INTERNATIONAL CIVIL AVIATION ORGANIZATION

REPORT OF THE THIRD TASK FORCE MEETING ON A REVISED ATS ROUTE STRUCTURE – ASIA TO MIDDLE EAST/EUROPE, SOUTH-OF-THE-HIMALAYAS (EMARSSH TF/3)

CAIRO, EGYPT, 7 – 11 MAY 2001

The views expressed in this Report should be taken as those of the Task Force and not of the Organization.

Adopted by the Task Force
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PART I – HISTORY OF THE MEETING

1. Introduction

1.1 The Third Task Force Meeting on a Revised ATS Route Structure – Asia to Middle East/Europe, South-of-the-Himalayas (EMARSSH TF/3) was held at the ICAO Middle East Office, Cairo, Egypt from 7 – 11 May 2001.

2. Attendance

2.1 The meeting was attended by 24 participants from 10 States and 2 International Organizations. A list of participants is at **Appendix A** to this report.

3. Opening of the Meeting

3.1 The meeting was opened by Mr. A. Zerhouni, Regional Director, ICAO Middle East Office who welcomed all participants to Cairo. He emphasized the importance of the EMARSSH project to both ATS users and providers. He advised the meeting that this project was unique in that it required the coordinated efforts of three ICAO regions, namely Asia/Pacific, Europe and the Middle East. Endorsement had been obtained from various forums including APANPIRG and the Regional Directors of the three ICAO regions during their Inter-regional Coordination meeting held in Bangkok, Thailand in October 2000. Mr. Zerhouni emphasized that the most effective way to achieve global harmonization of the CNS/ATM systems was through inter-regional co-operation extending across regional boundaries. He also noted the work already achieved by EMARSSH TF/1 and TF/2 and wished the meeting fruitful deliberations in continuing the work onwards from the Pacific Rim to the Middle East and Europe.

4. Officers and Secretariat

4.1 Mr. Mohamed Khonji, Deputy Regional Director, ICAO Middle East Office acted as Chairman of the meeting. He was assisted by Mr. John E. Richardson, ICAO Asia/Pacific Office Regional Officer, ATM and Core Team leader of EMARSSH project.

4.2 Mr. D.Ramdoyal, ICAO Middle East Office Regional Officer, ATM, acted as the Secretary of the meeting.

4.3 Mr. Khonji gave a brief historical background on the inception of EMARSSH project and introduced the members of the Core Team who will lead the project through to implementation. They comprised of Mr. Ron Rigney, Airservices Australia, Mr. Joseph Cheuk, Civil Aviation Department of Hong Kong, China, Mr. P.C. Goel, Airports Authority of India, Mr. Mervyn Fernando, Civil Aviation Authority of Singapore and Mr. David Behrens, IATA, Asia/Pacific Office. Mr. Richardson advised the meeting that considerable success and co-operation had already been achieved during EMARSSH TF/1 and TF/2 and welcomed the opportunity to continue this commitment by States and the aviation industry into and through the Middle East Region.

4.4 Mr. Hamad Mohamed Alaufi from Saudi Arabia and Mr. Davood Khodaverdi from I. R. of Iran were elected as new members of the Core Team representing the Middle East Region.

4.5 Mr. A. Zerhouni, the Regional Director, fully participated in the discussions and gave fruitful contributions/orientations to the meeting. Mr. Mamadou Traore, ICAO Middle East Office Regional Officer, CNS also attended and assisted the meeting where appropriate.

5. **Documentation and Working Language**

5.1 All discussions and documentation were in English. A total of 12 Working Papers and 4 Information Papers were considered by the meeting. A list of the Working and Information Papers is at **Appendix B.**

PART II - REPORT ON AGENDA ITEMS

Agenda Item 1: Adoption of the Agenda

1.1 The meeting reviewed the provisional agenda presented by the Secretariat and adopted it as the agenda for the meeting. The Agenda is at **Appendix C.**

Agenda Item 2: Principles for the design of ATS routes for EMARSSH

2.1 The meeting was given a presentation on the background and creation of the EMARSSH Project. Taking into account navigation capabilities of modern aircraft and new CNS/ATM technologies, it was considered appropriate that a revised route structure between Asia, Middle East and Europe be put in place. It was noted that this project has been endorsed by States and stakeholders concerned and is a model of inter-regional cooperation and co-ordination in line with the strategic objectives of the ICAO Global Air Navigation Plan for CNS/ATM Systems . The revised route structure will undoubtedly enhance safety and is a step forward in achieving the implementation of a seamless, global air traffic management system that will enable operators to meet their planned times of departure and arrival and adhere to their preferred flight profiles with minimum constraints. In developing this route structure, the needs of domestic and regional operations would also need to be considered.

2.2 The meeting noted that the concept of EMARSSH had already been discussed and endorsed by various Asia/Pacific regional meetings. The end result would be presented to the respective regional planning groups for endorsement and eventual inclusion in the air navigation plans. This procedure will also be followed in the Middle East Region. It was also noted that an ICAO Inter-Regional Co-ordination Group Meeting comprising Regional Directors from Paris, Cairo and Bangkok assisted by the Chief of the Regional Affairs Office in ICAO Headquarters, further endorsed the EMARSSH Project. As a result of these meetings, EMARSSH Principles were developed and reviewed and are produced at **Appendix D** to this report.

2.3 Utilizing Area Navigation (RNAV), the introduction of Required Navigation Performance (RNP), radar coverage and the planned introduction of Reduced Vertical Separation Minimum (RVSM) in the Western Asia and Middle East regions, it was appropriate to review the ATS route structure, especially with regard to the medium and long-haul inter-regional operations.

2.4 The meeting noted that States as well as the aviation industry were investing in modern ground and airborne equipment and training of staff in the use of this new technology. It was agreed to exploit the opportunity to maximise the use of airspace and give greater flexibility to aircraft operations.

2.5 When looking at any changes to a route structure, it was necessary to consider the whole flight from departure to destination. The meeting was advised that as the project moved through further Task Force meetings, States from adjoining regions should also participate. It will be necessary to involve these States and their respective ICAO regional offices in any changes to the route structure within the framework of the area identified by this project. Other matters concerning route design will be considered within the framework already established by regional planning bodies.

2.6 It was noted that working guidelines for the construction of ATS routes were developed by APANPIRG/5 some years ago. These guidelines were considered to be helpful tools when considering changes to the route structure under consideration. The guidelines are described in **Appendix E** to this report. The meeting noted that RNP 5 is being progressively introduced in the continental airspace of the Middle East Region, within the coverage of navigational aids, whereas the EMARSSH route network which has been developed in the oceanic area of the ASIA Region is based on RNP 10 values. It was

acknowledged that harmonisation will be necessary with the Middle East EMARSSH route network which is not expected to be a difficulty. The meeting was also of the view that some areas in the Middle East Region will initially require the introduction of RNP 10 over oceanic and remote continental airspace where ground based navigational aids would not support RNP 5.

Agenda Item 3: Identify the area to be considered by EMARSSH TF/3

3.1 The meeting was advised that the purpose of the EMARSSH project is to devise ATS routes which will focus on end-to-end routing (city pairs) for long-haul and medium-haul flights from Asia to the Middle East and Europe.

3.2 Due to the distance between some of these city pairs, it would be necessary to look at the overall route structure in segments of airspace, both laterally and longitudinally. It was noted that EMARSSH TF/1 and TF/2 dealt with the area from Australia to India. It was suggested to the meeting that the segment from Pakistan westwards through the Middle East region to the EUR boundary would be a suitable area for this meeting to consider. The meeting was also invited to include lateral dimensions to this area during discussions

Area Reviewed

3.3 The meeting reviewed the area to be considered and decided that all or part of the following FIRs should form the boundary of the area in which EMARSSH routes would be arranged:

Northern border: Tehran FIR
Eastern border: Karachi / Lahore and Kabul FIRs
Southern border: Muscat, Sanaa FIRs
Western border: Cairo, Damascus FIRs

3.4 ATS routes in Pakistan were not reviewed as Pakistan was not represented. However, the meeting noted the proposed route structure that was addressed in an IATA Joint Route Development Group (JRDG) by Afghanistan, Iran, Pakistan and IATA. This was taken into account when developing the proposed route structure.

EMARSSH Route Structure

3.5 In developing the EMARSSH route structure within the MID region the meeting considered the routes proposed by IATA. It was noticed that the proposal contained user requirement for additional routes within the MID Region. The meeting was of the opinion that the EMARSSH route structure should not address intra-MID requirements as these are addressed within the framework of existing regional planning mechanism. EMARSSH routes should instead focus on Asia/Europe long- haul traffic flows and also some long- hauls requirements from MID Region to either Asia or Europe which have so far not been addressed. Therefore, it was agreed that these intra-MID requirements would be addressed by the appropriate MIDANPIRG subsidiary bodies i.e. RNP/RNAV TF/5 and ATS/AIS/SAR/SG/5 meeting.

3.6 The meeting noted that the second EMARSSH Task Force meeting had developed a route network up to the limit of the MID Region, and that there were some inconsistencies in the extension of the proposed routes into the MID Region. Some segments had to be reviewed and harmonized with the existing route structure with a view to take into account of the MID region requirements.

3.7 The meeting also noted that some States had indicated that the long- haul EMARSSH route network should not affect the existing route structure within their FIRs and the routes should instead

be harmonized with the actual setup, or otherwise, be routed well outside the main traffic flow areas.

3.8 The concern of some States regarding routes that had been established but were found later severely under-utilised was highlighted.

3.9 The meeting recognized the need for identifying the EMARSSH requirements in a standardized manner consistent with existing methodologies and segments, which cannot be implemented at this stage, would either be reviewed or implemented at variance with the proposals.

3.10 The EMARSSH provisional route networks within the Middle East Region is at **Appendix F** to the Report. A chart showing these routes is at **Appendix G**.

Agenda Item 4: Factors to take into account in the route structure design

4.1 The meeting discussed the following factors to be taken into account in the development of the revised route structure.

Safety assessment and monitoring program

4.2. In order to implement the EMARSSH route structure based on RNP, a Safety Assessment is required, together with the establishment of an Aircraft Navigational Error monitoring program. The meeting noted the decision of the MID region to introduce RNP5 in some parts of the region where it can be supported by the ground based navigational aids and RNP10 in other parts of the region. The MID region has appointed UAE as the Central Monitoring Agency (CMA). Letters of Agreement (LOA) for the Monitoring of Aircraft Navigation Errors within the airspace where RNP5 is being introduced have been drawn between implementing States.

4.3 The methodology and the format relating to data required has been determined in co-ordination with the CMA.

Required Navigation Performance (RNP) – Airworthiness and Operational Approval

4.4 The meeting noted that the Manual on RNP (Doc 9613) was available for States to assist in the implementation of RNP.

RNP Routes/Airspace

4.5 *Separation Criteria*

4.5.1 The meeting noted that 50NM Lateral Separation is achievable in RNP10 airspace without any further enhancements to communication or surveillance. However, for application of 50NM Longitudinal Separation, Direct Controller Pilot Communication (DCPC) is required. That can be satisfied by voice or CPDLC. If DCPC is not available, then the appropriate longitudinal separation standard should be applied. This, however, would not prohibit the implementation of RNP10 with 50NM lateral separation. To achieve the full benefit of RNP10, States are encouraged to consider the provision of DCPC in their future modernisation plans.

4.6 *Exclusive/Non-Exclusive RNP Airspace*

4.6.1 The meeting considered the issue of whether RNP Designated Airspace should be Exclusive or Non-Exclusive. Where airspace cannot be designated as exclusive, the States may consider

introduction of a vertical limit to define exclusive and non-exclusive airspace.

Publication of Aeronautical Information Circular (AIC) and other documentation

4.7 As decided in the EMARSSH TF/2 meeting, a model AIC format was introduced to the meeting. However, it was noted that some of the MID region states introducing RNP5 have adopted an AIC format for issuance of AIC pertaining to the introduction of RNP5 and RNP10 Routes/Airspace in parts of the MID region.

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4.8 The meeting noted the requirement for documentation that would need to be in place as per the Implementation Work Program. This documentation includes:

a) AIC
b) Operational Letters of Agreement
c) AIP Supplement
d) Amendment of DOC 7030
e) Charts (including SIDs and STARs)
f) Training syllabus
g) ATC Procedures

Contingency Procedures

4.9 The meeting considered that appropriate Contingency Procedures should be published in relevant documentation, in addition to that published in ICAO DOC 7030.

4.10 Contingency procedures which should be considered, include:

a) Weather Deviations
b) Navigational errors

Training considerations

4.11 The meeting considered a list of ATC training considerations and Training Course Guidelines developed by Malaysia for the implementation of the South China Sea Revised ATS Route Structure scheduled for 1 November 2001. These are shown at **Appendices J and K** to this Report.

Other considerations

4.12 The meeting deliberated upon various other issues, related to the implementation of the revised Route Structure and introduction of RNP criteria. Some of the issues are listed below.

4.13 *Military considerations*

4.13.1 Within the area of consideration, there are many military areas, which may affect EMARSSH implementation.

4.13.2 The meeting considered the benefits that could be achieved through the application of reduced lateral separation standards associated with ATS Routes within designated RNP airspace and adjacent military airspace.

4.13.3 The meeting noted the increasing use of CNS/ATM systems by civil aircraft which enables aircraft to fly their optimum desired routes at the required time, speed and height, with no delay or

deviation, and its relation with the concept of EMARSSH.

4.13.4 Military Prohibited and Restricted Areas, often declared operational 24 hours per day (H24), are not always used during notified hours, causing unnecessary delays to civilian aircraft. The Joint-use (sharing) of military airspace was impressed upon for the operational efficiency of modern aircraft.

4.13.5 The requirement for civil/military Letters of Agreement (LOA) was further re-iterated in accordance with the ICAO *Manual Concerning Interception of Civil Aircraft (Doc 9433).*

4.13.6 When considering military participation in regional meetings, the meeting was reminded of MIRANPIRG/4 meeting Conclusion 4/43 (Inclusion of military representatives in delegations to regional meetings - That States should encourage to include, where necessary, representatives from their military authorities in all delegations to Regional meetings, especially where there are civil military co-ordination implications in the topic to be discussed by the meeting).

4.13.7 The meeting agreed to the following:

a) In the interest of sharing the limited airspace resource, civil and military authorities in the MID region should establish a coordinated effort amongst themselves and the airspace users to define the information and capabilities necessary to improve civil use of military airspace when not being utilized as designated. Joint-use (sharing) of the military airspace areas and established scheduling procedures will allow the military to continue its training and testing while granting the users greater strategic planning opportunities.

b) In order for civil and military authorities to flexibly use the military airspace which could be integrated into the EMARSSH routes, there is a need to develop and implement a real-time military airspace notification system between the ACCs and the military. Presently, good co-ordination and communication between the civil and military authorities can allow for real-time use of the military airspace for the users. Future systems and automation will enhance the information sharing providing for greater real-time use. The real-time notification system is key in allowing the ACCs to make real-time tactical decisions, thus providing the users the opportunity to reduce cost, mileage and time.

c) The requirement for establishment of joint-use (sharing) of military airspace areas to notify the commercial users of the availability of the military airspace should be considered by States that have not done so.

d) That States in the Middle East region should brief and co-ordinate with their military authorities the requirements of EMARSSH as appropriate.

4.14 *RVSM*

4.14.1 The meeting also considered that the implementation of RVSM will further enhance the airspace capacity available under the EMARSSH Route Structure.

4.15 The Meeting discussed the following factors to be taken into account in the development of the revised route structure.

RNP types and transition issues

4.16 *RNP5*

4.16.1 Aircraft with RNP5 capability must meet a cross-track keeping accuracy no greater than +/- 5 NM for 95% of the flight time in RNP5 airspace. This value includes signal source error, airborne receiver error, display system error, and flight technical error. This navigation performance assumes the necessary coverage provided by satellite or ground based navigation aids is available for the intended route to be flown.

4.16.2 RNP5 is designed for use in high density continental airspace and was originally introduced into European airspace to take account of existing aircraft equipage and current navigation infrastructure.

4.16.3 RNP5 requires that aircraft are equipped with one or more approved and installed RNAV systems, comprising one or more sensors, RNAV computer, control display unit, and navigation displays(s) (e.g., HSI CDI), provided the system is monitored by the flight crew and that in the event of a system failure, the aircraft retains the capability to navigate relative to ground based navigation aids.

4.16.4 The RNP type for implementation on ATS routes within the MID Region is;

a) RNP5 for all route segments where the navigational aids will support this; and

b) RNP10 for other route segments

4.16.5 The navigation performance standard assumes that the necessary coverage provided by satellite or ground based navigation aids is available for the intended route to be flown.

4.16.6 Aircraft conducting navigation within RNP5 designated airspace, retain the capability to resume navigation relative to ground based navigation aids, in the event of an onboard RNAV system failure.

4.17 *RNP 10*

4.17.1 Aircraft with RNP10 capability must meet a cross-track keeping accuracy and along-track positioning accuracy no greater than +/- 10 NM for 95% of the flight time in RNP10 airspace. This includes positioning error, flight technical error (FTE), path definition error and display error.

4.17.2 RNP10 is designed for use by aircraft conducting navigation within Oceanic and Remote areas and supports reduced lateral and longitudinal separation minima of 50 NM.

4.17.3 RNP10 requires that aircraft operating in Oceanic and Remote areas be equipped with at least two independent and serviceable Long Range Navigation Systems (LRNSs) comprising INS, IRS/FMS or GPS, of integrity such that the navigation systems do not provide misleading information with an unacceptable probability.

4.18 *Distinctions between RNP5 AND RNP10*

4.18.1 There are significant differences between RNP5 and RNP10. RNP5 approval does not automatically qualify an aircraft for RNP10 operations, or vice versa.

Flight planning for operations in both RNP5 and RNP10 designated airspace

4.19 ICAO Doc 4444 appendix 2 (Item 10 Note 5) states:

> *"Inclusion of letter R indicates that an aircraft meets the RNP type prescribed for the route segment(s), route(s) and/or area concerned"*.

Transition between RNP10 and RNP5 airspace

4.20 Under EMARSSH, RNP10 air routes/airspace may have to interface with RNP5 designated routes/airspace.

4.21 RNP5 is based upon ground-based navigational aids and related aircraft equipage. It is essential that the transition point between RNP10 and RNP5 airspace occur within the rated coverage of the referenced ground-based navigational aids.

Annotation of RNP requirements on charts

4.22 In consideration of the recommendations from the AIS/MAP section of ICAO Headquarters, and MIDANPIRG/6, Conclusion 6/21, the meeting noted 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 the states:

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.

Dynamic transition from old to new route structure

4.23 The experience of other regions/states who implement various RNP types prior to 28 November 2002, should be used as guidance for transition to EMARSSH route structure. Other examples where similar transition planning has been undertaken, include the South China Sea restructure, and Y2K. Industry/airline advice and guidance should also be sought.

EMARSSH AIP Supplement - Model

4.24 The Meeting recognized the need for a standardised notification to Industry and ATS Providers, of the changes associated with the implementation of the EMARSSH Route Structure.

4.25 The EMARSSH Core Team undertook an action item to produce a Draft AIP SUPP model for presentation to EMARSSH TF/4.

Agenda Item 5: Develop a coordinated action plan for the implementation of actions agreed by

the meeting

5.1 The Meeting discussed the implementation plan of actions required for the development of the EMARSSH Route Structure and the introduction of RNP5 and RNP10 routes/airspace. The Meeting agreed that separate Task Lists and Schedules should be prepared for both the Asia/Pacific Region, and the Middle East Region. These are attached at **Appendix H** (i and ii respectively).

5.2 The meeting was advised that there were three traffic flows to be considered within the EMARSSH project. These traffic flows are between Asia and Europe, Asia and the Middle East Gulf States and the Middle East and Europe. The meeting noted that implementation is planned for 28 November 2002. However States may consider implementing EMARSSH Routes on a coordinated Sub-regional basis at an earlier date.

Agenda Item 6: Other Business

6.1 The meeting noted that ADS/CPDLC was being introduced into the Middle East Region. IATA requested that standardised procedures be followed for the trials, demonstration and data collection of ADS/CPDLC and supplied the meeting with suggested procedures. These are found at **Appendix I**.

Agenda Item 7: Date and Venue of the next Meeting

7.1 The meeting was advised that a date and venue for EMARSSH TF/4 had not as yet been finalised but will be decided and advised shortly.

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LIST OF WORKING AND INFORMATION PAPERS

WP/IP	AGENDA ITEM	TITLE	Presented by
WP1	1- Adoption of the Agenda	Provisional Agenda	Secretariat
WP2	2- Principles for the design of ATS routes for EMARSSH	EMARSSH Background & Principles developed	Secretariat
WP3	3- Identify the area to be considered by EMARSSH TF/3	Area under Consideration for the Implementation of the EMARSSH Route Structure	Secretariat
WP4	4- Factors to take into account in the Route Structure Design	RNP10 AIC Template	Secretariat
WP5	4- Factors to take into account in the Route Structure Design	Design of the EMARSSH Route Structure -Considerations	Secretariat
WP6	4- Factors to take into account in the Route Structure Design	Design of the EMARSSH Route Structure – CNS/ATM	Secretariat
WP7	5- Develop an Action Plan for Implementation of the Revised Route Structure	Implementation Strategy	Secretariat
WP8	4- Factors to take into account in the Route Structure Design	Middle East Civil/Military Co-ordination	Secretariat
WP9	3- Identify the area to be considered by EMARSSH TF/3	Middle East ATS Route Structure Proposal	IATA
WP10	4- Factors to take into account in the Route Structure Design	Air Traffic Services based on ADS/CPDLC Facilities	Iran
WP11	4- Factors to take into account in the Route Structure Design	The Latest Development in the Air Navigation field in the Iran, Islamic Republic of CAO	Iran
WP12	4- Factors to take into account in the Route Structure Design	Training Considerations	Secretariat
IP1	-	List of WPs/IPs	Secretariat
IP2	-	Tentative Meeting Schedule	Secretariat
IP3	-	Information Bulletin	Secretariat
IP4	2- Principles for the design of ATS routes for EMARSSH	EMARSSH TF/2 Report	Secretariat

AGENDA

Agenda Item 1:	Adoption of the Agenda
Agenda Item 2:	Principles for the design of ATS routes for EMARSSH
Agenda Item 3:	Identify the area to be considered by EMARSSH TF/3
Agenda Item 4:	Factors to take into account in the route structure design
Agenda Item 5:	Develop a co-ordinated action plan for the implementation of actions agreed by the meeting
Agenda Item 6:	Other Business
Agenda Item 7:	Date and Venue of the next meeting

PRINCIPLES TO BE USED IN THE DEVELOPMENT OF THE ROUTE NETWORK

1. That, using the advantages of existing aircraft capabilities and new CNS/ATM technology and procedures, a revised ATS trunk route structure between Asia and Europe/Middle East will be developed in order to provide safe and efficient air traffic management with the least impact to environmental concerns;

2. That, these ATS trunk routes be developed primarily for international long-haul and medium-haul flights, however they may also be used where necessary for other regional and domestic operations;

3. That, as much as possible planning of ATS trunk routes will be on the basis that each route is laterally separated from each other;

4. That, the development of these route structures will be fully co-ordinated amongst the involved Asia/Pacific ATS Providers and airlines. Also due to the length of these trunk routes, harmonisation is required with both MID and EUR Regions; and,

5. That co-operation is required between all concerned states and the aviation industry, to ensure an efficient flow of international aircraft operations between Asia, Europe and the Middle East.

GUIDELINES FOR THE DEVELOPMENT OF ATS ROUTES

1. ATS routes will satisfy appropriate ICAO SARPS;

2. Where possible, routes should be established to increase efficiency, reduce complexity and provide additional benefits to users;

3. Separation assurance principles should apply;

   3.1 Routes should be established with sufficient separation to operate independently;

   3.2 Where possible, routes in a radar environment should be procedurally (laterally) separated; and

   3.3 Segregated tracks should be established on medium/high density routes and determined by set criteria;

4. Where required, routes should be constructed to support terminal area management procedures, e.g. SIDS/SRDS/STARS and flow management techniques, as applicable;

5. Holding patterns should be laterally separated from other tracks and tolerances captured within a single sector;

6. A maximum of two routes containing high density should be blended at a single point. Inbound tracks should be blended at <90 degrees. Up to three low density traffic routes may be blended at a single point;

7. Multiple crossing points involving major traffic flows should be avoided;

8. Enroute crossings should be minimized. Where crossings are inevitable they should where possible, be established for cruise configuration. Such crossings should occur, where possible, within radar coverage;

9. Airspace sectorization should take account of the route structure and workload considerations. If necessary, airspace should be re-sectorized to accommodate changes to the air route configuration;

10. Routes should be constructed so as to reflect the optimum navigational capabilities of the principal users (e.g. RNAV or conventional);

11. The prime determinant should not be the minimum number of track miles. A small increase in track miles may optimise traffic flows, avoid unpredicted delays or avoid holding requirements;

12. Due allowance should be given to existing and future Flight Data Processing (FDP)/Radar Data Processing (RDP) capability (i.e. notification of messages for auto hand-off) etc);

13. A periodic safety audit and review process of routes should be conducted to test traffic demand against capacity criteria, and the guidelines. This should ideally be done in parallel with an annual sectorization review; and

14. Routes that can no longer be justified should be deleted.

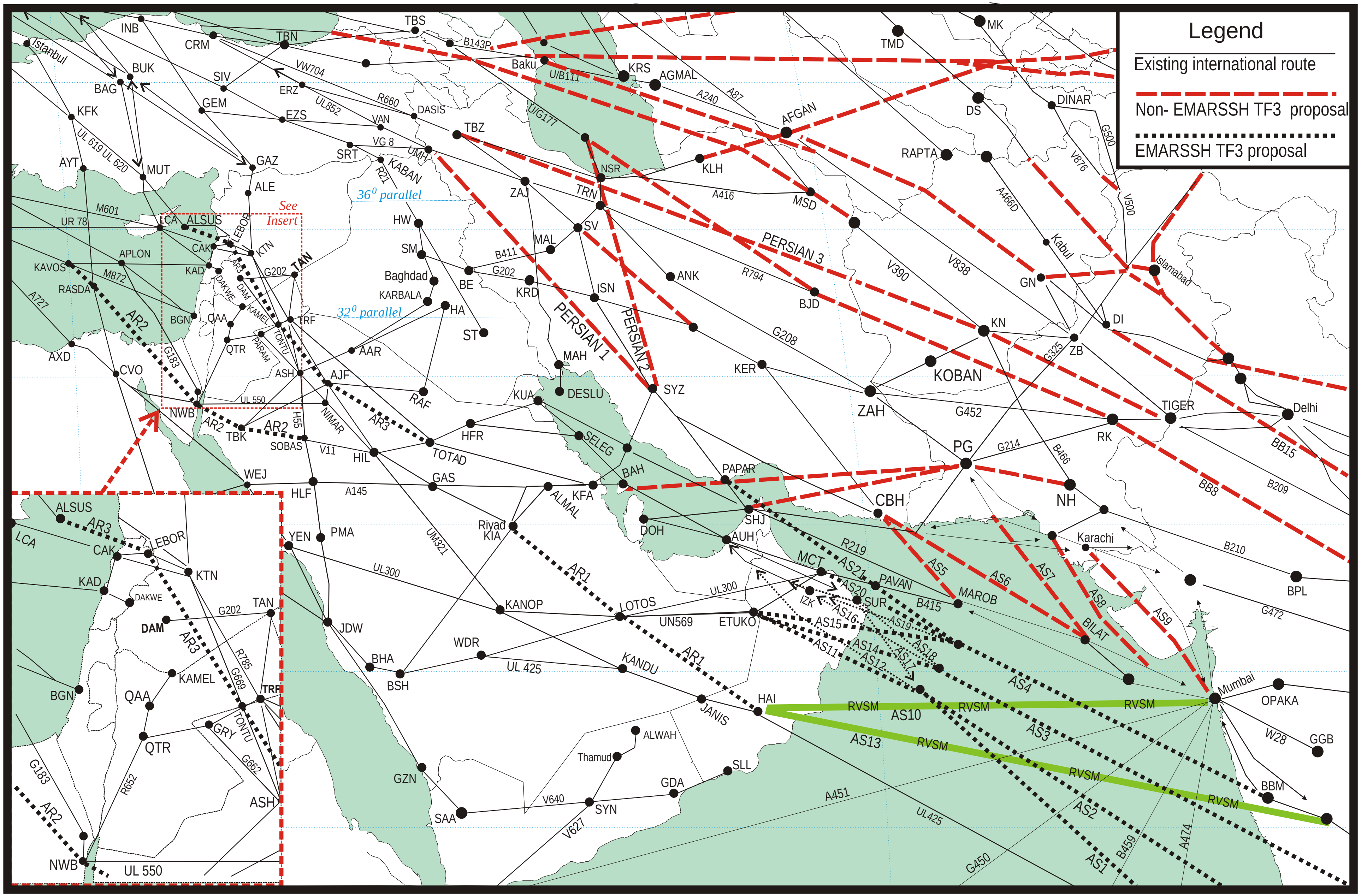
S/No	EMARSSH ROUTES	DESCRIPTION	REMARKS
1	AS1	TVM – 2020N 06038E	Agreed to at EMARSSH TF/2, however this route was not economically feasible to airlines and Oman indicated that it would violate sensitive airspace. Therefore the meeting adopted the IATA proposal to converge AS1 and AS2 at the Muscat FIR boundary.
2	AS2	CLC – 2020N 06038E	Agreed to at EMARSSH TF/2 and adopted by EMARSSH TF/3.
3	AS3	BBG – 2100N 06126E	Agreed to at EMARSSH TF/2 and adopted by EMARSSH TF/3.
4	AS4	BBM – 2140N 06214E	Agreed to at EMARSSH TF/2 and adopted by EMARSSH TF/3.
5	AS5	MAROB – CBH	Agreed to at EMARSSH TF/2
6	AS6	BILAT – CBH	Agreed to at EMARSSH TF/2
7	AS7	BILAT – PG	Agreed to at EMARSSH TF/2; Single direction westbound.
8	AS8	1950N 07100E – 2210N 06830E – SAPNA	Agreed to at EMARSSH TF/2
9	AS9	MUMBAI – XXN YYYE – KARACHI	Agreed to at EMARSSH TF/2
10	AS10	HAI – MUMBAI	To be considered in connection with the implementation of RVSM and in consultation between India and Oman. IATA to provide projected numbers of flights that would use this route.

S/No	EMARSSH ROUTES	DESCRIPTION	REMARKS
11	AS11	2020N 06038E - ETUKO	
12	AS12	2020N 06038E – Abeam IZK - AUH	Single direction
13	AS13	BBI – HAI	To be considered in connection with the implementation of RVSM and in consultation between India and Oman. However, even using RVSM this route will conflict with traffic flows to Male and Seychelles and will most likely carry restricted altitudes. IATA to provide projected numbers of flights that would use this route.
14	AS14	2100N 06126E – ETUKO	
15	AS15	2140N 06214E – ETUKO	
16	AS16	2100N 06126E – IZK	Single direction
17	AS17	SUR - 2020N 06038E	Single direction
18	AS18	2100N 06126E – SUR	
19	AS19	2140N 06214E – IZK	Single direction
20	AS20	2140N 06214E – MCT	
21	AS21	2140N 06214E – PAPAR	This route segment links AS4 with the Iranian PERSIAN 1 resulting in an efficient routing between Europe and India/Indonesia. Oman will consider providing additional transitions from AS-2 and AS-3 to join with AS21 if there is a

S/No	EMARSSH ROUTES	DESCRIPTION	REMARKS
			formal request from IATA.
22	PERSIAN 1	SHJ – SYZ - UMH	Proposed by IR of Iran and agreed to by IATA
23	PERSIAN 2	SHJ – SYZ – ULDUS	Proposed by IR of Iran and agreed to by IATA
24	PERSIAN 3	DASIS - SOKAM	Proposed by IR of Iran and agreed to by IATA
25	AR1	HAI – KIA	This route will require coordination with military as it impacts military training airspace.
26	AR2	SOBAS – TBK – NWB – RASDA – KAVOS	This route will require coordination with military as it impacts military training airspace west of TBK. IATA to provide projected numbers of flights that would use this route. A concern was voiced that after a similar routing of UL550 was recently implemented it was not being flown. Therefore IATA was asked to provide projected numbers of flights for this route combination as well.
27	AR3	TOTAD – AJF – TONTU – LEBOR – ALSUS	Alignment of this route was agreed in principle to the need for a parallel operation to G669/R785 that avoids the bottleneck at KTN. However, this must be discussed further among the affected States and IATA.

Legend

AJF	Al Jouf	KIA	King Khaled
AUH	Abu Dhabi	KN	Kandahar
BBI	Bellary	NWB	Nuweibaa
BBG	Bangalore	PG	Panjgur
BBM	Belgaum	SHJ	Sharjah
CBH	Chah Bahar	SYZ	Shiraz
CLC	Calicut	TBK	Tabuk
GAS	Gassim	TBZ	Tabriz
HAI	Haima	TVM	Trivandrum
HIL	Hail	UMH	Uromiyeh
IZK	Izki		



Legend
Existing international route
Non- EMARSSH TF3 proposal
EMARSSH TF3 proposal
See Insert
36⁰ parallel
32⁰ parallel
Istanbul
INB
CRM
TBN
TBS
B143P
Baku
KRS
AGMAL
MK
TMD
BUK
BAG
SIV
VW704
ERZ
U/B111
A240
A87
AFGAN
DS
DINAR
KFK
GEM
EZS
UL852
R660
DASIS
U/G177
G500
VAN
TBZ
RAPTA
V876
UL 619 UL 620
VG 8
SRT
UMH
R21
KABAN
NSR
KLH
AYT
MUT
GAZ
ALE
ZAJ
TRN
A416
MSD
A466D
V500
M601
UR 78
LCA
ALSUS
LEBOR
HW
SV
PERSIAN 3
V390
V838
Kabul
CAK
KTN
MAL
B411
SM
ANK
R794
GN
Islamabad
APLON
KAVOS
KAD
G202
TAN
Baghdad
BE
G202
KRD
ISN
BJD
RASDA
M872
KARBALA
A727
DAKWE
DAM
AR3
KAMEL
TRF
HA
BGN
QAA
ST
PERSIAN 1
PERSIAN 2
G208
KN
ZB
DI
AR2
TONTU
QTR
PARAM
AAR
MAH
KER
G325
AXD
G183
ASH
AJF
DESLU
KOBAN
CVO
UL 550
KUA
SYZ
ZAH
RAF
NWB
NIMAR
AR3
G452
TIGER
Delhi
TBK
AR2
H55
HFR
RK
SOBAS
V11
HIL
TOTAD
SELEG
PG
G214
B466
BB15
GAS
BAH
PAPAR
BB8
B209
WEJ
HLF
A145
KFA
ALMAL
NH
Riyad
KIA
CBH
SHJ
DOH
YEN
PMA
UM321
AUH
Karachi
R219
B210
UL300
AR1
MCT
AS21
AS5
AS6
AS7
PAVAN
AS20
MAROB
BPL
IZK
SUR
B415
AS8
AS9
G472
KANOP
LOTOS
UL300
JDW
UN569
ETUKO
AS16
AS15
AS19
AS14
AS18
AS11
AS12
AS17
BILAT
WDR
KANDU
AS4
BHA
BSH
UL 425
HAI
RVSM
AS10
Mumbai
OPAKA
JANIS
AS13
AS3
ALWAH
Thamud
W28
GGB
SLL
GZN
GDA
V640
AS2
BBM
SYN
SAA
V627
A451
UL425
B459
A474
G450
AS1
ALSUS
AR3
LCA
CAK
LEBOR
KTN
KAD
DAKWE
G202
TAN
DAM
R785
G669
KAMEL
BGN
QAA
TRF
GRY
TONTU
QTR
G662
G183
R652
ASH
AR2
NWB
UL 550

Appendix G

EMARSSH TASK LIST and SCHEDULE – Asia/Pacific Region

No	Task	Action by	Target Date (not later than)	Date Start	Date Finish	Remarks
1	Produce Draft AIC on intention to introduce RNP10 Airspace	ICAO APAC	20 Apr 2001		7 May 2001	completed
2	Produce Draft AIP SUPP on intention to introduce EMARSSH Routes	EMARRSH Core Team	14 Jul 2001			
3	Nav error monitoring – LOAs	Implementing States, ICAO	30 Apr 2001			
4	Central Monitoring Agency appointed	ICAO (Asia/Pacific Regional	30 Apr 2001			
5	Nav error monitoring procedures	Central Monitoring Agency	30 Apr 2001			
6	Implementation of Navigation Error Monitoring RNP10	Implementing States	30 Apr 2001			
7	AIC Publication	Implementing States	01 Jul 2001			
8	Investigate implementation of special EMARSSH page on ICAO web-site	ICAO APAC	30 Jun 2001			
9	Amend Regional SUPPS	ICAO APAC	28 Sep 2002			
10	RNP10 approval procedures developed	Operators, Users and Implementing States	01 Dec 2001			
11	Completion of Safety Assessment	CMA, Safety Analyst, Implementing States and ICAO	Oct 2001 (Delhi meeting)			

No	Task	Action by	Target Date (not later than)	Date Start	Date Finish	Remarks
12	Arrange Seminar on Provisions of Procedural Separation	ICAO	Apr 2002			
13	AIP Maps and Charts	Implementing States	28 May 2002			
14	AIP SUPPS	Implementing States	28 May 2002			
15	ATC Procedures	Implementing States	28 May 2002			
16	ATC Letters of Agreement	Implementing States	28 May 2002			
17	Staff Training	Implementing States and Operators	28 Nov 2002			
18	RNP10 implementation	Implementing States	28 Nov 2002			

EMARSSH TASK LIST and SCHEDULE – Middle East Region

No	Task	Action by	Target Date (not later than)	Date Start	Date Finish	Remarks
1	Produce Draft AIC on intention to introduce RNP10 Airspace	ICAO APAC	7 May 2001	7 May 2001	7 May 2001	Completed – presented during TF/3 meeting.
2	Produce Draft AIP SUPP on intention to introduce EMARSSH Routes	EMARRSH Core Team	14 Jul 2001			
3	Nav error monitoring – LOAs	Implementing States, ICAO		Completed	completed	Completed with RNP5
4	Central Monitoring Agency appointed	ICAO (MID)		Completed	Completed	UAE is CMA for MID RNP5 (Note Singapore appointed CMA for RNP10)
5	Nav error monitoring procedures	Central Monitoring Agency		Completed	Completed	Completed – associated with RNP5
6	Implementation of Navigation Error Monitoring – RNP5	Implementing States				Phase one – implemented Phase two – Mar 2002
7	AIC Publication	Implementing States			Completed	AIC for RNP5 phase one published AIC for RNP5 phase two pending
8	Investigate implementation of special EMARSSH page on ICAO web-site	ICAO APAC	30 Jun 2001			ICAO APAC to arrange
9	Amend Regional SUPPS	ICAO MID	28 Sep 2002			
10	RNP approval procedures developed	Operators, Users and Implementing States	01 Dec 2001		Completed	RNP5 procedures implemented RNP10 TBD
11	Completion of Safety Assessment	CMA, Safety Analyst, Implementing States and ICAO	Oct 2001 (Delhi meeting)			UAE for MID (ongoing) Australia for APAC (TBD)

No	Task	Action by	Target Date (not later than)	Date Start	Date Finish	Remarks
12	Arrange Seminar on RNP Procedural Separation	ICAO	Jun 2001			
13	AIP Maps and Charts	Implementing States	28 May 2002			
14	AIP SUPPS	Implementing States	28 May 2002			
15	ATC Procedures	Implementing States	28 May 2002			
16	ATC Letters of Agreement	Implementing States	28 May 2002			
17	Staff Training	Implementing States and Operators	28 Nov 2002			States and Operators to determine training schedule and requirements
18	RNP5 implementation RNP10 implementation	Implementing States Implementing States	14 Jun 2001 Mar 2002 28 Nov 2002			Phase one implementation Phase two implementation RNP10 TBD

Pilot Procedures for ADS/CPDLC Trials

NOTE: These are suggested procedures that are based on procedures used on previous CNS/ATM trials. Please consult local NOTAMs for actual procedure.

Reason for trials and data collection: Implementation of CPDLC and ADS requires complete interoperability between ground automation systems, the various avionics of CPDLC/ADS, the data link service provider and the communications service providers. This requires data collection, review and resolution of any problems experienced. Because interoperability requires end to end interoperability there may be a requirement to have all parties present as a FANS Interoperability Team (FIT) to address persistent problems (see Attachment A). In addition, trials allow airline and ATS Providers to develop and demonstrate proficiency in CPDLC/ADS operations and procedures.

Flight Plan Notification:

1. Data link capability should be included in item 10 of the flight plan (equipment) by use of the letter "J"
2. Data link media should be included in item 18 by use of the prefix "DAT/" followed by the letter S and/or V for satellite and VHF data link capability, i.e. DAT/SV
3. Aircraft registration number shall be included in item 18 as the ground system uses the filed flight identification and aircraft registration number to compare with those contained in the AFN logon.
4. Serviceable ADS equipment should be annotated in item 10 of the flight plan by adding the letter "D" to the SSR equipment carried.

AFN Logon Addresses:

Example:
Bangkok FIR: **VTBB**
Calcutta FIR: **VECO**
Yangon FIR: **VYYF**

CPDLC Procedures:

1. For areas where HF communication will be the back-up means of controller to pilot communication, conduct an HF radio check prior to entering the FIR.
2. If not already in CPDLC communication with air traffic control (ATC), log on at least 10 minutes prior to entering into the FIR that is conducting the CPDLC trial. The pilot should inform ATC via voice of the successful completion of CPDLC connection. If unable to successfully logon, the pilot should inform ATC that they were unable to logon.
3. Controller to pilot communications opened by voice communication should be closed by voice.
4. Controller to pilot communications opened by CPDLC should be closed by CPDLC.
5. The flight identification to be used for an AFN logon shall be exactly the same as that filed in the ATS flight plan.
6. In order to avoid potential ambiguity in messages, each CPDLC downlink message should contain only a single clearance request.

7. All CPDLC messages should use pre-formatted message elements to the maximum extent possible. Free text should be used only when the appropriate pre-formatted message element does not exist.
8. Pilots who are unable to establish a data link connection or loose their data link connection should inform ATC via voice communications.

Data Collection:

1. Data collection is essential to test and validate CPDLC and ADS operations. At the beginning of the trials, there should be a set period of time where data collection should contain reports of successful logon for statistical purposes as well as any unsuccessful logon attempts. For reports of successful logons the flight should indicate "successful logon" in the description or remarks section of your report.
2. The data submitted should be submitted in a standardised format (see **FANS-1/A Problem Report Form** in Attachment B), either as a form to be faxed or e-mailed, or by sending an ACARS report using a standardised template for data collection. An example is:

Format		Sample AOC Downlink
1. AAAA	(Logon address)	1. VYYF
2. Yes/No	(Successful/unsuccessful)	2. Yes
3. N	(No. of attempts)	3. 1
4. HHMM	(UTC time of first attempt)	4. 1835
5. AAAA	(Active Centre)	5. VYYF
6. AAAA	(Next Centre)	6. VECO
7. AAAA Auto/Man	(Next Active Ctr, transferred automatically or manually)	7. Manual
8. Nxx.x Exxx.x or AAAA	(Position coordinates or Waypoint name)	8. DOPID
9. (Remarks if any)		9. No Auto transfer to NDA

Note: *The ACARS message format already contains the flight number and tail number that is required for the FANS Report.*

Send the Report to:

List parties that should receive the FANS

Point of contact for real-time problem solving :

To assist in real-time problem solving contact (fill in 24 hour phone number)

Note: Attachment B contains a more detailed description of the FANS system validation process (Part III, Chapter 1 of the INTERNATIONAL CIVIL AVIATION ORGANIZATION ASIA AND PACIFIC OFFICE GUIDANCE MATERIAL ON CNS/ATM OPERATIONS IN THE ASIA/PACIFIC REGION).

REVISED SOUTH CHINA SEA ATS ROUTE STRUCTURE IMPLEMENTATION

Suggested Training Considerations:

a) Theory

- A short background on the development of RNP routes
- A description of RNP10 routes
- Understanding of RNP10 – Qualities
- Useable levels along the parallel routes
- What are the parallel routes
- What are RNAV routes
- What are the qualities of RNAV routes
- What is the difference between RNAV and RNP10 routes
- What are the other routes (ATS)
- Deviation procedures
- Navigation error reporting procedure
- Monitoring agency
- Action when not able to fly RNP10 routes
- Separation Minima
- LOA, Transfer points
- When do the RNP10 routes become inoperative – all routes some routes

b) Practical

- Exercises in assigning all levels since the RNP10 routes are laterally separated routes
- Exercises concerning deviations
- Exercises on Non RNP approved aircraft flying along the RNP10 routes
- Exercises on co-ordination procedures
- No PDC/MNT
- What happens when the direct line fails

****

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MALAYSIA

"draft"

COURSE GUIDE

SOUTH CHINA SEA ATS ROUTE STRUCTURE IMPLEMENTATION

"draft"

MARCH 2001
Ver1/ax/vausu

COURSE: **SOUTH CHINA SEA ATS ROUTE STRUCTURE IMPLEMENTATION.**

AIM: TO EQUIP THE AREA RATED/ENROUTE CONTROLLERS WITH THE NECESSARY KNOWLEDGE AND SKILLS FOR THE SUCCESSFUL IMPLEMENTATION OF THE SOUTH CHINA SEA ATS ROUTE STRUCTURE IN OCTOBER 2001.

COURSE OBJECTIVE:

A. AT THE END OF THE COURSE THE AREA RATED/ENROUTE CONTROLLER WILL BE ABLE TO IMPLEMENT RNP10 PROCEDURES.

B. TO PROVIDE A SAFE, ORDERLY AND EFFICIENT FLOW OF TRAFFIC.

TARGET CANDIDATES:

AREA RATED/ENROUTE CONTROLLES AT THE LUMPUR , KOTA KINABALU AND KUCHING ACCs.

COURSE DURATION:

THEORY: 1 DAY.

SIMULATOR: 6 HOURS PER PARTICIPANTS

GRADING SCALE

A grading scale of 1 to 5 has been used in the Lesson Guides to convey the required level of knowledge and is intended to indicate the following degree of knowledge and proficiency.

1. Denotes an understanding of a principle.

2. Denotes a basic knowledge of a subject.

3. Denotes knowledge of the subject and the ability where applicable, to apply it practically.

4. Denotes a thorough knowledge of the subject and the ability to apply it with speed and accuracy.

5. Denotes extensive knowledge of the subject and the ability to apply procedures derived from it with judgement in the light of the circumstances.

SOUTH CHINA SEA ATS ROUTE STRUCTURE IMPLEMENTATION.

NO.	SUBJECT	COURSE GUIDE
1.	RNP ROUTES	1 - 3
2.	CHARACTERISTICS OF RNAV ROUTES	4 - 9
3.	DEVIATION PROCEDURES	10 - 12
4.	SEPARATION MINIMA	13 - 15
5.	LETTER OF AGREEMENT	16 - 18

TOTAL HOURS 6 HOURS

SIMULATOR (PER TRAINEE).

EXERCISES 1 - 4 (1 hr. x 4) **6 HOURS.**

SOUTH CHINA SEA ATS ROUTE STRUCTURE

RNP ROUTES.

OBJECTIVES

- **To equip participants with knowledge on the development of RNP routes.**
- **To be able to describe an RNP10 route.**
- **To understand the characteristics of RNP10 routes.**

SOUTH CHINA SEA ATS ROUTE STRUCTURE

CONTENT

- **A short background on the development of RNP routes.**
- **A description of RNP routes.**
- **The characteristics of RNP10 routes.**

LESSON PLAN

LESSON 1			
Introduction			**Duration: 1 Hr.**
	GRADE	**REFERENCE**	
1. A short background on the development of RNP routes. i. General ii. Terms iii. RNAV operations within the RNP concept	2	DOC 9613 1.1, 1.3, 2.1, 2.2	
2. A description of RNP routes. i. Airspace use ii. Elements of RNP	2	DOC 9613 2.3, 3.2, 3.3	
3. The characteristics of RNP10 routes. i. Airspace characteristics ii. Airspace requirements	2	DOC 9613 4.2, 4.3	
Summary			

H/O: HANDOUTS. OHP: OVERHEAD PROJECTOR

SOUTH CHINA SEA ATS ROUTE STRUCTURE

CHARACTERISTICS OF RNAV ROUTES.

OBJECTIVES

- **To understand what are parallel routes and useable flight levels along parallel routes.**
- **To understand RNAV routes and their characteristics.**
- **To understand the differences between RNAV and RNP10 routes.**
- **To recognise other ATS routes.**

SOUTH CHINA SEA ATS ROUTE STRUCTURE

CONTENT

- **What are parallel routes and the useable flight levels along parallel routes.**
- **RNAV routes and their characteristics.**
- **Comparison between RNAV and RNP10 routes.**
- **Brief explanation on other ATS routes.**

LESSON PLAN

LESSON 2 & 3			
Introduction			**Duration: 1 Hr.**
	GRADE	**REFERENCE**	
1. What are parallel routes and the useable flight levels along parallel routes. i. Establishment of ATS routes ii. Cruising levels	4	Annex 11 2.11, 5.3, Annex 2 Appendix3	
2. RNAV routes and their characteristics. i. General ii. Operating procedures	5	Doc 9573 Chapter 2, Chapter 3	
3. Comparison between RNAV and RNP10 routes. i. ATS routes for use by RNAV equipped aircraft ii. The choice of RNP values iii. Estimating navigation accuracy	4	Annex 11 Attachment B Doc 9613 Appendix B & C	
4. Brief explanation on other ATS routes. i. Establishing ATS routes	4	Annex 11 Appendix A	
Summary			

H/O: HANDOUTS. OHP: OVERHEAD PROJECTOR

SOUTH CHINA SEA ATS ROUTE STRUCTURE

DEVIATION PROCEDURES.

OBJECTIVES

- **To be understand the navigation error reporting procedures.**
- **To equip participants with skills to process air traffic during deviations.**

SOUTH CHINA SEA ATS ROUTE STRUCTURE

CONTENT

- **ATS procedures in RNP airspace.**
- **Contingency procedures within RNP airspace.**
- **Monitoring of RNAV systems for RNP operations.**

LESSON PLAN

LESSON 4

Introduction **Duration: 1 Hr.**

		REFERENCE	
1. ATS procedures in RNP airspace. i. Navigation performance accuracy ii. ATS procedures in RNP airspace	5	DOC 9613 4.3.1 – 4.3.5	
2. Contingency procedures within RNP airspace. i. Flight crew contingency procedures ii. ATC contingency procedures	5	DOC 9613 4.3.6 – 4.3.9	
3. Monitoring of RNAV systems for RNP operations i. System design, construction and installation ii. Monitoring iii. Measure of navigation system performance iv. Data link interface	3	DOC 9613 5.3.22, 5.4 APANPIRG	

Summary

H/O: HANDOUTS. OHP: OVERHEAD PROJECTOR

SEPARATION MINIMA.

OBJECTIVES

- ✈ **To be able to apply correct separation minima to aircraft in RNP airspace.**
- ✈ **To equip participants with skills to process air traffic during non-compliance of RNP10.**

SOUTH CHINA SEA ATS ROUTE STRUCTURE

CONTENT

- **Separation minima.**
- **Action when aircraft unable to comply with RNP10**

LESSON PLAN

LESSON 5

Introduction **Duration: 1 Hr.**

		REFERENCE	
1. Rules applicable to all IFR flights	4	Annex 2 5.1, 5.1.2, 5.2,	
2. Separation minima i. General provision for the separation of controlled aircraft ii. Vertical separation iii. Horizontal separation iv. Reduction in separation minima v. Tables of cruising levels	5	DOC 4444 1 - 9 Annex 3 Appendix 3 DOC 9689 Appendix 5	
3. Traffic unable to comply with RNP10 i. Essential traffic situation ii. Longitudinal separation minima based on distance using RNAV where RNP is specified	5	DOC 4444 8.6.2.1, 14	

Summary

H/O: HANDOUTS. OHP: OVERHEAD PROJECTOR

SOUTH CHINA SEA ATS ROUTE STRUCTURE

LETTER OF AGREEMENT.

OBJECTIVES

- **To understand and comply with the agreed procedures with adjacent units.**

SOUTH CHINA SEA ATS ROUTE STRUCTURE

CONTENT

- **Letter of agreements with the adjacent ACCs.**
- **Contents of a letter of agreement.**

LESSON PLAN

LESSON 6

Introduction **Duration: 1 Hr.**

		REFERENCE	
1. List of letters of agreement.	2	LOAs.	
2. Contents of a letter of agreement i. Purpose ii. Separation iii. ATC clearance limits iv. Communications v. Coordination procedures and transfer of control vi. Delegation of responsibility vii. Contingency procedures viii. Termination of coordination	2	LOAs	
3. RNP routes	2	DOC 9613 4.2	

Summary

H/O: HANDOUTS. OHP: OVERHEAD PROJECTOR

SOUTH CHINA SEA ATS ROUTE STRUCTURE

SIMULATOR EXERCISES.

OBJECTIVES

- **To simulate possible air traffic scenarios in the South China Sea ATS route structure in compliance to RNP10.**

SOUTH CHINA SEA ATS ROUTE STRUCTURE

CONTENT

- **Assignment of levels on RNP10 routes.**
- **Deviations.**
- **Non RNP equipped aircraft flying along RNP10 routes.**
- **Coordination procedures.**
- **No PDC/MNT.**
- **Contingency procedures.**

SIMULATOR EXERCISES

Briefing		**Duration: 6 Hrs.**	
		REFERENCE	
1. Exercise on level assignment on RNP10 routes. 2. Exercise on level assignment on RNP10 routes plus deviations. **3.** Exercise on level assignment on RNP10 routes plus Non RNP equipped aircraft flying in the RNP10 routes. **4.** Exercise on level assignment on RNP10 routes using No PDC/MNT. **5.** Exercise on level assignment on RNP10 routes using No PDC/MNT plus emergencies scenarios. **6.** Exercise on any of the above combinations.	5		
Debrief			