

FOURTH MEETING OF THE ALLPIRG/ADVISORY GROUP

(Montreal, 6 – 8 February 2001)

Agenda Item 2.1: Interregional coordination and harmonization mechanisms – Harmonization of air navigation systems

INTERFACE PROBLEMS AND RESOLUTION AS A RESULT OF THE IMPLEMENTATION OF SYSTEMS AND PROCEDURES

(Presented by the Secretariat)

SUMMARY

This paper describes how the interregional harmonization of air navigation systems impacts the MIDANPIRG Work Programme. The approach undertaken as an interim process is put forward for consideration by ALLPIRG.

REFERENCES

CNS/ATM Implementation Plan for the Middle East (First Edition – September 2000)
Global Air Navigation Plan for CNS/ATM Systems (Doc 9750)
MIDANPIRG/6 Report
MIDANPIRG Subsidiary Bodies Reports

1. INTRODUCTION

1.1 At the very earliest stage of the CNS/ATM systems planning process, the need to identify the interregional coordinating mechanism was recognized. The integration of different approaches into our harmonized framework seems to be an urgent request from all ICAO Regions, convened by the PIRGS to ALLPIRG.

1.2 The Middle East Region appears to be the smallest geographic area in size. This paper is an attempt to identify elements that support interregional coordination planning in the areas of timelines, common procedures, the alignment of goals, the dissemination of information and Memoranda of Understanding/operational Letters of Agreement between two or more States. The MID Region bridges Europe, Asia and Africa; the coordinating activities are increasingly among our paramount priorities in

planning and follow-up in many fields in relation with CNS/ATM and associated activities (CBAs , databases, etc.).

1.3 This aspect of our work programme is one of our major challenges for the next cycle (2001 – 2005), where most of the target dates committing the States in the Region will be agreed upon, taking into account interregional and/or global issues.

2. DISCUSSION

2.1 MID ATS route network

2.1.1 Out of a total of 89 ATS routes in the region, 51 have been fully implemented and 21 partially implemented. The MIDANPIRG regularly reviews the implementation of the routes and proposes appropriate action to achieve full implementation. However, it should be noted that there are a few sensitive airspaces in the region, such as over Iraq and Afghanistan.

2.1.2 A new interregional coordination body called the Europe-Middle East ATM Coordination Bureau (EMAC) is in the process of being established between the civil aviation authorities of European and Middle East States to rationalize the ATS route network in the Eastern Mediterranean area and harmonize the RVSM process as a priority. The existing South West Asia ATS Coordinating Group (SWACG) would address the harmonization of the route network between Eastern European States and the Middle East.

2.1.3 As a first step in the interregional coordination process, an IRCM was held in Bangkok in October 2000. It was noted that a revised ATS route structure between Asia and Europe through the Middle East has been proposed. The planning and development of these route structures would take advantage of existing and on-going CNS/ATM technologies in order to provide safe and efficient air traffic management with the least impact to environmental concerns. The development of these routes would require constant coordination amongst all concerned States/ATS providers and users, as well as between the MID and EUR Regions to achieve an effective operational result. A cost/benefit analysis would also be required to reflect the advantages of this project to the provider States. The next meeting of that kind will take place in Cairo in October 2001.

2.2 RVSM and other options for reducing congestion in the MID Region

2.2.1 Planning for the introduction of RNP routes in the MID Region as an option for reducing congestion has already commenced. The target date for introduction of RVSM in the MID Region has been agreed for 2003, on a date to be determined as the planning for implementation proceeds. The MIDANPIRG/6 Meeting agreed that improved radar surveillance, RNP 5 (applicable in March 2001) routes and RVSM were complementary measures, all of which would have application in different circumstances. The meeting formulated Conclusion 6/8, advising the States that the planning for measures to reduce congestion in the MID Region should be based on radar surveillance in areas of high traffic density where it is not yet currently available. The RNP routes and airspace should be introduced as soon as possible in those areas where this would contribute to reduction of congestion. The meeting also agreed that the plans for the introduction of RVSM should be harmonized with the plans for its introduction in neighbouring regions and, in particular, should take into account the plans for its introduction in the western part of the Asia/Pacific Regions.

2.2.2 The MIDANPIRG/6 Meeting noted that it had been necessary to undertake some re-organization of air routes, particularly in transition areas. Since the European RVSM programme had assumed that the MID Region would not be implementing RVSM until after the date for Europe, some of this air route re-organization could affect MID States. The programme 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.

2.2.3 The observer from EUROCONTROL also briefed the meeting on the height monitoring programme and its relation 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 minimum aircraft system performance specification (MASPS), 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.

2.2.4 EUROCONTROL had requested all States, including those in the MID Region, to make all efforts to support aircraft operators in their States to modify their fleets for RVSM and to obtain RVSM approvals, to encourage aircraft operators to submit their plans on RVSM equipage to the EUROCONTROL User Support cell, to ensure that the required Letters of Agreement with adjacent RVSM States are coordinated and completed in time for RVSM implementation and to 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.

RVSM implementation in the MID Region

2.2.5 The MIDANPIRG/6 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 advanced for an accurate estimate to be made. 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.

2.2.6 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 costs 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.

2.2.7 The meeting then agreed to establish a MID RVSM Task Force to 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 (1 000 ft) Vertical Separation Minimum between FL 290 and FL 410 Inclusive* (Doc 9574) and the requirements of users, to identify any areas within the MID Region where it may not be feasible to introduce RVSM in the initial implementation, to determine the extent to which a cost/benefit analysis is required prior to the implementation of RVSM, to coordinate with the bodies responsible for the implementation of RVSM in adjacent regions in order to harmonize implementation plans and to develop guidance material for RVSM operations in the MID Region, taking into account existing guidance material which has been developed by other regions.

RVSM coordination with ASIA/PAC

2.2.8 The Asia/Pacific RVSM TF/8 Meeting (Hong Kong, 28 August – 1 September 2000), was attended by officers from the MID Regional Office and one MID State (Saudi Arabia). The RVSM TF/9 Meeting (Bangkok, Thailand, 8 – 12 January 2001), was attended by DEPRD from the Regional Office and four MID States (Bahrain, Iran, Oman and UAE). Both meetings 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. A target date of 27 November 2003 for the introduction of RVSM in eight FIRs (mainly Bangladesh, India, west part of Malaysia, Pakistan and Sri Lanka) south of the Himalayas, was agreed in the RVSM TF/9 Meeting. Both meetings agreed 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. During RVSM TF/8, it was recognized that the ideal situation for the extension of RVSM further westward would be a coordinated introduction of RVSM in the FIRs of the western part of the Asia/Pacific Regions 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. The RVSM TF/9 Meeting examined the possibility of appropriate MID States participating in the planned data collections, and also participating in some of the future seminars and meetings of the task force with the aim of achieving a coordinated implementation of RVSM for all the airspace involved in the major traffic flow from Asia to Europe south of the Himalayas.

2.2.9 The participation in the planned Asia/Pacific data collection was considered by the first meeting of the 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 Regions, as it was unlikely that the MID Region would be able to complete all the planning and implementation requirements by 21 February 2002.

2.2.10 In connection with the above, the MID Region would invite Western Asian States adjacent to the MID Region (India and Pakistan) to attend the second meeting of the MID RVSM Seminar and Task Force, to be held in Dubai, United Arab Emirates, from 7 to 11 April 2001.

2.2.11 The Asia/Pacific Regions would invite all MID States to a RVSM seminar, to be held in Kuala Lumpur, Malaysia, from 25 to 27 April 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.

2.3 GNSS

2.3.1 The MIDANPIRG/6 Meeting noted that, although a number of States in other regions had now approved GNSS as a primary means of navigation, 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

2.3.2 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 and introduce any changes which may be needed in order to authorize the use of GNSS as a means of navigation within their airspace. 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

2.3.3 The development and implementation of procedures for airworthiness and operational approval of GNSS is a State responsibility. It was 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.

2.3.4 The MIDANPIRG/6 Meeting agreed that the approval of GNSS for en-route use, in particular, should be treated as a 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.

2.3.5 The MIDANPIRG/6 Meeting agreed that the regional target date for implementation of GNSS for en-route and non-precision approach should be 2002, and that this target date should be reviewed soon in order to confirm its feasibility and to determine an AIRAC date for implementation. Recognizing that a high priority on the implementation of GNSS as a supplemental means navigation system has been placed, all States which have not already done so were 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 Use of the Global Navigation Satellite System (GNSS)* — as a guide; and
- c) 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, with the intention of introducing GNSS as supplemental means as early as possible in the year 2002.

2.3.6 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 programme for the development of the requirements for GNSS beyond supplemental means to primary means, including consideration of the need for monitoring, a means of alerting, RAIM prediction programmes, WGS-84 implementation and institutional issues. This work programme would need to ensure that all the points were adequately addressed; its development has been assigned to the GNSS Task Force.

Interregional satellite test-bed (ISTB) for the MID Region

2.3.7 The MIDANPIRG and its GNSS Task Force agreed to start with the issues related to ISTB, in order to get sufficient expertise and assess what benefits the MID Region could gain from these trials. It was noted that, in the framework of the European Commission Policy, a formal offer was 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. The objective of the trials is to reach the near-Cat. 1 accuracy requirements by the EGNOS system in the MID Region. The demonstrations and trials are now conducted by Egypt and two other MID States which will be elected very soon (Bahrain, Saudi Arabia and UAE). Egypt will hold a meeting in mid-February for the first round of trials, and either Saudi or Bahrain will conduct further trials this year in order to complete the grid database.

2.4 RNP/RNAV

2.4.1 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 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 MID operators to whom approvals have been issued	26

2.4.2 It was noted 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 would be desirable to have ICAO guidance material. It was noted that the Review of the General Concept of Separation Panel (RGCSP) had commenced the development of this; however, it is 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. 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

2.4.3 The question of the priority routes for the initial introduction of RNP 5 were addressed. It was agreed at the MIDANPIRG/6 Meeting that the recommended approach would be a progressive introduction of RNP 5 on a route-by-route basis, and that it should be confined 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.

2.4.4 The routes which will be designated as RNP 5 for the Phase 1 implementation are shown at Appendix A and in the chart at Appendix B.

Establishment of a regional navigation error monitoring system

2.4.5 The Guidance Material on Implementation of RNP/RNAV in the Middle East Region requires the establishment of a system for monitoring navigation errors in airspace where RNP requirements are introduced.

2.4.6 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, MIDANPIRG/6 advised all States which have not yet developed procedures for issuing RNP 5 approvals to assign the development of these procedures a high priority.

2.5 WGS-84 implementation in the MID Region

2.5.1 The MIDANPIRG/6 Meeting adopted the use of the standard reporting format reflecting all the detailed information on WGS-84 implementation approved by the ANC. Following the MIDANPIRG/6 Meeting, a State letter was sent to all States in the region for providing the information in the standard reporting format. Ten States have responded so far and the information is given in Appendix C. It could be noted that the States in this region have made reasonable progress in implementing the WGS-84.

2.6 Communications

Transition to ATN

2.6.1 Based on the outcome of ATNP/3, a guidance material for the ground-to-ground element of the ATN transition was developed by the MIDANPIRG/6. As a useful tool, planning documents and technical documents are being developed in order to facilitate ATN implementation in the MID Region. An AFTN-based AIDC procedure will be implemented in the MID Region and will continue to be in operation until it is replaced by an ATN AIDC procedure.

2.6.2 Meanwhile, AMHS procedures will be introduced in a progressive manner. Since it was noted that there is some interest to introduce on-line data interchange (OLDI) in the region, MIDANPIRG/6 estimated the need to evaluate the situation and status of the OLDI protocol.

2.6.3 Coordination should be carried out between interregional centres in order to harmonize the procedures and protocols and thereby to ensure systems compatibility.

Frequency lists

2.6.4 One of the important aspects requiring interregional coordination is the protection of the aeronautical radio frequency spectrum from interference from adjacent regions. Actions are underway to harmonize the frequency lists published by the ASIA/PAC, AFI and EUR/NAT Offices and to expedite the publication of frequency lists by the MID Office.

Introduction of the VSAT system

2.6.5 To prevent a lack of links between Kabul centre and the adjacent centres, IATA provided VSAT equipment, allowing Kabul centre to establish voice and data communications with Karachi centre in the first phase. The project scope provides the capability for implementing all ICAO regional planning requirements for air traffic control in Kabul FIR, including AFTN and ATS direct speech (ATS/DS) circuits to Lahore and Karachi, and ATS/DS circuits to Tehran, Dushanbe, Tashkent and Ashgabad.

2.6.6 Since this solution seemed attractive, the MIDANPIRG/6 encouraged States and the MID Office to further study the cost-effectiveness and technical feasibility of the use of VSAT technology in order to improve the quality of aeronautical communications in the MID Region.

AFTN circuits

2.6.7 The upgrading of some interregional circuits and the implementation of an AFTN routing directory were accomplished, but they are operating without coordinated protocols due to an interface problem between AFTN and CIDIN centres. This interface problem is expected to be resolved when AFTN/AMHS and CIDIN/AMHS are implemented following coordination with adjacent regions.

3. CONCLUSION

3.1 The interfacing between regions, is mainly based on the coordinating needs between States which have a common goal to fulfill. The main tools for the inter-State coordination should be developed in a format which helps the States concerned to hold their discussions and perform their actions without any misinterpretation or delay vis-à-vis their respective regional plans.

3.2 As a consequence, the more detailed and accurate the guidelines directed towards implementation are tailored by ICAO, the better the commitment and the outcome of the coordinating process will be between the States involved, wherever they are located, either within or between ICAO Regions.

3.3 The interregional dialogue should address the common issues only when PIRGs have recognized their need, and should call for States to take the operational or procedural measures. This objective will lead to a number of inter-PIRG consultations without creating a new intermediate structure between the regional and the global planning as it works today.

4. ACTION BY ALLPIRG

4.1 The meeting is invited to:

- a) note the need for coordination at the interface between regions; and
- b) note the work being carried out between the MID and other regions.

APPENDIX A

PRIORITY ROUTES FOR THE INITIAL INTRODUCTION OF RNP 5

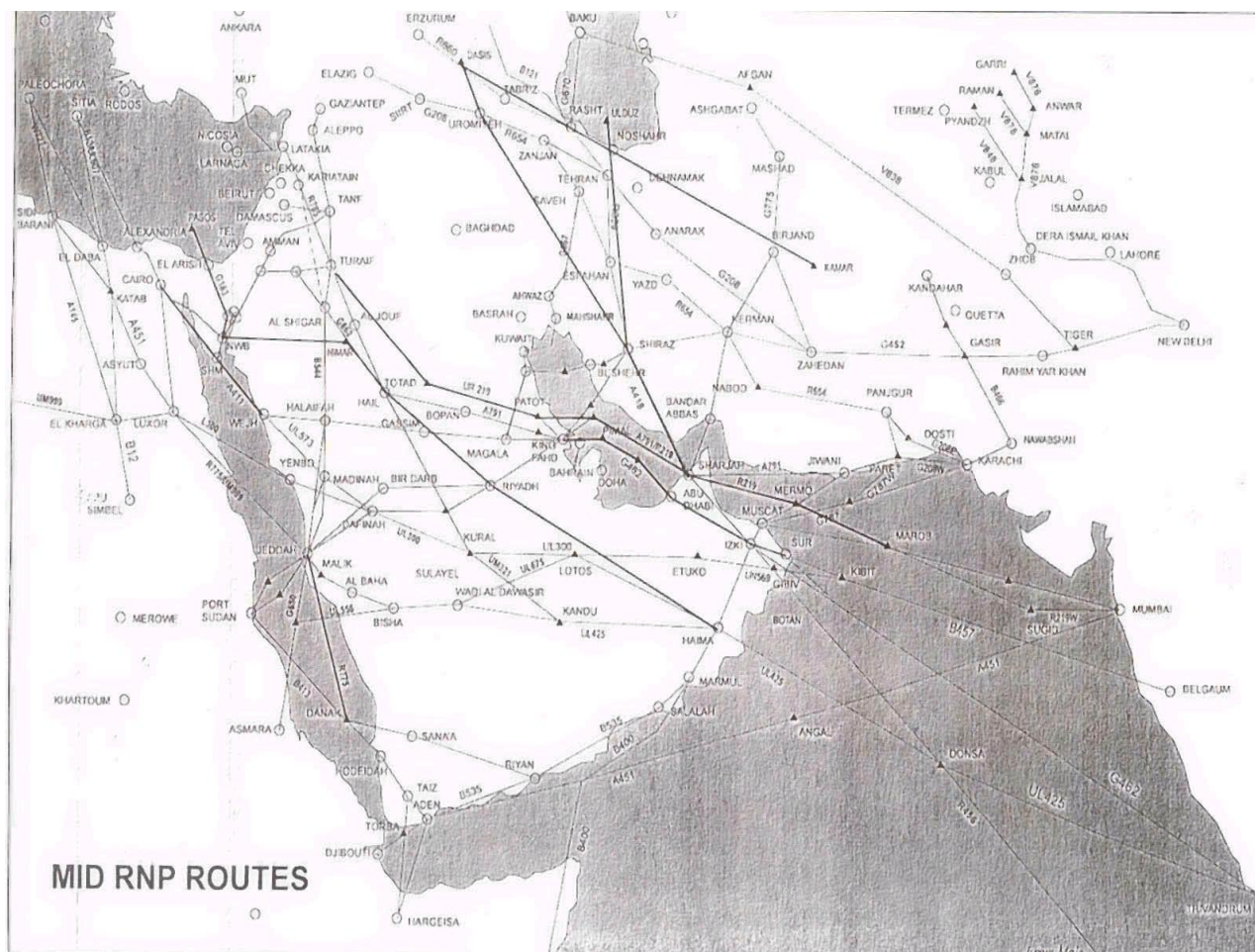
1. JEDDAH R775 DANAK
2. CAIRO A411 SHM WEJH
3. PASOS G183 EL ARISH TABA NUWEIBA DCT NIMAR G662 HAIL G662
RIYADH DCT HAIMA
4. TURAIIF UR219/R219 MAROB
5. AL SHIGAR G662 HAIL A791 KING FAHAHD G462 IZKI G462 SUR
6. SHARJAH DCT SHIRAZ DCT UROMIYEH DCT DASIS
7. SHIRAZ DCT ULDUZ
8. KAMAR DCT RASHT DCT DASIS

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 R219.

APPENDIX B

ROUTES THAT WILL BE DESIGNATED AS RNP 5
FOR PHASE 1 IMPLEMENTATION



APPENDIX C

WGS-84 IMPLEMENTATION IN THE MID REGION

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	
BAHRAIN (OBBI) Bahrain Intl.	30 12	PA1 NPA	X	X	X	X X	X X	X	X	TBA	X		
CYPRUS (LCLK) Larnaka Intl. (LCPH) Pafos Intl. .	04 22 11 29	NPA PA1 NPA PA1	X	X	X X	X X X X	X X X X	X X	NA	NA	X		
EGYPT (HEBL) Abu-Simbel (HEAX) Alexandria (HESN) Aswan (HECC) Cairo (HELX) Luxor (HEMM) Mersa- Matruh (HEPS) Port Said (HESH)Sharm-El-Sheikh (HESC) St. Catherine	15 33 18 36 04 22 17 35 05 23 16 34 02 20 15 33 06 24 10 28 04 22 17 35	NPA NPA NPA NPA PAI PAI PAI PAI NPA NPA PAI PAI NINST NINST NPA NPA PAI PAI NINST NINST	X	X	X X								

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	
ISRAEL													
Information was received on telephone stating that the WGS-84 implementation has been planned for 2001 with a view to complete the work by the end of the year.													
JORDAN (OJAI) Amman/QAIA	08L 26R	PAI PAI	X	X	X	X X	X X	X			X		
	08R 26L	NINST NINST				X X	X X						
(OJAM) Amman/ Marka	24 06	PAI NINST			X	X X	X X	X					
(OJAQ) Aqaba	01 19	PAI NINST			X	X X	X X	X					
KUWAIT (OKBK) Kuwait Intl.	33L 15R	PA2 PA2	X	X	X	X X	X X	X	X		X		
	33R 15L	PA2 PA2				X X	X X						
LEBANON (OLBA) Beirut Intl.	18 36	NPA NINST	X	X	X	X X	X X	X	X	X	X	Category I Not used for landing	
	21 03	NINST NPA				X X	X X					Category I	
OMAN (OOMS) Muscat/Seeb	26 08	PAI PAI	X	X	X	X X	X X	X	X	X	X		
(OOSA) Salalah	07 25	PAI PAI			X	X X	X X	X	X				
SYRIA (OSAP) Aleppo Intl.	09 27	NINST NPA	Details not available. However, Syria has informed that a special team assigned with the task, has converted local co-ordinates into WGS-84 within Syrian FIR.										
(OSLK) Bassel Al-Assad	17 35	NPA NINST											
(OSDI) Damascus	05L 23L	NPA PAI											

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
SUDAN			X	X							Jan 01	
(HSSS) Khartoum	18 36	PA NPA			X	X X	X X	X				
(HSDN) Dongola	17 35	NPA NPA			X	X X	X X	X				
(HSGN) Geneina	04 22	NINST NINST			X	X X	X X	X				
(Hska) Kassala	02 20	NPA NPA			X	X X	X X	X				
(HSPN) Port Sudan	17 35	NPA PAI			X	X X	X X	X				
(HSSJ) Juba	13 31	PAI NINST			X	X X	X X	X				