RCP	Required Communication Performance (Concept still under development)
RDT&D	Research, Development, Trials and Demonstrations
RGCSP	Review of the General Concept of Separation Panel
RNAV	Area Navigation
RNP	Required Navigation Performance
RSP	Required Surveillance Performance (Concept still under development)
RTSP	Required Total System Performance (Concept still under development)
RVSM	Reduced Vertical Separation Minima
SAR	Search and Rescue
SARPs	Standards and Recommended Practices
SBAS	Satellite-Based Augmentation Systems
SICASP	Secondary Surveillance Radar Improvements and Collision Avoidance Systems Panel
SID	Standard Instrument Departure
SSR	Secondary Surveillance Radar
STAR	Standard Instrument Arrival
TBD	To Be Determined
TMA	Terminal Control Area
UNDP	United Nations Development Programme
VHF	Very High Frequency
VOR	VHF Omnidirectional Radio Range
VSM	Vertical Separation Minimum
WAAS	Wide Area Augmentation System
WGS 84	World Geodetic Reference System 1984

REFERENCES

ICAO Documents:

Annex 10 - Aeronautical Communications

Annex 11 - Air Traffic Services

Annex 15 - Aeronautical Information Services

Procedures for Air Navigation Services - Aircraft Operations (Doc 8168)

Procedures for Air Navigation Services - Rules of the Air and Air Traffic Services (Doc 4444)

Regional Supplementary Procedures (Doc 7030)

Air Navigation Plan - Middle East Region (Doc 9708)

Global Air Navigation Plan for CNS/ATM Systems, Volumes I and II

Guidance Material on Implementation of RNP/RNAV in the Middle East Region (MIDANPIRG/5 Report , Appendix 3Q)

Manual of ATS Data Link Applications (Doc 9694)

Manual on Required Navigation Performance (Doc 9613)

Manual on Airspace Planning Methodology for the Determination of Separation Standards (Doc 9689)

Manual on Implementation of a 300 m (1000 ft) Vertical Separation Minimum between FL 290 and FL 410 Inclusive (Doc 9574)

Manual of Technical Provisions for the Aeronautical Telecommunications Network (ATN) (Doc 9705)

Manual on Mode S Specific Services (Doc 9688)

Human Factors Digest No. 11 - Human Factors in CNS/ATM Systems (Circular 249)

Manual on Air Navigation Services Economics (Doc 9161)

Report on Financial and Related Organizational and Managerial Aspects of Global Navigation Satellite System (GNSS) Provision and Operation (Doc 9660)

Chapter 1: INTRODUCTION

1.1 Objective

1.1.1 The objective of the document is to describe the planning strategy and implementation timescales for the introduction of the communications, navigation and surveillance/air traffic management (CNS/ATM) systems in the Middle East Region, as part of the Regional Air Navigation Plan.

1.2 Scope

1.2.1 The scope of this plan is the same as for the ICAO *Air Navigation Plan - Middle East Region (Doc 9708).* The FIRs covered by the plan are shown in **Table 1-1** below.

Table 1-1: FIRs included in the CNS/ATM Implementation Plan for the Middle East Region

Amman	Jeddah
Baghdad	Kabul
Bahrain	Kuwait
Beirut	Muscat
Cairo	Sana a
Damascus	Tehran
Emirates	Tel Aviv

1.2.2 This plan includes CNS/ATM elements, technologies and candidate options pertaining to the Middle East Region CNS/ATM implementation.

1.2.3 The plan also takes into consideration CNS/ATM planning activities in the adjacent ICAO Regions, and the IATA User Driven CNS/ATM Plan.

1.3 Background

1.3.1 In the early 1980's, civil aviation recognised the increasing limitations of existing communication, navigation, surveillance and air traffic management systems, and the need to make improvements to overcome those limitations and also meet future needs. The Council of ICAO established the Special Committee on Future Air Navigation Systems (FANS) in 1983 to study new concepts and new technologies and to recommend a system that would overcome the present and foreseen problems and take aviation into the 21st century.

1.3.2 The FANS Committee made an extensive study of existing systems and the applications of new technologies. It concluded that the limitations of the existing systems are intrinsic to the systems themselves and were so restrictive to effective air traffic management that the problems could not be overcome on a global scale except by new concepts and new CNS systems which would in turn support more efficient ATM. The limitations of conventional systems are described in Chapter 1 of Volume 1 of the *Global Air Navigation Plan for CNS/ATM Systems* (the Global Plan).

1.3.3 The FANS Committee concluded that the exploitation of satellite technology was the only viable solution to overcome the limitations of the present system and meet future needs on a cost effective global basis. The Committee recognised that some of the present systems eg. VHF communications and SSR would continue to be appropriate, particularly in terminal areas and busy continental airspace. Thus communication with aircraft would be by voice and data using any or all or a combination of direct aircraft-satellite links, VHF and SSR Mode S. The concept of required navigation performance (RNP) was developed for specifying navigation requirements. It was expected that the global navigation satellite system (GNSS) would become the principal means of navigation for en-route, terminal area and non precision approach. ILS/MLS/DGNSS would be used for precision approach and landing. Surveillance would be by automatic dependent surveillance (ADS) together with SSR. These new CNS components would then allow improvements of the ATM system capacity and efficiency and would in turn permit more flexible and efficient use of airspace and allow for better accommodation of a flight's preferred profile in all phases of flight.

1.3.4 The system concept developed by the FANS Committee was endorsed by the ICAO 10th Air Navigation Conference in 1991. The Conference recommended that ICAO complete and maintain a global coordinated plan and accomplish the planning and implementation of the ICAO CNS/ATM systems through ICAO regional planning and implementation groups. The FANS (Phase II) Committee has completed the global co-ordinated plan in late 1993.

1.3.5 In May 1992, the ICAO Legal Committee concluded that the new concept was compatible with the provisions of the Chicago Convention and the regulatory role of ICAO and that there was no legal obstacle to the implementation and achievement of the new CNS/ATM concept. They also concluded that the guidelines for acceptable institutional arrangements were legally acceptable.

1.3.6 The 29th Session of the ICAO Assembly was informed of the endorsement of the CNS/ATM concept by the 10th Air Navigation Conference and this signalled the beginning of a new era for international civil aviation and started the many activities related to the planning and transition to the CNS/ATM systems. Further, this led to the establishment of planning and implementation regional groups (PIRGs), as a mechanism for structuring regional planning at various regions for effecting co-ordinated migration to CNS/ATM systems.

1.3.7 The global co-ordinated plan developed by the FANS II committee was revised and expanded during 1997 and 1998. The new document, now titled the *Global Air Navigation Plan for CNS/ATM Systems,* was presented to the World Wide CNS/ATM Systems Implementation Conference, held in Rio de Janeiro in May 1998. As well as expanding and updating the background information on the various elements comprising CNS/ATM, the new global plan attempts to bring up to date the progress achieved by the regions and illustrates, with appropriate timelines, the implementation schedule for the future.

1.4 Middle East Region Planning for CNS/ATM systems

1.4.1 At its first meeting, the Middle East Air Navigation Planning and Implementation Regional Group (MIDANPIRG) agreed, as a matter of urgency, to the establishment of an expert Sub-Group (the CNS/ATM Sub-Group) to address the planning and implementation aspects of the new CNS/ATM Systems. The CNS/ATM concept was also supported by the Limited Middle East (COM/MET/RAC)

Regional Air Navigation Meeting, held in January 1996.

1.4.2 The CNS/ATM Sub-Group has been responsible for the development of the *CNS/ATM Implementation Plan for the Middle East Region* (the Regional Plan) and the harmonization of national CNS/ATM plans. The plans developed by the sub-group are then reviewed by MIDANPIRG prior to adoption.

1.4.3 The implementation of the ICAO CNS/ATM Systems is a State responsibility, requiring States or groups of States to work together to develop implementation plans in harmonization with the regional and global plans. The MIDANPIRG agreed that States should be encouraged to participate in demonstrations and trials and make the results known to other States in the Regions as well as to ICAO. In its review of the new CNS/ATM Systems, and their particular relevance to the MID Region the MIDANPIRG recognized that the global CNS/ATM Systems offered solutions to the well-known limitations of the existing systems available to regional users.

Chapter 2: OVERVIEW OF CNS/ATM

2.1 Introduction

2.1.1 CNS/ATM has become possible because of technological developments in the communications, navigation and surveillance fields, in particular the availability of satellite navigation, permitting a high navigation accuracy independent of ground based navigation aids, and data communications with aircraft. These technologies have permitted the development of new concepts in air traffic management.

2.1.2 In the planning process, it is important that the specific Communications, Navigation and Surveillance systems to be implemented are based on the ATM requirements for the area under consideration, however in order to understand the ATM concepts which form part of CNS/ATM, it is first necessary to have some appreciation of the underlying CNS technologies.

2.1.3 The CNS/ATM system is based on global navigation systems, global communications systems, and automatic dependent surveillance. These systems can be, in part, dependent on facilities of other States, and facilities provided by communications service providers which are not under the auspices of any particular State.

2.2 Communications

Communications services envisaged

2.2.1 Aeronautical communications include:

a) safety communications requiring high integrity and rapid response:

   i) air traffic services communications (ATSC) carried out between ATS units or between an ATS unit and an aircraft, flight information and alerting; and

   ii) aeronautical operational control (AOC) communications carried out by aircraft operators, which also affect air transport safety, regularity and efficiency; and

b) non-safety related communications:

   i) private correspondence of aircraft operators (aeronautical administrative communications (AAC)); and

   ii) public correspondence (aeronautical passenger communications (APC)).

Continued requirement for terrestrial-based mobile communication

2.2.2 Terrestrial-based mobile communications will continue to be required. Their inherent short transmission delays are better suited where the rapid exchange, short transactions style of voice communication is required. While there will be a trend to move towards more data link communications for many functions, it is anticipated that voice communication will be needed for a long time in the future.

2.2.3 While not an operational factor, the potential lower cost of a terrestrial over a satellite service is a significant factor in the continued use of terrestrial facilities where they can be made available.

Air-Ground Communications

2.2.4 The available means of communication between ground and aircraft are VHF voice, HF voice, Controller Pilot Data Link Communications (CPDLC) and Satellite Voice. In areas where CNS/ATM routes and/or airspace are to be established beyond the range of normal VHF voice communications, CPDLC will generally become the primary means of communication, with complementary HF voice and satellite voice.

2.2.5 CPDLC is a means of communications between controller and pilot using data link for ATC communications. It is the introduction of data link communications, and the ability to maintain such communications with aircraft in oceanic and remote areas, which represents the most significant change in the communications environment.

2.2.6 CPDLC messages are normally displayed on a screen, and/or printed, on receipt.

Ground-Ground Communications

2.2.7 Communications between and within ATS units may be by AFTN, voice, or ATS Interfacility Data Communications (AIDC).

2.2.8 AIDC provides a means by which data may be exchanged during the notification, coordination and transfer of control phases of operations. The use of AIDC will significantly reduce the need for voice coordination.

2.2.9 The AIDC message sets and procedures are designed for use over any ground/ground circuit, including the AFTN and the ATN.

Aeronautical telecommunication network (ATN)

2.2.10 The ATN will provide for the interchange of digital data between a wide variety of end system applications supporting end users, such as; aircraft operators, air traffic controllers, and aeronautical information specialists. The ATN, based on the International Organization for Standardization (ISO) Open Systems Interconnection (OSI) reference mode, allows for the inter-operation of dissimilar air-ground and ground-to- ground subnetworks as a single Internet environment. End systems attach to AtN subnetworks and communicate with end systems on other subnetworks, by using ATN routers. ATN routers can be either moibile (aircraft based) or fixed (ground based). The ATN routers select the logical path across a set of ATN subnetworks that can exist between any two end systems. This path selection process uses the network level addressing, quality of service and security parameters provided by the initiating end system. Thus the initiating end system does not need to know the particular topology, or availability of, specific subnetworks. The ATN architecture is shown in **Figure 2-1**.

2.2.11 In support of a multi-national and multi-organisational environment, the ATN will provide a network management framework which will allow routers to operate on a largely autonomous basis. In this context, routers will be capable of performing routing management tasks based on operational, policy and security considerations.

2.2.12 In summary, the ATN is designed to transfer data between end-users independent of protocols and addressing schemes internal to any one participating sub-network. In order to meet this objective, all participating sub-networks must be interconnected via inter-network routers observing common inter-networking conventions and standards. This strategy will provide network-independent interface for all ATN users.

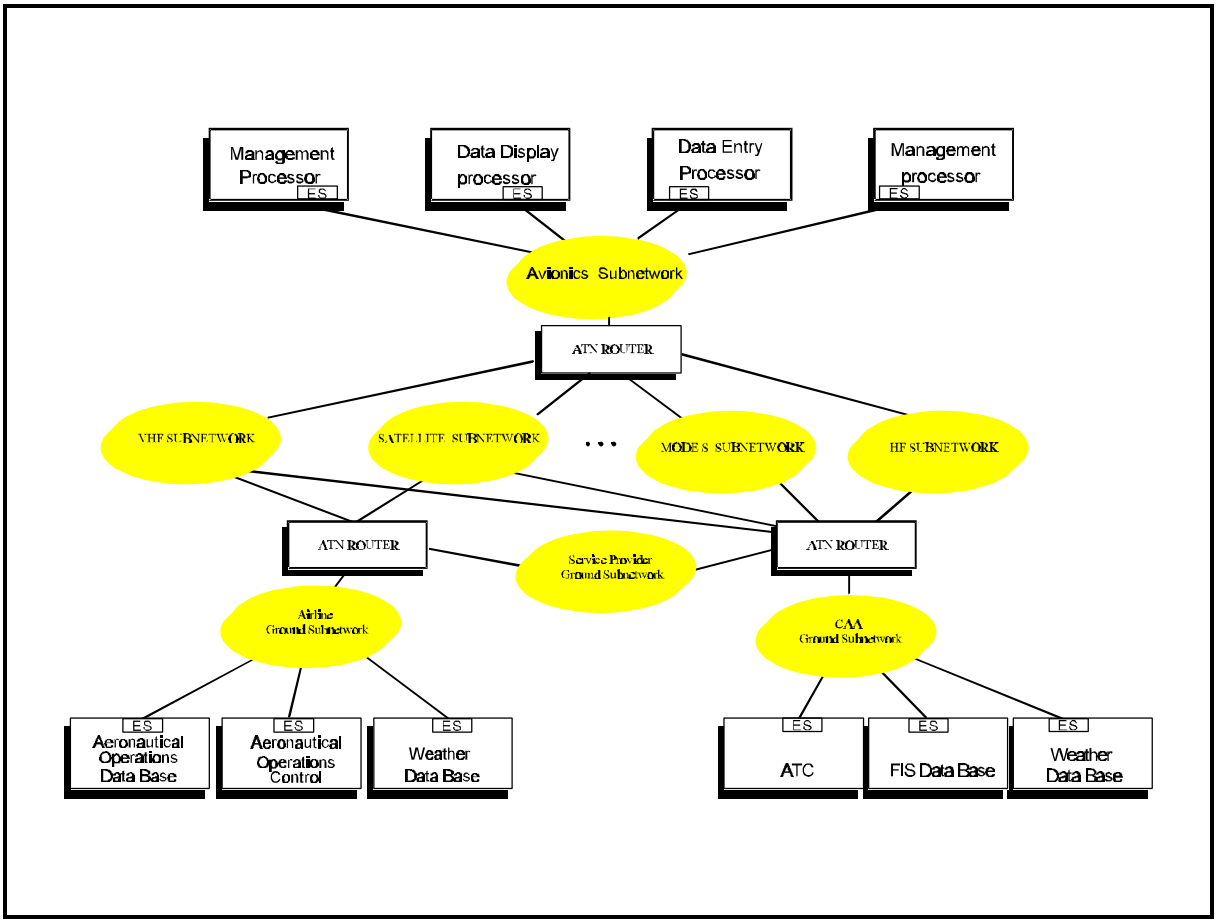


Fig 2-1. ATN data communication environment

2.3 Navigation

2.3.1 The level of aircraft navigation capability required for particular operations will be expressed by Required Navigation Performance (RNP) criteria. Under this concept aircraft will be certified or approved as meeting a certain RNP type. There will no longer be a requirement for the carriage of specified navigation equipment, nor will the navigation equipment used to achieve the performance criteria necessarily be the same for all aircraft.

2.3.2 RNP as a concept applies to navigation performance within an airspace and therefore affects both the airspace and the aircraft. RNP is intended to characterise an airspace through a statement of the required navigation performance accuracy (RNP type) to be achieved within the airspace. The RNP type is based on a navigation performance accuracy value which is expected to be achieved at least 95% of the time by the population of aircraft operating within the airspace.

2.3.3 The certification or approval of an aircraft for a given RNP type may well be geographically or time limited. For example, an aircraft which meets RNP 1 requirements on the basis of systems using ground-based navaids would only be approved for RNP 1 operations within the range of the necessary navaids.

2.3.4 Air traffic service providers will designate certain routes or airspace as specific RNP routes or airspace. This will indicate to the users that State approval is required for the operator to flight plan and fly within the designated route or airspace.

2.3.5 The major technological change in navigation will be the progressive adoption of Global Navigation Satellite Systems (GNSS). These systems will provide for world-wide positional coverage, and will eventually be used for non-precision and precision approaches, in addition to en-route navigation.

2.3.6 To overcome inherent system limitations and to meet performance requirements for accuracy, integrity, availability and continuity for all phases of flight, the basic GNSS position information requires varying degrees of augmentation. Augmentation systems are classified in three broad categories: aircraft-based (ABAS), ground-based (GBAS) and satellite-based (SBAS). These augmentation systems are further described in Chapter 6 of Volume I of the Global Plan.

2.4 Surveillance

2.4.1 It is expected that SSR Modes A and C will continue to be used in terminal areas and in busy en-route areas. SSR Mode S will be introduced where its capabilities confer operational benefits.

2.4.2 Mode S interrogations (uplink) can be addressed to individual aircraft. This allows the transmission of coded information to the transponder fitted with data link capability. The Mode S reply (downlink) may contain the aircraft identity, its altitude, or other data, depending on what is required by the ground station and depending on the aircraft fit. The Mode S interrogations and replies are protected by a robust error detection/correction scheme which gives high reliability to the information transferred.

2.4.3 In addition to the information described above, a Mode S ground station can obtain some or all of the following information from a Mode S transponder:

a) the unique Mode S address of the aircraft; (24 bit)

b) aircraft on the ground status (used to aid processing of SSR replies in conflict alert systems and radar data/flight data processing systems);

c) aircraft identification (in the form specified in item 7 of the ICAO flight plan);

d) aircraft pressure-altitude with 25-foot resolution; and

e) other information through use of the Mode S data link, including Mode specific services.

2.4.4 The ability to obtain the above information is dependent upon the level of the transponder fitted to the aircraft, except for the first two items which are available from all levels.

2.4.5 In the CNS/ATM environment, surveillance will also be provided by Automatic Dependent Surveillance (ADS). There are two types of ADS in the CNS/ATM environment, ADS and ADS Broadcast (ADS-B). The two types of ADS are inherently different.

2.4.6 ADS allows an aircraft to send position data addressed to a specific ATS Unit at specified intervals, or on the occurrence of a specific event at the request of the ATS Unit. ADS is not intended to replace radar but rather to be used in those areas where procedural separation is applied. It will replace manual position reporting in those areas.

2.4.7 In non-radar airspace, the use of ADS will enhance flight safety and, once the necessary capabilities for display of information relating to aircraft separation are available, will facilitate the reduction of separation minima and better accommodate user-preferred flight profiles.

2.4.8 The implementation of ADS, through reliable data link communications, will provide surveillance capability in oceanic airspace and other areas, such as en-route continental airspace, where non-radar air traffic control services are currently provided. The implementation of ADS may also provide benefits in terminal areas.

2.4.9 The automatic transmission of the aircraft position by ADS has the potential to replace present pilot position reports. In non-radar airspace, the effective use of ADS in air traffic services will facilitate the reduction of separation minima, enhance flight safety, and better accommodate user-preferred profiles.

2.4.10 The ADS application allows the implementation of reporting agreements, called contracts, which are established exclusively by the ground system. An ADS contract is an ADS reporting plan which establishes the conditions of ADS data reporting (i.e., data required by the ATC system and the frequency of the ADS reports which have to be agreed prior to the provision of the ADS services).

2.4.11 An ADS contract specifies the conditions under which an ADS report is to be initiated, and the data groups that will be included in the reports. There are three types of contract: a *demand contract* which provides a single report, a *periodic contract* which provides a report at a regular periodic interval determined by the ground system, and an *event contract* which provides a report when or if a specified event (e.g. divergence from track by more than a specified amount, change of airspeed by more than a specified amount) takes place.

Table 2-1: Comparison of CNS Elements of Conventional and CNS/ATM Systems

	Function	*Conventional system elements*	*CNS system elements*
Oceanic continental en-route airspace with low-density traffic	Communications*	VHF voice HF voice	VHF voice/data (Notes 3 and 4) AMSS data/voice (Note 4) HF data/voice (Note 4) ATN router/end system
	Navigation	LORAN-C NDB VOR/DME Barometric altimetry INS/IRS	GNSS Barometric altimetry GNSS altitude INS/IRS
	Surveillance	Primary radar/SSR Voice position reports	ADS/ADS B
Continental airspace with high-density traffic	Communications*	VHF voice	VHF voice/data (Note 4) AMSS data/voice (Note 4) SSR Mode S data link ATN router/end system
	Navigation	LORAN-C NDB VOR/DME Barometric altimetry INS/IRS	GNSS Barometric altimetry GNSS altitude (Note 2) INS/IRS
	Surveillance	Primary radar (Note 1) SSR Mode A/C	SSR Mode A/C or S ADS/ADS B
Oceanic airspace with high-density traffic	Communications*	HF voice	AMSS data/voice (Note 4) HF data/HF voice (Note 4) ATN router/end system
	Navigation	MNPS LORAN-C Barometric altimetry INS/IRS	GNSS Barometric altimetry GNSS altitude (Note 2) INS/IRS
	Surveillance	Voice position reports	ADS
Terminal areas with high-density traffic	Communications*	VHF voice	VHF voice/data SSR Mode S data link ATN router/end system
	Navigation	NDB VOR/DME ILS/MLS Barometric altimetry INS/IRS	GNSS ILS/MLS/DGNSS (Note 5) Barometric altimetry INS/IRS
	Surveillance	Primary Radar (Note 1) SSR/Mode A/C	SSR Mode A/C or S ADS/ADS-B
Terminal areas with low density traffic	Communications*	VHF voice	VHF voice/data
	Navigation	NDB VOR/DME ILS/MLS Barometric altimetry INS/IRS	GNSS ILS/MLS/DGNSS (Note 5) Barometric altimetry INS/IRS
	Surveillance	Primary Radar (Note 1) SSR Mode A/C	ADS/ADS-B

Note 4 – AMSS voice/HF voice/VHF voice is used as back-up

Note 5 - As per Annex 10, Vol. 1, Chapter 2

* The aeronautical telecommunication network (ATN) based on the International Organization for Standardization (ISO) open system interconnection (OSI) reference model provides for internetworking of aeronautical air-ground and ground-ground data links and is applicable to all airspace in future systems.

2.5 Air Traffic Management

2.5.1 The term Air Traffic Management (ATM) covers all the functions of airspace management (including both strategic and tactical airspace management), air traffic services and air traffic flow management. The concepts which are being developed for the CNS/ATM system will see the control resources more concentrated on the management of active air traffic.

2.5.2 These changes will be achieved by the introduction of new airspace and air traffic management concepts, and new automated tools to support air traffic control decision making. Improved communication systems will be used to help reduce ATC communications and coordination workloads. ATC decision making should be speeded by the availability of the outputs from automated processing of digitized data affecting air traffic management tasks.

2.5.3 It is important that, in the development of automated support for ATM functions, that the human is kept in the decision making process, in accordance with the principles of Human Centred Automation, as described in the *Human FactorsDigest No 11, Human Factorsin CNS/ATM Systems (ICAO Circular 249-AN/149)* .

Goals and Benefits of a Global ATM System

2.5.4 Tables 2-2 and 2-3 set out the goals and benefits of a Global ATM System, as described in Chapter 4 of Volume I of the Global Plan.

Table 2-2

GOALS OF A GLOBAL ATM SYSTEM
! To provide greater flexibility and efficiency by accommodating user-preferred flight profiles.
! To improve existing levels of safety.
! To accommodate the full range of aircraft types and airborne capabilities.
! To improve the provision of information to users, including weather conditions, the traffic situation, and the availability of facilities.
! To organize airspace in accordance with ATM provisions and procedures.
! To increase user involvement in ATM decision making, including air-ground dialogue for flight plan negotiation.
! To create, to the maximum extent possible, a single continuum of airspace where boundaries are transparent to users.
! To increase capacity to meet future demand for air traffic.

Table 2-3

BENEFITS OF A GLOBAL ATM SYSTEM

- The new ATM capabilities and more accurate data will make it possible to enhance safety, reduce delays, and increase airspace and airport capacity.
- Future ATM operations will become much more flexible, resulting in greater capability to accommodate user-preferred trajectories. New capabilities will make it possible to permit flexible routing, as well as dynamic modifications to aircraft routes, in response to changes in weather and traffic conditions.
- Improved flow management will prevent excessive levels of congestion.
- Data link will transmit a variety of information from Appropriately equipped aircraft to the ground and between ground units, and provide enhanced information to the cockpit. It will dramatically reduce workload, and reduce the channel congestion and communications errors that characterize the current voice environment.
- Terminal and en-route ATM functions will be integrated to provide smooth traffic flows into and out of terminal areas.
- Air traffic controllers will be able to establish more efficient approach streams.

2.5.5 Many of the systems which will produce these benefits these goals and benefits will require the exchange of real-time data between ATS systems, aircraft systems and airline operational control (AOC) systems. The planning and implementation of CNS/ATM systems therefore requires a high level of co-operation between service providers and users.

Chapter 3: EVOLUTION AND TRANSITION

3.1 General

3.1.1 The transition to new CNS systems should be based on the requirements for the ATM requirements for the airspace under consideration. It needs to be recognised that not all ground systems and not all aircraft will be fully equipped in all areas of CNS/ATM and to the same level of functionality and performance at a given time.

3.1.2 In the course of implementation, ground systems may go through several phases of development and validation. During the different phases, various modes of communications may be offered. Various means of surveillance may be employed. Air traffic management may be traditional procedural air traffic control based on voice or data link position reporting, radar control, ADS based procedural air traffic control, or screen based ADS driven ATM with various levels of system integration with ATM support systems such as FDPS, flight plan conformance monitoring, conflict prediction, conflict resolution and AIDC.

3.1.3 The ground based systems will initially be confronted with a variety of airborne equipment configurations and functionality. While the number of aircraft certified to FANS 1/A and ICAO CNS/ATM 1 standards will increase, aircraft with traditional methods of enroute communications and navigation will continue in global service for many years. Some other aircraft may carry a combination of conventional and advanced equipment such as GNSS.

3.1.4 As air traffic scenarios in different parts of the world differ widely, and will continue to do so in the future, the new global system must be able to work and ultimately be harmonized with a variety of traffic densities, types of aircraft and avionics, and differing levels of ATC ground systems sophistication, without leading to undue diversification or proliferation of systems and procedures.

3.1.5 The development of the CNS/ATM system will therefore need to be evolutionary, and will need to take into account the requirements of operating in a mixed environment during the transition phase. In order to provide incentives for aircraft operators to equip their fleets with the new technology, it is important that the transition planning does result in positive benefits for those operators who do invest in new technology CNS/ATM systems. To achieve this objective, it will be necessary to establish a methodology and mechanism for cost benefit analysis.

3.2 The Evolutionary Transition Process

3.2.1 It is recognized that there are major long-term consequences in the adoption of a CNS concept which would eventually permit the elimination of a variety of current CNS systems. Decisions to withdraw, or decisions on whether systems can be removed, depend on many factors. Among others, it is apparent that actual transition and the timing of withdrawal of existing systems will depend on the demonstrated capability and implementation of the new systems. A clear and compelling case for transition to the new CNS systems will include consideration of the benefits perceived by the aviation community for the management of air traffic.

3.2.2 In developing guidelines for transition, consideration should be given to the specific problems and issues affecting transition to full operational use for type of each CNS system, and in each category of airspace and phase of flight. **Table 3-1** lists a range of issues which should be considered in the planning the transition. They are grouped under the headings of Human, Equipment/Facilities/Infrastructure, Operational, Management and Cost.

3.2.3 Since CNS planning is based on ATM requirements, it is also useful to consider the relationship between the ATM and CNS elements. **Tables 3-2 to 3-6** show the technical CNS elements and the related procedural ATM elements, together with the ATM benefits, for a range of typical airspace types.

3.2.4 These tables are based on those contained in Chapter 4 of Volume I of the Global Plan. They are intended to show typical scenarios. They are not all-encompassing, nor are all elements absolute requirements for the airspace types listed.

Table 3-1 - General transition issues

Human	
1	Procedures and training for use of new system and its use in parallel with the current system
2	Human/machine interface issues for new system and its use in parallel with current system
3	Operator/user confidence and competency in new system
4	Selection criteria for operators/users of new system
5	Automation issues
6	Operator knowledge of system mix
Equipment/Facilities/Infrastructure	
1	Availability of equipment, facilities and infrastructure for new and old systems
2	Maintain ability of new and old equipment, facilities and infrastructure types
3	Partial or non-standard equipage within facility or aircraft
4	Partial equipage across facilities or aircraft fleet
5	Integrity assurance and back-up for new and old system
6	Multiple equipment types or facilities for same function
7	Design of new systems for ability to upgrade further
8	Replacement of aging components of old system
9	Upgrading aircraft/facilities with limited remaining life
10	Capacity on coverage issues
11	Certification of equipment for new system
12	New contractual relationships between States and communication service providers
Operational	
1	Use of different systems in different flight phase
2	Different aircraft capabilities or use classes in same airspace
3	National or other boundaries with different infrastructure
4	Non-equipped intruders
5	Disruption of operations to change system
6	Supplementary versus sole-means use
7	Aircraft/facilities out of service to re-equip
8	Initiate benefits of new system during transition
Management	
1	Standards and regulations
2	Phased transition; intermediate steps
3	Organizational restructing during transition
4	Pre-operational trials
5	R & D and applications development
6	Need and incentives to minimize duration of transition period
7	Communication between States on implementation plans
8	Redeployment of staff
Cost	
1	New system cost and investment in old system; amortization
2	Cost of maintaining parallel systems

Table 3-2. ATM Oceanic/continental airspace with low-density traffic

Functions	Technical elements		Procedural aspects		ATM benefits
	Ground	Air	Structure	Procedures	
COM					
AMSS voice and data HF voice and data	ATN connectivity to AMSS, HF ATN end-systems (HMI) Voice AMSS, HF	ATN connectivity to AMSS and HF avionics Voice AMSS, HF	RCP *	Data link handling procedures Message format	Improved tactical control Improved pilot/controller communications Facilitate ATC/FMS dialogue
NAV					
GNSS	NIL	GNSS receiver FMS	RNP Airspace organization RNP certification/ approval	Navigation procedures	Improved airspace utilization

* Emerging concept or technology consensus still to be reached

SUR					
ADS ADS-B *	ATN connectivity to AMSS and HF Situation display for ADS and ADS-B*	ATN connectivity with ADS and ADS-B function and situation display * ADS, ADS-B avionics	Airspace organization RSP *	Surveillance procedures Message format	Reduction of R/T workload Improved situational awareness*
AUTOMATION					
Decision support systems	Automated flight data processing Conflict alert advisory prediction- resolution software	FMS	Airspace organization	Automation procedures and algorithm development Message format	Increase in direct routings Improved conflict prediction and resolution

* Emerging concept or technology consensus still to be reached

Table 3-3. ATM — Oceanic airspace with high-density traffic

Functions	Technical elements		Procedural aspects		ATM benefits
	Ground	Air	Structure	Procedures	
COM AMSS voice and data HF voice and data Extended VHF voice and data	ATN connectivity to AMSS, HF, extended VHF ATN end-systems (HMI) Voice AMSS, HF, extended VHF	ATN connectivity to AMSS, HF, extended VHF avionics Voice AMSS, HF, extended VHF	RCP *	Separation criteria Data link handling procedures Message format	Improved tactical control Improved pilot/controller communications Facilitate ATC/FMS dialogue
NAV GNSS		GNSS receiver FMS	RNP Airspace organization including separation criteria RNP certification/ approval	Navigation procedures	Increase airspace capacity by reduction in separation minima due to increased positional accuracy Improved airspace utilization

* Emerging concept or technology consensus still to be reached

SUR ADS ADS-B*	ATN connectivity to AMSS, HF and extended VHF Situation display for ADS and ADS-B*	ATN connectivity with ADS and ADS-B* function and situation display ADS and ADS-B* avionics	Airspace organization including separation criteria RSP*	Surveillance procedures Message format	Increased airspace capacity by reduction in separation minima due to improved conformance monitoring Improved airspace utilization Reduction of R/T workload Improved situational awareness*
AUTOMATION Decision support systems	Automated flight data processing Conflict alert advisory prediction-resolution software	FMS	airspace organization	Automation procedures and algorithm development Message format	Increase in direct routings Increase in user-preferred flight profiles Increased capacity Improved traffic planning Improved conflict prediction and resolution Improved trajectory planning

* Emerging concept or technology consensus still to be reached

Table 3-4. ATM Continental airspace with high-density traffic

Functions	Technical elements		Procedural aspects		ATM benefits
	Ground	Air	Structure	Procedures	
COM AMSS voice and data VHF voice and data SSR Mode S data link	ATN connectivity to SSR Mode S and VHF ATN end-systems (HMI) Voice VHF	ATN connectivity to VHF and SSR Mode S avionics Voice VHF	RCP *	Separation criteria Data link handling Message format	Improved pilot/controller communications Facilitate ATC/FMS dialogue Complement VHF coverage Reduction of R/T workload
NAV GNSS	Augmentation	GNSS receiver FMS	Application of RNP Airspace organization including separation criteria RNP certification/ approval	Navigation procedures	Increased airspace capacity by reduction in separation minima dure to increased positional accuracy Improved airspace utilization

* Emerging concept or technology consensus still to be reached

SUR ADS ADS-B* SSR	ATN connectivity to VHF, SSR Mode S Situation display for ADS and ADS-B*	ATN connectivity with ADS and ADS-B* function and situation display SSR Mode S transponder ADS and ADS-B* avionics	Airspace organization including separation criteria Application of RSP*	Surveillance procedures	Increased airspace capacity by reduction in separation minima due to improved conformance monitoring Improved airspace utilization Reduction of R/T workload Improved situational awareness (ADS, ADS-B*) complement to and possible back-up for SSR Reduced need for PSR
AUTOMATION Decision support systems	Automated flight data processing Conflict alert advisory prediction-resolution software	FMS	airspace organization	Automation procedures and algorithm development Message format	Improved traffic planning Improved conflict prediction and resolution Improved trajectory planning Increase in direct routings Increase in user-preferred flight profiles

* Emerging concept or technology consensus still to be reached

Table 3-5. ATM Terminal areas with high-density traffic

Functions	Technical elements		Procedural aspects		ATM benefits
	Ground	Air	Structure	Procedures	
COM					
VHF voice and data SSR Mode S data link	ATN connectivity to VHF and SSR Mode S ATN end-systems (HMI) Voice VHF	ATN, connectivity to VHF, SSR Mode S avionics Voice VHF	Airspace organization Application of RCP *	Separation criteria Message format Data link procedures	Improved pilot/controller communications Facilitate ATC/FMS dialogue Complement VHF coverage Reduction of R/T workload
NAV					
GNSS ILS MLS	ILS MLS Augmentation systems	GNSS receiver ILS MLS MMR FMS	Application of RNP Airspace organization including separation criteria RNP certification/ approval	Approach procedures	Increased airspace capacity by reduction in separation minima due to increased positional accuracy Improved airspace utilization

* Emerging concept or technology consensus still to be reached

SUR ADS ADS-B* SSR	ATN connectivity to VHF and SSR Mode S Situation display for ADS and ADS-B*	ATN connectivity with ADS and ADS-B* function and situation display SSR Mode S transponder ADS and ADS-B* avionics	Airspace organization including separation criteria Application of RSP*	Surveillance procedures development	Increased airspace capacity by reduction in separation minima due to improved conformance monitoring Improved airspace utilization Reduction of R/T workload Improved situational awareness* (ADS, ADS-B*) complement to and possible back-up for SSR Reduced need for PSR
AUTOMATION Decision support systems	Automated flight data processing Conflict alert advisory prediction-resolution software Metering software	FMS	airspace organization	Automation procedures and algorithm development Message format	Increase in direct routings Improved sequencing and flight profiles Improved trajectory planning Improved traffic planning Improved conflict prediction and resolution

* Emerging concept or technology consensus still to be reached

Table 3-6. ATM Terminal areas with low-density traffic

Functions	Technical elements		Procedural aspects		ATM benefits
	Ground	Air	Structure	Procedures	
COM					
VHF voice and data	ATN connectivity for VHF ATN end-systems Voice VHF	ATN connectivity to VHF avionics Voice VHF	RCP *	Data link procedures Message format	Improved pilot/controller communications Facilitate ATC/FMS dialogue Complement VHF coverage
NAV					
GNSS	Augmentation systems	GNSS receiver	RNP certification approval	Approach procedures	Improved airspace utilization
SUR					
ADS ADS-B* SSR	ATN connectivity for VHF Situation display for ADS and ADS-B*	ATN connectivity with ADS and ADS-B* function and situation display ADS, ADS-B* avionics	RSP *	Surveillance procedures	Improved airspace utilization Improved situational awareness* Reduced need for PSR
AUTOMATION					
Decision support systems	Situation display Automated flight data processing	FMS		Automation procedures and algorithm development Message format (Doc 4444)	Increase in user-preferred flight profiles Improved traffic planning Improved conflict prediction and resolution

* Emerging concept or technology consensus still to be reached

Chapter 4: PLANNING CONSIDERATIONS

4.1 General

4.1.1 The Global Plan is the foundation document for CNS/ATM planning world-wide. It covers the operational, technical, economic, financial, legal and institutional elements, and describes an overall planning methodology which incorporates all these elements.

4.1.2 The following chapters of the Global Plan deal with the issues of global and regional planning:

Volume I, Chapter 2 ICAO s Planning Structure for CNS/ATM

Volume I, Chapter 3 Global Planning Methodology

Volume II, Chapter 2 Regional Planning and Implementation.

7.1.1 ICAO has also produced a document the *National Plan for CNS/ATM Systems - Guidance Material,* for use by States in the development of national CNS/ATM implementation plans. (The current edition of this document is version 1, dated 30 April 1999). This document should be consulted for detailed information on determination of the elements of the CNS/ATM system which are appropriate in a particular State, the timing of their introduction, and the withdrawal of conventional systems.

7.2 The Parties Involved in the CNS/ATM Planning Process

7.2.1 While the planning process is co-ordinated by ICAO, the implementation is the responsibility of States, users and manufacturers. Harmonization of plans at all levels is a prerequisite if the end result is to be a system in which there is global uniformity of requirements.

7.2.2 The roles of the various CNS/ATM partners are shown in **Table 4-1**.

Table 4-1. Planning Functions of the CNS/ATM Partners

CNS/ATM Partners	Planning levels	Deliverables	Guidance
ICAO	Global	Global plan	ICAO policy
Regional planning groups	Regional	Regional plan	Global plan
Group of States	Sub-regional	Sub-regional plan	Regional plan
States	National	National plan	Regional plan
Airspace users	Regional, national	User-driven plan	Regional, national plans
Service providers	Global, regional, national	Service-provider plan	Global, regional, national plans
Industry	Global, regional, national	Manufacturer plan	Global, regional and national plans

The Global CNS/ATM Planning Methodology

7.2.3 The global planning methodology for CNS/ATM is described in detail in Chapter 3 of Volume I of the Global Plan, which should be read in conjunction with this chapter of the Regional Plan.

7.2.4 The methodology is based on an eleven-step process, starting with the determination of major international traffic flows and homogeneous ATM areas. The ATM objectives and requirements are determined for each area by analysis of their characteristics, and the requirements for CNS systems are derived from the ATM requirements. The methodology also includes assessments of costs and benefits, and funding issues.

7.2.5 Appendix 4-A to this document contains an extract from the global Plan which describes the methodology in detail.

7.3 **The Regional CNS/ATM Planning Process**

7.3.1 The global plan is to serve as a basis, not as a substitute, for the detailed implementation plans, which are the responsibility of the regional planning bodies. The implementation of the future global CNS systems will not occur at the same time and at the same pace in all regions.

7.3.2 The regional planning process is described in Chapter 2, Volume II, of the Global Plan. This is attached as Appendix 4-B to this document.

7.3.3 Within the Middle East Region, the CNS/ATM planning process is under the control of MIDANPIRG, supported by the activities of relevant Sub-Groups and Task Forces. These are:

The CNS/ATM Sub-group

The COM/MET Sub-Group

The ATM/AIS/SAR Sub-Group

The GNSS Task Force

The AFS/ATN Task Force

The RNP/RNAV Task Force

The Middle East Region Traffic Forecasting Group (MER TFG)

14.1.1 The CNS/ATM Sub-Group undertakes the development and maintenance of the Regional Plan. The other bodies are responsible for more detailed planning for implementation within their own areas of expertise.

14.1.2 The CNS/ATM user-driven plan developed jointly by IATA/AACO is intended to complement the CNS/ATM implementation plan for the Middle East Region.

APPENDIX 4-A

(From Global Plan, Volume I, Chapter 3, Section 3.4)

3.4 Planning Methodology

3.4.1 The basis of developing a global, integrated ATM system will be an agreed-to structure of homogeneous ATM areas and major international traffic flows. These areas and flows can be seen as the thread tying together the various elements of the world-wide aviation infrastructure into a global system. The Global Plan lists several of these. Further identification of these areas and traffic flows should be carried out by PIRGs in collaboration with the aircraft operators, reflecting the latter's requirements. The table at Appendix B to Chapter 4 and the tables in the ATM and CNS chapters of Volume II of the Global Plan will assist the PIRGs in determining the international CNS/ATM systems infrastructure necessary to support the implementation of the homogeneous ATM areas and major international traffic flows.

3.4.2 Considering the communications, navigation and surveillance elements of the CNS/ATM systems infrastructure to support air traffic management, it is necessary for each region to first ascertain the ATM objectives for a given homogeneous ATM area or major international traffic flow, then determine which of the CNS elements are needed to fulfil those objectives, followed by an assessment of the technical elements and implementation options that would most appropriately and cost effectively meet the ATM objectives for that area or traffic flow.

3.4.3 Based on the above, PIRGs are responsible for the integration and harmonization of CNS/ATM systems plans for their various regions, while ICAO, through this Global Plan, ALLPIRG meetings, world-wide conferences, and an interregional co-ordination mechanism, will carry out the interregional co-ordination to ensure global compatibility, harmonization and seamlessness of the systems.

3.4.4 The ATM operational concept being developed will be applicable on a global basis. In order to be consistent with world-wide growth and to support economy of operations globally, however, it also needs to be adapted to distinct areas with specific traffic flows. For this reason, the planning process for any particular region must begin with identification of these specific homogeneous ATM areas and/or major international traffic flows, based on user needs followed by the development of an ATM plan for the region.

3.4.5 Each regional planning group will develop its own work structure for accomplishing the work associated with the step-by-step approach listed hereunder. In some cases an already-established working group or CNS/ATM sub-group may be in a suitable position to accomplish the work; in other cases, specific task forces or sub-groups will need to be established.

3.4.6 The step by step approach for planning ATM requirements and CNS infrastructure is as follows:

Step 1. Identify homogeneous ATM areas and/or major international traffic flows.

Step 2. List the ICAO Region(s), flight information region(s) and State(s) involved in the homogenous ATM areas and/or major international traffic flows (Figure 3-1 refers).

Step 3. Carry out air traffic forecasts and ascertain airspace user needs.

Step 4. Evaluate the current infrastructure of the areas identified in Step 2 in terms of:

a) ATM limitations and shortcomings;

b) separation Standards; and

c) CNS availability.

Step 5. Determine the ATM objectives and requirements for the areas identified in Step 2.

Step 6. Establish CNS requirements necessary to support the desired ATM objectives identified in Step 5.

Step 7. Analyse the benefits/improvements resulting from Steps 5 and 6 in order to establish:

a) costs/benefits;

b) relative priority; and

c) implementation dates of the various ATM objectives and CNS facilities for each of the homogenous ATM areas and/or major international traffic flows.

Step 8. Considering the many technical solutions and implementation options available, repeat as necessary Steps 5, 6 and 7 to determine the most appropriate solution.

Step 9. Examine the possibilities of funding implementation of the CNS/ATM systems infrastructure for States requiring financial assistance.

Step 10. Determine means and methods of cost recovery.

Step 11. Establish a framework to interface with all the CNS/ATM partners on a continuing basis to ensure the harmonious and integrated implementation of CNS/ATM systems in homogenous areas and/or along major international traffic flows.

3.4.7 The tables at the appendices to Chapters 4 through 7 will form the framework by which further development could be accommodated by the PIRGS, through the regional planning mechanisms, leading to a global, integrated ATM system. The FASIDs of the regional ANPs should therefore be developed in full consideration of the high-level guidance provided by Volume I and the step-by-step approach described here and conceptualized in the tables of Volume II of the Global Plan. As the ATM operational concept and the associated required communication performance (RCP)[1], required navigation performance (RNP), required surveillance performance (RSP)[1] and required total system performance (RTSP)[1] mature, they should be integrated into the planning process so that further development could take place. Planning and implementation should therefore be seen as a continuing, evolving and maturing process.

1 Emerging Technology or concept consensus still to be reached

APPENDIX 4-B

(*From Global Plan, Volume II, Chapter 2, Section 2.1.3*)

2.1.3 Process Description

2.1.3.1 The PIRG should review the Global Plan with its objectives, functions and the Statement of ICAO policy on CNS/ATM systems implementation and operation with respect to the particular region. **Figure 2-1** illustrates the approach to planning for CNS/ATM systems on the basis of homogenous ATM areas/major international traffic flows.

2.1.3.2 Based on specific features of geographical nature, traffic flows, airspace structure, essential facilities and services, traffic density and level of sophistication required, the region should be divided, if necessary, into a number of homogenous areas, taking into account the priority structure of CNS systems elements and areas of applicability with regard to implementation (paragraph 3.2 refers). Major international traffic flows should be identified wherein it is logical to specify a detailed plan for the implementation of CNS/ATM systems (paragraph 3.3 refers). An evaluation of present CNS/ATM systems in the homogenous areas and/or major traffic flows should be made, identifying shortcomings.

2.1.3.3 For the homogenous ATM areas or major international traffic flows, an air traffic forecast of the growth of air transport, including computer and general aviation, should be developed. Based on this forecast, a specific ATM plan should be developed. During the process, the specific needs of the users and the service providers should be taken into account.

2.1.3.4 Subsequent to the development of ATM plans, ATM objectives and CNS requirements should be determined. After an analysis, decisions on technical and operational systems implementation time lines should be reflected in regional implementation tables and in the tables of Volume II of the Global Plan.

2.1.3.5 The priorities in terms of time scales should be established in response to identified constraints and the requirements of States as to the systems and areas of applicability whereby the most immediate benefits could be provided or where early implementation may be most likely. The planning methodology in paragraph 3.4 of Volume I of the Global Plan provides a step-by-step approach for PIRGs to follow. The establishment of milestones should take into account the following key events relative to each system:

a) completion of pertinent tasks by relevant ICAO groups, including the adoption of SARPs;

b) adoption of relevant avionics Standards;

c) completion of relevant research and development and application development;

d) availability of sufficient satellite capacity;

e) availability of avionics;

f) completion of pre-operational trials and a validation process;

g) availability of suitable procedures;

h) availability of ground infrastructure;

i) completion of training;

j) effective date for mandatory carriage, where appropriate; and

k) withdrawal of obsolete systems elements (airborne and ground).

2.1.3.6 The regional CNS/ATM systems plan should be finalized by reflecting technical and operational requirements. To facilitate implementation, regional planning should take account of each element of CNS systems (tables of Chapters 6, 7, and 8 of Volume II refer) and relevant objectives of ATM as identified in the tables in Chapter 5.

Chapter 15: AIR TRAFFIC IN THE MID REGION

15.1 Introduction

15.1.1 Traffic forecasts provide the means of determining the likely future demand for ATM services, and are therefore an essential part of the CNS/ATM planning process. ICAO has adopted a uniform strategy for the preparation of traffic forecasts in support of the regional planning process. This has involved the creation of specialist Traffic Forecasting Groups in each Region, to provide their corresponding PIRG with forecasts of aircraft movements for the major international traffic flows defined as part of the CNS/ATM planning process. These forecasts also take into account IATA input regarding airline fleet development plans.

15.2 Air Traffic Forecasts

15.2.1 The ICAO Middle East Region Traffic Forecasting Group (MER TFG) has only recently been established, and is still in the process of developing the procedures to be used for the collection of data and the production of forecasts. In the interim, a preliminary traffic forecast for the region has been prepared by the ICAO Forecasting and Economic Planning Section. Appendix 5-A to this document contains details of this forecast.

15.2.2 This information will be updated as the MER TFG progresses its work.

APPENDIX 5-A

The following information is an extract from the ***Aircraft Movement Forecasts for the CNS/ATM Sub-Group of MIDANPIRG***, prepared by the ICAO Forecasting and Economic Planning Section, November 1998. The forecasts indicated that

> Traffic to, from and within the Middle East region on the five major identified route groups for the period 1998-2003 is expected to increase at an average annual rate of 5.6 per cent.
>
> The Intra-Middle East route group is expected to experience the highest average annual growth rate of 7 per cent per annum.
>
> The Asia/Pacific-Middle East, Africa-Middle East, Europe-Middle East and North America-Middle East route groups are expected to experience growth rates of 6 per cent, 5.7 per cent, 4.8 per cent and 4.5 per cent respectively for the period concerned as illustrated in Table 3.

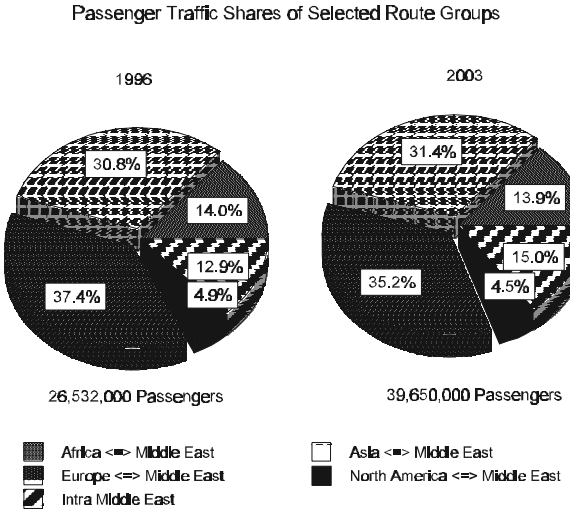
TABLE 3

PASSENGER FORECAST TO THE YEAR 2003

	1997	1998	1999	2000	2001	2002	2003	1998-2003 Average annual growth (%)
NAM	1,362	1,428	1,487	1,554	1,623	1,695	1,774	4.5
INTRA MEA	3,951	4,221	4,525	4,841	5,180	5,543	5,931	7.0
EUR	10,534	11,048	11,578	12,130	12,711	13,321	13,962	4.8
ASPAC	8,786	9,314	9,874	10,464	11,092	11,758	12,463	6.0
AFR	3,955	4,180	4,419	4,671	4,937	5,218	5,516	5.7
	28,597	30,194	31,881	33,665	35,550	37,543	39,650	5.6

5.7.2 These forecasts result in the change of the passenger traffic share for the year 2003 as depicted in **Figure 2**.

FIGURE 2



6 FORECASTS OF AIRCRAFT MOVEMENTS

6.1 Using the methodology described above[2], movement forecasts for the major route groups for the 1996-2003 were developed.

6.2 The historical trends in load factors and average seats for the route groups concerned as well as expectations of future load factors and trends in average seats are described in **Tables 4 and 5** respectively.

TABLE 4

LOAD FACTORS FORECASTS TO THE YEAR 2003

	1997	1998	1999	2000	2001	2002	2003
NAM	69.6	69.7	69.9	70.0	70.2	70.3	70.4
[illegible]	58.4	58.5	58.6	58.8	58.9	59.0	59.1
[illegible]	62.6	62.7	62.9	63.0	63.1	63.2	63.4
[illegible]	64.5	64.6	64.8	64.9	65.0	65.1	65.3
[illegible]	58.4	58.5	58.6	58.8	58.9	59.0	59.1
MEA							

2 *The methodology is not reproduced in this document. For information relating to this, see the report of the MER TFG/3 meeting*

TABLE 5

AVERAGE AIRCRAFT SIZE FORECAST TO THE YEAR 2003

(Number of seats per aircraft)

	1996	1997	1998	1999	2000	2001	2002	2003
NA	252	255	258	261	264	267	271	274
NA	187	189	191	193	196	198	200	203
NA	198	200	203	205	208	210	213	215
NA	252	255	258	261	264	267	271	274
NA	196	198	201	203	206	208	211	213

6.3 The estimated aircraft movement growth rates for the respective route groups are given in **Table 6**.

TABLE 6

AIRCRAFT MOVEMENTS FORECAST TO THE YEAR 2003

	1996	2003	Average Annual Growth (%) 1996-2003
AFR-MEA	17.8	23.8	4.2
ASIA-MEA	67.8	92.4	4.5
EUR-MEA	123.0	154.9	3.3
INTRA MEA	130.6	190.3	5.5
Total	339.2	461.4	4.5

6.4 Using the 1996 OAG Data as the base year, movement forecasts for the top 25 city-pairs for each of the regions were estimated. The forecasts for the rest of the city-pairs are aggregated into one figure, and included as others in each of the tables. The city-pairs are ranked by descending order based on 1996 departures. The movement forecasts for the city-pairs of the route groups concerned are given in **Tables 7 to 10**.

TABLE 7

BETWEEN MIDDLE EAST AND AFRICA

TOP 25 CITY PAIRS RANKED BY 1996 DEPARTURES

		1996	2003
Rank	Cities	Departures	Departures
1	Jeddah-Khartoum	1074	1436
2	Cairo-Khartoum	1007	1347
3	Dubai-Nairobi	638	853
4	Jjeddah-Djibouti	530	709
5	Asmara-Jeddah	463	619
6	Khartoum-Riyadh	453	606
7	Addis Ababa-Jeddah	448	599
8	Cairo-Morocco	447	598
9	Jeddah-Tunis	424	567
10	Jeddah-Nairobi	409	547
11	Cairo-Tunis	404	540
12	Addis Ababa-Cairo	364	487
13	Morocco-Jeddah	350	468
14	Abu Dhabi-Khartoum	344	460
15	Cairo-Johannesburg	335	448
16	Damascus-Khartoum	322	431
17	Morocco-Tripoli	314	420
18	Amman-Tunis	301	403
19	Asmara-Cairo	298	399
20	Dubai-Entebbe	274	366
21	Cairo-Nairobi	274	366
22	Dubai-Johannesburg	264	353
23	Doha-Khartoum	263	352
24	Jeddah-Kano	256	342
25	Damascus-Tunis	234	313
	OTHERS	7310	9774
	Total All City Pairs	17800	23805

Total number of city pairs in this route group is 101

TABLE 8

BETWEEN MIDDLE EAST AND ASIA/PACIFIC

TOP 25 CITY PAIRS RANKED BY 1996 DEPARTURES

		1996	2003
Rank	Cities	Departures	Departures
1	Dubai-Karachi	4717	6432
2	Bombay-Dubai	3183	4340
3	Bombay-Muscat	2030	2768
4	Karachi-Muscat	1970	2686
5	Bombay-Kuwait	1633	2227
6	Colombo-Dubai	1434	1955
7	Abu Dhabi-Bombay	1375	1875
8	Jeddah-Karachi	1361	1856
9	Abu Dhabi-Karachi	1326	1808
10	Bombay-Riyadh	1158	1579
11	Delhi-Dubai	1074	1465
12	Muscat-Trivandrum	986	1345
13	Dubai-Male	955	1302
14	Dhaka-Dubai	954	1301
15	Bangkok-Dubai	925	1261
16	Abu Dhabi-Colombo	874	1192
17	Dubai-Peshawar	873	1190
18	Dubai-Singapore	854	1165
19	Abu Dhabi-Bangkok	807	1100
20	Bombay-Dhahran	800	1091
21	Doha-Karachi	779	1062
22	Dhahran-Karachi	772	1053
23	Dubai-Hong Kong	767	1046
24	Dubai-Kuala Lumpur	716	976
25	Bombay-Doha	673	918
	OTHERS	34781	47431
	Total All City Pairs	67777	92421

Total number of city pairs in this route group is 192

TABLE 9

BETWEEN MIDDLE EAST AND EUROPE
TOP 25 CITY PAIRS RANKED BY 1996 DEPARTURES

		1996	2003
Rank	Cities	Departures	Departures
1	Dubai-London	2918	3675
2	Athens-Larnaca	2879	3626
3	Frankfurt-Tel Aviv	1942	2446
4	Bahrain-London	1862	2345
5	Larnaca-London	1854	2335
6	London-Tel Aviv	1834	2310
7	Rome-Tel Aviv	1781	2243
8	Paris-Tel Aviv	1722	2169
9	Istanbul-Tel Aviv	1709	2152
10	Dubai-Frankfurt	1625	2047
11	Athens-Cairo	1551	1953
12	Cairo-Frankfurt	1539	1938
13	Cairo-London	1538	1937
14	Tel Aviv-Zurich	1420	1788
15	Cairo-Rome	1320	1662
16	Amsterdam-Tel Aviv	1278	1610
17	Beirut-London	1135	1429
18	Athens-Tel Aviv	1075	1354
19	Kuwait-London	1060	1335
20	Cairo-Istanbul	1001	1261
21	Ercan-Istanbul	990	1247
22	Bucharest-Tel Aviv	989	1246
23	Copenhagen-Tel Aviv	925	1165
24	Tel Aviv-Vienna	915	1152
25	Moscow-Tel Aviv	906	1141
26	OTHERS	85203	107302
27	Total All City Pairs	122971	154873

Total number of city pairs in this route group is 442

TABLE 10

INTRA MIDDLE EAST

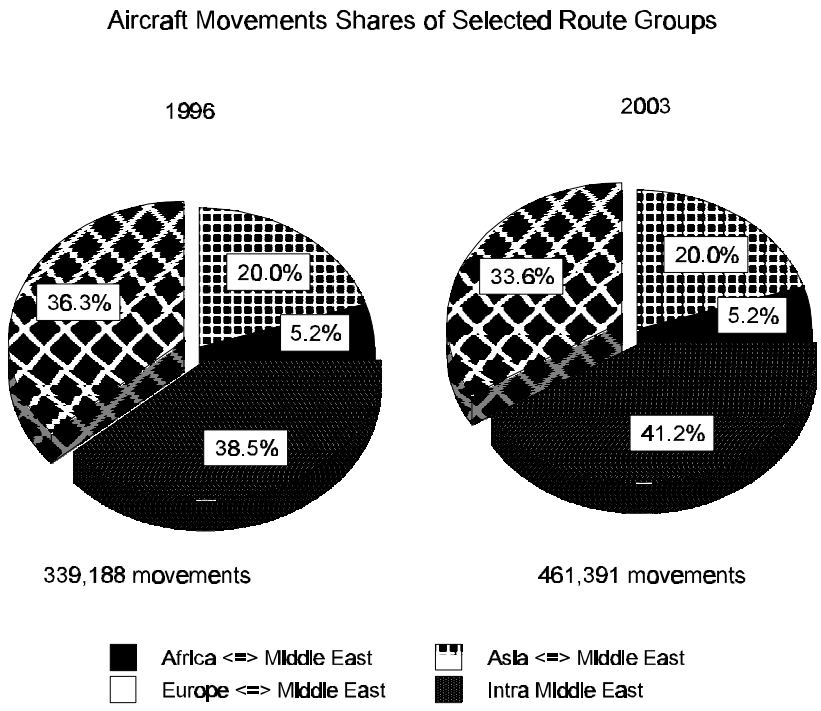
TOP 25 CITY PAIRS RANKED BY 1996 DEPARTURES

		1996	2003
Rank	Cities	Departures	Departures
1	Bahrain-Doha	5582	8131
2	Dubai-Muscat	5227	7614
3	Cairo-Jeddah	5080	7400
4	Abu Dhabi-Bahrain	3922	5713
5	Doha-Dubai	3761	5478
6	Abu Dhabi-Doha	3658	5328
7	Abu-Dhabi-Muscat	3064	4463
8	Dubai-Kuwait	3027	4409
9	Bahrain-Dhahran	2948	4294
10	Bahrain-Dubai	2730	3977
11	Abu Dhabi-Dubai	2628	3828
12	Amman-Beirut	2339	3407
13	Dhahran-Riyadh	2210	3219
14	Jeddah-Riyadh	2172	3164
15	Bahrain-Kuwait	2165	3154
16	Cairo-Kuwait	1883	2743
17	Bahrain-Muscat	1839	2679
18	Doha-Muscat	1694	2467
19	Amman-Cairo	1387	2020
20	Cairo-Dubai	1349	1965
21	Damascus-Kuwait	1339	1950
22	Dubai-Riyadh	1323	1927
23	Aleppo-Damascus	1293	1883
24	Beirut-Kuwait	1261	1837
25	Cairo-Riyadh	1245	1813
	OTHERS	65514	95426
	Total All City Pairs	130640	190292

Total number of city pairs in this route group is 242

6.5 The total aircraft movements to/from and within the Middle East region are estimated to increase from some 339 000 in 1996 to slightly over 461 000 in 2003 at an average annual growth rate of 4.5 per cent. The resulting movements shares for the years 1996 and 2003 are depicted in **Figure 3**.

FIGURE 3



Chapter 6: CURRENT ATM PROCEDURES AND CNS SYSTEMS IN THE MIDDLE EAST REGION

6.1 Introduction

6.1.1 A comprehensive assessment and analysis of the characteristics and the capabilities of the present system and of their implementation in various parts of the world ascertained that the limitations of the present communications, navigation, and surveillance (CNS) systems amounts to essentially three factors:

a) the propagation limitations of current line-of-sight systems and/or accuracy and reliability limitations imposed by the variability of propagation characteristics of other systems;

b) the difficulty, caused by a variety of reasons, to implement present CNS systems and operate them in a consistent manner in large parts of the world; and

c) the limitations of voice communications and the lack of digital air-ground data interchange systems in the air and on the ground.

6.1.2 The limitations summarised in paragraph 6.1.1 are intrinsic to the systems themselves. Although their effects are not the same for every part of the world, it is evident that one or more of these factors inhibits the further development of air navigation almost everywhere. New CNS systems should surmount these limitations to allow air traffic management (ATM) on a global scale to evolve and become more responsive to the users' needs. Therefore, they should provide for:

a) global CNS coverage from ground level to very high altitudes, also embracing remote, off-shore, and oceanic areas;

b) digital data interchange between air and ground systems to fully exploit the automated capabilities of both;

c) digital data interchange between ATS area control centres and ground earth stations and between ATS providers facilities; and

d) navigation/approach service for runways and other landing areas which need not be equipped with precision landing aids.

6.2 Present Systems in the Middle East

Air Traffic Management (ATM)

6.2.1 While there are some remote and less developed areas which do not have radar coverage, the MID Region is, in general, well covered by radar. Current air traffic control procedures are therefore mostly based on the use of radar control.

6.2.2 There are a small number of fixed RNAV routes in the region. On the majority of routes outside radar coverage within the region, 10 minutes longitudunal separation is applied.

6.2.3 Table 6-1 lists specific ATM limitations by Homogeneous ATM Area (as defined in Chapter 7, Table 7-1).

Communications (Air/Ground)

6.2.4 At present, communication in the region is provided by VHF voice. However, in some parts of the region, air ground communications are limited to HF, often with the need of intermediate communicators.

6.2.5 The only form of VHF data link available in region is which is used for aeronautical operational control communications (AOC).

6.2.6 existing low AFTN system some parts the region not fully of supporting the efficient exchange of data required in the present ATS system. Furthermore, the ground/ground between ACCs affected through lack of circuits.

6.2.7 present infrastructure NAVAIDs within region is adeq foreseeable requirements of region until becomes the means of

Surveillance

6.2.8 Radar in the East is available in some areas but not in those areas it necessary for ATC purposes where its would be physically possible. some

Table 6-1: ATM Limitations by Homogeneous Area

Item	Description of Limitation	Applicable	Remarks
1	communications	AR-2, AR-3	by other means in future.
2	standard phraseology difficulties in air/ground and communications, particularly with CIS States, and aircraft	AR-1, AR-2, AR-3	CPDLC and AIDC will help alleviate problem
	Lack of flexibility in use of airspace due to military	AR-1, AR-2, AR-3	Results in delays and extra track miles
	Choke points on routes between Mediterranean and	AR-1	Due to lack of surveillance, overflight restrictions
5	Implementation of a number ATS routes not completed	AR-1, AR-2, AR-3	mileage flown and provide alternate routes to relieve congestion.
	Delays to aircraft northbound from UAE through Iranian	AR-1, AR-3	Introduction of CNS/ATM routes may help

Chapter 7: AIR TRAFFIC MANAGEMENT

7.1 Introduction

7.1.1 The general objective of ATM is to enable aircraft operators to meet their planned times of departure and arrival and adhere to their preferred flight profiles with minimum constraints without compromising agreed levels of safety.

7.1.2 The scope of ATM as described in the Global Plan encompasses airspace management (ASM), air traffic services (ATS), air traffic flow management (ATFM) and ATM related aspects of flight operations. It is envisaged that as systems evolve, there will be a functional integration of the ground and air components, and a greater involvement of airborne automated systems in the air traffic management process.

7.1.3 The ATM component of the CNS/ATM system, and the Global ATM concept of operations, are described in detail in Chapter 4 of Volume I of the Global Plan.

7.2 ATM Planning in the MID Region

Identification of major traffic flows

7.2.1 For the purpose of CNS/ATM planning, the MID Region has, in accordance with the planning methodology contained in the Global Plan, been divided into homogeneous areas based on traffic flows. Three such areas have been defined, as shown in **Table 7-1**. The traffic flows are shown graphically in **Figure 7-1**.

7.2.2 The ATM system within the MID Region will, as for all other Regions, become part of an integrated global ATM system. The achievement of this goal will require harmonization of national plans of the States within the Region, and harmonization and standardization with the plans of other Regions.

ATM Operations in the Middle East Region

7.2.3 The majority of the Region comprises continental airspace, most of which is well covered by radar and VHF. There are some remote and oceanic areas where VHF is not available. There are also areas, including some carrying high density traffic, where radar coverage is not available.

7.2.4 In the short and medium term, it is expected that the MID Region will continue to be served by a fixed ATS route network. At present the routes are predominantly conventional navaid based routes, with a small number of RNAV routes. Future plans will see the progressive introduction of more fixed RNAV routes, and the introduction of RNP on these routes. A document titled *Guidance Material on the Implementation of RNP/RNAV in the Middle East Region* (contained in the report of MIDANPIRG/5, Appendix 3Q) has been produced to provide more detailed information to States and users regarding the requirements relating to the introduction of these routes.

7.2.5 The principal means of reducing congestion and delays in the region are seen as being the introduction of additional radars, the introduction of RNP 5 allowing closer route spacing, and the introduction of RVSM. Planning for the introduction of these measures should be based on the following principles:

a) Radar surveillance should be provided in areas of high traffic density where it is not currently available.

b) RNP routes and airspace should be introduced as soon as possible in those areas where this would contribute to reduction of congestion.

c) for the of RVSM be harmonized with the plans for its in neighbouring and in should take account the for its introduction in the western part of the Asia/Pacific region;

d) for the introduction of RVSM should be commenced three in advance the intended implementation date.

7.2.6 States been encouraged MIDANPIRG to towards improving ry co-ordination, and include military in delegations meetings, with view to more

7.3 **Transition Guidelines**

7.3.1 The general relating to and evolution already been in Chapter 3, where the importance of maintaining safety and need to in a environment where both aircraft ATS providers ha e levels of capabilities have been

Region

Area of *(AR)*	*Traffic flow*		*Type of area covered*	
AR 1	Asia and Europe, Middle East, Europe and the the northern Arabian Peninsula Mediterranean.	Amman, Baghdad, Cairo, Damascus, Emirates, Jeddah, Tel Aviv	Continental high	Mainly intra-regional and MID EUR . Some overflying
AR-2	Egypt and the Peninsula to/from Europe, Africa and Asia.	Cairo, Bahrain, Emirates, Jeddah, Muscat, Sana a	Remote Continental and Oceanic low density (but seasonally high density)	Mainly landing and departing the MID region. Some EUR/AFI traffic. Seasonal pilgrim flights to and from Africa, Central, South and South-East Asia
AR 3	Asia and Europe, Asia and the Middle East, Europe and the Middle East, north of the Gulf.	Teheran, Kabul	Continental high density	Major flow ASIA/EUR.

7.3.2 Transition planning must also take into account the present operating fleet and the re-equipment plans of airlines operating within the MID Region.

7.3.3 It is important that as CNS/ATM systems are progressively introduced, the ATM procedures should provide positive benefits for those operators who equip with the new technology.

7.3.4 Volume I Chapter 4 of the Global Plan contains detailed information on the specific transition issues apply to ATM. A copy of this is reproduced at **Appendix 7-A** to this chapter.

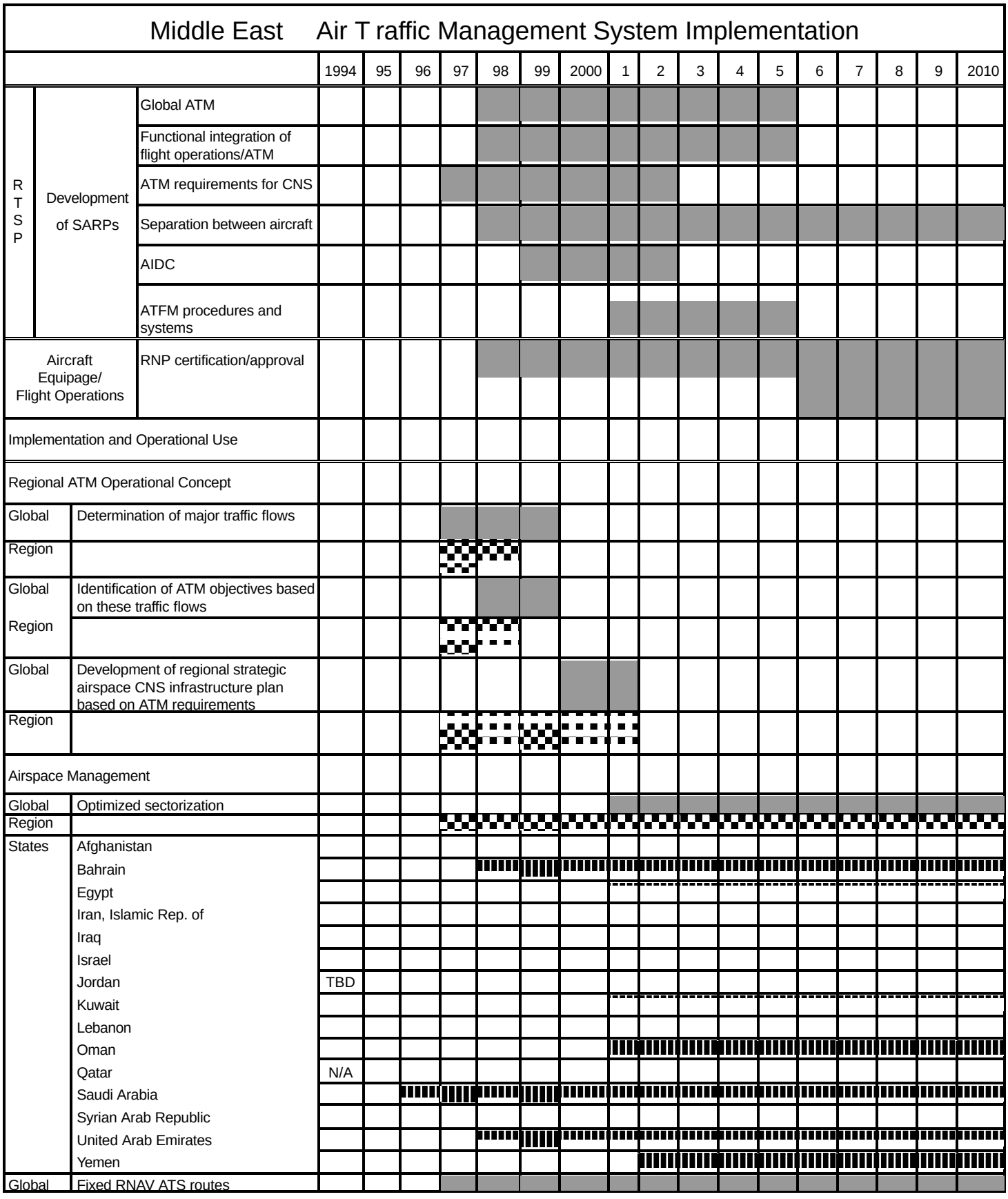
7.3.5 The requirements for the introduction on RNP/RNAV and associated reductions in separation are specified in the *Middle East Implementation Plan for the Introduction of RNP/RNAV*. A copy attached **Appendix 7-B** to this chapter.

7.4 **Middle East Transition Timescale**

7.4.1 The key Global and Middle East events in the transition to the new ATM system are shown in **Table 7-2**. The timescales for individual States are based on the latest information provided by those States, and will be revised as updated information becomes available.

7.4.2 The style of presentation is the same as that used in the corresponding tables of Chapter 5 Volume II of the Global Plan.

Table 7-2


Middle East Air T raffic Management System Implementation
1994
95
96
97
98
99
2000
1
2
3
4
5
6
7
8
9
2010
RTSP
Development of SARPs
Global ATM
Functional integration of flight operations/ATM
ATM requirements for CNS
Separation between aircraft
AIDC
ATFM procedures and systems
Aircraft Equipage/ Flight Operations
RNP certification/approval
Implementation and Operational Use
Regional ATM Operational Concept
Global
Determination of major traffic flows
Region
Global
Identification of ATM objectives based on these traffic flows
Region
Global
Development of regional strategic airspace CNS infrastructure plan based on ATM requirements
Region
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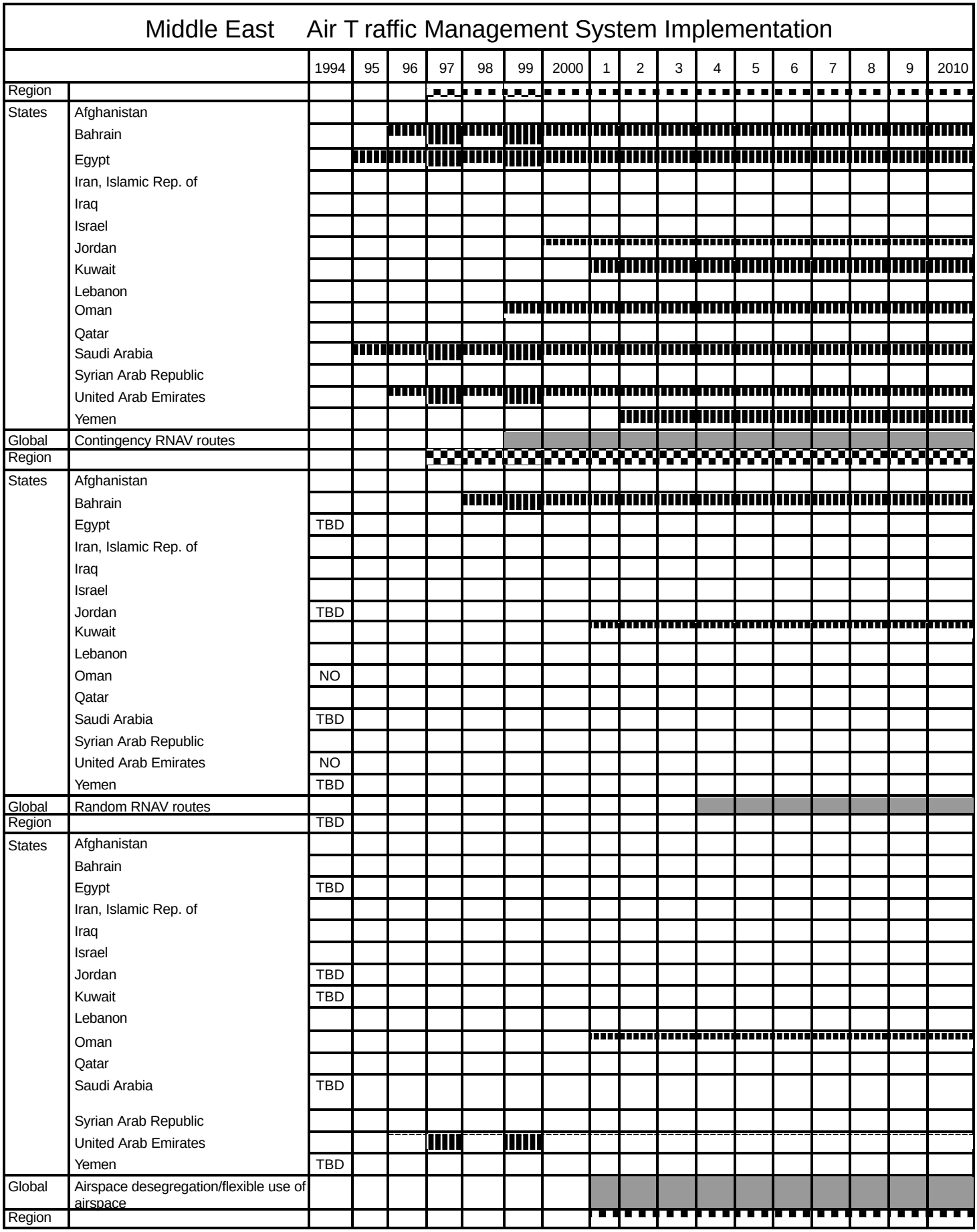
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Airspace desegregation/flexible use of airspace
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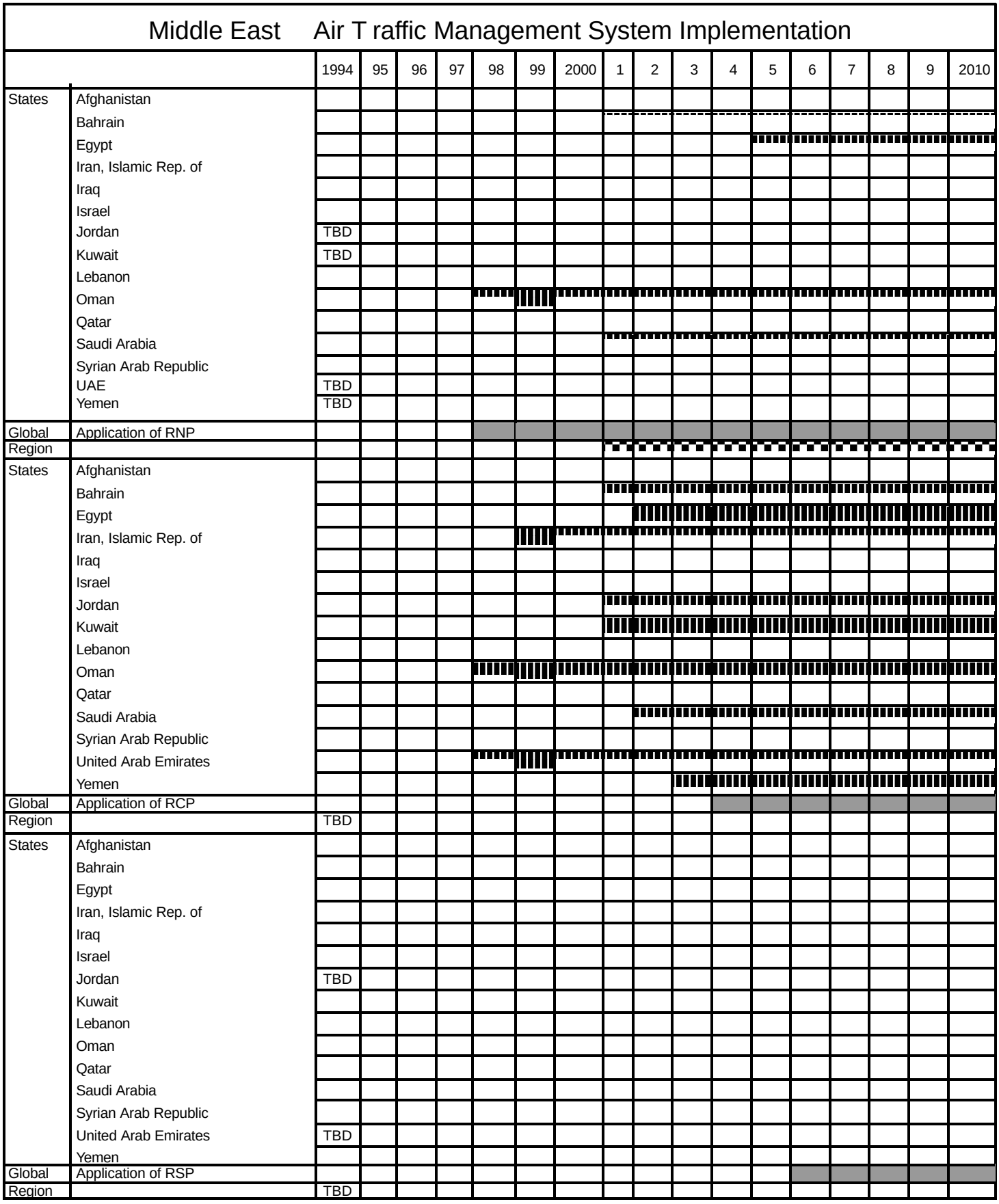
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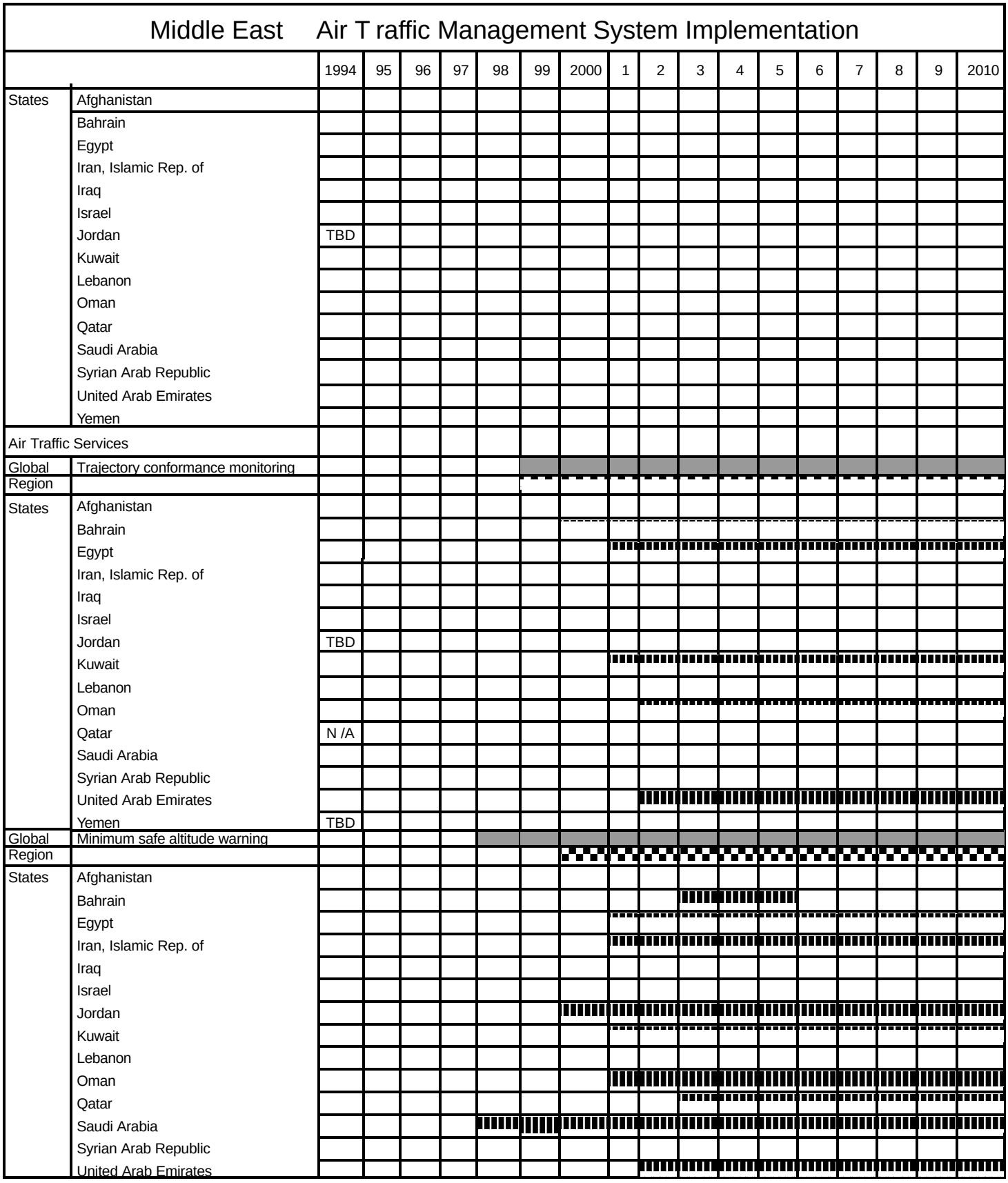
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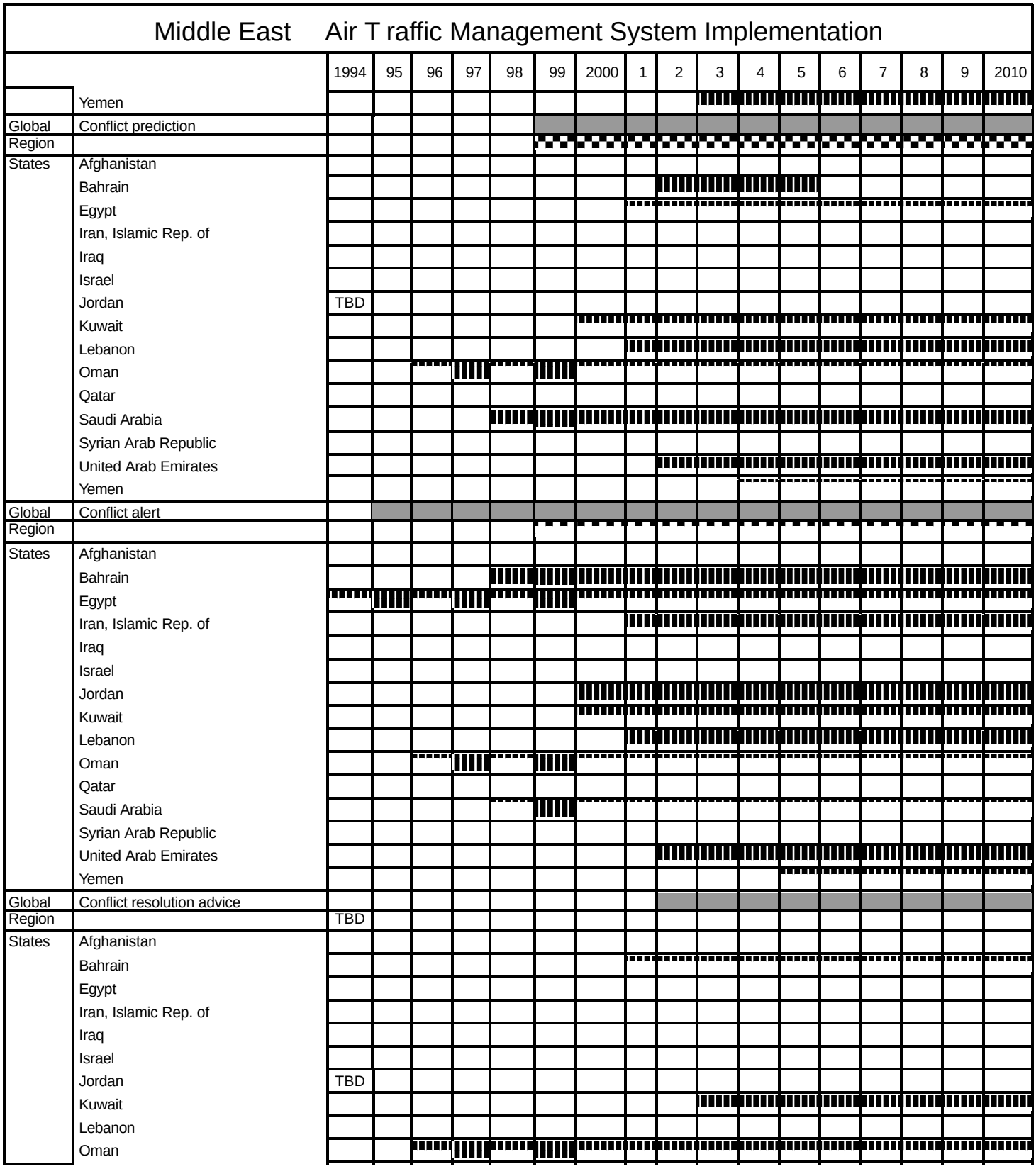
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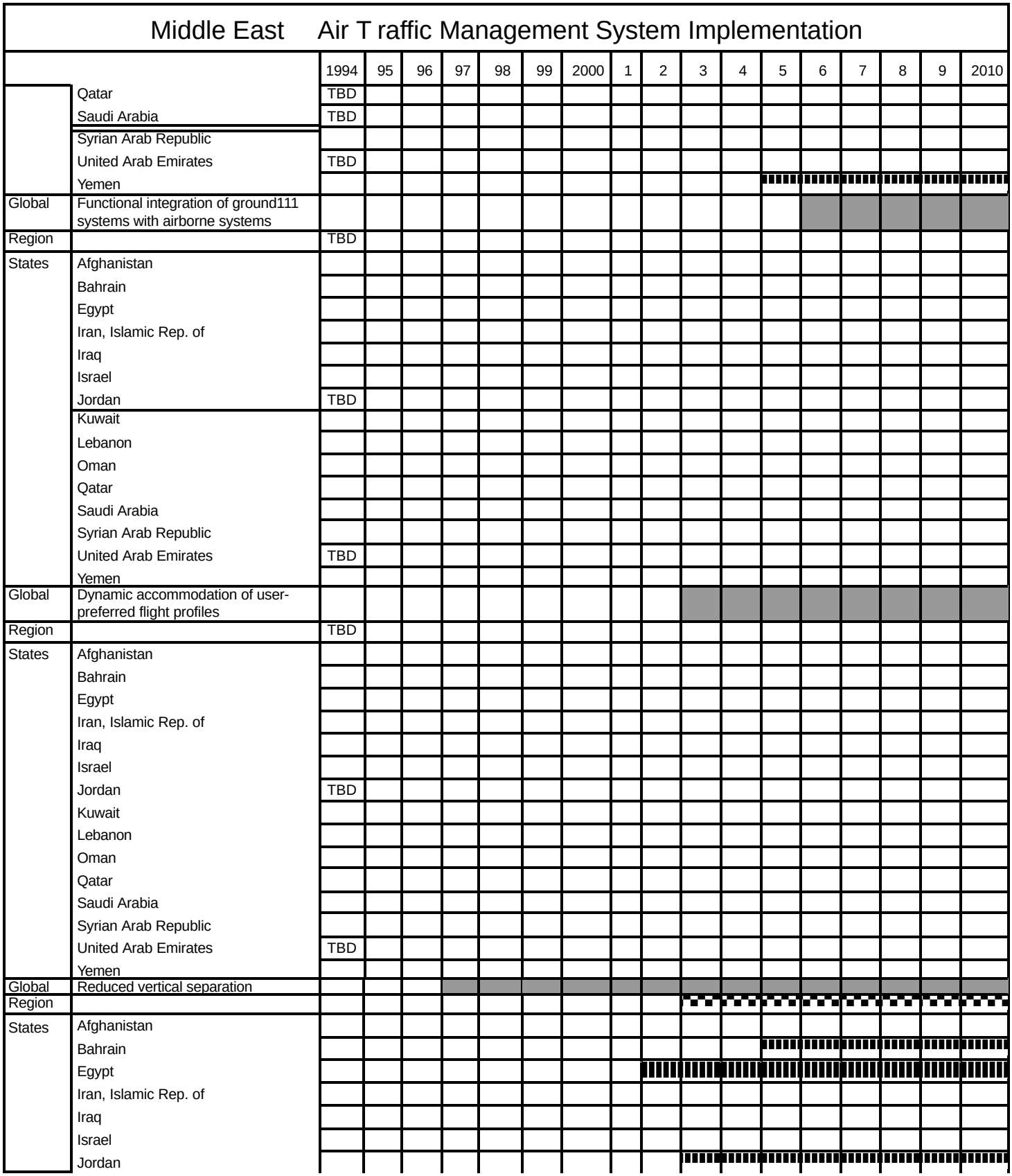
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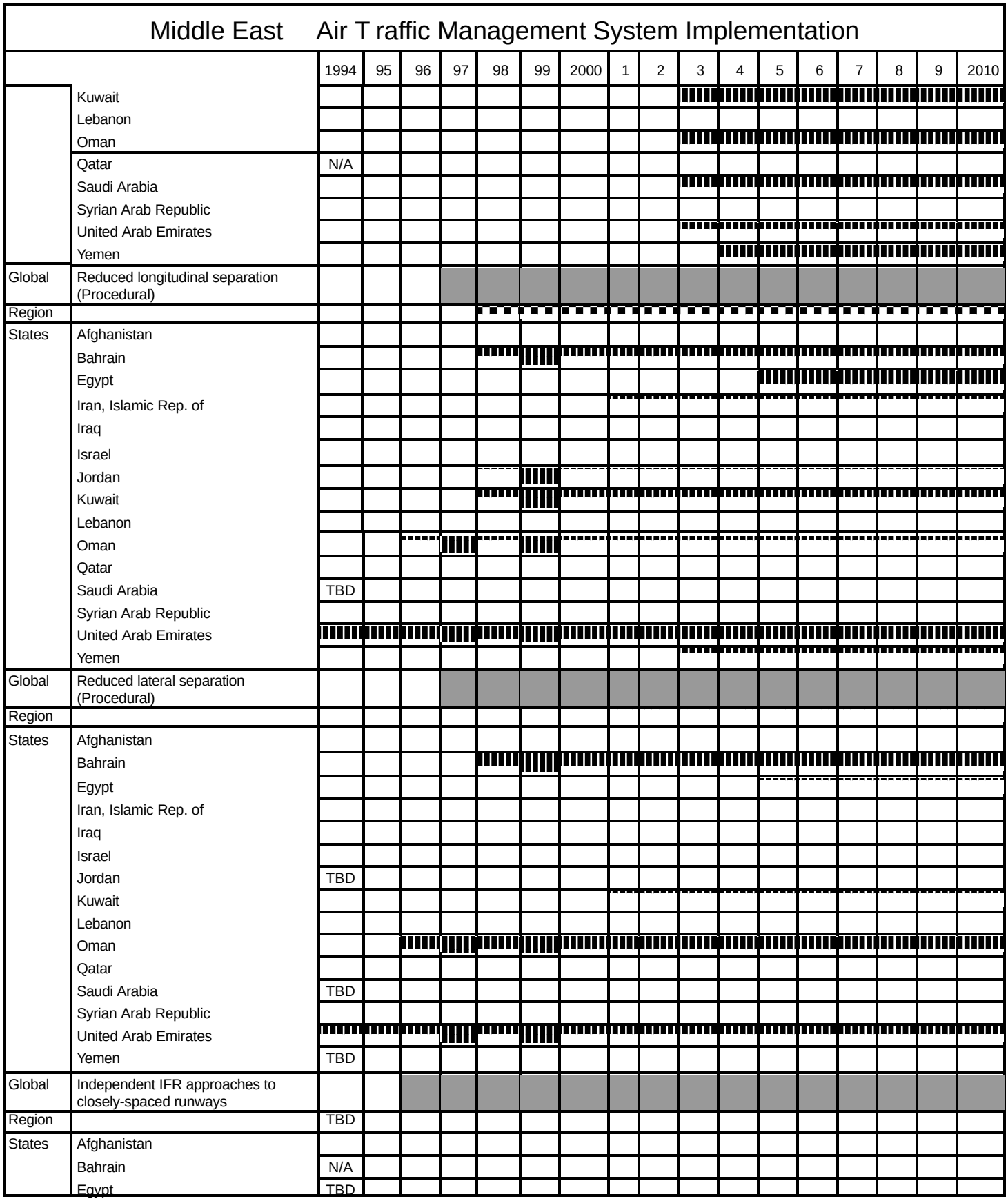
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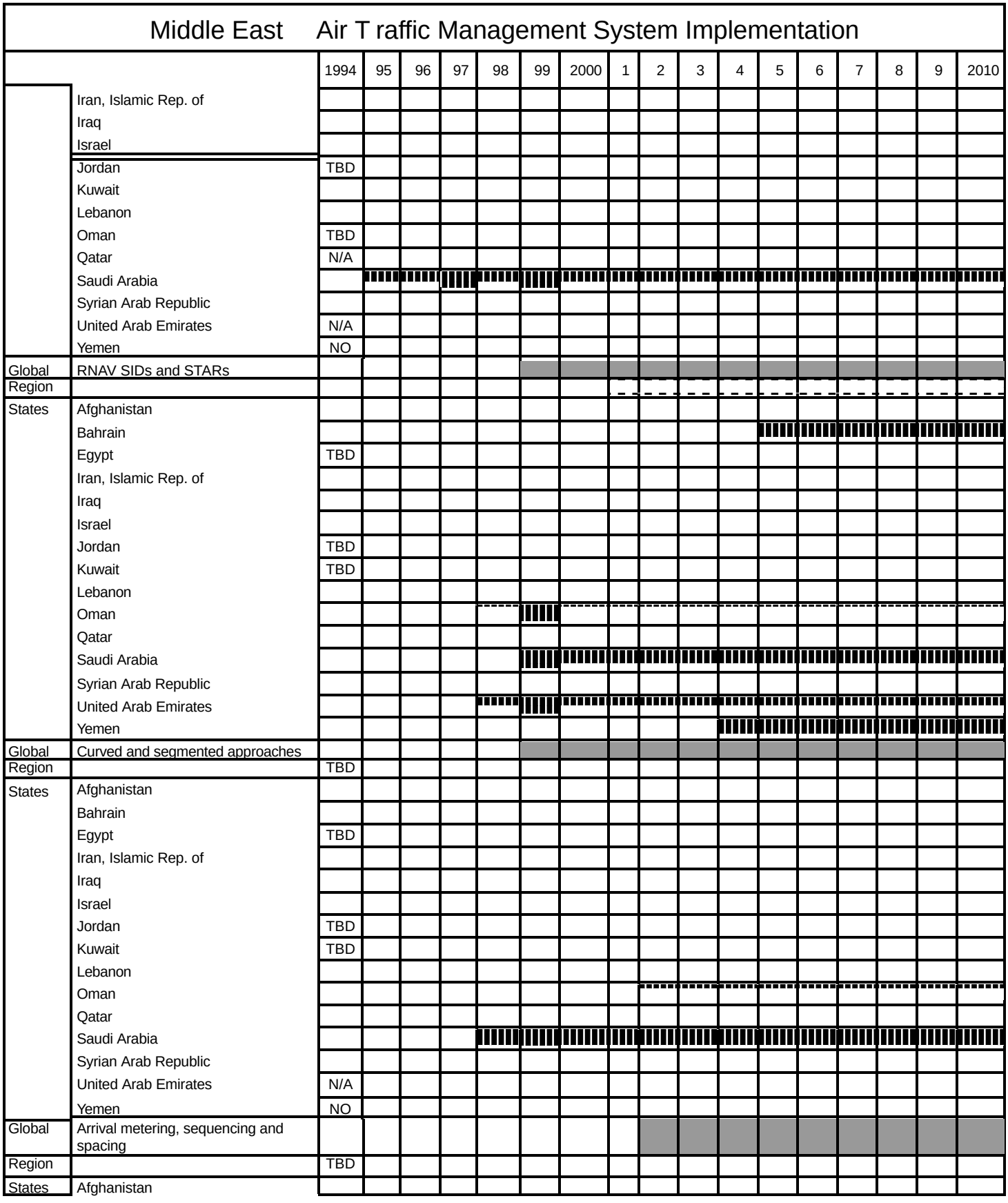
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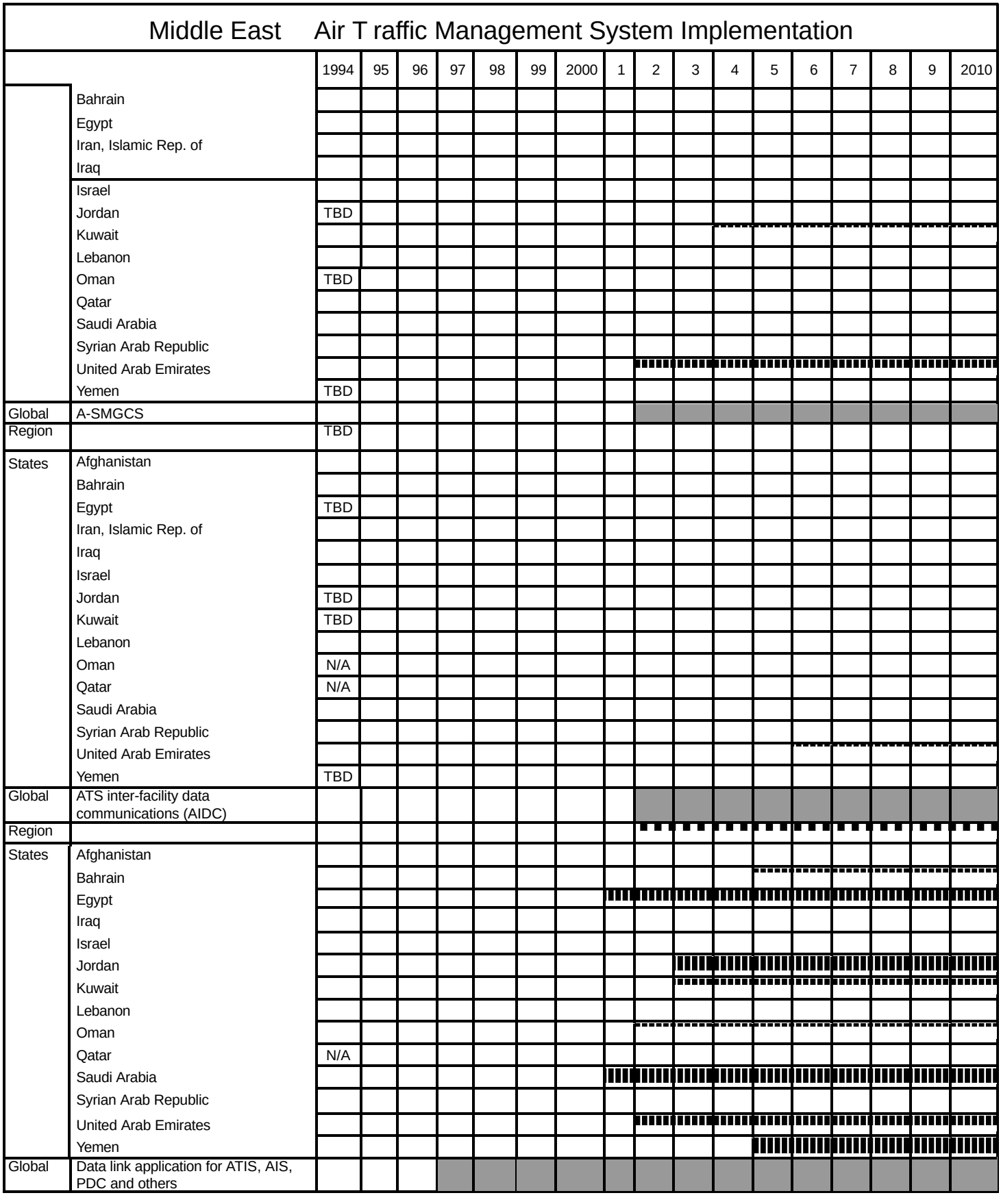
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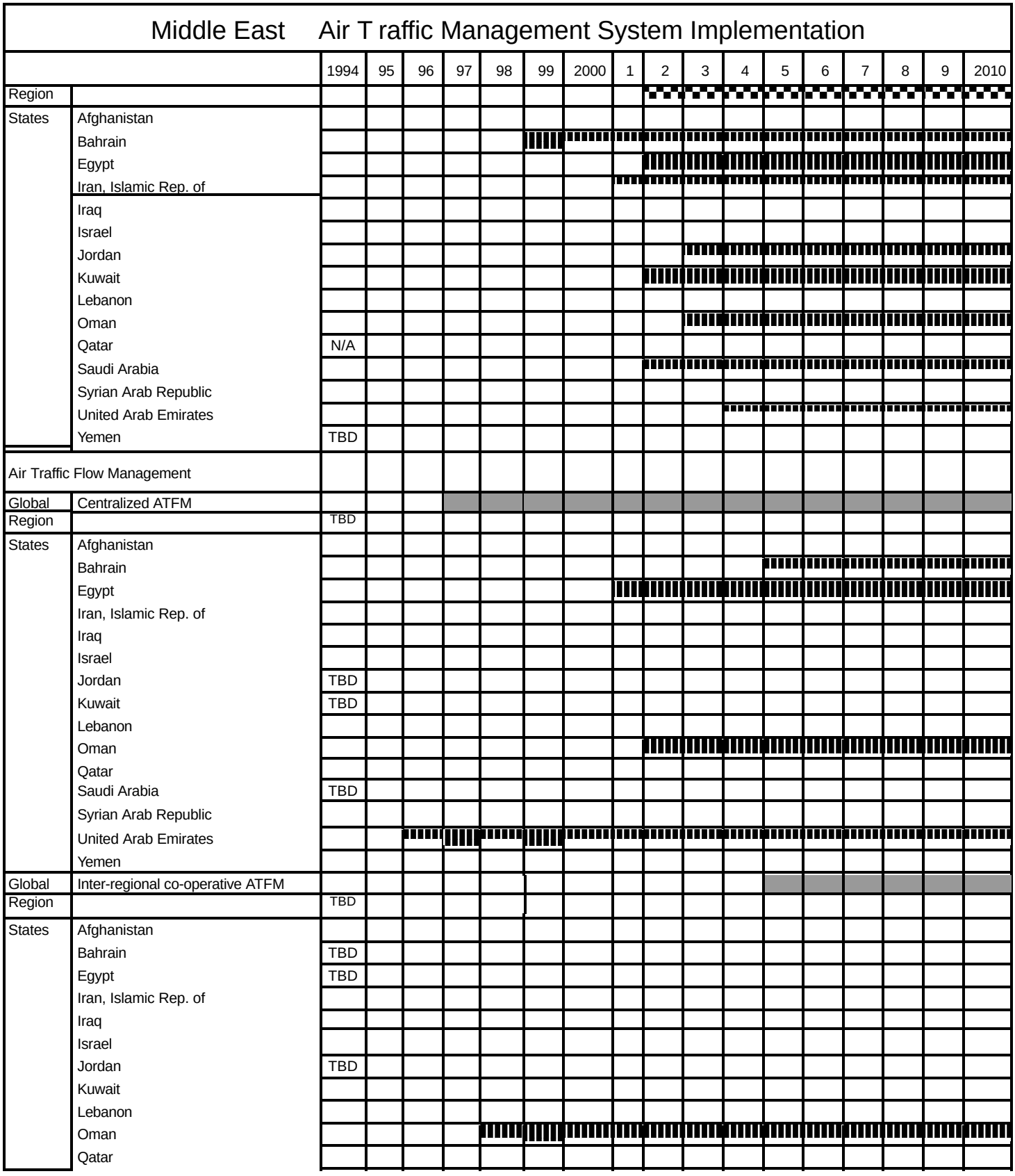
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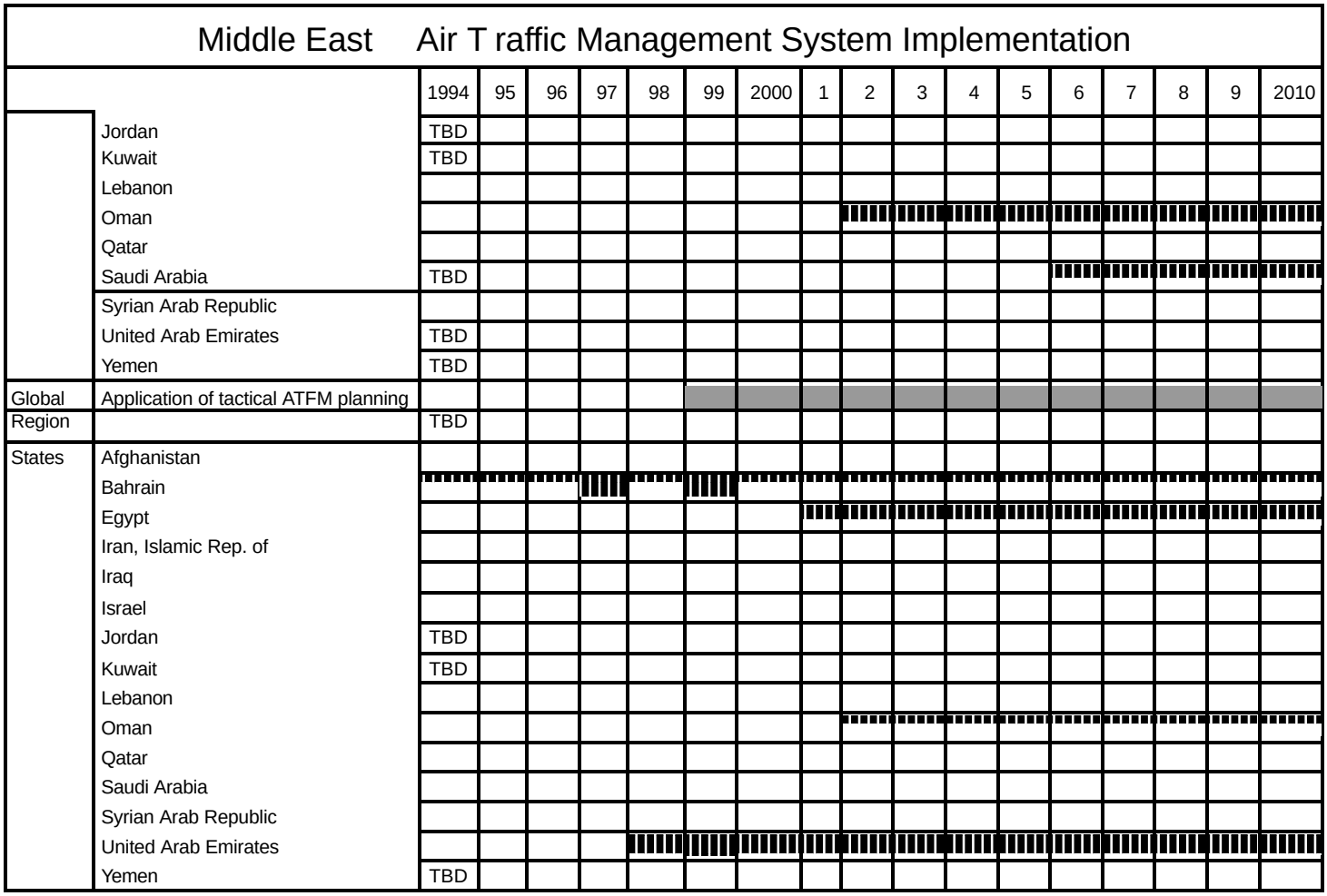
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APPENDIX 7-A

GUIDELINES FOR TRANSITION TO AIR TRAFFIC MANAGEMENT SYSTEMS

(*From Appendix F to Chapter 4 of Volume I of the Global Plan*)

General

The ATM system should ensure the provision of safe, uniform procedures on a global basis.

The ATM system must improve upon the present, agreed to levels of safety.

The ATM system should offer to the users maximum flexibility and efficiency in airspace utilization, taking into account their operational and economic needs, as well as the ground system capabilities.

The ATM system should facilitate a dynamic airspace environment that allows aircraft operators to follow preferred and flexible flight profiles with minimum constraints.

The ATM system must be capable of functional compatibility of the data exchanged between the airborne and the ground elements, in order to ensure global efficiency.

The ATM system should allow for the sharing of airspace between different categories of users, and the airspace should be organized as flexibly as possible, considering different levels of aircraft equipage.

The various elements for the over-all ATM system should be designed to work together effectively to ensure homogeneous, continuous and efficient service to the user from pre-flight to post-flight.

Pilots and air traffic controllers should be kept involved in the ATC process, and automated systems should be human-centred.

The ATM system should be capable of working with a wide variety of traffic densities, aircraft types, avionics sophistication, etc.

The ATM system should not be overly sensitive to random disturbances, such as outages, emergencies, errors in forecasting, etc.

Transition and implementation

The development and implementation of the ATM system should be evolutionary.

The design of the ATM system should provide a well-understood, manageable, cost-effective sequence of improvements that keeps pace with user needs and culminates in a system meeting safety, capacity, efficiency and environmental demands.

The ATM system design should allow for implementation at various levels of sophistication to provide services tailored to specific applications and regions.

Future ATM systems should be implemented in a way that allows adjacent systems to interface so that boundaries are transparent to airspace users.

During the transition period to future ATM systems, present levels of integrity, reliability and availability of existing systems must be maintained.

Airspace organization and management

In the design of the future airspace structure, airspace boundaries and divisions should not prevent the efficient use of automated conflict detection and resolution techniques nor the exploitation of the advanced avionics of modern aircraft.

The aim of airspace sectorization should be to develop an optimum airspace configuration, in combination with the use of other suitable methods for increasing ATM system capacity.

Airspace use should be carefully co-ordinated and monitored in order to cater for the conflicting legitimate requirements of all users and to minimize any constraints on operations.

When it is unavoidable to segregate different categories of traffic, the size, shape and regulation category of airspace should be tailored to the minimum required to protect the operations concerned.

The permanent segregation of airspace should be avoided in favour of flexible use of airspace[3]; however, where it is necessary to cater for specific flight operations, e.g. military, reservation of airspace for such events should be limited in time and space to the minimum required.

Efficient communications should be provided between the entities providing services to air traffic, in order to enhance civil-military co-ordination in real-time.

Consideration should be given to combining flight information services with available surveillance services outside controlled airspace.

To facilitate airspace design, planning should be based on an area control concept rather than on a fixed route network whenever practicable/feasible.

Random area navigation (RNAV) areas should be introduced whenever practicable/feasible in order to enable aircraft to fly their preferred routes.

Fixed route systems based on RNAV should only, if necessary, be applied in high traffic density airspace. Such route systems shall be published and shall be designed to enable air traffic to be separated systematically, while seeking to permit economical flight paths.

Areas that should strive for the earliest and shortest implementation are those where there are known constraints in today's system; that is, where user needs are not met, or where user benefits cannot be fully realized.

Air traffic services

The implementation and application of automation and other advanced technologies, while necessary to increase efficiency and regularity, should maintain and where possible, improve the controller's work environment.

The implementation of an improved air navigation system should be supported by improvements in the communication, navigation and surveillance systems and by advanced automation functions.

Airspace capacity increases should not cause a concurrent increase in controller workload.

Automation aids such as conflict prediction and resolution advisory functions should be introduced to assist the controller where practicable. The accuracy of these systems must be assured.

As the use of automation increases, full advantage should be taken of the ensuing safety benefits.

Automation aids which improve planning data accuracy and reduce the necessity for controller

3 Emerging concept or technology - consensus still to be reached.

interventions to resolve conflicting situations, must contain provisions which allow for required controller awareness in relation to the traffic situation.

The ATM system will allow for a transfer of responsibility of some separation functions from ground to airborne systems under specific circumstances. The trend may continue based on advancements in cockpit situational awareness, however, the ground system should remain as the overriding authority in all cases where arbitration is required.

Data link application should take place in an early stage of the transition phase based on the availability of any of the foreseen data link systems.

Application of data link should aim for a reduction of voice communication load and also for an improvement in the provision of flight data (short-term intent and four-dimensional profile data for the entire flight route) by providing flight management system (FMS) data to the ground ATC system.

Communications networks between ATM facilities within a State and ATM facilities in adjacent States should be established if they do not already exist.

States and/or regions should co-ordinate to ensure that where ATC applications supported by aeronautical mobile-satellite service (AMSS) such as automatic dependent surveillance (ADS) are to be introduced, they should be introduced approximately simultaneously in adjacent fight information regions (FIRs) through which there are major traffic flows.

States should develop operational procedures, in collaboration with neighbouring FIRs for the implementation of new systems such as ADS within airspace under their control, where such application would be advantageous.

Rules and procedures should facilitate the operation of aircraft with different equipment in the same ATM environment.

States and/or regions may consider segregating traffic according to CNS capability, and granting preferred routes/flight levels to aircraft with improved capabilities.

States and/or regions should co-ordinate to ensure that separation standards and procedures for appropriately equipped aircraft are introduced approximately simultaneously in each FIR through which major traffic passes.

Systems or other provisions must allow the controller to ensure safe separation in the event of system failures.

Implementation of new functions should be maintained or improve existing or basic functions rather than just replace them and should relieve rather than worsen controller functions.

Rules and procedures should be developed to facilitate the transfer of aircraft between adjacent systems which provide different levels of services.

Rules and procedures for the sharing of responsibility between the ground ATC system and the flight management system for calculating and maintaining flight profiles should be clearly defined prior to implementation.

All the future automation specifications for ATC systems should provide for functional coherence between air traffic flow management and air traffic control systems.

Air traffic flow management (ATFM)

Data should be collated on likely future demand from historical information, planned development by airports and airlines, aircraft manufacturers' order books, plus the macro-economic forecasts of trends in the home and other State economies.

A recognized and common methodology for the assessment of the capacity of the current and planned ATM system should be developed to include sector capacities and in particular "choke" points.

Regions should consider the introduction of a centralized flow management unit.

Where more than one flow management unit exists, plans to harmonize procedures and practices with adjacent units should be developed.

Human factors

Planning and implementation of improved ATM capabilities should include consideration of human factors impacts and requirements. The goals listed for the future ATM system should be qualified in relation to human factors, at least in terms of the following considerations:

The level of safety targeted for the future system should be defined not only with reference to various system statistics, but also with reference to error-inducing mechanisms related to human capabilities and limitations as well as important individual cases;

Definition of system and resource capacity should include reference to the responsibilities, capabilities, and limitations of ATS personnel and air crews who must retain situation awareness and understanding in order to carry out all of their responsibilities;

Dynamic accommodation of three and four-dimensional flight trajectories to provide user-preferred routings while an ultimate goal for users may initially be restricted by human capabilities and the need to organize the flow of air traffic in an orderly manner in order to provide separation. The transition period will need careful research and evaluation on human factors aspects;

Provision of large volumes of potentially relevant information to users and ATS personnel should be limited to what is absolutely necessary and be mediated by methods that effectively package and manage such information to prevent information overload while providing information pertinent to particular operational needs;

A single airspace continuum should be free of operational discontinuities and inconsistencies between kinds of airspace and kinds of facilities that affect responsibilities and activities of air crews or ATS personnel at functional boundaries;

Organization of airspace in accordance with ATM procedures should also be readily learnable, recallable, and, to the maximum practical extent, intuitively understandable by air crews and ATS personnel; and

Responsibilities of pilots, air traffic controllers and system designers should be clearly defined prior to the implementation of new automated systems and tools (e.g. conflict resolution advisories, data link, ADS, etc.).

Aerodrome operations

Metering, sequencing and spacing aids should be introduced in areas where there are frequent delays to arriving aircraft in all weather conditions.

Simultaneous approaches to closely spaced parallel runways should be implemented at locations where technology and procedures have been developed that permit such use.

Alternative approach capabilities should be considered for terminal applications where there are closely spaced airports, closely spaced parallel runways, noise footprint requirements, terrain/obstacle clearance requirements, or limited real estate available for new runway construction.

Data link communications should be considered at airports to relieve air-ground voice communications congestion, and thereby reduce errors or confusion arising from voice communications.

Automated surface movement guidance and control systems, in conjunction with surface detection radar or differential GNSS equipment, which associates callsigns with displayed surface locations and contain controller alerting capabilities, should be provided where the traffic density and/or local conditions warrant this.

Lighting systems, positional displays and other devices that assist pilots and controllers in preventing runway incursions should be introduced according to local needs.

APPENDIX 7-B

MIDDLE EAST IMPLEMENTATION PLAN FOR THE INTRODUCTION OF RNP/RNAV

(*Adopted by MIDANPIRG/5 - Conclusion 5/22*)

1 Purpose of the Document

1.1 This document sets out the regional policy for the ICAO Middle East Region in relation to the implementation of RNP/RNAV routes, and RNP-based separation.

1.2 It is not intended to replace or over-ride existing ICAO material. Its function is to provide checklists for planners, to specify the regional RNP/RNAV priorities and the timescales for introduction.

2 Identified routes in the Middle East Region where the introduction of RNP would be beneficial

2.1 Routes through Iran/Afghanistan

a) Uromiyeh to Karachi FIR

b) Uromiyeh to Lahore FIR via Kabul FIR

c) Birjand to CIS States via Northern Iran

2.2 Routes through the Arabian Peninsula

a) Routes within the Gulf area

b) Western Turkey to the Gulf

c) Indian Sub-continent to Cairo FIR

d) Jeddah to Indonesia via Sana a FIR

e) Riyadh to the Arabian Sea via Muscat FIR

f) Indian Sub-Continent to Muscat FIR

g) Morocco to Jeddah via Cairo FIR (Haj route UM999)

3 RNP Types in the Middle East Region

3.1 The RNP type for initial implementation on ATS routes within the MID Region where the declaration of RNP is required shall be:

a) RNP 5 for all route segments where the CNS infrastructure will support this; and

b) RNP 10 for other route segments.

4 Separation Standards

4.1 The separation standards available for use on RNP/RNAV routes are described in the *Guidance material on Implementation of RNP/RNAV in the Middle East Region.* This document also provides references to the basic ICAO documents where the conditions of use of these standards is specified.

4.2 RNP will initially be used in the MID Region only to achieve reductions in lateral separation. The separation minima to be used are:

a) 50 NM track spacing in oceanic and remote areas using RNP 10

b) 18 NM track spacing in non-radar airspace for routes carrying opposite direction traffic using RNP 5

c) 16.5 NM track spacing in non-radar airspace for routes carrying same direction traffic only using RNP 5

d) 10-15 NM track spacing in radar airspace using RNP 5.

5 Implementation Checklist

5.1 Objective

To achieve an orderly , well co-ordinated implementation of RNP airspace and/or routes, taking into account user, provider and support group requirements, capabilities and limitations. Proper advance notice must be provided to users, providers and support groups to achieve readiness prior to the implementation date.

5.2 Initial Planning

5.2.1 Initial planning should include the following sections within the relevant national administrations of the States involved and external organizations:

a) Air Traffic Services

b) Aeronautical Information Services

c) CNS systems planners

d) Airworthiness

e) Flight Standards

f) Operators and industry organizations

g) Military authorities

5.2.2 Resources needed for implementation should be identified, co-ordination procedures between the various bodies involved should be defined, and an initial target date should be set.

5.3 Requirements relating to the introduction of RNP.

5.3.1 Prior to the introduction of RNP airspace or routes, it is necessary to ensure that all the following criteria are satisfied:

a) Ensure, through consultation with operators and relevant industry organizations that the technical means of compliance with the proposed RNP, including aircraft equipage and any required ground infrastructure, is available.

b) Allow adequate time for intra and inter regional co-ordination and the development of amendment proposals to the Air Navigation Plan where necessary.

c) Ensure that airworthiness and operational approval procedures for aircraft systems are available.

d) Provide adequate lead time for installation and approval of required airborne systems.

e) Ensure that appropriate contingency procedures to cover degradation of navigation performance and in-flight emergencies are in place.

f) Provide adequate lead time for publication of revisions to documents (e.g. AIP, airworthiness and flight standards procedures).

g) Ensure that adequate time is provided for education and training of ATC, aircrew, airline flight operations personnel (dispatchers) and engineering staff responsible for the airworthiness release of aircraft.

h) Ensure that conversion of coordinates to WGS-84 has been completed for all airspace where RNP is to be introduced.

5.4 Requirements associated with the introduction of new Separation Standards

5.4.1 The following list is a general summary of the requirements associated with the introduction of new RNP-based separation standards. For full details, it will be necessary to consult the reference documents listed the *Guidance Material on Implementation of RNP/RNAV in the Middle East Region* .

a) Ensure that appropriate SARPS and PANS to cover the proposed separation standards exist, and that all conditions applying to the separation standards to be introduced can be met.

b) Consult with operators and relevant industry organizations.

c) Consider whether the standards to be introduced will require modification to existing weather deviation procedures.

d) Ensure that appropriate contingency procedures to cover degradation of navigation performance and in-flight emergencies are in place.

e) Provide adequate lead time for publication of operational procedures for ATS aircrew, airline flight operations personnel (dispatchers) and engineering staff responsible for the airworthiness release of aircraft.

f) Ensure that adequate levels of communication and surveillance are available to ATC.

g) Ensure that adequate time is provided for education and training of ATC aircrew and airline flight operations personnel (dispatchers) and engineering staff responsible for the airworthiness release of aircraft.

h) Develop data collection and analysis procedures for communications and surveillance performance, aircraft navigation performance and/or traffic density, as required by the separation standards to be introduced.

i) Ensure that where required by the separation standards being introduced, navigation error monitoring procedures are in place.

5.5 **Airspace Planning**

5.5.1 New air routes should be constructed in accordance with the Working Principles for the construction of Air Routes, in Appendix B of the *Guidance Material on Implementation of RNP/RNAV in the Middle East Region*.

5.5.2 The introduction of new air routes may require changes to sectorization and management of airspace in order to achieve maximum efficiency. In particular, consideration should be give to the need for flexible use of airspace as described in Chapter 4 of Volume I of the *Global Air Navigation Plan for CNS/ATM Systems*.

Chapter 8: MAJOR TRAFFIC FLOWS - REQUIREMENTS FOR AIRCRAFT AND GROUND SYSTEMS TO SUPPORT ATM OPERATIONAL ENHANCEMENTS

8.1 Introduction

8.1.1 The characteristics of the major traffic flows within the region determine the nature of the ATM operational enhancements which are required, and the timing of their implementation. The three major traffic flow areas for the MID Region are described in Chapter 7 - Air Traffic Management.

8.1.2 There are differences in the traffic volume, and mix of aircraft types, from one traffic flow area to another. This may lead to different ATM operational requirements, and different timings for the introduction of operational enhancements. These differences may result in different requirements for CNS systems.

8.1.3 The major part of this chapter consists of a series of tables which describe the requirements for the systems, both ground and airborne, needed to support the various ATM operational enhancements.

8.2 Explanation of the Tables

Table 8-1:	This table sets out the ATM operational enhancements planned for each major traffic flow area, and gives the timescales for their introduction.
Tables 8-2 to 8-4:	These tables show the ATM operational requirements for communications, navigation and surveillance systems for each major traffic flow area.

8.2.1 Also included, at **Appendix 8-A**, is a copy of Appendix B to Chapter 4 of Volume I of the Global Plan. This describes the ATM operational requirements, for both aircraft and the ground systems, in an RNP/RNAV environment. This is a generic table, including options which would not be relevant to the MID Region. It is included here to provide a quick reference for the main requirements for implementation of the listed options. Note, however, that the relevant SARPS should always be consulted for detailed implementation planning.

Table 8-1

MID REGION – PLANNED ATM ENHANCEMENTS BY TRAFFIC FLOW AREA

AREA OF ROUTING	ATM OBJECTIVE/ STATES IMPLEMENTATION		95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10
AR-1 (Northern Arabian Peninsula, Near East and Northern Egypt)	Region	Longitudinal separation reduction to 80 NM RNAV																
	States	Bahrain																
		Egypt																
		Iraq																
		Israel																
		Jordan																
		Kuwait																
		Lebanon																
		Oman																
		Qatar	N	A														
		Saudi Arabia																
		Syrian Arab Republic																
		United Arab Emirates	N	A														
	Region	Longitudinal separation reduction to 50 NM/RNAV procedures (RNP 10)																
	States	Bahrain																
		Egypt																
		Iraq																
		Israel																
		Jordan	N	A														
		Kuwait																
		Lebanon																
		Oman	N	A														
		Qatar	N	A														
		Saudi Arabia																
		Syrian Arab Republic																
		United Arab Emirates	N	A														
	Region	Longitudinal separation reduction to 30 NM (RNP 5)[1]	T	B	D													

[1] SARPS not yet completed

MID REGION – PLANNED ATM ENHANCEMENTS BY TRAFFIC FLOW AREA

AREA OF ROUTING	ATM OBJECTIVE/ STATES IMPLEMENTATION		95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10
	States	Bahrain																
		Egypt																
		Iraq																
		Israel																
		Jordan	T	B	D													
		Kuwait																
		Lebanon																
		Oman	N	A														
		Qatar	N	A														
		Saudi Arabia																
		Syrian Arab Republic																
		United Arab Emirates	N	A														
	Region	Lateral Separation Reduction to 18 NM (RNP 5)																
	States	Bahrain																
		Egypt																
		Iraq																
		Israel																
		Jordan	T	B	D													
		Kuwait																
		Lebanon																
		Oman																
		Qatar																
		Saudi Arabia																
		Syrian Arab Republic																
		United Arab Emirates																
	Region	Introduce RVSM to 1 000 ft above FL 290																
	States	Bahrain	T	B	D													
		Egypt																
		Iraq																
		Israel																
		Jordan																
		Kuwait																
		Lebanon																
		Oman																
		Qatar	N	A														
		Saudi Arabia																
		Syrian Arab Republic																
		United Arab Emirates																
AR-2 (Southern Arabian Peninsula and Southern Egypt)	Region	Longitudinal separation reduction to 10 min /80 NM RNAV																
	States	Bahrain																
		Egypt																
		Oman																
		Saudi Arabia																
		United Arab Emirates	N	A														
		Yemen																
	Region	Longitudinal separation reduction to 50 NM/RNAV procedures (RNP 10)																
	States	Bahrain																
		Egypt																
		Oman	N	A														
		Saudi Arabia																
		United Arab Emirates	N	A														
		Yemen																

MID REGION – PLANNED ATM ENHANCEMENTS BY TRAFFIC FLOW AREA

AREA OF ROUTING	ATM OBJECTIVE/ STATES IMPLEMENTATION		95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10
	Region	Longitudinal separation reduction to 30 NM (RNP 5)[1]	T	B	D													
	States	Bahrain																
		Egypt																
		Oman	N	A														
		Saudi Arabia																
		United Arab Emirates	N	A														
		Yemen	T	B	D													
	Region	Lateral Separation Reduction to 18 NM (RNP 5)							■	■	■	■	■	■	■	■	■	■
	States	Bahrain																
		Egypt																
		Oman																
		Saudi Arabia																
		Syrian Arab Republic																
		United Arab Emirates																
		Yemen																
	Region	Introduce RVSM to 1 000 ft above FL 290									■	■	■	■	■	■	■	■
	States	Bahrain																
		Egypt																
		Oman										▬	▬	▬	▬	▬	▬	▬
		Saudi Arabia																
		United Arab Emirates										▬	▬	▬	▬	▬	▬	▬
		Yemen										▬	▬	▬	▬	▬	▬	▬
AR-3 (Iran/Afghanistan)	Region	Longitudinal separation reduction to 10 min /80 NM RNAV				■	■	■	■	■	■	■	■	■	■	■	■	■
	States	Afghanistan																
		Iran, Islamic Republic of																
	Region	Longitudinal separation reduction to 50 NM/RNAV procedures (RNP 10)								■	■	■	■	■	■	■	■	■
	States	Afghanistan																
		Iran, Islamic Republic of																
	Region	Longitudinal separation reduction to 30 NM (RNP 5)[1]	T	B	D													
	States	Afghanistan																
		Iran, Islamic Republic of																
	Region	Lateral Separation Reduction to 18 NM (RNP 5)							■	■	■	■	■	■	■	■	■	■
	States	Afghanistan																
		Iran, Islamic Republic of																
	Region	Introduce RVSM to 1 000 ft above FL 290									■	■	■	■	■	■	■	■
	States	Afghanistan																
		Iran, Islamic Republic of																

[1] SARPS not yet completed

[1] SARPS not yet completed

Table 8-2

MID REGION – ATM REQUIREMENTS FOR COMMUNICATIONS

AREA OF ROUTING	SYSTEM COMPONENT/ STATES' IMPLEMENTATION		95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10
AR-1 (Northern Arabian Peninsula, Near East and Northern Egypt)	Region	Continuous coverage of VHF voice																
	States	Bahrain																
		Egypt																
		Iraq																
		Israel																
		Jordan																
		Kuwait																
		Lebanon																
		Oman																
		Qatar																
		Saudi Arabia																
		Syrian Arab Republic																
		United Arab Emirates																
	Region	CPDLC																
	States	Bahrain																
		Egypt																
		Iraq																
		Israel																
		Jordan																
		Kuwait																
		Lebanon																
		Oman																
		Qatar	N /	A														
		Saudi Arabia																
		Syrian Arab Republic																
		United Arab Emirates																
	Region	ATN																
	States	Bahrain																
		Egypt																
		Iraq																
		Israel																
		Jordan																
		Kuwait																
		Lebanon																
		Oman																
		Qatar																
		Saudi Arabia																
		Syrian Arab Republic																
		United Arab Emirates																

MID REGION – ATM REQUIREMENTS FOR COMMUNICATIONS

AREA OF ROUTING	SYSTEM COMPONENT/ STATES' IMPLEMENTATION		95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10
AR-1 (Northern Arabian Peninsula, Near East and Northern Egypt)	**Region**	**AIDC**																
	States	**Bahrain**																
		Egypt																
		Iraq																
		Israel																
		Jordan																
		Kuwait																
		Lebanon																
		Oman																
		Qatar	N/	A														
		Saudi Arabia																
		Syrian Arab Republic																
		United Arab Emirates																
AR-2 (Southern Arabian Peninsula, and Southern Egypt)	**Region**	**Continuous coverage of VHF voice ***	**Not Feasible**															
	States	**Bahrain**																
		Egypt																
		Oman																
		Saudi Arabia																
		United Arab Emirates																
		Yemen																
	Region	**CPDLC**																
	States	**Bahrain**																
		Egypt																
		Oman																
		Saudi Arabia																
		United Arab Emirates																
		Yemen																
	Region	**ATN**																
	States	**Bahrain**																
		Egypt																
		Oman																
		Saudi Arabia																
		United Arab Emirates																
		Yemen																
	Region	**AIDC**																
	States	**Bahrain**																
		Egypt																
		Oman																
		Saudi Arabia																
		United Arab Emirates																
		Yemen																

* Coverage not possible in oceanic and remote parts of AR-2

MID REGION – ATM REQUIREMENTS FOR COMMUNICATIONS																			
AREA OF ROUTING	SYSTEM COMPONENT/ STATES' IMPLEMENTATION		95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10
AR-3 (Iran/Afghanistan)	Region	Continuous coverage of VHF voice																
	States	Afghanistan																
		Iran, Islamic Republic of																
	Region	CPDLC**																
	States	Afghanistan																
		Iran, Islamic Republic of																
	Region	ATN																
	States	Afghanistan																
		Iran, Islamic Republic of																
	Region	AIDC																
	States	Afghanistan																
		Iran, Islamic Republic of																

** FANS 1/A CPDLC

Table 8-3

MID REGION – ATM REQUIREMENTS FOR NAVIGATION

AREA OF ROUTING	SYSTEM COMPONENT/ STATES IMPLEMENTATION		95	96	97	98	99	00	1	2	3	4	5	6	7	8	9	10
AR-1 (Northern Arabian Peninsula, Near East and Northern Egypt)	Region	WGS 84																
	States	Bahrain																
		Egypt																
		Iraq																
		Israel																
		Jordan																
		Kuwait																
		Lebanon	T	B	D													
		Oman																
		Qatar																
		Saudi Arabia																
		Syrian Arab Republic	T	B	D													
		United Arab Emirates																
	Region	RNP 10	N/	A														
	States	Bahrain																
		Egypt																
		Iraq																
		Israel																
		Jordan	N/	A														
		Kuwait																
		Lebanon																
		Oman																
		Qatar	N /	A														
		Saudi Arabia																
		Syrian Arab Republic																
		United Arab Emirates																
	Region	RNP 5																
	States	Bahrain																
		Egypt																
		Iraq																
		Israel																
		Jordan																
		Kuwait																
		Lebanon																
		Oman																
		Qatar	T	B	D													
		Saudi Arabia																
		Syrian Arab Republic																
		United Arab Emirates																

MID REGION – ATM REQUIREMENTS FOR NAVIGATION

AREA OF ROUTING	SYSTEM COMPONENT/ STATES IMPLEMENTATION		95	96	97	98	99	00	1	2	3	4	5	6	7	8	9	10
AR-1 (Northern Arabian Peninsula, Near East and Northern Egypt)	Region	RNP 1	T	B	D													
	States	Bahrain	T	B	D													
		Egypt																
		Iraq																
		Israel																
		Jordan	T	B	D													
		Kuwait																
		Lebanon																
		Oman	T	B	D													
		Qatar	N /	A														
		Saudi Arabia																
		Syrian Arab Republic																
		United Arab Emirates	T	B	D													
AR-2 (Southern Arabian Peninsula, and Southern Egypt)	Region	WGS 84																
	States	Bahrain																
		Egypt																
		Oman																
		Saudi Arabia																
		United Arab Emirates																
		Yemen	T	B	D													
	Region	RNP 10																
	States	Bahrain																
		Egypt																
		Oman																
		Saudi Arabia																
		United Arab Emirates	N/	A														
		Yemen																
	Region	RNP 5																
	States	Bahrain																
		Egypt																
		Oman																
		Saudi Arabia																
		United Arab Emirates																
		Yemen																
	Region	RNP 1	T	B	D													
	States	Bahrain																
		Egypt																
		Oman	T	B	D													
		Saudi Arabia																
		United Arab Emirates	T	B	D													
		Yemen																

MID REGION – ATM REQUIREMENTS FOR NAVIGATION

AREA OF ROUTING	SYSTEM COMPONENT/ STATES	IMPLEMENTATION	95	96	97	98	99	00	1	2	3	4	5	6	7	8	9	10
AR-3 (Iran/Afghanistan)	Region	WGS 84																
	States	Afghanistan																
		Iran, Islamic Republic of																
	Region	RNP 10																
	States	Afghanistan																
		Iran, Islamic Republic of																
	Region	RNP 5																
	States	Afghanistan																
		Iran, Islamic Republic of																
	Region	RNP 1	T	B	D													
	States	Afghanistan																
		Iran, Islamic Republic of																

Table 8-4

MID REGION – ATM REQUIREMENTS FOR SURVEILLANCE

AREA OF ROUTING	SYSTEM COMPONENT/ STATES IMPLEMENTATION		95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10
AR-1 (Northern Arabian Peninsula, Near East and Northern Egypt)	Region	SSR Mode S																
	States	Bahrain																
		Egypt																
		Iraq																
		Israel																
		Jordan	T	B	D													
		Kuwait																
		Lebanon																
		Oman	N /	A														
		Qatar																
		Saudi Arabia																
		Syrian Arab Republic																
		United Arab Emirates																
	Region	ADS	T	B	D													
	States	Bahrain																
		Egypt																
		Iraq																
		Israel																
		Jordan	T	B	D													
		Kuwait																
		Lebanon																
		Oman	N /	A														
		Qatar	N /	A														
		Saudi Arabia																
		Syrian Arab Republic																
		United Arab Emirates	N/	A														
	Region	Interim ADS (FANS 1/A)	N/	A														
	States	Bahrain																
		Egypt																
		Iraq																
		Israel																
		Jordan																
		Kuwait																
		Lebanon																
		Oman	N /	A														
		Qatar	N /	A														
		Saudi Arabia	N/	A														
		Syrian Arab Republic																
		United Arab Emirates	N/	A														

MID REGION – ATM REQUIREMENTS FOR SURVEILLANCE

AREA OF ROUTING	SYSTEM COMPONENT/ STATES IMPLEMENTATION		95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10
AR-2 (Southern Arabian Peninsula, and Southern Egypt)	Region	SSR Mode S																
	States	Bahrain																
		Egypt																
		Oman	N /	A														
		Saudi Arabia																
		United Arab Emirates																
		Yemen	T	B	D													
	Region	ADS																
	States	Bahrain																
		Egypt																
		Oman	N /	A														
		Saudi Arabia																
		United Arab Emirates	N/	A														
		Yemen																
	Region	Interim ADS (FANS 1/A)																
	States	Bahrain																
		Egypt																
		Oman	N /	A														
		Saudi Arabia																
		United Arab Emirates	N/	A														
		Yemen	T	B	D													
AR-3 (Iran/Afghanistan)	Region	SSR Mode S	T	B	D													
	States	Afghanistan																
		Iran, Islamic Republic of																
	Region	ADS																
	States	Afghanistan																
		Iran, Islamic Republic of																
	Region	Interim ADS (FANS 1/A)																
	States	Afghanistan																
		Iran, Islamic Republic of																

APPENDIX 8-A

(*From Appendix 4-B of Chapter 4 of the Volume I of the Global Plan*)

ATM Operational Requirements in an RNP/RNAV Environment

Code	ATM Operational Enhancements	Required Functions (Air)	Required Services (Ground)	Notes	References
AIR TRAFFIC SERVICES					
1. Routings and required conventional functionalities					
1A	RNAV fixed routes	RNAV capability	NAVAID infrastructure		
1B	RNAV flexible routes	RNAV capability	NAVAID infrastructure		
2. Routings and required CNS/ATM functionalities					
2A	Fixed routes	DCPC (voice/data) RNP approval/certification FMS	DCPC (voice/data)	See Notes 1, 2 & 3	
2B	Flexible routes	DCPC (voice/data) RNP approval/certification FMS	DCPC (voice/data)	See Notes 1, 2 & 3	
2C	Dynamic user-preferred re-route (e.g. DARPs)	DCPC (voice/data) RNP approval/certification AOC data link Direct flight plan uploads FMS	DCPC (voice/data) AOC data link Flight plan generation AOC/ATS data communication	Utilization dependent on airspace complexity See Notes 1, 2 & 3	
2D	Autonomy of flight concept	TBD	TBD	Concept still undergoing definition by ICAO	

Code	ATM Operational Enhancements	Required Functions (Air)	Required Services (Ground)	Notes	References
3. En-route vertical separation					
3A	1 000 ft vertical separation between FL 290 and FL 410	RVSM certification /operational approval Voice/data communication	Height monitoring systems Voice/data communication	Sampling to verify that aircraft population height keeping accuracy is in conformance with appropriate standards	RVSM Manual (Doc 9574) ICAO Regional Supplementary Procedures (Doc 7030) NAT/RAC-1, 2-1
4. En-route longitudinal separation					
4A	80 NM (non-radar environment)	RNAV capability Voice/data communication	MNT periodic distance verification DCPC voice/data or ATC monitoring of communications	see Note 1	PANS/RAC (Doc 4444) Part III Section 8.5
4B	50 NM (non-radar environment)	RNP 10 approval/certification FMS DCPC voice/data	distance verification every 30 minutes MNT DCPC voice/data	MNT may be required see Notes 1, 2 and 3	PANS/RAC (Doc 4444) Part III Section 8.6
4C	30 NM (non-radar environmental)	TBD	TBD		
4D	Less than 30 NM (non-radar environmental)	TBD	TBD		

Code	ATM Operational Enhancements	Required Functions (Air)	Required Services (Ground)	Notes	References
4E	10 minutes (non-radar environment)	RNAV voice/data communication	MNT where prescribed Voice/data communication	RNAV capability may not be required in all situations accurate time requirement/common time reference see Notes 1, 2 and 3	PANS/RAC (Doc 4444) Part III Sections 8.2.1, 8.4 ATS Planning Manual (Doc 9426) Section 2 Chapter 2
4F	7 minutes - same speed aircraft (non-radar environment)	TBD	TBD		
5. En-route lateral separation					
5A	60 NM (non-radar environment)	RNP 12.6 approval/certification voice/data communication	voice/data communication pilot position reports	performance monitoring may be required see Notes 1, 2, 3 and 5	Annex 11 Attachment B Section 3
5B	50 NM (non-radar environment)	RNP 10 approval/certification voice/data communication	voice/data communication pilot position reports	performance monitoring may be required see Notes 1, 2, 3 and 5	Annex 11 Attachment B Section 3
5C	30 NM (non-radar environment)	TBD	TBD	when developed, this minima will be for use in remote and oceanic areas	

Code	ATM Operational Enhancements	Required Functions (Air)	Required Services (Ground)	Notes	References
5D	16.5 NM uni-directional (non-radar environment)	RNP 4 or 5 approval/certification DCPC voice	DCPC voice	see Notes 3, 5, 6 and 7	Annex 11 Attachment B Section 3
5	18 NM bi-directional (non-radar environment)	RNP 4 or 5 approval/certification DCPC voice	DCPC voice	see Notes 3, 5, 6 and 7	Annex 11 Attachment B Section 3
5F	10 to 15 NM (radar environment)	RNP 5 approval/certification DCPC voice	radar DCPC voice	see Notes 3, 5, 6 and 7	Annex 11 Attachment B Section 3
5G	8 to 12 NM (radar environment)	RNP 4 approval/certification DCPC voice	radar DCPC voice	see Notes 3, 5, 6 and 7	Annex 11 Attachment B Section 3
AIRSPACE MANAGEMENT					
6A	Airspace desegregation and flexible use of airspace	To be provided to all aircraft	Separate databases for: Aircraft AOC Military reserved airspace National security Environmental AIS database Airports Weather Traffic SAR Rules of the air	This provides the information that is necessary to create flexible use of airspace	

Code	ATM Operational Enhancements	Required Functions (Air)	Required Services (Ground)	Notes	References
AIR TRAFFIC FLOW MANAGEMENT					
7A	Integrated air tlow management	To be provided to all aircraft	Separate databases for: Aircraft AOC Airspace requirements Environmental AIS Airports Weather Traffic forecast Integrated automation of database management AOC interface ATC/ASM/ATFM interface	Purpose is to ensure an optimum flow of air traffic by balancing traffic demand and ATC capacity	

NOTES

1. When data link is used for communication, voice communications must be available. Depending upon the separation requirement, the voice requirement may be for direct voice.
2. Performance requirements of data link depend on the application for which it is being used.
3. The approval for RNP operations is specific for each RNP type.
4. ADS requirement is associated with and related to the over-all communication performance requirements for position reporting.
5. Lateral route systems require regional safety assessments and agreement.
6. In some cases, the RNP requirement may be met without RNAV, however in future CNS/ATM systems, all aircraft are expected to be RNAV equipped.
7. The safety analyses of minima for RNP 5 were based on comparison with a VOR reference system using a target level of safety of 2×10^{-8}, which is valid up to the year 2000. After that time, further safety assessments will be required against a new target level of safety.

Chapter 88: COMMUNICATIONS

88.1 General

88.1.1 The communication element of CNS/ATM systems provides for the exchange of aeronautical data and messages between aeronautical users and/or automated systems. Communication systems are also used in support of specific navigation and surveillance functions.

88.1.2 Detailed information regarding the communication element of CNS/ATM systems is provided at Chapter 5 of the Global Plan.

88.2 Transition guidelines

88.2.1 Guidelines for transition to the future communications system should be such as to encourage early equipage by users through the earliest possible accrual of the system benefits. Although a transition period during which dual equipage, both airborne and ground, will be necessary in order to ensure the reliability and availability of the new system, the guidelines should be aimed at minimizing this period to the extent practicable. The Global Plan, Vol. I, Chapter 5, Appendix B lists the guidelines taht States, regions, users, service providers and manufacturers should consider when developing CNS/ATM systems or planning for implementation of such systems.

88.2.2 The details of the guidelines are as follows:

a) *States should begin to use data link systems as soon as possible after they become available*

Early use of data link systems will provide important experience to guide further development and use of new communications systems. In addition, the benefits of data link systems will become more apparent with early use.

b) *Transition to AMSS should initially be in oceanic airspace and in continental en-route airspace with low-density traffic*

In oceanic and some remote continental areas, air-ground communication is presently unavailable or non-existent, and AMSS could provide a significant early benefit. In some oceanic areas, traffic levels are high; HF communication link congestion frequently occurs. For these areas, early introduction of AMSS for position reporting and two-way ATS communications could relieve HF communication system congestion.

c) *States and/or regions should co-ordinate to ensure that where ATC applications supported by AMSS are to be introduced, they should be introduced approximately simultaneously in adjacent flight information regions (FIRs) through which there are major traffic flows*

This will provide seamless transition through FIR boundaries.

d) *During the transition period after AMSS is introduced, the current levels of integrity, reliability and availability of existing HF communications systems must be maintained*

HF communications will provide back-up to AMSS and will accommodate non-AMSS equipped airspace users. In addition, prospects for eventual use of AMSS should not deter States from meeting near-term ATS communication needs with new or enhanced HF communication services. In cases where HF voice communication services are to be withdrawn and replaced by AMSS, HF services should be phased out gradually.

e) *Data Communication connectivity between ATC facilities within a State and ATC*

facilities in adjacent States should be established, if they do not already exist.

Data communication connectivity between ATC facilities will be required to support automated procedures and/or increased traffic volumes associated with ATM system improvements. Ground-to-ground ATN connectivity will be required to replace the AFTN when full automation, or bit oriented applications, are implemented.

f) *ATN should be implemented in phases*

Existing air-ground data communication links and associated ground based message processors should be used initially, where possible. For ground-ground data communications, two levels of ATN Transition have to be identified; one is the interoperable ground Internet working based on ATN Internet SARPs, and the other is ground-ground communication services (e.g. AMHS, AIDC) over ATN internetworking, The ground internetworking is used for air-ground communication services, e.g. ADS, CPDLC, FIS, as well as ground-ground communication services. The first phase of the ATN is achieved by upgrading the ground internetworking capability by implementing X.25 protocol, and by deploying critical elements of the ATN, such as ATN ground-ground routers, and by providing ground-ground messaging service by deploying critical transition elements such as AFTN/ATN gateways, targeting to migrate to AMHS as defined in ATN AMHS SARPs. The deployment and validation of the gateway and ATN ground routers is needed. The second phase of the ATN is achieved by implementing the air-ground ATN routers and associated SARPs compliant protocols, which also requires validation as well as by implementing air ground data communication services (e.g. ADS, CPDLC, FIS) over ATN internetworking.

g) *New ATM systems should support bit-oriented applications for communications with applications located in aircraft (A/G) or applications located in other ground systems (G/G)*

To facilitate interoperability, these new systems are required to be compatible with the ATN Internet and upper layer protocol architectures. During the transition period it will be necessary to provide for the encoding of applications data into character based message formats for exchange over character oriented networks.

h) *States should establish procedures to ensure that both security and interoperability aspects of the ATN are not compromised .*

88.3 **Transition timescale**

88.3.1 The main events for the implementation of the new communications system are shown in Table 9-1, in keeping with the guidelines in the global plan and the activities being carried out on a worldwide basis. This programming is subject to modification at any time, on the basis of available information.

88.3.2 This information may be used by Middle East States to start their own communications transition planning. In turn, States should inform the CNS/ATM Sub-group about their plans, so as to facilitate the updating of the regional plan.

88.3.3 Table 9-1 maintains the information provided in the global plan regarding avionics and standards and procedures. Trials have been structured on the basis of available information; it is expected that new trials will be scheduled to take place in some Middle East States.

88.4 In relation to Table 9-1, the time scales concerning implementation and operational use signify that within those time scales a specific communication system should be executed, which could co-exist with the current system until the year 2010, at which time the new system would replace the elements not contemplated in the new concept.

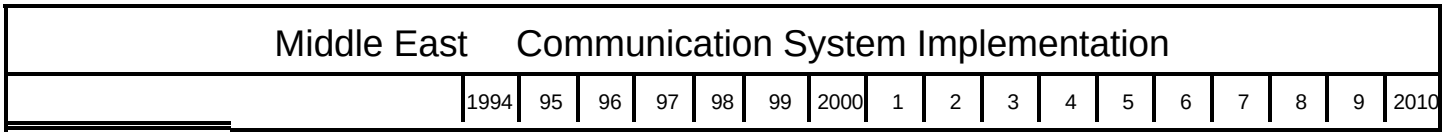
Table 9-1

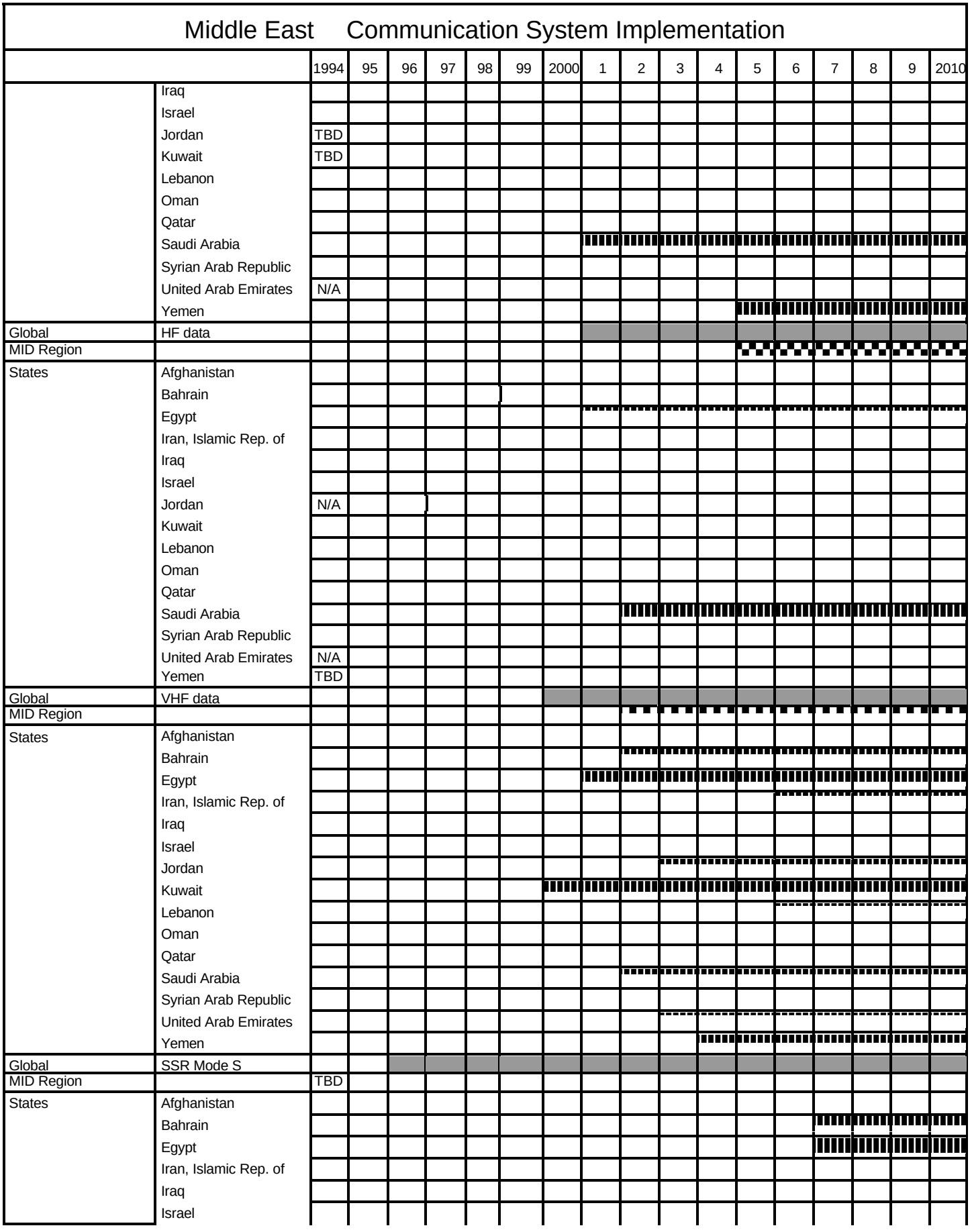
Middle East Communication System Implementation

			1994	95	96	97	98	99	2000	1	2	3	4	5	6	7	8	9	2010
RCP	Development of SARPs	AMSS																	
		HF data																	
		VHF data																	
		SSR Mode S																	
		ATN																	
	Aircraft Equipage	AMSS																	
		HF data																	
		VHF data																	
		SSR Mode S																	
		ATN																	
		FANS 1 (or equivalent)																	
Trials & Demonstrations																			
Global		AMSS																	
MID Region			TBD																
States		Afghanistan																	
		Bahrain	TBD																
		Egypt																	
		Iran, Islamic Rep. of																	
		Iraq																	
		Israel																	
		Jordan	N/A																
		Kuwait																	
		Lebanon																	
		Oman																	
		Qatar																	
		Saudi Arabia																	
		Syrian Arab Republic																	
		United Arab Emirates	N/A																
		Yemen																	
Global		HF data																	
MID Region			TBD																
States		Afghanistan																	
		Bahrain	TBD																
		Egypt																	
		Iran, Islamic Rep. of																	
		Iraq																	
		Israel																	
		Jordan	N/A																
		Kuwait																	
		Lebanon																	
		Oman																	
		Qatar																	
		Saudi Arabia																	
		Syrian Arab Republic																	
		United Arab Emirates	N/A																
		Yemen	TBD																
Global		VHF data																	
MID Region																			
States		Afghanistan																	
		Bahrain																	

Middle East Communication System Implementation

		1994	95	96	97	98	99	2000	1	2	3	4	5	6	7	8	9	2010
	Egypt																	
	Iran, Islamic Rep. of																	
	Iraq																	
	Israel																	
	Jordan																	
	Kuwait																	
	Lebanon																	
	Oman																	
	Qatar																	
	Saudi Arabia																	
	Syrian Arab Republic																	
	United Arab Emirates																	
	Yemen																	
Global	SSR Mode S																	
MID Region		TBD																
States	Afghanistan																	
	Bahrain																	
	Egypt	TBD																
	Iran, Islamic Rep. of																	
	Iraq																	
	Israel																	
	Jordan	TBD																
	Kuwait																	
	Lebanon																	
	Oman																	
	Qatar																	
	Saudi Arabia																	
	Syrian Arab Republic																	
	United Arab Emirates																	
	Yemen	TBD																
Global	ATN																	
MID Region																		
States	Afghanistan																	
	Bahrain																	
	Egypt																	
	Iran, Islamic Rep. of																	
	Iraq																	
	Israel																	
	Jordan	N/A																
	Kuwait																	
	Lebanon																	
	Oman																	
	Qatar																	
	Saudi Arabia																	
	Syrian Arab Republic																	
	United Arab Emirates																	
	Yemen																	
Implementation and operational use																		
Global	AMSS																	
MID Region																		
States	Afghanistan																	
	Bahrain																	
	Egypt																	
	Iran, Islamic Rep. of																	


Middle East Communication System Implementation
1994
95
96
97
98
99
2000
1
2
3
4
5
6
7
8
9
2010


Middle East Communication System Implementation
1994
95
96
97
98
99
2000
1
2
3
4
5
6
7
8
9
2010
Iraq
Israel
Jordan
TBD
Kuwait
TBD
Lebanon
Oman
Qatar
Saudi Arabia
Syrian Arab Republic
United Arab Emirates
N/A
Yemen
Global
HF data
MID Region
States
Afghanistan
Bahrain
Egypt
Iran, Islamic Rep. of
Iraq
Israel
Jordan
N/A
Kuwait
Lebanon
Oman
Qatar
Saudi Arabia
Syrian Arab Republic
United Arab Emirates
N/A
Yemen
TBD
Global
VHF data
MID Region
States
Afghanistan
Bahrain
Egypt
Iran, Islamic Rep. of
Iraq
Israel
Jordan
Kuwait
Lebanon
Oman
Qatar
Saudi Arabia
Syrian Arab Republic
United Arab Emirates
Yemen
Global
SSR Mode S
MID Region
TBD
States
Afghanistan
Bahrain
Egypt
Iran, Islamic Rep. of
Iraq
Israel

Middle East Communication System Implementation																	
	1994	95	96	97	98	99	2000	1	2	3	4	5	6	7	8	9	2010

Middle East Communication System Implementation

		1994	95	96	97	98	99	2000	1	2	3	4	5	6	7	8	9	2010
	Jordan	TBD																
	Kuwait	TBD																
	Lebanon																	
	Oman																	
	Qatar																	
	Saudi Arabia																	
	Syrian Arab Republic																	
	United Arab Emirates																	
	Yemen	TBD																
Global	ATN																	
MID Region																		
States	Afghanistan																	
	Bahrain																	
	Egypt																	
	Iran, Islamic Rep. of																	
	Iraq																	
	Israel																	
	Jordan																	
	Kuwait	TBD																
	Lebanon																	
	Oman																	
	Qatar																	
	Saudi Arabia																	
	Syrian Arab Republic																	
	United Arab Emirates																	
	Yemen																	
MID Region	Ground eq. FANS 1/A																	
States	Afghanistan																	
	Bahrain																	
	Egypt																	
	Iran, Islamic Rep. of																	
	Iraq																	
	Israel																	
	Jordan	N/A																
	Kuwait	TBD																
	Lebanon																	
	Oman																	
	Qatar																	
	Saudi Arabia																	
	Syrian Arab Republic																	
	United Arab Emirates																	
	Yemen	TBD																

Chapter 89: NAVIGATION

89.1 General

89.1.1 The navigation element of CNS/ATM systems is meant to provide accurate, reliable and seamless position determination capability, world-wide, through the introduction of Required Navigation Performance.

89.1.2 Detailed information regarding the navigation element of CNS/ATM systems is provided at Chapter 6 of the Global Plan.

89.2 Transition Guidelines

89.2.1 Guidelines for transition to the future systems encourage equipage by users for the earliest possible accrual of systems benefits. Although a transition period of dual equipage, both airborne and ground, is often necessary to ensure the reliability and availability of a new system, the guidelines are aimed at minimizing this period to the extent practicable. The Global Plan, Vol. I Chapter 6, Appendix B lists the guidelines that States, regions, systems or planning for implementation of such systems. These guidelines are reproduced below for ease of reference and in support of regional planning.

GUIDELINES FOR TRANSITION TO NAVIGATION SYSTEMS

The global navigation satellite system (GNSS) should be introduced in an evolutionary manner for supplemental en-route use first, and later for use as the sole-means radio navigation system.

The ground infrastructure for current navigation systems must remain available during the transition period.

States/regions should consider segregating traffic according to navigation capability and grating preferred routes to aircraft with better navigation performance.

States/regions should co-ordinate to ensure that separation standards and procedures for appropriately equipped aircraft are introduced approximately simultaneously in each FIR through which major traffic passes.

89.3 Transition timescale

89.3.1 The timescale for the implementation of the new navigation systems in the MID Region is shown in Table 10-1. This timescale is subject to modification at any time, on the basis of available information.

89.3.2 This information may be used by States of the MID Region to establish their own plans for the transition to navigation systems.

89.3.3 The timetable shown in Table 10-1 follows a normal sequence of events. The development of SARPs, space segment availability, augmentation systems and aircraft equipage are those envisaged at a global level. The other two lines, trials and demonstrations and implementation and operational use, are purely regional events and, thus, are subject to modification on the basis of available information.

89.3.4 In relation with Table 10-1, the time scales concerning implementation and operational use signify that within those time scales a specific navigation system should be executed, which could co-exist with the current system until the year 2010, at which time the new system would replace the elements not contemplated in the new concept.

Table 10-1

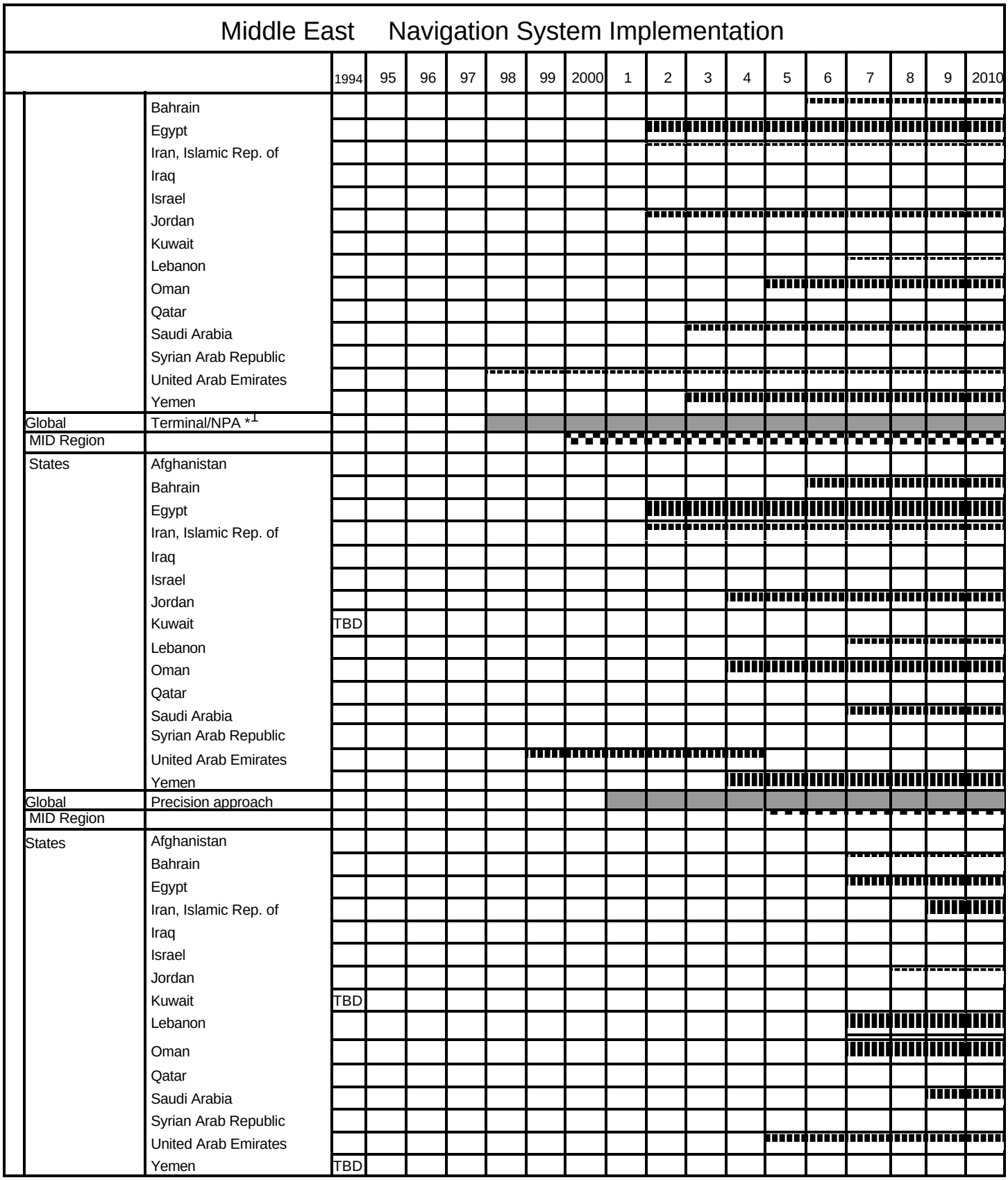
Middle East Navigation System Implementation

			1994	95	96	97	98	99	2000	1	2	3	4	5	6	7	8	9	2010
GNSS	Development of SARPs	GNSS performance criteria to support operational requirements																	
		Development of GNSS NPA procedures																	
		Use of GNSS with augmented systems																	
		Long-term satellite navigation system																	
RNP	Development of SARPs	En-route																	
		Terminal/NPA																	
		Precision approach																	
Space Segment Availability		GPS																	
		GLONASS																	
		GEO satellite overlay																	
Satellite-Based Augmentation System		US WAAS																	
		Europe EGNOS																	
		Japan MSAS																	
Aircraft Equipage		GNSS avionics																	
Trials & Demonstrations																			
Global		GNSS + ABAS																	
MID Region			TBD																
GNSS	States	Afghanistan																	
		Bahrain																	
		Egypt	TBD																
		Iran, Islamic Rep. of																	
		Iraq																	
		Israel																	
		Jordan	TBD																
		Kuwait																	
		Lebanon																	
		Oman																	
		Qatar																	
		Saudi Arabia																	
		Syrian Arab Republic																	
		United Arab Emirates	N/A																
		Yemen																	
Global		GNSS + ABAS + SBAS																	
MID Region			TBD																
	States	Afghanistan																	
		Bahrain																	
		Egypt	TBD																
		Iran, Islamic Rep. of																	
		Iraq																	

Middle East Navigation System Implementation

			1994	95	96	97	98	99	2000	1	2	3	4	5	6	7	8	9	2010
GNSS		Israel																	
		Jordan	TBD																
		Kuwait																	
		Lebanon																	
		Oman																	
		Qatar																	
		Saudi Arabia																	
		Syrian Arab Republic																	
		United Arab Emirates	NO																
		Yemen																	
	Global	GNSS + ABAS + GBAS																	
	MID Region		TBD																
	States	Afghanistan																	
		Bahrain																	
		Egypt	TBD																
		Iran, Islamic Rep. of																	
		Iraq																	
		Israel																	
		Jordan	TBD																
		Kuwait																	
		Lebanon																	
		Oman																	
		Qatar																	
		Saudi Arabia																	
		Syrian Arab Republic																	
		United Arab Emirates																	
		Yemen	TBD																
	Implementation and operational use																		
	Global	WGS-84																	
	MID Region																		
	States	Afghanistan																	
		Bahrain																	
		Egypt																	
		Iran, Islamic Rep. of																	
		Iraq																	
		Israel																	
		Jordan																	
		Kuwait																	
		Lebanon	TBD																
		Oman																	
		Qatar																	
		Saudi Arabia																	
		Syrian Arab Republic	TBD																
		United Arab Emirates																	
		Yemen	TBD																
	Global	En-route *1																	
	MID Region																		
	States	Afghanistan																	

* 1 Note: Use of GNSS for En-route and Terminal /NPA will initially be as supplemental Means. Primary and Sole Means TBD



* 1 Note: Use of GNSS for En-route and Terminal /NPA will initially be as supplemental Means. Primary and Sole Means TBD

Chapter 90: SURVEILLANCE

90.1 General

90.1.1 The surveillance systems presently in use can be divided into two main types: dependent surveillance and independent surveillance. In dependent surveillance systems, aircraft position is determined on board and then transmitted to ATC. The current voice position reporting is a dependent surveillance system in which the position of the aircraft is determined from on-board navigation equipment and then conveyed by the pilot to ATC by radiotelephony. Independent surveillance is a system which measures aircraft position from the ground. Current surveillance is either based on voice position reporting or based on radar (primary surveillance radar (PSR) or secondary surveillance radar (SSR)) which measures range and azimuth of aircraft from the ground station.

90.1.2 The surveillance systems of the new CNS/ATM systems include not only those above but also Automated Dependant Surveillance (ADS), its derivative ADS-broadcast (ADS-B) and the Airborne Collision Avoidance System (ACAS).

90.1.3 Detailed information regarding the surveillance elements of CNS/ATM systems is provided at Chapter 7 of the Global Plan.

90.2 Transition Guidelines

90.2.1 Guidelines for transition to the future systems encourage equipage by users for the earliest possible accrual of systems benefits. Although a transition period of dual equipage, both airborne and ground, is often necessary to ensure the reliability and availability of a new system, the guidelines are aimed at minimizing this period to the extent Practicable. The Global Plan, Vol. I, Chapter 7, Appendix B lists the guidelines that States, regions, users, service providers and manufacturers should consider when developing CNS/ATM systems or planning for implementation of such systems. These guidelines for the introduction of ADS are reproduced below for ease of reference and in support of regional planning:

GUIDELINES FOR TRANSITION TO SURVEILLANCE SYSTEMS

States should as necessary, develop operational procedures, in accordance with ICAO SARPs, procedures and guidelines, for the implementation of ADS within airspace under their control.

Transition to ADS should initially begin in oceanic airspace and in continental en-route airspace with low-density traffic.

States and/or regions should ensure that ADS is introduced in a co-ordinated fashion in adjacent FIRs traversed by major traffic flows.

Where different surveillance methods are employed in adjacent FIRs, commonality or compatibility of systems should be ensured to enable a service which is transparent to the user.

During the transition period in which ADS position reporting is introduced, the current levels of integrity, reliability and availability of existing position reporting systems must be maintained.

States and/or regions should take action within the ICAO framework to ensure that implementation of changes due to ADS and other systems result in more efficient use of airspace.

During the transition to ADS, suitably-equipped aircraft should be able to derive benefits from the use of preferred routes without penalizing non-ADS equipped aircraft.

ADS should be introduced in incremental phases.

ADS equipment should be implemented in accordance with standards and procedures in such a way as to permit the use of ADS as a backup for the other surveillance methods.

90.3 **Transition timescale**

90.3.1 The timescale in the implementation of the new surveillance systems in the MID Regions is shown in Table 8. These events are based on the available information and are subject to change as and when more information is available.

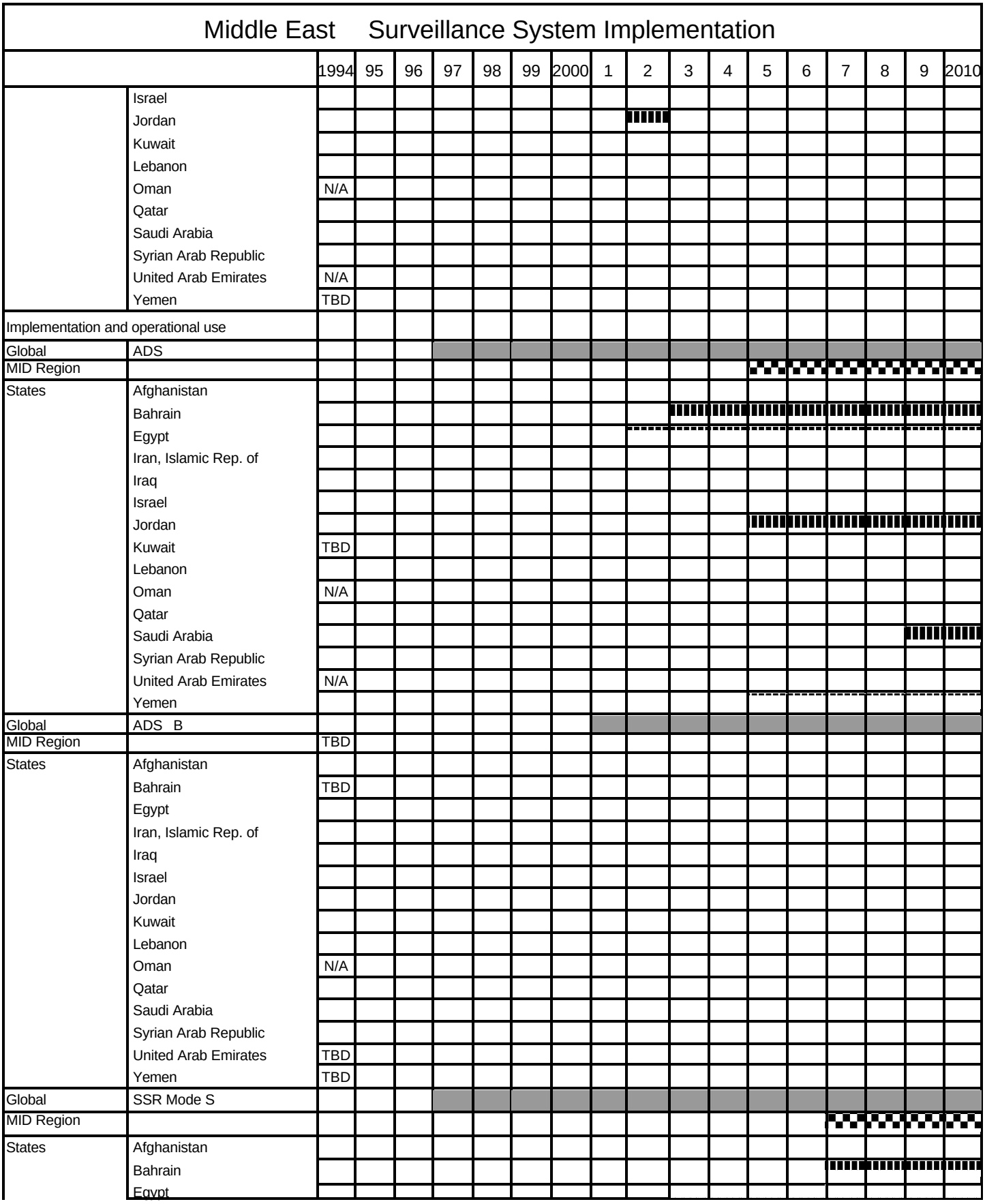
90.3.2 The timetable shown in Table 8 follows a normal sequence of events. Aircraft equipage and the establishment of standards and procedures are those envisaged at a global level. The other two lines, trials and demonstrations and implementation and operational use, are purely regional events and, thus, are subject to modification on the basis of regional information available.

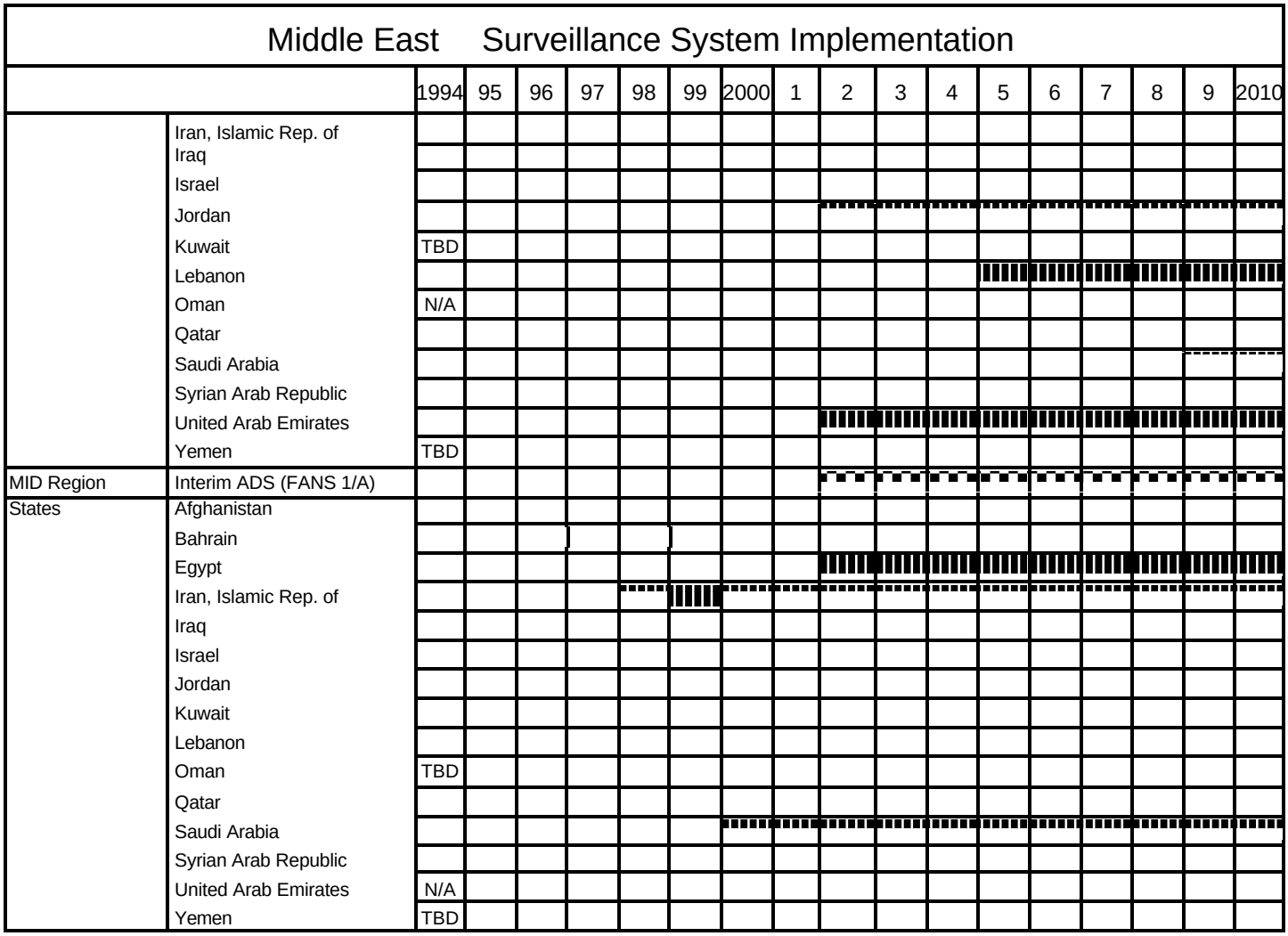
90.3.3 In relation with Table 8, the timescales concerning implementation and operational use signify that within those timescales a specific surveillance system should be executed, which could co-exist with the current system until the year 2010, at which time the new system would replace the elements not contemplated in the new concept.

Table 11-1

Middle East Surveillance System Implementation

			1994	95	96	97	98	99	2000	1	2	3	4	5	6	7	8	9	2010
RSP	Development of SARPs	ADS																	
		ADS B	TBD																
		SSR Mode S																	
	Aircraft Equipage	ADS	TBD																
		ADS B																	
		SSR Mode S																	
		Interim ADS (FANS 1/A)																	
Trials & Demonstrations																			
Global		ADS																	
MID Region																			
States		Afghanistan																	
		Bahrain																	
		Egypt																	
		Iran, Islamic Rep. of																	
		Iraq																	
		Israel																	
		Jordan																	
		Kuwait																	
		Lebanon																	
		Oman	N/A																
		Qatar																	
		Saudi Arabia																	
		Syrian Arab Republic																	
		United Arab Emirates	N/A																
		Yemen																	
Global		ADS-B																	
MID Region			TBD																
States		Afghanistan																	
		Bahrain	TBD																
		Egypt	TBD																
		Iran, Islamic Rep. of																	
		Iraq																	
		Israel																	
		Jordan																	
		Kuwait																	
		Lebanon																	
		Oman	N/A																
		Qatar																	
		Saudi Arabia																	
		Syrian Arab Republic																	
		United Arab Emirates	N/A																
		Yemen	TBD																
Global		SSR Mode S																	
MID Region																			
States		Afghanistan																	
		Bahrain																	
		Egypt																	
		Iran, Islamic Rep. of																	
		Iraq																	


Middle East Surveillance System Implementation
1994
95
96
97
98
99
2000
1
2
3
4
5
6
7
8
9
2010
Israel
Jordan
Kuwait
Lebanon
Oman
N/A
Qatar
Saudi Arabia
Syrian Arab Republic
United Arab Emirates
N/A
Yemen
TBD
Implementation and operational use
Global
ADS
MID Region
States
Afghanistan
Bahrain
Egypt
Iran, Islamic Rep. of
Iraq
Israel
Jordan
Kuwait
TBD
Lebanon
Oman
N/A
Qatar
Saudi Arabia
Syrian Arab Republic
United Arab Emirates
N/A
Yemen
Global
ADS B
MID Region
TBD
States
Afghanistan
Bahrain
TBD
Egypt
Iran, Islamic Rep. of
Iraq
Israel
Jordan
Kuwait
Lebanon
Oman
N/A
Qatar
Saudi Arabia
Syrian Arab Republic
United Arab Emirates
TBD
Yemen
TBD
Global
SSR Mode S
MID Region
States
Afghanistan
Bahrain
Egypt


Middle East Surveillance System Implementation
1994
95
96
97
98
99
2000
1
2
3
4
5
6
7
8
9
2010
Iran, Islamic Rep. of
Iraq
Israel
Jordan
Kuwait
TBD
Lebanon
Oman
N/A
Qatar
Saudi Arabia
Syrian Arab Republic
United Arab Emirates
Yemen
TBD
MID Region
Interim ADS (FANS 1/A)
States
Afghanistan
Bahrain
Egypt
Iran, Islamic Rep. of
Iraq
Israel
Jordan
Kuwait
Lebanon
Oman
TBD
Qatar
Saudi Arabia
Syrian Arab Republic
United Arab Emirates
N/A
Yemen
TBD

Chapter 91: HUMAN RESOURCE DEVELOPMENT AND TRAINING NEEDS

91.1 Introduction

91.1.1 The report of the Tenth Air Navigation Conference in Montreal, 5 20 September 1991, recognized the importance of human factors in the CNS/ATM systems; an importance that would continuously increase with the level of automation in ATC applications.

91.1.2 Training requirements associated with new technologies are of particular interest, especially to developing States. Training, or the lack thereof, is an important reason given for the lack of implementation of existing systems in those States.

91.1.3 Human Resource and training needs are covered in Chapter 10 of Volume I of the Global Plan.

91.2 Training Requirements

91.2.1 The Global Plan divides training requirements into three categories: *Foundation Training*, which provides the basis on which specialized courses are built and will be common to all training streams, *Training for Implementation Planners*; and *Job Specific Training.*

91.2.2 The requirements for these different categories of training are described in sections 10.2 to 10.4 of the Volume I of the Global Plan, which are attached as **Appendix 12-A** to this document.

91.3 Possible Sources of Training Support

91.3.1 The conduct of training courses is the responsibility of the State. However, it is likely that many States will need further guidance in regard to training, and perhaps assistance.

91.3.2 In 1990, ICAO established the TRAINAIR program, to enhance training in civil aviation fields. The program involves the development and sharing of Standardized Training Packages (STP), according to a standardized methodology, by participating member States. Membership is open to all government-operated civil aviation training centres.

91.3.3 ICAO sTechnical Co-operation Programme can also assist in the development of training capabilities and the funding of fellowships for international training through Technical Co-operation Projects.

APPENDIX 12-A TRAINING NEEDS

(*Extract from Chapter 10 of Volume I of the Global Plan*)

10.1.4 CNS/ATM systems training needs can be seen as falling into three primary categories.

a) **Foundation training**. Early training in the fundamentals of automation, digital communications, satellite communications and computer networking is needed to provide all civil aviation personnel with the pre-requisite skills prior to receiving job specific training;

b) **Training for implementation planners.** Training is needed at senior management level to provide decision makers with the basic information needed to begin planning form implementation of CNS/ATM systems. This type of training is needed for managers who will be responsible for planning the ATM operational aspects of the systems; and

c) **Job specific training**. The third category of training needed is that necessary for personnel to manage, operate and maintain the systems on an ongoing basis. This category also represents the bulk of the training needed and the most complex to design, develop and implement. Taking this into consideration, ICAO has developed a strategy for the development of training programmes, as described in this chapter.

10.1.5 The first two categories of training described above (paragraph 10.1.4 a) and b) refers) should be implemented as soon as possible and are described in more detail below. A long-term strategy for development of the job specific training needed to manage, operate and maintain CNS/ATM systems on an on-going basis, is also outlined below.

10.2 Foundation Training

10.2.1 In addition to the usual subjects covered in typical civil aviation training centres, some additional foundation or pre-requisite training will be necessary. This training will ensure that all personnel who will be involved with the planning, implementation, management, operation and maintenance o the new systems have an appropriate background in the base concepts and technologies. Such foundation training should be developed so that it addresses the specific needs of the technical and operational planners, as well as all personnel that will eventually be involved in the operation, maintenance and management of the new systems. The training needs include the following general areas:

a) CNS/ATM systems;

b) digital communications;

c) computer fundamentals;

d) computer communications, including local/wide area networks;

e) ISO s OSI reference model;

f) satellite communications systems used for fixed and mobile applications;

g) satellite navigation systems;

h) automation issues;

i) fundamentals of air traffic management; and

j) aeronautical databases.

10.3 CNS Systems Implementation Planning - Training Needs

10.3.1 The existing communication, navigation and surveillance systems have mostly been planned, implemented and operated by individual States. The new CNS/ATM systems, however, are global in nature and as such, are usually planned and implemented at a regional or global level. Regional implementation can be carried out by collective regional entities or commercial service suppliers. As a result, many States can simply buy CNS services with a minimum of local implementation of the systems.

10.3.2 Given the modality for the implementation of the technical systems, the technical management personnel of Civil Aviation Administration (CAAs) will need to become familiar with the major functions and features of CNS systems, as well as the implementation, leasing and purchasing options available. They should then examine various options for systems implementation with their ATM colleagues and jointly decide upon their transition strategy. In this regard, training that provides an overview of the following CNS systems should be provided for senior technical management personnel:

a) Communication: AMSS, VDL, SSR Mode S datalink and ATN;

b) Navigation: GPS, GLONASS and various augmentation systems;

c) Surveillance: SSR Modes A, C and S, ADS and ADS-B*1; and

d) relevant organizational, economic, certification and operational matters.

10.4 ATM Operational Implementation Planning - Training Needs

10.4.1 Senior operational managers involved with transition planning to the new systems will need an overview of the topics listed above. In addition, operational managers should receive training in the following areas:

a) traffic forecasting and cost/benefit analysis techniques;

b) air traffic management

   1) airspace planning;

   2) air traffic flow management (ATFM) systems and procedures;

   3) air traffic services (ATS) systems and procedures; and

   4) ATM-related aspects of flight operations;

c) CNS/ATM transition and implementation project planning;

d) human resource planning and training issues;

e) issues related to the increased use of automation in the new systems; and

f) operational and quality control issues associated with aeronautical databases.

10.4.2 As the existing systems will be operated in parallel with the new systems for a period of time, human resource planning and training will be a major challenge during the transition period.

10.4.3 CNS/ATM systems will result in a greater use of automation in many of the air traffic control functions that were previously performed manually. As a result, interactions between controllers and flight crews will take on a different dimension. Thus, it its important that the operational planners receive early training in these issues, including the full implications of automation, including backup procedures to be used in the event of system malfunctions. This area of training will also be important during the job specific training for anyone involved in operation of CNS/ATM systems.

- end -

* 1 Emerging concept or technology consensus still to be reached

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Appendix 4.3F to the Report on Agenda Item 4.3

COMMUNICATIONS, NAVIGATION, SURVEILLANCE/ AIR TRAFFIC MANAGEMENT/IMPLEMENTATION COORDINATION/SUB-GROUP (CNS/ATM/IC/SG)

TERMS OF REFERENCE AND WORK PROGRAMME

(Revised - September 2000)

1. Co-ordinate the updating, on a regular basis of the CNS/ATM Implementation Plan for the MID Region in the light of new developments.

2. Promote harmonization and convergence of national, MID and Global CNS/ATM plans.

3. Provide a forum for:

   a) the harmonization of the plans of States, international organizations and airlines for the implementation of CNS/ATM within the MID Region;

   b) the active exchange of information between States; and

   c) the resolution of planning and implementation problems as they arise.

4. Identify and co-ordinate for CNS/ATM implementation priorities in the MID Region, and promote implementation activities in the field of CNS/ATM.

5. Review and identify intra and inter regional co-ordination issues and where appropriate recommend actions to address those issues.

6. Monitor the progress of trials and demonstrations within the MID Regions, and information from other Regions.

7. Review and identify shortcomings and deficiencies that impede implementation or affect provision of efficient CNS/ATM services.

8. Suggest ways and means of providing assistance in planning and implementation CNS/ATM elements to States in the Region.

9. Identify CNS/ATM requirements for inclusion in the MID FASID in a progressive manner

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REPORT ON AGENDA ITEM 4.4- MIDDLE EAST AIR NAVIGATION ISSUES- MET

Review of MET related matters

4.4.1 An executive summary of the report of the fourth meeting of the SADIS Operations Group (SADISOPSG/4) held in Paris, 7 to 11 June 1999, was presented to the meeting. The SADISOPSG/4 meeting developed one draft conclusion for consideration and endorsement by the [APANPIRG, or APIRG, or EANPG, or MIDANPIRG]. This conclusion concerned a proposal by the SADISOPSG that SADIS user States should be requested to nominate a SADIS operational focal point for their State who could liaise, as necessary, with the SADIS provider State and Secretary of the SADISOPSG regarding day to day SADIS operational matters. In this context, the MIDANPIRG endorsed the following conclusion:

CONCLUSION 6/29 SADIS OPERATIONAL FOCAL POINT IN USER STATES

That SADIS User States are requested to nominate an operational person involved with day to day SADIS operations in that State, to act as the SADIS operational focal point,

Note:

a) to assist States in nominating the appropriate officer, the request to States should indicate clearly that the SADIS operational focal point would be expected to be available to respond to queries and receive information from the SADIS provider State and Secretary, SADISOPSG on operational matters, and maintain contact with any other SADIS users in the State concerned; and

b) on receipt of the information from States, the Secretary of the SADISOPSG should provide the information to the SADIS provider State, and include the list of the SADIS operational focal points in a future amendment to the SADIS User Guide.

4.4.2 An executive summary of the report of the fifth meeting of the SADIS Operations Group (SADISOPSG/5) held in Dakar, Senegal, from 5 to 9 June 2000, was presented to the meeting. The SADISOPSG/5 agreed in its Conclusion 5/12 that the fourth SADIS enhanced two-way VSAT already purchased under the test programme should be located in Dakar, Senegal. The SADISOPSG/5 also agreed to start interim trials immediately based on the enhanced London, Pretoria and Zurich two-way VSATs and complete the final trials with four enhanced VSATs as soon as the Dakar VSAT came on line (Conclusion 5/13). This left the fifth enhanced two-way VSAT still to be deployed. The SADISOPS/5 agreed that this situation should be brought to the attention of the PIRGs concerned in case they would wish to designate a particular centre as a future operational SADIS two-way VSAT site, and developed *Conclusion 5/14: ALLOCATION OF FIFTH SADIS ENHANCED TWO-WAY VSAT* addressed to its parent PIRGs. As a result of discussions the MIDANPIRG decided to refer SADISOPS/5 Conclusion 5/14 to its COM/MET Sub-Group for further consideration.

REPORT ON AGENDA ITEM 4.5- MIDDLE EAST AIR NAVIGATION ISSUES- AOP

General

4.5.1 The meeting recalled that the MIDANPIRG/4 established an AOP Sub-Group and the MIDANPIRG/5 formulated its TOR and assigned certain tasks. Unfortunately, due to non-availability of an AGA Officer in the Regional Office the AOP Sub-Group could not meet so far. The First Meeting of the AOP Sub-Group is now planned for early November 2000.

4.5.2 It was noted that the AOP Sub-Group will address the AOP matters in accordance with its Terms of Reference, in its First Meeting and present its report to MIDANPITG/7.

AOP - Aerodrome Certification

4.5.3 The meeting noted that, following the 31st General Assembly endorsement of the ICAO Safety Oversight Program, the Council requested the Secretary General to pursue urgently, in consultation with the Air Navigation Commission, the potential expansion of the ICAO Safety Oversight Program to include amongst others, aerodromes. It was also noted that the World-wide Directors General Conference, Montreal, 10 to 12 November 1997 recommended that the proposed expansion of the program beyond the three areas currently covered (Annexes 1, 6 and 8), be under the consideration of the Council until it would find an appropriate time to diversify. Furthermore, the Conference had recommended that new criteria be developed which would require the regulatory oversight of, amongst others, aerodromes**, since a number of States did not have suitable legislation in this regard.**

4.5.4 The meeting noted that currently, there is no requirement in **Annex 14** or any other ICAO document for aerodromes to be certified. This is due to the fact that, so far, most international aerodromes were owned and operated by governments or their agencies and, thus, compliance with the applicable standards and regulations in force to ensure minimum levels of safety was not deemed to be a problem. However, with the continuing growth of the aviation industry and increasing trend in privatization of aerodromes, the need to ensure safety by the provision of adequate facilities and services at aerodromes has gained greater emphasis. Additionally, as identified by the DGCA/97 Conference, many States may not have the requisite legislation related to oversight of aviation that would empower the State Civil Aviation administrations to carry out their role as regulators.

4.5.5 Annex 14, Volume I specifications have generally formed the basis not only for planning and design of aerodromes, but also for assessing the adequacy of an aerodrome for handling anticipated operations, as well as for certification of some new aerodromes. It was noted that Annex 14 has been adopted by States in whole or in part as their national regulations or adapted to satisfy national needs. **Some States which have their own aviation legislation have also developed aerodrome certification procedures**. However, there are many States, which do not have such legislation and, consequently, do not have a certification procedure in place. In view of the increased emphasis on **global aviation safety, the development of suitable provisions on licensing/certification of aerodromes was undertaken by the Secretariat to assist States in fulfilling their regulatory obligations.**

4.5.6 The meeting noted that the ANC considered a proposal to amend Annex 14 envisaging inclusion of a new section that would introduce the requirement for aerodromes to be certified and authorized its circulation to States for comments. The Amendment proposes that aerodromes used for international operations shall be certified under appropriate regulatory framework. A Recommended Practice would cover other aerodromes in the interest of safety. It also includes provisions on the establishment of a safety management system at aerodromes. The new Standard would require a safety management system to be in operations from 27 November 2003. A new Recommended Practice on establishing a safety management system would become applicable on 1 November 2001. This requirement would facilitate the endeavor by States to ensure that the aerodrome operator (be it a government-owned aerodrome or a corporative or privatized entity) is obliged to provide adequate and safe facilities and services.

4.5.7 The meeting noted that A State Letter AN 4/11.1.46 00/71 dated 12 July 2000 was circulated to all States by ICAO HQ for comments and that this State Letter with all the attachments is available in ICAO website www.icao.int/icaonet and can be accessed using the access code assigned to the States.

4.5.8 The meeting also noted that a manual on certification of aerodromes has been developed by the Secretariat based on input from some States who have such practices and is intended to facilitate States in establishing similar regulatory procedures. It contains details of an aerodrome certification regulatory system, model regulations needed for certifying an aerodrome, and the procedures that may be used by State regulatory authority.

4.5.9 Noting the information provided by the Secretariat, the meeting adopted the following Conclusion:

CONCLUSION 6/30- AERODROME CERTIFICATION

That, States are urged to review and provide comments to ICAO HQ on the proposed amendment to Annex 14 as circulated in ICAO State Letter AN 4/11.1.46 00/71 dated 12 July 2000 and in the interest of safety, take appropriate steps to initiate action on establishing aerodrome certification procedures and aerodrome safety management systems.

REPORT ON AGENDA ITEM 4.6- MIDDLE EAST AIR NAVIGATION ISSUES- MID ANP/FASID

4.6.1 On 26 February 1997, the ICAO Council decided that the regional air navigation plans (ANPs) should be published in two volumes: a Basic ANP and a Facilities and Services Document (FASID). The meeting recalled that the basic ANP was to contain stable plan material while the FASID was to set forth the dynamic material from the plan and also include appropriate additional guidance, particularly with regard to implementation, to complement the material contained in the Basic ANP.

4.6.2 The initial versions of the MID Basic ANP and FASID documents were developed at the ANP/FASID TF/1 meeting, held in Cairo from 23 26 February 1999, however further development of the documents was interrupted by the need to concentrate almost exclusively on Y2K related matters during 1999 and the early part of 2000.

4.6.3 Since the first MID ANP/FASID Task Force meeting, the CAR/SAM Basic ANP and FASID, which incorporated new material not previously in the ANP, had been approved by Council, which also recommended that all Regions should include similar information in their ANP/FASID documents. The Regional Office undertook a revision of the draft MID ANP/FASID to include generic descriptive material relating to CNS/ATM similar to that in the CAR/SAM documents, and mature material specific to the Region taken from the MID CNS/ATM Plan. These revised versions of the documents were circulated to States for their review prior to the meeting. It was noted that the modifications made in this revision were predominantly in the descriptive text, as any changes in the tables describing the facilities required in the region would require input from the States and users.

4.6.4 A number of States expressed the view that more time would be required to thoroughly review the draft ANP and FASID documents and provide input on necessary changes. The meeting agreed that an extension of the deadline for comments by the States would be desirable, and that a further meeting of the ANP/FASID Task Force would be necessary in order to undertake harmonization of requirements.

DECISION 6/31 MIDDLE EAST BASIC ANP AND FASID

That

a) the date for comments by States on the draft MID Basic ANP and FASID be extended to 31 December 2000;

b) a further meeting of the ANP/FASID Task Force be held in the first quarter of 2001 to undertake harmonization of the documents where required; and

c) the ANP/FASID Task Force meeting, the documents be processed for approval according to established ICAO procedures.

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4.6.5 The meeting noted that additional action could be needed in relation to the Tables AOP of the ANP and FASID, which had not gone through a comprehensive review, but for some amendments suggested by States and others concerned, since the MID/3 RAN (1984). The Draft Tables AOP for inclusion in the MID Basic ANP and FASID prepared by the Secretariat were therefore considered in more detail by the Meeting.

4.6.6 The meeting noted that the Air Navigation Plan (ANP), which will now consist of two parts, namely, Basic ANP and FASID, is a planning document and need not necessarily reflect the existing facilities and services. The facilities and services shown in the documents represent those, which will be needed for a reasonable period in future, say, approximately 5 years. Therefore these documents are not to be used for operational purposes. The existing facilities and services should be shown in the AIPs published by States, which are meant for operational purposes.

4.6.7 It was noted that the Basic ANP Table AOP contained the list of Aerodromes as agreed and published by the States for International Scheduled Air Transport, Regular Use (RS), International Non-scheduled Air Transport, Regular Use (RNS), International Scheduled Air Transport, Alternate Use (AS) and International Non-schedule Air Transport Alternate Use (ANS).

4.6.8 The FASID Table AOP contained the Facilities and Services to be provided at the aerodromes listed in the Basic ANP. The Physical Characteristics of the Runway, Taxiway and Apron are decided based on the Traffic Forecasts and the largest aeroplanes normally expected to use the aerodrome, and the Facilities and Services are to conform to the BORPC and the ICAO SARPs included in the Annexes supported by other related documents such as ICAO Manuals etc. In this regard the attention of the meeting was drawn to the relevant paragraphs of BORPC and Annex 14 Volume I, Third Edition, July 1999.

4.6.9 It was also noted that the Draft AOP parts of the Basic ANP/FASID had not yet been co-ordinated with the States. The meeting agreed that the tables be reviewed by the AOP sub-group at its first meeting, and that the results of this review should be provided to the planned meeting of the ANP/FASID Task Force .

REPORT ON AGENDA ITEM 4.7- MIDDLE EAST AIR NAVIGATION ISSUES- OTHER RELATED MATTERS

Middle East Regional Traffic Forecasting Group

4.7.1 The meeting was presented with a progress report on the activities of the Middle East Regional Traffic Forecasting Group MER TFG. The Group has held annual meetings since 1997 and has presented periodic reports to MIDANPIRG and its subsidiary bodies including the CNS/ATM and ATM/AIS/SAR Sub-Groups. Preliminary forecasts of aircraft movement to, from, across and within the MID region were prepared by ICAO Forecasting and Economic Planning Section on behalf of the Group and were presented to MIDANPIRG/5, the CNS/ATM Sub-Group and to the ATM/AIS/SAR Sub-Group.

4.7.2 The meeting was briefed about Conclusions 4/4 and 4/5 of the ATM/AIS/SAR sub-Group and Conclusion 4/1 of the CNS/ATM Sub-Group which presented additional requirements to MER TFG and proposed that the regional traffic forecasting capacity be upgraded through appropriate training and the inclusion of ATC Officers in the membership of the Group.

4.7.3 The meeting also recalled the Recommendations of the Rio CNS/ATM Implementation Conference and the Conclusions of ALLPIRG/3 to expand the Terms of Reference of PIRGs to include the development of business cases and the conduct of cost/benefit analysis in relation to air navigation planning and implementation activities. It was noted that the changes made to the Terms of Reference of MIDANPIRG would have an impact on the Terms of Reference of MERTFG.

4.7.4 The work programme of MER TFG was presented to the meeting. It contained two main items; (a) to refine, update and fine-tune the Preliminary Traffic Forecasts prepared by the Secretariat in such a manner as to respond adequately to the detailed requirements of planning and implementation processes; and (b) to upgrade regional traffic forecasting capacity through appropriate training. The meeting was informed that secretariat was in the process of accomplishing both tasks.

4.7.5 Noting that conclusions 4/4 and 4/5 of the ATM/AIS/SAR Sub-Group and conclusion 4/1 of the CNS/ATM Sub-Group were already adopted by MIDANPIRG/6, the meeting made the following conclusion:

CONCLUSION 6/32- TRAFFIC FORECASTING ACTIVITIES

Noting the progress made so far by the Middle East Regional Traffic Forecasting Group

Noting, further, the conclusions and recommendations of the RIO Conference on CNS/ATM Implementation and of the third session of ALLPIRG, the meeting:

a) Requests the MER TFG to examine and expand its Terms of Reference taking into account the relevant conclusions of ALLPIRG/3 and the recommendations of the Rio Conference on CNS/ATM Implementation.

b) Requests the MER TFG to coordinate with regional and other organizations in building up an appropriate database to support MID regional traffic forecasting activities.

c) Urges States which are members of MER TFG to include ATC and Air Transport Officers when making their nominations to the Group.

d) Urges MID States to support the activities of the MER TFG by availing relevant FIR and ATC data to the Group.

Regional Human Resource Training and Planning Needs

4.7.6 The meeting for the first time was given the opportunity to be informed on how human resources and training needs are presently developed within ICAO, as they relate to the implementation of the MID Regional Plan, and the new MID CNS/ATM Regional Plan.

4.7.7 A Training Planning process was proposed in the four following steps:

Step 1: Identification of training needs

The types of training needed will initially be identified by the Air Navigation Bureau based on commitments made by States to implement facilities and services within a Regional Air Navigation Plan. It is envisioned that individual States, assisted by the Regional Offices, as required, will be able to determine training needs in the future, based on guidance in this area being developed through ANC Task No. PEL-9601.

Step 2: Gather information through the human resource planning questionnaire

Each State will then identify the numbers of personnel needing specific types of training, based upon their national implementation plans. To obtain consistent and appropriate data from States, ICAO will have developed a questionnaire which would include a summary of the types of training needed to support the Regional Air Navigation Plan (Step 1 refers)

Step 3: Determine the requirement for regional training capabilities

States would forward the completed questionnaires on the training needs within the region (Step 2 refers) to the ICAO Middle East Regional Office. The Regional Office would prepare a summary, based on a thorough analysis of the data. This summary would then be transmitted to MIDANPIRG for assessment.

MIDANPIRG will consider establishing an appropriate body that could address training planning issues and ensure that the human resource development capabilities within the Region are compatible with plans for implementing facilities and services concerned.

The training planning body of MIDANPIRG would be tasked with analysing the aggregate of

requirement for regional training capabilities. Recommendations for the establishment of regional training capabilities would be presented to MIDANPIRG for evaluation.

Step 4: Formulate a plan for establishment of regional training capabilities

MIDANPIRG will determine the appropriate process for formulating a plan for the development of regional training capabilities within specific training centers.

4.7.8 The Islamic Republic of Iran informed the meeting that their Training Center has obtained TRAINAIR membership, and invited contracting States to take advantage of their training capabilities.

4.7.9 The meeting, while noting the four steps; urges States to conduct a preliminary assessment of their Human Resources/Training Capabilities as described in Step 1 and 2 above, based on the amended sample questionnaire which will be forwarded to States through a State letter.

REPORT ON AGENDA ITEM 5 - SHORTCOMINGS AND DEFICIENCIES IN THE AIR NAVIGATION FIELD.

Shortcomings and Deficiencies in the AOP field

5.1 The meeting noted that, in order to facilitate the AOP Sub-Group to undertake the tasks assigned to it, a State Letter with a questionnaire was circulated to States early September requesting the States in the region to provide information on AOP facilities and services at their international aerodromes. The information thus obtained will be reviewed by the AOP Sub-Group and a comprehensive list of Shortcomings and Deficiencies will then be prepared and reported to MIDANPIRG/7. In this regard, the meeting adopted the following Conclusion:

CONCLUSION 6/33- AOP FACILITIES AND SERVICES

That, the States in the MID Region are urged to provide information concerning the AOP facilities and services at their international aerodromes to ICAO Regional Office before 15 October 2000, in response to the ICAO State Letter No. ME 3/56.4222 dated 3 September 2000.

Shortcomings and Deficiencies in the ATM/SAR and AIS Fields

5.2 The ATS/SAR and AIS shortcomings and deficiencies in the MID Region were reviewed by the ATM/AIS/SAR SG/4 meeting in October 1999. This meeting developed a more detailed listing of shortcomings and deficiencies than had previously been presented. This included a route-by-route description of all those ATS routes included in the MID ANP, which had not been fully implemented, and a similar listing of all ICAO charts, which had not been implemented.

5.3 The Shortcomings and Deficiencies in these fields were updated by the secretariat, where possible, prior to the MIDANPIRG/6 meeting. Three more ATS routes were identified as fully implemented, and two States completed WGS-84 implementation. However there were a number of target dates during the year 2000 which had been set at the ATM/AIS/SAR SGT/4 meeting, but which were not achieved. It was not possible to update these without input from the States.

5.4 During the meeting, further updates were provided by a number of States, however it was not possible to undertake a detailed review of target dates. It was therefore decided that the task of updating these should be deferred until the next ATM/AIS/SAR Sub-Group meeting. It was recognized that in order for the Sub-Group to complete this task, it would be necessary for the ICAO Regional Office to actively follow up specific shortcomings and deficiencies with the States concerned. It would also be necessary for all States to thoroughly review the table of shortcomings and deficiencies prior to the meeting, so that they would be in a position to provide realistic target dates at the meeting.

CONCLUSION 6/34 MONITORING AND FOLLOW-UP OF CORRECTIVE ACTIONS TO ALLEVIATE SHORTCOMINGS AND DEFICIENCIES.

That States and Organizations which are assigned responsibility for corrective actions in relation to air navigation shortcomings and deficiencies are urged, through their executing bodies,

a) to cooperate with the MID Regional Office and one another in the development of plans to alleviate shortcomings and deficiencies; and

b) to provide the ICAO MID Regional Office with the information related to current and planned corrective actions which is necessary for the Regional Office and MIDANPIRG to carry out their monitoring and follow-up responsibilities.

5.5 The meeting also noted that the majority of the shortcomings and deficiencies in the ATM/SAR fields were related to non-implementation or partial implementation of the ATS routes listed in Table ATS 1 of the MID ANP (Doc 9708), and that this had been a long-standing problem. Some initiatives had already been taken to develop alternate routings which could be implemented. It was agreed that the ATM/AIS/SAR Sub-Group should be asked to examine all the routes which were not fully implemented in order to identify other situations where re-design of the routes may help solve the problem.

5.6 The updated table of Shortcomings and Deficiencies in the ATM/SAR and AIS fields are at **Appendices 5A** and **5B** to the report on Agenda Item 5.

Shortcomings and Deficiencies in the CNS field

5.7 The meeting was presented with the list of Shortcomings and Deficiencies in the CNS field which was developed by MIDNAPIRG/5 meeting and updated by the AFS/ATN TF/5 and TF/6 meetings. The information contained in this list was made available from States and ICAO Regional Office.

5.8 Therefore the meeting reviewed and updated the list with the most recent information made available from the States. This list of Shortcomings and Deficiencies in the CNS field is presented in **Appendix 5C** to the report on Agenda Item 5

Shortcomings and Deficiencies in the MET field

5.9 The meeting reviewed the table of MET Shortcomings and Deficiencies adopted by MIDANPIRG/5, and noted that the COM/MET Sub-Group had not met between MIDANPIRG/5 meeting and MIDANPIRG/6 meeting. In this context, the meeting felt that the table provided was general and requested that a more breakdown of specific details and listing of concerned States would be required. The meeting therefore, requested that the table of MET shortcomings and deficiencies should referred to the COM/MET Sub-Group for further breakdown, and agreed on the following Decision:

DECISION 6/35- TABLE OF SHORTCOMINGS AND DEFICIENCIES

That, the table of Shortcomings and Deficiencies in the MET field at **Appendix 5D** is referred to the COM/MET Sub-Group for further breakdown of specific details and listing of concerned States.

MIDANPIRG/6
Appendix 5A to the Report on Agenda Item 5

TABLE OF AIR NAVIGATION SHORTCOMINGS/DEFICIENCIES IN THE ATM/SAR FIELD IN THE MIDDLE EAST REGION

Item No	Identification		Shortcoming/Deficiency				Corrective Action			
	Requirement	States/ Facilities	Description	Date first reported	Status *	Remarks	Description	Executing body	Target Date	Priority**
1	MID/ASIA ANP Charts ATS 1 and ATS 2	Iraq	Closure of the Baghdad FIR	26/5/95	D	The FIR and the ATS routes within it exist in the ANP, but are not useable at present for international flights (UN Resolution)	Awaiting lifting of UN restrictions		TBD	B
2	LIM/MID/RAN Rec 2/10 Reservation of airspace	All MID states	Extensive military restricted airspace affecting efficiency of airspace management	26/5/95	S	Military restricted airspace is preventing the establishment of direct routes, requiring extra track miles to be flown and affecting the efficiency of airspace management.	A. ICAO to survey States to establish compliance with Rec 2/10 B. IATA to advise specific deficiencies related to military airspace C. States to continue co-ordination with military to achieve more flexible use of airspace.	A. ICAO B. IATA C. All MID States	A. TBD B. Done C. TBD	B
3	LIM/MID/RAN Rec 2/9 Civil/Military Co-ordination	TBD	Lack of established bodies for Civil Military Co-ordination	15/6/98	S	Lack of civil military co-ordination bodies in some States is contributing to problems with incursions by military aircraft into civil airspace The following States advised they do have civil military co-ordination bodies: Bahrain, Egypt, Iran, Israel, Jordan, Kuwait, Oman, Saudi Arabia	A. ICAO to survey States to establish compliance with Rec 2/9 B. ICAO to organize a civil/military co-ordination seminar C. States which have not already done so to take action as required by LIM MID RAN Rec 2/9 to establish civil military co-ordination bodies.	A. ICAO B. ICAO C. States	A. TBD B. TBD C. TBD	A

Item No	Identification		Shortcoming/Deficiency				Corrective Action			
	Requirement	States/ Facilities	Description	Date first reported	Status *	Remarks	Description	Executing body	Target Date	Priority**
4	LIM/MID/RAN Concl. 3/7 Cooperation between States in SAR	All MID States	Lack of Search and Rescue Agreements between neighbouring States	11/11/94	S	Lack of SAR agreements can be detrimental to safety of persons in distress where searches overlap national boundaries. Draft Model SAR agreements adopted at MIDANPIRG/5.	A. States to commence negotiations with neighbours to establish SAR agreements B. Implement operational SAR agreements C. Implement entry agreements for SAR aircraft of other States	All MID States	A. TBD B. TBD C. TBD	A
5	LIM MID RAN Concl 2/28	Sub-Regional problem in NW of MID Region	Choke points on ATS route between Mediterranean and Gulf area	26/5/95	D	Single route structure through East Mediterranean States causing traffic processing difficulties including the use of uneconomical level assignment. 5 min longitudinal separation has been introduced, and Planning underway for introduction of an additional route	A. 5 minute long. sep. B Initial Coordination meeting for planning new route C. Further coordination meeting to finalize plans D. Improved surveillance in Syria	 C. Jordan Saudi Arabia Syria D Syria	A. done B. done C. TBD D. TBD	B
6	LIM/MID/RAN Rec 2/3 Regional Contingency Planning	All MID States	Lack of ATS contingency plans in the MID Region	5/12/97	S	LIM/MID/RAN requested MIDANPIRG to consider regional aspects of contingency planning. Workshop had been planned for 1999, but cancelled due to Y2K	A ICAO MID Office to hold workshop on contingency planning B States to develop contingency plans following workshop.	A. ICAO B. All MID States	A. TBD B. TBD	B
7	MID ANP Table ATS-1 Plan of ATS routes	Afghanistan Pakistan Uzbekistan	ATS route **A219** not implemented	5/12/97	S	Implemented Nawabshah to Kandahar as B466. Re-designated because of prior use of this designator in ASIA/PAC region	ICAO to follow up with States to determine what action is needed to achieve implementation	ICAO	TBD	B
8	MID ANP Table ATS-1 Plan of ATS routes	Israel Jordan Syria	ATS route **A412** not implemented	5/12/97	S	Jerusalem to Amman not yet implemented.	ICAO to follow up with States to determine what action is needed to achieve implementation	ICAO	TBD	B

Item No	Identification		Shortcoming/Deficiency				Corrective Action			
	Requirement	**States/ Facilities**	**Description**	**Date first reported**	**Status ***	**Remarks**	**Description**	**Executing body**	**Target Date**	**Priority****
9	MID ANP Table ATS-1 Plan of ATS routes	Cyprus Greece	ATS route **A414** not implemented	5/12/97	S	Route as currently defined lies outside the MID region. To be extended to Tel Aviv.	To be discussed in EMAC meetings.	Cyprus, Greece, Israel, through EMAC***	TBD	B
10	MID ANP Table ATS-1 Plan of ATS routes	Bahrain Qatar Saudi Arabia	ATS route **A415** not implemented	5/12/97	S	Not yet implemented Doha to King Khalid	Saudi Arabia and Qatar to continue negotiations to open this route.	Saudi Arabia Qatar	TBD	B
11	MID ANP Table ATS-1 Plan of ATS routes	Iran Iraq	ATS route **A417** not implemented	5/12/97	S	No sections implemented	ICAO to follow up. See Item 1.	ICAO	TBD	B
12	MID ANP Table ATS-1 Plan of ATS routes	Bahrain Saudi Arabia U.A.E Yemen	ATS route **A419** not implemented	5/12/97	S	Not yet implemented Abu	A. States to organize informal coordination meeting to review route structure from Gulf south into Arabian Peninsula B. Develop ANP amendment proposal for revised route structure C. Implement revised route structure	A. States B. States and ICAO C. States	A. 1 Q 2001 B. 2 Q 2001 C. 3 Q 2001	B
13	MID ANP Table ATS-1 Plan of ATS routes	Iraq Syria Turkey	ATS route **A421** not implemented	5/12/97	S	No sections implemented	ICAO to follow up with States to determine what action is needed to achieve implementation	ICAO	TBD	B
14	MID ANP Table ATS-1 Plan of ATS routes	Iraq	ATS route **A424** not implemented	5/12/97	S	Not yet implemented Rafha to Baghdad	ICAO to follow up with States to determine what action is needed to achieve implementation	ICAO	TBD	B

Item No	Identification		Shortcoming/Deficiency				Corrective Action			
	Requirement	**States/ Facilities**	**Description**	**Date first reported**	**Status ***	**Remarks**	**Description**	**Executing body**	**Target Date**	**Priority****
15	MID ANP Table ATS-1 Plan of ATS routes	Bahrain Iran	ATS route **A453** not implemented	5/12/97	S	Not yet implemented Kish to Bahrain	A. IATA and Bahrain have developed proposal for re-alignment. To be co-ordinated with Iran B. Circulate amendment proposal	Bahrain Iran ICAO	A. TBD B. TBD	B
16	MID ANP Table ATS-1 Plan of ATS routes	Iran Kuwait	ATS route **A788** not implemented	5/12/97	S	Re-alignment of A788 agreed by States concerned.	States to issue NOTAMS and finalize LOAs	Iran Kuwait	31/12/00	B
17	MID ANP Table ATS-1 Plan of ATS routes	Egypt Jordan Saudi Arabia	ATS route **A791** not implemented	5/12/97	S	Ras Sudr - METSA - Hail not yet implemented.	A. States to coordinate and examine possible re-alignment of this route, or the possibility of L550 satisfying requirement B. Develop amendment proposal if required	Egypt Jordan Saudi Arabia IATA	A. TBD B. TBD	B
18	MID ANP Table ATS-1 Plan of ATS routes	Iraq Saudi Arabia	ATS route **B401** not implemented	5/12/97	S	No sections implemented	ICAO to follow up. See Item 1.	ICAO	TBD	B
19	MID ANP Table ATS-1 Plan of ATS routes	Iraq Syria	ATS route **B402** not implemented	5/12/97	S	No sections implemented	ICAO to follow up. See Item 1.	ICAO	TBD	B
20	MID ANP Table ATS-1 Plan of ATS routes	Israel Cyprus	ATS route **B406** not implemented	5/12/97	S	No sections implemented	To be discussed in EMAC*** meetings.	Israel Cyprus	TBD	B
21	MID ANP Table ATS-1 Plan of ATS routes	Cyprus Lebanon Syria Turkey	ATS route **B410** not implemented	5/12/97	S	No sections implemented	To be discussed in EMAC*** meetings.	Cyprus Lebanon Syria Turkey	TBD	B

Item No	Identification		Shortcoming/Deficiency				Corrective Action			
	Requirement	States/ Facilities	Description	Date first reported	Status *	Remarks	Description	Executing body	Target Date	Priority**
22	MID ANP Table ATS-1 Plan of ATS routes	Afghanistan Iran Jordan Saudi Arabia	ATS route **B411** not implemented	5/12/97	S	AL Shigar to ARAR implemented in Saudi Arabia. Implemented in Iran except for NOTSO to Kabul FIR boundary.	States to co-ordinate to achieve further implementation of this route.	A. Saudi Arabia Jordan B. Afghanistan Iran	A. TBD B. TBD	B
23	MID ANP Table ATS-1 Plan of ATS routes	Jordan Saudi Arabia Syria	ATS route **B412** not implemented	5/12/97	S	No sections implemented Saudi Arabia and Jordan ready to implement.	States to co-ordinate to finalize implementation	Jordan Saudi Arabia Syria	TBD	B
24	MID ANP Table ATS-1 Plan of ATS routes	Bahrain Qatar	ATS route **B415** not implemented	5/12/97	S	Not implemented Doha to Bahrain Subject to military restrictions	States to continue negotiations with one another and military	Bahrain Qatar	31/12/00	B
25	MID ANP Table ATS-1 Plan of ATS routes	Bahrain Qatar Saudi Arabia	ATS route **B419** not implemented	5/12/97	S	Not implemented Doha - King Fahd Subject to military restrictions	States to continue negotiations with one another and military	Bahrain Qatar Saudi Arabia	31/12/00	B
26	MID ANP Table ATS-1 Plan of ATS routes	Syria Turkey	ATS route **B538** not implemented	5/12/97	S		ICAO to follow up with States to determine what action is needed to achieve implementation	ICAO	TBD	B
27	MID ANP Table ATS-1 Plan of ATS routes	Cyprus Jordan Lebanon Turkey	ATS route **B545** not implemented	5/12/97	S	No sections implemented	To be discussed in EMAC*** meetings.	Cyprus Jordan Lebanon Turkey	TBD	B
28	MID ANP Table ATS-1 Plan of ATS routes	Cyprus Iraq Lebanon Syria	ATS route **G202** not implemented	5/12/97	S	Not implemented SAMARRA - TANF and DAMASCUS - BEIRUT.	To be discussed in EMAC*** meetings.	Cyprus Iraq Lebanon Syria	TBD	B

Item No	Identification		Shortcoming/Deficiency				Corrective Action			
	Requirement	States/ Facilities	Description	Date first reported	Status *	Remarks	Description	Executing body	Target Date	Priority**
29	MID ANP Table ATS-1 Plan of ATS routes	Bahrain Saudi Arabia Yemen	ATS route **G652** not implemented	5/12/97	S	Not implemented ETUKO to Aden	A. States to organize informal coordination meeting to review route structure from Gulf south into Arabian Peninsula B. Develop ANP amendment proposal for revised route structure C. Implement revised route structure	A. States + IATA B. States and ICAO C. States	A. 1 Q 2001 B. 2 Q 2001 C. 3 Q 2001	B
30	MID ANP Table ATS-1 Plan of ATS routes	Bahrain Saudi Arabia U.A.E.	ATS route **G660** not implemented	5/12/97	S	Not implemented King Abdul Aziz to Abu Dhabi	A. States to organize informal coordination meeting to review route structure from Gulf south into Arabian Peninsula B. Develop ANP amendment proposal for revised route structure C. Implement revised route structureh	A. States B. States and ICAO C. States	A. 1 Q 2001 B. 2 Q 2001 C. 3 Q 2001	B
31	MID ANP Table ATS-1 Plan of ATS routes	Jordan Syria	ATS route **G662** not implemented	5/12/97	S	Not implemented Damascus to Guriat	States to continue coordination to achieve implementation	Jordan Syria	31/12/00	B
32	MID ANP Table ATS-1 Plan of ATS routes	Cyprus Israel Jordan	ATS route **G664** not implemented	5/12/97	S	No sections implemented	To be discussed in EMAC*** meetings.	Cyprus Israel Jordan	TBD	B
33	MID ANP Table ATS-1 Plan of ATS routes	Iran	ATS route **G665** not implemented	5/12/97	S	Implemented, but segment Shiraz - NABOD is only available at night	ICAO to follow up with Iran to determine what action is needed to achieve full implementation	ICAO	TBD	B

Item No	Identification		Shortcoming/Deficiency				Corrective Action			
	Requirement	**States/ Facilities**	**Description**	**Date first reported**	**Status ***	**Remarks**	**Description**	**Executing body**	**Target Date**	**Priority****
34	MID ANP Table ATS-1 Plan of ATS routes	Saudi Arabia Yemen	ATS route **G667** not implemented	5/12/97	S	Rationalization of G667/G782/A788 finalized. Not implemented in Jeddah	States to coordinate to achieve implementation.	Saudi Arabia Yemen	TBD	B
35	MID ANP Table ATS-1 Plan of ATS routes	Iraq	ATS route **G669** not implemented	5/12/97	S	Not yet implemented NISER to SOLAT	ICAO to follow up. See Item 1.	ICAO	TBD	B
36	MID ANP Table ATS-1 Plan of ATS routes	Iran Iraq Syria	ATS route **G671** not implemented	5/12/97	S	No sections implemented	ICAO to follow up with States to determine what action is needed to achieve implementation	ICAO	TBD	B
37	MID ANP Table ATS-1 Plan of ATS routes	Afghanistan Iran Pakistan Turkmenistan	ATS route **G792** not implemented	5/12/97	S	No sections implemented	ICAO to follow up with States to determine what action is needed to achieve implementation	ICAO	TBD	B
38	MID ANP Table ATS-1 Plan of ATS routes	Iraq	ATS route **G795** not implemented	5/12/97	S	Not yet implemented TAMIM to Rafha	ICAO to follow up. See Item 1.	ICAO	TBD	B
39	MID ANP Table ATS-1 Plan of ATS routes	Cyprus Jordan Lebanon Syria	ATS route **R219** not implemented	5/12/97	S	Not implemented Turaif to Beirut, and within Nicosia FIR	States to co-ordinate to finalize implementation within the MID region. Implementation in Nicosia to be discussed in EMAC meetings.	Cyprus Jordan Lebanon Syria	31/12/00	B
40	MID ANP Table ATS-1 Plan of ATS routes	Iraq	ATS route **R651** not implemented	5/12/97	S	No sections implemented	ICAO to follow up. See Item 1.	ICAO	TBD	B

Item No	Identification		Shortcoming/Deficiency				Corrective Action			
	Requirement	States/ Facilities	Description	Date first reported	Status *	Remarks	Description	Executing body	Target Date	Priority**
41	MID ANP Table ATS-1 Plan of ATS routes	Israel Jordan Syria	ATS route **R653** not implemented	5/12/97	S	No sections implemented			TBD	B
42	MID ANP Table ATS-1 Plan of ATS routes	Iran Oman	ATS route **R658** not implemented	5/12/97	S	No sections implemented	States to coordinate to achieve implementation	Iran Oman	TBD	B
43	MID ANP Table ATS-1 Plan of ATS routes	Bahrain Saudi Arabia Qatar Yemen	ATS route **R659** not implemented	5/12/97	S	Not implemented Doha to	A. States to organize informal coordination meeting to review route structure from gulf south into Arabian Peninsula B. Develop ANP amendment proposal for revised route structure C. Implement revised route structureh	A. States + IATA B. States and ICAO C. States	A. 1 Q 2001 B. 2 Q 2001 C. 3 Q 2001	B
44	MID ANP Table ATS-1 Plan of ATS routes	Iraq Turkey	ATS route **R784** not implemented	5/12/97	S	Not implemented SIDAD to Siirt	ICAO to follow up with States to determine what action is needed to achieve implementation	ICAO	TBD	B
45	MID ANP Table ATS-1 Plan of ATS routes	Egypt Saudi Arabia	ATS route **L550** not implemented	5/12/97	S	Proposal developed for a revised route Nuweiba to NIMAR.	Finalize LOAs and NOTAMS. Issue ANP amendment proposal.	Egypt Saudi Arabia ICAO	31/12/00	B

EXPLANATORY NOTES

*S = shortcoming D = deficiency

** Priority for action to remedy the shortcoming is based on the following safety assessments:

Urgent requirements having a **direct** impact on **safety** and requiring **immediate** corrective actions.

Urgent requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is urgently required for air navigation safety.

Top priority requirements **necessary** for air navigation **safety**.

Top priority requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is considered necessary for air navigation safety.

Intermediate requirements **necessary** for air navigation **regularity and efficiency**.

Intermediate priority requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is considered necessary for air navigation regularity and efficiency.

*** EMAC = European Middle East regional coordination mechanism on ATM

MIDANPIRG/6
Appendix 5B to the Report on Agenda Item 3

TABLE OF AIR NAVIGATION SHORTCOMINGS/DEFICIENCIES IN THE AIS/MAP FIELD IN THE MIDDLE EAST REGION

Item No	Identification		Shortcoming/Deficiency				Corrective Action			
	Requirement	States/Facilities	Description	Date first reported	Status *	Remarks	Description	Executing body	Target Date	Priority**
1	ANNEX 15: Para 4.1.1	Iraq, Syria	Newly Restructured AIP	June 1996	S		ICAO to follow up with States to determine what action is needed to achieve implementation	ICAO	TBD	A
2	Para 6.1	Iraq, Israel, Syria , Yemen	AIRAC	22/5/95	S (Yemen D)	Yemen does not fully adhere to AIRAC	ICAO to follow up with States to determine what action is needed to achieve implementation	ICAO	TBD	A
3	Para 3.4.4.1	Iraq Israel Saudi Arabia Syria Yemen	WGS-84	1/12/97	S	Israel, Saudi Arabia, Syria and Yemen have partly completed implementation.	ICAO to follow up with States who have not established target dates to determine what action is needed to achieve implementation All states to implement in accordance with Appendix 5 of Annex 11	A. ICAO B. Israel C. Saudi Arabia E. Iraq Syria Yemen	A. TBD B. 4 Q 2000 C. 4 Q 2001 E. TBD	A
4	ANNEX 4 : Chart production requirements	Iran	Non-production of Aerodrome Obstacle Chart-ICAO Type A	22/5/95	S	*Note: No further action since ATM/AIS/SAR SG/4*	ICAO to follow up with States to determine what action is needed to achieve implementation and current target dates	A. ICAO B. Egypt	A.TBD B. TBD	A

Item No	Identification		Shortcoming/Deficiency				Corrective Action			
	Requirement	States/Facilities	Description	Date first reported	Status *	Remarks	Description	Executing body	Target Date	Priority**
5	ANNEX 4 : Chart production requirements	Egypt Iran Yemen	Non-production of Aerodrome Obstacle Chart-ICAO Type C	22/5/95	S		ICAO to follow up with States to determine what action is needed to achieve implementation and current target dates	ICAO	TBD	A
6	ANNEX 4 : Chart production requirements	Iran Iraq Lebanon	Non-production of Aerodrome/ Heliport Chart - ICAO	22/5/95	S		ICAO to follow up with States to determine what action is needed to achieve implementation and current target dates	ICAO	TBD	A
7	ANNEX 4 : Chart production requirements	Jordan U.A.E.	Non-production of Area Chart - ICAO	22/5/95	S		ICAO to follow up with States to determine what action is needed to achieve implementation	A. ICAO B. Jordan C. U.A.E.	A. TBD B. TBD C. TBD	A
8	ANNEX 4 : Chart production requirements	Lebanon U.A.E.	Non-production of Enroute Chart-ICAO	22/5/95	S		ICAO to follow up with States to determine what action is needed to achieve implementation and current target dates	A. ICAO B. Lebanon U.A.E.	A. TBD B. TBD	A
9	ANNEX 4 : Chart production requirements	Egypt Iran Jordan Lebanon Yemen	Non-production of Precision Approach Terrain Chart-ICAO	22/5/95	S		ICAO to follow up with States to determine what action is needed to achieve implementation and current target dates	A. ICAO B. States	A. TBD B. TBD	A

Item No	Identification		Shortcoming/Deficiency				Corrective Action			
	Requirement	States/Facilities	Description	Date first reported	Status *	Remarks	Description	Executing body	Target Date	Priority**
10	ANNEX 4 : Chart production requirements	Egypt Yemen	Non-production of Standard Arrival Chart-Instrument-ICAO	22/5/95	S		ICAO to follow up with States to determine what action is needed to achieve implementation and current target dates	A. ICAO B. Egypt Yemen	A.TBD B. TBD	A
11	ANNEX 4 : Chart production requirements	Egypt	Non-production of Standard Departure Chart-Instrument-ICAO	22/5/95	S		Egypt has already planned production	Egypt	TBD	A
12	ANNEX 4 : Chart production requirements	Lebanon	Non-production of Visual Approach Chart - ICAO	22/5/95	S		ICAO to follow up with States to determine what action is needed to achieve implementation and current target dates	ICAO	TBD	A
13	ANNEX 4 : Chart production requirements	Bahrain Egypt Iran Iraq Jordan Saudi Arabia U.A.E. Yemen	Non-production of World Aeronautical Chart - ICAO	22/5/95	S		ICAO to follow up with States to determine what action is needed to achieve implementation. Responsibilities for production to be reviewed by ATM/AIS/SAR SG/5	A. ICAO B. Egypt C. Other States	A. TBD B. 31/3/01 C. TBD	A

Note: The status of implementation of these requirements in Afghanistan is not known, due to the restrictions on communicating directly with the ATS authorities in Afghanistan.

EXPLANATORY NOTES

*S = shortcoming D = deficiency

** Priority for action to remedy the shortcoming is based on the following safety assessments:

AU@ priority = **Urgent** requirements having a **direct** impact on **safety** and requiring **immediate** corrective actions.

Urgent requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is urgently required for air navigation safety.

AA@ priority = **Top priority** requirements **necessary** for air navigation **safety**.

Top priority requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is considered necessary for air navigation safety.

AB@ priority = **Intermediate** requirements **necessary** for air navigation **regularity and efficiency**.

Intermediate priority requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is considered necessary for air navigation regularity and efficiency.

SHORTCOMINGS/DEFICIENCIES IN THE CNS FIELD

(Ref. Air Navigation Plan - Middle East Region)

PART III - COMMUNICATIONS (COM). Doc 9708

Identification		**Shortcomings/deficiencies**				**Corrective action required**			
Requirements	**States/facilities**	**Description**	**Date first Reported**	**Status ***	**Remarks**	**Description**	**Executing body**	**Expected date of Complete**	**Priority for action****
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	07/10/1998	S	Lebanon is ready to implement the circuit		Jordan-Lebanon		B
	Israel - Jordan Ben Gurion - Amman AFTN Circuit	The circuit is not yet implemented	07/10/1998	S	Jordan has planned to implement the circuit in the foreseen future.				B
	Iraq - Lebanon Baghdad- Beirut AFTN Circuit	The circuit is not yet implemented	07/10/1998	S	Iraq and Lebanon have initiated talks for implementation. Lebanon is ready to implement the circuit		Iraq - Lebanon		B

Identification		Shortcomings/deficiencies				Corrective action required			
Requirements	**States/facilities**	**Description**	**Date first Reported**	**Status ***	**Remarks**	**Description**	**Executing body**	**Expected date of Complete**	**Priority for action****
	Afghanistan-Bahrain Kabul-Bahrain AFTN Circuit	The circuit is not yet implemented	07/10/1998	S	Bahrain is ready to implement the circuit	Follow-up the matter with IATA concerning Afghanistan			B
	Afghanistan-Iran Kabul-Tehran AFTN Circuit	The circuit is not yet implemented	07/10/1998	S					B
	~~Kuwait - Qatar Kuwait - Doha AFTN Circuit~~	~~The circuit is not yet implemented~~	~~07/10/1998~~	~~S~~		~~The circuit is limplemented on 100 bauds~~	~~Kuwait Qatar~~	~~Second Quarter 2000~~	~~B~~
AFTN Main Circuits (LIM MID RAN Rec10/5)	Egypt Jordan Amman Cairo AFTN Circuit	The circuit is implemented on 50 bauds	19/10/1999	D	Egypt is ready to up-grade the circuit to 100 bauds or higher if traffic justifies	Egypt will co-ordinate with Jordan for up-grading	Egypt Jordan		B
	Bahrain Saudi Arabia Bahrain Jeddah AFTN Circuit	The circuit is implemented on 200 bauds	19/10/1999	D	The circuit is working satisfactorily	Will be up-graded to CIDIN		Second Quarter 2001	B
	Bahrain Kuwait Bahrain Kuwait AFTN Circuit	The circuit is implemented on 100 bauds	19/10/1999	D		Planned to be up-graded to 300 bauds	Bahrain Kuwait	TBD	B

Identification		Shortcomings/deficiencies				Corrective action required			
Requirements	**States/facilities**	**Description**	**Date first Reported**	**Status ***	**Remarks**	**Description**	**Executing body**	**Expected date of Complete**	**Priority for action****
	Bahrain Singapore Bahrain Singapore AFTN Circuit	The circuit is implemented on 200 bauds	19/10/1999	D	Operating satisfactorily on 200 bauds	Planned to be up-graded to medium speed circuit (1200-2400)	Bahrain Singapore	TBD	B
	Lebanon Saudi Arabia Beirut Jeddah AFTN Circuit	The circuit is implemented on 100 bauds	19/10/1999	D		Planned to be up-graded to 300 bauds	Lebanon Saudi Arabia	Second Quarter 2001	B
	Lebanon Kuwait Beirut Kuwait AFTN Circuit	The circuit is implemented on 100 bauds	19/10/1999	D	The circuit is operating satisfactorily on 200 bauds.	Planned to be up-graded to 300 bauds			B
	Egypt Saudi Arabia Cairo Jeddah AFTN Circuit	The circuit is implemented on 100 bauds	19/10/1999	D		Planned to be up-graded to CIDIN	Egypt Saudi Arabia	Second Quarter 2001	B
	Egypt Kenya Cairo Nairobi AFTN Circuit	The circuit is implemented on 50 bauds	19/10/1999	D	Egypt is ready to up-grade the circuit to 100 bauds	Egypt and Kenya agreed to upgrade the circuit to 1200 bps	Egypt Kenya	Fourth Quarter 2000	B
	Egypt Tunisia Cairo Tunis AFTN Circuit	The circuit is implemented on 100 bauds	19/10/1999	D		Planned to be up-graded to CIDIN	Egypt - Tunisia	Upon Tunis readiness	B

Identification		Shortcomings/deficiencies				Corrective action required			
Requirements	**States/facilities**	**Description**	**Date first Reported**	**Status ***	**Remarks**	**Description**	**Executing body**	**Expected date of Complete**	**Priority for action****
	Saudi Arabia Ethiopia Jeddah Addis Ababa	The circuit is implemented on 50 bauds	19/10/1999	D	The circuit is not working satisfactorily. Saudi Arabia is ready to up-grade the circuit to higher speed.	ICAO MID Regional Office is following-up the matter with ICAO Nairobi Office			A
	Kuwait Pakistan Kuwait Karachi AFTN Circuit	The circuit is implemented on 50 bauds	19/10/1999	D	Kuwait is ready to up-grade the circuit to 100 bauds. No traffic justification for 300 bauds		Kuwait Pakistan		B
	Iran Kuwait Kuwait Tehran AFTN Circuit	The circuit is implemented on 100 bauds	19/10/1999	D	No traffic justification for 300 bauds				B

Identification		Shortcomings/deficiencies				Corrective action required			
Requirements	**States/facilities**	**Description**	**Date first Reported**	**Status ***	**Remarks**	**Description**	**Executing body**	**Expected date of Complete**	**Priority for action****
ATS Speech Circuit Plan (LIM MID RAN Conclusion 6/11)	Yemen Ethiopia-Eritrea India Djibouti Saudi Arabia Somalia Oman	All ATS Speech Circuits connecting following adjacent centres provided by Yemen use speed dial: Addis-Ababa Asmara Mumbai Djibouti Jeddah Mogadishu Muscat	07/10/1998	D	Sometimes, Communications facilities do not permit communications to be established within 15 seconds	Yemen will be urged to implement Direct Speech Circuits with adjacent centres using dedicated lines ICAO MID Regional Office is following up the matter with ICAO Nairobi Office concerning the African States. Saudi Arabia and Oman are ready to implement a dedicated circuit with			A

Identification		Shortcomings/deficiencies				Corrective action required			
Requirements	**States/facilities**	**Description**	**Date first Reported**	**Status ***	**Remarks**	**Description**	**Executing body**	**Expected date of Complete**	**Priority for action****
	Saudi Arabia Eritrea Sudan	The ATS Speech Circuit connecting the following adjacent centres to Jeddah use speed dial: Asmara Khartoum	19/10/1999	D	Jeddah Khartoum on speed dial Khartoum Jeddah on HF	ICAO MID Regional Office is following-up the matter with ICAO Nairobi Office. Saudi Arabia is ready to implement the dedicated circuits with Asmara and Khartoum			A
AFTN usage (LIM MID RAN Rec 6/2)	States concerned	Recording of statistics in appropriate form, exchange of the circuit loading data with corresponding stations, evaluate circuit loading and take remedial action when occupancy level exceeds permissible levels	22/05/1995	D	Refer to ICAO fax ref. F.ME 165 reminding States to send data to Regional Office. Copy of Table to be filled is attached to Appendix 3B to the report on Agenda Item 3		States concerned		B

S = shortcoming D = deficiency

** Priority for action to remedy the shortcoming is based on the following safety assessments:

Urgent requirements having a **direct** impact on **safety** and requiring **immediate** corrective actions.

Urgent requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is urgently required for air navigation safety.

Top priority requirements **necessary** for air navigation **safety**.

Top priority requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is considered necessary for air navigation safety.

Intermediate requirements **necessary** for air navigation **regularity and efficiency**.

Intermediate priority requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is considered necessary for air navigation regularity and efficiency.

Definitions:

a) Shortcomings

a situation where a facility is not installed or a service is not provided in accordance with a regional air navigation plan is considered to be a shortcoming

b) Deficiencies

a situation where an existing facility or service is partially unserviceable, incomplete or not operated in accordance with ICAO specifications and procedures is considered to be a deficiency.

AIR NAVIGATION SHORTCOMINGS/DEFICIENCIES IN THE MET FIELD IN THE MID REGION

Item No	Identification		Shortcomings/Deficiencies				Corrective Action			
	Requirement	States/ Facilities	Description	Date first reported	Status *	Remarks	Description	Executing body	Target Date	Priority
1	MID RAN Rec. 10/13	To be decided	Status of Impl. Of facilities & services at Aero. MET offices in MID Region	May 95	D	Lack of reliable data and non-adherence to recommended procedures and coding guidelines	States to make full use of TCP to train their personnel at all levels & acquire the equipment to support air navigation	To be decided	Ongoing	A
							COM/MET SG to monitor adherence to procedures and guidelines	COM/MET SG	Ongoing	A
	Rec. 10/19	To be decided	Training for new meteorological codes	May 95	D		States to ensure that all staff concerned continue to receive training in coding procedures for AIREP, METAR, SPECI & TAF codes	To be decided	Ongoing	A
2[1]	MET service at aerodromes	Egypt: a) Luxor b) Hurgada	 No Wx forecast Inadequate service	 April 98 April 98	 D D		 Ensure forecasts are available. Improve service.	 Egyptian MET Authority	 ASAP ASAP	 B B
		Syria: a) Damascus	 No valid forecasts	 April 98	 D		 Ensure forecasts are valid and available.	 Syrian MET Authority	 ASAP	 B
3	All provisions in ANP	Afghanistan Baghdad	*	*	*	*	*	*	*	U

Due to prevailing situation, little or no information is available regarding the provision of aeronautical MET services to civil aviation.
S = Shortcoming D = Deficiency.
U = **Urgent** Urgent requirements having a **direct** impact on **safety** and requiring **immediate** corrective actions.
A = **Top priority** requirements **necessary** for aviation **safety**.
B = **Intermediate** requirements **necessa**ry for aviation **regularity.**

[1] Source of information: IFALPA Annex 19 part 3 dated April 1998

REPORT ON AGENDA ITEM 6- REVIEW OF OUTSTANDING CONCLUSIONS AND DECISIONS OF MIDANPIRG AND DEVELOPMENT OF THE FUTURE WORK PROGRAMME.

Review of outstanding Conclusions and Decisions of MIDANPIRG

6.1 The meeting was informed of the follow-up actions taken by the Secretariat on the Conclusions/Decisions adopted by MIDANPIRG/5. While reviewing, the meeting noted that some of the listed Conclusions/Decisions were actioned or superseded by MIDANPIRG/6 Conclusions/Decisions. However, Conclusions/Decisions that were not actioned are restated, list is at **Appendix 6A** to the report on Agenda Item 6. Secretariat of each MIDANPIRG subsidiary body should follow-up and report outcome to the next MIDANPIRG meeting (MIDANPIRG/7).

6.2 The meeting was informed by the Secretariat that, a series of systematic State letters will be dispatched by the MID Regional Office in which the outstanding MIDANPIRG/4-5-6 Conclusions/Decisions will be listed, in order to keep track of follow-up actions.

Development of Future Work Programme

MID Office Tentative Schedule of Meetings, Seminars and Workshops

6.3 The meeting reviewed the Table of MID Office tentative schedule of meetings, seminars and workshops from October 2000 to June 2001. The table included the next MIDANPIRG/7 meeting proposed for November 2001. The meeting expressed the need for a second ANP/FASID Task Force meeting in 1st quarter of year 2001, and questioned the non-existence on the table of the Training Task Force meeting. After discussions, it was agreed that Training Task Force would be listed depending on availability of training expertise and required information from the MID Region.

6.4 Bahrain requested that the proposed MID RVSM TF/1 scheduled for 3-5 October 2000 be

importance of RVSM, which included the requirement for harmonization with Asia/PAC and European Regions. In addition the MID ATM Regional Officer who will support the RVSM TF/1 will be transferred to Montreal soon after the meeting.

6.5 Egypt announced that, as the coordinator of the ISTB Action Group, would host a meeting on 30-31 October 2000 (refer to page 4.3-3, para 4.3.13, ISTB for MID Region). United Arab Emirates indicated that it would host a meeting during November 2000, of MID States that were involved in monitoring navigation errors in relation to RNP 5 implementation in the MID Region.

6.6 Due to the COM/MET SG not convening in year 2000, the meeting suggested that this Sub-Group should meet in year 2001and address some of the pending tasks and report to MIDANPIRG/7. Kuwait indicated that an ITU WRC2003 preparation meeting might be required in order to prepare for the WRC 2003 meeting.

6.7 Saudi Arabia indicated that the requirements for a second CNS/ATM/IC/SG meeting should be considered to follow the meetings of Sub-Groups and Task Forces, prior to MIDANPIRG/7. The meeting noted all these requirements and highlighted that, due to time, MID Office Secretariat human resource and budget shortages, a mechanism to finance all these meetings would be required. A flimsy was presented by Saudi Arabia providing suggestions to move forward and progress the work programme and tasks assigned to MIDANPIRG subsidiary bodies.

6.8 The meeting after discussing all mentioned above, agreed that, the final dates for the meetings would be co-ordinated between the Secretariat and the respective Chairman of the concerned Group and that the schedule of meetings, seminars and workshops would be adjusted soon after MIDANPIRG/6 meeting. The co-ordinated version of MID Office tentative schedule is at **Appendix 6B** to the report on Agenda Item 6

Working Method

6.9 Saudi Arabia indicated that future meetings should start with review of the last MIDANPIRG Conclusions/Decisions in order for the Regional Group to know what progress has been made, and more time should be devoted to CNS/ATM planning discussions so that the group can visualize the way that the Sub-Group is heading. The Secretariat explained that PIRG meetings should focus on handling of strategies which do not involve detailed discussions, as this normally is the task of its subsidiary bodies. Moreover, the Secretariat stressed that emphasis should be on implementation and assistance to States, and follow-up of the corrective actions to shortcomings and deficiencies. In fact the last day usually is devoted to any other business, in which strategic issues and future work programme are discussed. Saudi Arabia suggested that during last day of the meeting, until such time that the draft is presented to the meeting, half of that last day may be dedicated for informal discussions on planning strategic issues.

6.10 The meeting was of the opinion that Chairman of individual MIDANPIRG subsidiary bodies should present the meeting with their groups report. However, as all Chairmen were not present, this was not possible.

6.11 The Secretariat urged future participants to various groups to send in advance their working or information papers at least ten days before the meeting.

MIDANPIRG/6
Appendix 6A to the Report on Agenda Item 6

MIDANPIRG/5
LIST OF CONCLUSIONS AND DECISIONS

CONCLUSION 5/1- COORDINATION MEETINGS TO FURTHER THE IMPLEMENTATION OF THE MID ATS ROUTE NETWORK

That all States, taking into account the priorities assigned to the non-implemented ATS routes as indicated in **Appendix 3B** to this report, initiate coordination with the other States involved in order to achieve full implementation of all routes as soon as possible.

CONCLUSION 5/4- APPLICATION OF MEASURES TO REDUCE CONGESTION IN THE MID REGION

That planning measures to reduce congestion in the MID Region should be based on the following considerations:

a) the feasibility of using capacity enhancement measures should always be considered;

b) in developing regional plans for ATFM measures to manage demand, it should be noted that

i) tactical ATFM measures are currently used and should continue to be used, in co-ordination with adjacent FIRs, to manage demand during periods of significant congestion; and
ii) strategic ATFM may be required on a seasonal basis for specific airports (e.g. for Haj flights).

CONCLUSION 5/8- IMPLEMENTATION OF WGS-84

That, in order to accomplish a smooth transition, States which have not already done so are encouraged to expedite their preparations for the implementation of WGS-84

CONCLUSION 5/10- IMPLEMENTATION OF ADDITIONAL CIDIN CIRCUITS IN THE MIDDLE EAST REGION

That, States who have not already planned to implement CIDIN in their centres, consider waiting for the outcomes of the co-ordination with the European Region before planning to implement CIDIN, or plan for a direct transition from AFTN to ATN.

CONCLUSION 5/13 - SURVEY OF EXCHANGES OF OPMET INFORMATION BETWEEN MID AND AFI AND BETWEEN MID AND EUR REGIONS

That,

a) the MID Regional Office arranges for another survey of OPMET exchanges between MID and AFI and between MID and EUR regions before MIDANPIRG/6

b) the results of the survey be presented in a specific manner for appropriate remedial action by State(s) concerned

DECISION 5/15- SADIS STRATEGIC ASSESSMENT TABLES

That, MIDANPIRG tasks its COM/MET Sub-group to maintain the SADIS Strategic Assessment Tables, at **Appendix 3N** to the report on this Agenda Item, on an annual basis and forward them to the SADISOPSG in time for each SADISOPSG meeting.

DECISION 5/17 - PROPOSAL FOR A JOINT DEVELOPMENT WORK BETWEEN MID REGION AND EGNOS ON VARIOUS ISSUES RELATED TO GNSS IMPLEMENTATION IN MID REGION

That MIDANPIRG

(a) accept the initiative of the European Tripartite Group to:

1. participate in the initiative of ETG in conducting an inter-regional SBAS cost/benefit analysis, together with current ETG international partners,

2. exchange information with ETG on GNSS technical certification requirements drawing upon the work conducted by the ETG safety assessment team,

3. exchange information with ETG on current work on institutional and organizational framework,

4. participate with ETG and its international partners (AFI region, India and Japan) in Inter-regional SBAS Test bed (ISTB) trials,

(b) accept any initiative by other SBAS providers to conduct similar trials and demonstrations with the MID region, provided that the mechanism and scope of involvement of the States and users of the MID region and the scenarios are clearly defined and accepted, and stressing that such a participation by the MID region with EGNOS in joint test bed activities would by no means prejudice a future decision on the final choice of an augmentation system by the MID region.

DECISION 5/18 - IMPLEMENTATION OF INTER-REGIONAL SATELLITE TEST-BED (ISTB) FOR THE MID REGION

That, MIDANPIRG GNSS Task Force should be the co-ordinating body for the implementation of Inter-Regional Satellite Test-Bed (ISTB) for the MID Region. A contact group within the GNSS Task Force shall be designated to carry-out the tasks outlined in **Appendix 3P** to the report on Agenda Item 3.

CONCLUSION 5/19 - MID REGION STRATEGY FOR GNSS IMPLEMENTATION

The Strategy for the implementation of GNSS in the MID Region should take into consideration the following criteria:

1. Implementation should be consistent with the Global Plan, and should be conducted in a progressive, co-ordinated and collective manner for all phases of flight.

2. There should be a full examination of the extent to which the basic signals from current and planned Navigation Satellites accessible in the Region can meet the navigational requirements of ATM service providers and aircraft operators in the Region.

3. Any augmentation system deemed necessary (SBAS/GBAS) should be implemented in full compliance with ICAO SARPs taking into account operational requirements and available standards, and should be provided on a co-operative, multinational basis.

4. Due account should be taken of SBAS being developed in adjacent regions (e.g. GNOS), and such trials and demonstrations in involving these systems as may be required should be conducted, in determining the optimum means of implementing SBAS in the MID Region.

5. Due account should be taken of user equipage plans

6. The augmentation option to be implemented should be the most cost-effective one after a comprehensive cost/benefit analysis (CBA) of all the available options, including a zero-action option. The CBA should be carried out by a group comprising representations from all involved parties, including users. Any decommissioning of equipment assumed in the cost/benefit analysis of the preferred option should be validated by MIDANPIRG in the final decision process.

7. Possible sources of funding for studies, demonstrations and trials to assist in the selection of the most cost-effective augmentation option, and, to the extent necessary, of the subsequent implementation process of the selected option, should be identified and addressed.

8. The institutional and legal issues related to GNSS implementation in MID Region should be identified and addressed.

9. Guidance material should be developed by ICAO for State CAAs and Operators to assist in the airworthiness certification and operational approval of related airborne systems and operational procedures, and for ATS service providers to assist in staff training and licensing.

10. The result of study to be undertaken covering all related aspects for establishing a regional space and ground infrastructure, as part of a multinational approach for the provision of GNSS augmentation in addition to communication and surveillance in MID Region.

11. High priority should be given to introduce GNSS as supplementary means in the Middle East Region.

DECISION 5/23 - GUIDELINES FOR AN EVOLUTIONARY TRANSITION TO THE GROUND-TO-GROUND ELEMENT OF THE ATN

That, the AFS/ATN Task Force, in developing guidelines for an Evolutionary Transition to the ground-to-ground element of the ATN, take into consideration:

a) The National CNS/ATM plans of MID States and the MID CNS/ATM Regional Plan in order to ensure compatibility between the work of the relevant Sub-Groups, Task Forces and of the States.

b) The work already accomplished by the ATN Panel.

c) ATN developments carried out in other regions and the importance of the interfaces with adjacent regions.

CONCLUSION 5/27 - ADEQUATE EQUIPMENT AND TRAINING/SUPERVISION OF PERSONNEL

That, MID States be urged to make greater efforts to ensure adequate equipment and training and supervision of personnel involved in all aspects of Communications, Navigation and Surveillance Services.

CONCLUSION 5/28 - TERRESTRIAL LINKS BETWEEN PTT AND AIRPORT

That, States should be urged to improve the quality of terrestrial links between PTT and airport by using modern technology and/or providing back-up links.

DECISION 5/34 - ESTABLISHMENT OF A MID REGION MULTINATIONAL FACILITIES AND SERVICES TASK FORCE

That, a MID Multinational Facilities and Services Task Force be established, for the purpose of examining the mechanisms of financing the implementation of civil aviation systems where required in the MID Region.

MIDANPIRG/6
Appendix 6B to the Report on Agenda Item 6

MID OFFICE TENTATIVE SCHEDULE OF MEETINGS, SEMINARS AND WORKSHOPS

October 2000 November 2001

DATE	*MEETING/SEMINAR/WORKSHOP*	*SITE*	*REMARKS*
OCTOBER 2000			
3-5	MID RVSM TF/1	Cairo	
NOVEMBER 2000			
13-16	AOP SG/1	Cairo	
TBD	MER TFG/4	Cairo	3rd week, Length 4 days.
JANUARY 2001			
08-12	ASPAC RVSM TF/9	Bangkok	ASPAC Region meeting, invitation extended to MID Region.
TBD	AOP Workshop	Cairo	4th week, length and topic to be decided by AOP SG/1 (above).
FEBRUARY 2001			
TBD	ANP/FASID TF/2	Cairo	2nd week, Length 2 days.
TBD	RVSM & RVSM Training Seminar Asia/MID Focus	TBD (Asia)	Asia seminar, invitation extended to MID Region.
MARCH 2001			
TBD	AFS/ATN TF/7	Cairo	2nd week, Length 4 days.
APRIL 2001			
TBD	COM/MET SG/4	Cairo	Length 4 days.
TBD	MID RVSM TF/2	Cairo	Length 4 or 5 days. (Possibility of seminar and meeting).
MAY 2001			
TBD	GNSS TF/3	Cairo	2nd week, Length 3 days.
JUNE 2001			
TBD	RNP/RNAV TF/5	Cairo	Length 4 or 5 days.
TBD	MER TFG/5	Cairo	3rd or 4th week, Length 4 days. Possibility of conversion to workshop.

MID OFFICE TENTATIVE SCHEDULE OF MEETINGS, SEMINARS AND WORKSHOPS

DATE	*MEETING/SEMINAR/WORKSHOP*	*SITE*	*REMARKS*
JULY 2001			
TBD	MID RVSM TF/3	Cairo	Length 4 or 5 days.
SEPTEMBER 2001			
TBD	CNS/ATM/IC SG/1	Cairo	1st or 2nd week, Length 5 days.
OCTOBER 2001			
TBD	ATM/AIS/SAR SG/5	Cairo	Length 5 days.
NOVEMBER 2001			
TBD	MIDANPIRG/7	TBD	1st or 2nd week (to be confirmed), Length 5 days meeting.

OTHER MEETINGS OF INTEREST TO THE MID REGION

DATE	*MEETING/SEMINAR/WORKSHOP*	*SITE*	*REMARKS*
OCTOBER 2001			
15-17	IATA Global Navcom 2001 Conference and Exhibition	Amman	Invitation will circulated by IATA.

Notes:

1. Above meetings are subject to confirmation by ICAO MID Regional Office invitation letters.

2. States interested in hosting any of the above meetings are required to coordinate at least three (03) months in advance with the ICAO MID Regional Office.

3. Information on other meetings of interest to the MID Region, if known, will be circulated to MID States in advanced.

4. The above Table will be subject to periodic changes, in case of amendments.

REPORT ON AGENDA ITEM 7: ANY OTHER BUSINESS

7.1 The meeting was of the opinion that the GULF Co-operation Council (GCC) as a Sub-Regional entity should be invited to future MIDANPIRG meeting as an observer. The meeting was advised that formal request should be handed to the ICAORD Cairo for further consideration.

7.2 IATA presented an informa
Exhibition which is scheduled to take place in Amman, Jordan, 15-17 October 2001. IATA indicated that
ed the
meeting on the conditions of preparation of this important gathering as a result of close cooperation and co-ordination between IATA and ICAO. He stated that it was a good opportunity for the Middle East Region to be the venue for the next Global Navcom meeting in order to play an outstanding role in the future of CNS/ATM planning and implementation

7.3 The Secretariat announced the launch of the new URL ICAO MID Office website (http://www.cairo-icao.int) in addition to (http://www.icao.int/Mid), where reports, list of Conclusions/ Decisions, working, information and discussion papers and other communication of interest to future meetings will be provided.

Closing of the Meeting

7.4 The meeting ended by expressing its gratitude and appreciation to the Chairman, the Secretariat for their management towards the successful conduct of the meeting. The meeting was closed at 1530.

- END -