INTERNATIONAL CIVIL AVIATION ORGANIZATION

REPORT OF THE POST IMPLEMENTATION REVIEW MEETING ON A REVISED ATS ROUTE STRUCTURE – ASIA TO MIDDLE EAST/EUROPE, SOUTH OF THE HIMALAYAS (EMARSSH PIRM)

GOLD COAST, QUEENSLAND, AUSTRALIA, 31 MARCH TO 2 APRIL 2003

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 Post Implementation Review Meeting on a revised ATS route structure – Asia to Middle East/Europe, South of the Himalayas (EMARSSH PIRM) was held in the Gold Coast, Queensland, Australia from 31 March to 2 April 2003.

2. Attendance

2.1 The meeting was attended by 37 participants from 10 States (Australia, Cambodia, India, Indonesia, Malaysia, Nepal, Pakistan, Singapore, Sri Lanka, Thailand), 3 International Organizations (IATA, IFALPA, IFATCA) and SITA, a Communications organisation. A list of participants is at **Appendix A** to this report.

3. Opening of the Meeting

3.1 The meeting was opened by Mr. Bernie Smith, Chief Executive Officer, Airservices Australia. In his opening address, Mr. Smith welcomed the delegates to the Post Implementation EMARSSH meeting and wished them a successful outcome in the deliberations of this meeting. He highlighted that never before has there been such a demand on Air Navigation Service Providers and Airline Operators to safely deliver enhanced route capacity and operating efficiencies. He praised ICAO for taking the initiative in establishing the EMARSSH Task Force, following some initial work which had been undertaken by IATA's Joint Route Development Group. It was pointed out that, under the Chairmanship of Mr. John Richardson, the EMARSSH Task Force has delivered on the development and implementation of an enhanced ATS Route Structure between Australia, Asia, the Middle East and Europe. The welcome address of Mr. Smith is at **Appendix D** to the report.

3.2 Mr. John Richardson, Chairman of the EMARSSH Task Force, welcomed the participants to the Gold Coast and, on behalf of the ICAO Regional Director, Mr. L.B. Shah, conveyed a message wishing the meeting every success in its deliberations. In his opening remarks, he stated that due to present events in the Middle East region, the Regional Directors of the Cairo, Paris and Bangkok Offices, who intended to be present, unfortunately could not attend. He gave an overview of the creation of the EMARSSH project and pointed out that we now have a new route system which has been developed over three ICAO regions from Australasia to Europe and the Middle East. Mr. Richardson further emphasized that follow-up action was still required in enhancing this system to its full potential, thus ensuring that the cost benefits for both the users and the providers of the service were realized.

3.3 Mr. Richardson also thanked Mr David Behrens, IATA Asia/Pacific Director of Operations and Infrastructure, for his leading role in the conception and materialization of the EMARSSH project as a member of the Core Team. He advised the meeting that Mr. Behrens was not able to attend this meeting due to commitments with regards to the crisis in the Middle East. On behalf of Mr. Behrens, he conveyed apologies to the meeting. He also thanked other members of the Core Team for a job well done. He pointed out that the world is now passing through a difficult time and the consequent impact is being severely felt by the aviation industry. He stated that if we continue to work as a team as we did through the EMARSSH project, he was confident that we would jump this present hurdle and continue forward to a bright horizon.

4. Officers and Secretariat

4.1 Mr. John E. Richardson, Regional Officer, Air Traffic Management, ICAO Bangkok Office and Chairman of the EMARSSH Task Force, introduced the members of the Core Team present,

who lead the EMARSSH project through to implementation. They were Mr. Dhiraj Ramdoyal, Regional Officer, Air Traffic Management, ICAO Middle East Office, Mr. Ron Rigney, Airservices Australia and Mr. Mervyn Fernando, Civil Aviation Authority of Singapore.

5. Documentation and Working Language

5.1 All discussions were conducted in English. Documentation was issued in English. A total of 7 Working Papers and 10 Information Papers were considered by the meeting. A list of the Papers is at **Appendix B**.

PART II - REPORT ON AGENDA ITEMS

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

Agenda Item 1: Review Implementation Actions Prior to 28 November 2002

1.1 The meeting was given a background to the EMARSSH project leading up to implementation on 28 November 2003.

1.2 It was recalled that the concept of EMARSSH was discussed and endorsed by various regional meetings held since March 2000. It should also be noted that the Asia and Pacific Air Navigation Regional Planning and Implementation Group (APANPIRG) agreed to the project in September 2000, and an ICAO Inter-Regional Co-ordination Group Meeting comprising Regional Directors from Paris, Cairo and Bangkok plus the Chief of the Regional Affairs Office in ICAO Headquarters, further endorsed the EMARSSH Project. The APANPIRG Conclusion on the EMARSSH Project was passed by the Air Navigation Commission (ANC) and the ICAO Council later in 2000.

1.3 Nine EMARSSH meetings were held between February 2001 and August 2002. It was noted that over 32 States were involved in the EMARSSH project which included more than 40 FIRs.

1.4 This project took less than two years from the first EMARSSH meeting to the implementation date of 28 November 2002. Taking into consideration the size of this project covering three ICAO regions from Australasia to the Middle East and joining the ECAC routing system, EMARSSH was the largest revised route structure project ever undertaken by ICAO, States concerned, IATA and their airlines. The meeting noted that Phase one of the project from Australasia to Southeast Asia was completed in less than twelve months, giving immediate benefits to aircraft operating on this traffic flow.

1.5 It was highlighted that the success of the EMARSSH project was mainly attributed to the dedication and involvement of all partners who have spared no efforts in ensuring that all measures be taken in a timely manner so as to safely implement the project on 28 November 2002. The action plan called for the commitment of all States/service providers to meet the target dates which were set for the implementation of the required facilities and services which involved amongst other things, the improvement of communication and coordination procedures, review and signing of operational letters of agreement between all service providers.

1.6 The meeting was advised that notwithstanding that substantial benefits had been realized since implementation, further improvements in procedures and route design are required to gain the maximum effect from the EMARSSH project.

1.7 The meeting was urged to continue working together to improve the route structure in accordance with the aims put forward in the EMARSSH Principles, which were agreed to by all States concerned at the commencement of the project.

Agenda Item 2: Review Operations After 28 November 2002

2.1 The following information was given to the meeting from States present regarding the effect of the EMARSSH route structure on ATS and aircraft operations in their area of responsibility:

2.2 Australia

2.2.1 The meeting recalled that earlier meetings of the EMARSSH Task Force had encouraged States, where possible, to implement EMARSSH routes on a sub-regional basis earlier than 28 November 2002.

2.2.2 Accordingly, during EMARSSH Task Force one and two meetings, Australia, Indonesia, Malaysia and Singapore examined several EMARSSH route proposals for early implementation on 29 November 2001. The early implementation of these new routes was designated EMARSSH Phase One.

2.2.3 In addition to detailed planning activities associated with EMARSSH Phase One, Indonesia proceeded with the implementation of RNP10 on several of these proposed new EMARSSH routes. The meeting was reminded that Australia had previously implemented RNP10 airspace on 4 October 2001.

2.2.4 The meeting noted the excellent degree of cooperation between the Indonesian Civil and Military Authorities, which had resulted in the alignment of two new EMARSSH routes either in close proximity to, or overhead existing Military special use airspace. In the case of the EMARSSH route L511, (PKP-SBY-BRM) approval was given for operations Southbound at or above FL330 across the top of special use airspace.

2.2.5 Australia also informed the meeting that environmental approval was required within Australian airspace in relation to the alignment of L511 (SBY-BRM), as this new ATS route passed overhead the township of Broome on the Northwestern coastline of Australia.

2.2.6 The meeting also noted that since the implementation of EMARSSH Phase One on 29 November 2001, route capacity had been further enhanced through the introduction of RVSM across the common Australia/Indonesia airspace boundary.

2.2.7 Australia informed the meeting of plans to extend RNP to all Australian administered airspace on 17 April 2003, without specifying a particular RNP type. This will facilitate the application of both RNP10 and RNP4 separation standards and in addition, facilitate the implementation of future RNP types. The extension of RNP will extend the benefits of RNP, to all Australian administered airspace, to a larger number of domestic and international aircraft. Future regional implementation of RNP will streamline regional and cross-FIR boundary operations in addition to enhancing safety and reducing controller workload.

2.2.8 The meeting also acknowledged the contribution made by Dr. David Anderson, Safety Analyst for Airservices Australia, for his assistance in providing a safety assessment of the EMARSSH Project.

2.3 India

2.3.1 The meeting noted that the implementation of the EMARSSH routes within Indian FIRs was carried out on schedule on 28 November 2002 at 0200 UTC. The transition was smooth although slight problems were encountered during the initial phases of the implementation..

2.3.2 It was noted that Chennai and Kolkata FIRs had a total of 12 Bay of Bengal EMARSSH routes within their airspace. The meeting was informed that the following issues still needed to be addressed:

i) Weather deviation procedures (Bay of Bengal);
ii) Multiple crossing points;
iii) Flight planning;
iv) Proper use of Mach number technique (MNT)

Weather deviation procedures

2.3.3 It was noted that the Bay of Bengal area is prone to severe weather conditions including cyclonic weather conditions, forcing aircraft to divert on occasions up to100 NM off track, affecting the traffic flow on adjacent routes. The meeting was informed that the weather deviation procedures are already in the Regional Supplementary Procedures (Doc 7030/4), however it was agreed that the secretariat will look into other weather deviation procedures developed for adjacent regions to see if they are appropriate for the Asia/Pacific region under conditions which occur in the Bay of Bengal and possibly the Arabian Sea.

Multiple crossing points

2.3.4 The meeting noted that there were several crossing routes over the Bay of Bengal, in particular P762 and L301 which restrict flights using these routes to lower flight levels FL260/270. Due to the majority of flights using the parallel routes during the evening rush period, it was difficult to overcome this matter at the moment. However, the meeting recognized that with the planned implementation of RVSM on 27 November 2003, relief to these crossing aircraft could be expected.

2.3.5 In the meantime, it was agreed that the NOTAM on this restriction for crossing tracks will remain, however outside the evening rush period it was also agreed that no matter what ATS route was planned, aircraft who were first able to use the airspace would be granted priority to fly their planned level. This would be achieved through coordination between ACCs concerned.

Flight planning

2.3.6 The meeting was advised that there had been cases where changes to the filed flight plans were made by aircraft en-route, and requests were made to divert to other routes at crossing points, thus defeating the spirit of EMARSSH routes. This situation leads to an increase in the workload of ATCs. The need for restricting flights to follow a single EMARSSH route, in accordance with the light plan was recognised. Deviations will only be considered in exceptional circumstances, dictated by operational requirements.

Use of Mach Number Technique (MNT)

2.3.7 The meeting was informed that MNT was not applied on some routes due to unreliable communications facilities. Although it was recognised that extended VHF is not a pre-requisite for the implementation of MNT, it was pointed out that India will reconsider the application of MNT on route N877 and P628 once the extended VHF facilities at Port Blair become reliable covering these routes. In addition India was requested to implement MNT (faster in back) on L759 and M770 as soon as possible in conjunction with other initiatives to relieve bottlenecks.

Extended VHF

2.3.8 The meeting was advised that extended VHF facilities are available through RCAG at Port Blair under Chennai and Kolkata FIRs.

ADS/CPDLC

2.3.9 The meeting was apprised of the availability of ADS and CPDLC facilities, fully commissioned, at Chennai and Kolkata Centres.

Letters of Agreement

2.3.10 Letters of Agreement between India and the neighbouring States of Myanmar and Indonesia covering Kolkata/Chennai FIRs and Yangon/Medan FIRs are in the process of finalization, nevertheless interim agreements are in place to cover transfer arrangements and other matters.

2.4 Indonesia

2.4.1 Indonesia informed the meeting that EMARSSH routes were implemented in two phases within the Indonesian airspace. Phase One was implemented in conjunction with the States of Australia, Malaysia and Singapore on 29 November 2001 and RNP10 was implemented on these routes on 29 December 2001.

2.4.2 EMARSSH Phase Two was implemented within the western part of the Jakarta FIR (Medan Upper Sector) on 28 November 2002 and included new routes between the adjoining FIRs of Kuala Lumpur, Colombo, Chennai and Singapore. RNP10 was also implemented coincidentally with these new routes.

2.4.3 The meeting was informed that since the full implementation of EMARSSH, a review had been undertaken of traffic movement data, which showed that there had been a significant increase in movements on several routes, especially on the new ATS Route P574.

2.4.4 As a result of this increase in traffic, Indonesia informed the meeting of plans to further expand the implementation of RNP10 and to undertake some limited modification to the route structure between Southeast Asia and Australia, to further enhance route capacity and reduce Controller workload. Indonesia informed the meeting that proposed plans for ATS route modification will be presented to the adjoining States of Australia and Singapore.

2.4.5 The meeting noted the cooperative ATS Coordination and airspace arrangements that had been implemented with EMARSSH Phase Two and commended both Indonesia and Malaysia for their initiative in relation to these arrangements.

2.5 Malaysia

2.5.1 Malaysia informed the meeting that with the implementation of EMARSSH, airlines are now utilizing the available route structure across the Bay of Bengal, which was not the case previously. It was also noted by the meeting that cooperation from the Malaysian military authorities assisted in the design of the EMARSSH route structure.

2.5.2 Initially ground delays were quite significant and, in some cases, greater than pre-EMARSSH implementation because the LOAs required spacing additional to basic MNT. However the LOAs now reflect basic MNT procedures thus minimizing ground delays. Radar hand-off procedures with adjacent FIR unit have also been amended to allow minimum spacing for aircraft that will diverge after a certain point.

2.5.3 Malaysia reported that there were occasions when aircraft had to be allocated FL260 with the concurrence of the accepting unit due to traffic. The no-PDC arrangement works well when departures are from two airports only. However when a departure from a third airport joins the flow, level

allocation under the no-PDC arrangement does not work.

2.5.4 Action has been completed to upgrade the Direct Speech Circuit and AFTN link between Kuala Lumpur ACC and Chennai ACC to 64KPS. The circuits were commissioned on 1st April 2003.

2.5.5 It is anticipated that the implementation of RVSM in the Bay of Bengal on 27th. November 2003 will reduce ground delays.

2.5.6 Malaysia also presented an Information Paper providing some brief details on dual flight planning. While some benefits of this were apparent, it caused extra ATC workload and difficulties to adjacent States. Currently, the Malaysian automated ATC system cannot process two flight plans for the same flight. Australia's TAAATS also cannot accept dual flight plans. The meeting was advised that there were several other technical aspects that would need to be worked through for such a procedure to be put in place. The meeting agreed to defer discussion on this matter to the ATS/AIS/SAR Sub Group.

2.6 Nepal

2.6.1 The meeting was advised that Nepal has been instrumental in proposing additional routes through the Katmandu FIR to enhance the east/west route structure since the Asia/Pacific Regional Air Navigation meeting held in Bangkok in 1993.

2.6.2 Unfortunately, despite further adjustments to the original proposal, there has not as yet been agreement by other States affected by these changes. At the EMARSSH Task Force meetings held prior to implementation Nepal offered further refinements to their proposals which had the support of IATA. There was however an issue with these proposed routes transiting through military airspace of adjacent States which still requires further civil/military consultations. Nevertheless, as both of these proposed routes are seen as benefits, the issue will be further discussed at subsequent meetings in an endeavour to open the routes for international operations. The concerned routes are commonly known as BB17 and BB18.

2.7 Pakistan

2.7.1 Pakistan advised the meeting that EMARSSH implementation went smoothly through both the Karachi and Lahore FIRs. The establishment of additional ATS routes has given more flexibility to the management of international aircraft transiting through Pakistan both via I.R. Iran and Afghanistan. ATS Routes which are now available for air traffic flows from Europe to the Far East and vice versa which include A466, N644, L750, B466, G452, G208, A791, B210, G472, N519, P318N.

2.7.2 It was recognized that further improvements can be achieved to the revised structure but would need further consultation with adjacent States as well as military authorities. These proposals included Himalaya 1, Pakistan 1, Pakistan 7 and restructuring of A466.

2.7.3 The meeting was advised that almost the entire airspace of Pakistan is covered by Secondary Surveillance radar and VHF using repeater stations, except for small portions of airspaces near Zahedan in the West and PURPA in the North East. Action is in hand to enhance the VHF coverage in the West up to Zahedan by installing VHF repeater stations at Dalbandin, a domestic airport, on the route segment G452/G208W. The meeting was also advised that Pakistan will, at the appropriate time, look at possibilities to enhance surveillance requirements, including ADS-B to cover areas outside present radar coverage.

2.7.4 It was noted that military operations within Afghanistan had reduced in intensity and normal civil/military coordination effectively handling military requests which caused little or no disruption to international civil operations.

2.7.5 Preparations for implementation of RVSM on 27 November 2003 are in progress. The aircraft approval process has commenced by the national airline and other operators as well as appropriate training of air traffic controllers. The meeting noted that Afghanistan, Tajikistan and China will not be part of the RVSM implementation process planned for 27 November 2003 and therefore Pakistan will need to transition aircraft to and from the three mentioned States.

2.8 Singapore

2.8.1 The meeting was informed that gains of EMARSSH (ie options for several alternative routes; and fewer ground delays) have not materialised as expected. In fact, according to Singapore, ground delays at Changi Airport had increased from an average of about 15% in October 2002 to 23% in December 2002 after EMARSSH implementation due to downstream States having applied restrictions as follows:

a) Instead of basic MNT, as described in Doc 9426, a minimum of 14 minutes spacing between departures without closing speeds was required;

b) The requirement for flights that diverge onto separate routes downstream from the Singapore FIR to be spaced by at least 5 mins; and

2.8.2 An additional problem was the bunching of flights on specific routes which further complicated the situation by flights operating at mach numbers ranging from M 81 to M 86.

2.8.3 Notwithstanding the above, the meeting was pleased to note that since 26 February 2003, the States concerned had commenced applying correct MNT spacing between flights on the same route. In addition, instead of 5 mins spacing, radar separation is now being applied between flights that will diverge onto separate routes. These arrangements have helped reduce the percentage of Changi's Europe-bound delays from an immediate post implementation average of 23% to 17%.

2.8.4 However, the meeting was advised that the westbound delays could be further reduced if:

a) flights are distributed across the available routes over the Bay of Bengal.

b) one route could be set aside for flights that agree to operate at a common mach number, say M.84; and

c) airlines spread out their departure times.

2.8.5 It also noted that the Civil Aviation Authority of Singapore actively encourages airlines to spread out their flights by faxing out routing details of westbound flights by 9 pm (1300 UTC) each day to all the airlines.

2.9 Thailand

Review the lower limit of EMARSSH route

2.9.1 The meeting was reminded that the lowest useable level (LUL) for most EMARSSH routes was FL280. Thailand requested the meeting to consider revising the LUL for the route structure to FL260. During peak traffic periods some flights preferred to depart at FL260, even though this flight level was below controlled airspace, so as to avoid being delayed on the ground for FL280. It was mentioned that, when RVSM is implemented on 27 November 2003, it is likely to apply only between FL290 and FL410. Non RVSM-capable aircraft would therefore have only one flight level to operate at – i.e. FL280. According

to Thailand there was therefore a need to make FL260 the LUL for EMARSSH as it would add capacity for non-RVSM flights as well as to facilitate the departure of long-haul flights

2.9.2 The meeting was advised that the question on RVSM levels over the Bay of Bengal is still being considered by the RVSM Task Force and it would be premature to discuss this at the moment.

Re-establishment of Conventional ATS route

2.9.3 Thailand recalled that when the EMARSSH route structure became effective, most of the conventional ATS routes over the Bay of Bengal were withdrawn. However, the meeting was advised that this area still had non-RNP 10 and non-RVSM capable aircraft operating and consideration should be given to re-introducing some conventional ATS routes beneath the EMARSSH route structure. The meeting noted that this matter raises other issues especially regarding controller workload and changes to lateral separation procedures compared to the RNP10 environment.

Flight level reservation on ATS route B463

2.9.4 The meeting was informed that, to avoid delays, some Europe-bound flights chose to operate on ATS route B463, thus by-passing other Europe-bound traffic on R468, P646/N895, L507 & G473 out of South East Asia. In this regard, Thailand and Myanmar were considering the issuance of a NOTAM restricting Europe-bound flights using B463 to FL240 or below and FL350 or above between 1400 and 1900 UTC daily. This restriction would not apply in the event of an emergency, when contingency arrangements are in place or when there was an impact to flight safety.

2.9.5 The meeting was of the view that there were sufficient routings out of Singapore and Kuala Lumpur for aircraft from these locations not to interfere with Bangkok departure by using B463. It was considered not to be in the spirit of the EMARSSH route design.

No-PDC arrangement

2.9.6 Thailand informed the meeting that the current No-PDC arrangement had been operating since 0200 UTC, 28 November 2002. It was further noted that the arrangement was effective during the peak period and assisted in reducing ATS coordination which in turn minimized delays to the westbound air traffic flows. The view was expressed that there was no necessity for the No PDC arrangement to be applied outside the peak periods because the arrangement did not facilitate flexible ATS operations and limited the access of flights from other regions to FL280/FL310. This matter had been previously discussed under para 2.3.5 which had the support of the meeting.

Improvements to ATS coordination and CPDLC services

2.9.7 The meeting noted that improvements were still required in some areas. In particular there are inter-ACC coordination problems and air/ground communication difficulties. In this regard, Thailand urges improvements to coordination procedure and communication facilities.

Amendment of Letter of Agreement

2.9.8 Malaysia and Thailand have amended their Letters of Agreement (LOA) between Bangkok and Kuala Lumpur ACCs on 15 March 2003. in regard to radar handover procedures. The LOA now calls for the longitudinal spacing between two aircraft to be 20 NM (or 10nm laterally) on diverging airways from Phuket westbound irrespective of speed differential.

2.10 IATA

2.10.1 IATA advised the meeting that EMARSSH was a major step forward in air traffic services with the implementation of RNAV and RNP-10 routes. In addition, EMARSSH is a success story of civil/military cooperation with the dynamic sharing of airspace by allowing night-time or a high altitude shelf for civil operations. States are to be commended for their successful negotiations with their military counterparts.

2.10.2 However, not all of the planned EMARSSH phase II program, as originally agreed by States, could be implemented. Therefore, instead of 4 independent Asia – Europe flows across the northern half of the Bay of Bengal and through India, Pakistan and Afghanistan, there are still the same two independent flows (via TIGER or SAMAR at the India/Pakistan FIR boundary) that existed prior to EMARSSH. Unfortunately the favourable options of routes that could have allowed a more even distribution of traffic loads that was envisaged, did not occur due to all northern traffic flows having to route over the existing two bottlenecks.

Need for additional independent flows between Asia – Europe.

2.10.3 The meeting was advised that airline needs for traffic flows can best be explained by the example of Afghanistan and Iran. Depending on operational requires such as seasonal upper wind patterns, loading and destination, airlines from SIN/KUL/BKK have requirements to fly either through the Russian Federation sovereign airspace via Afghanistan, the Caspian Sea via Afghanistan, or via Turkey or the Black Sea through the I.R. of Iran.

2.10.4 Flights across the Caspian and Black Seas have the highest demand. With the reduced vertical capacity in Afghanistan, traffic already exceeds capacity and is this is likely to increase. Consequently, there is a significant need for three independent flows flying across India, Pakistan and Afghanistan to the Caspian and Black Sea to cater for departures from Bangkok, Kuala Lumpur, Singapore, Delhi and Mumbai. The most preferred solution is to provide a route between ASOPO (northern end of P628) and Rahim Yar Khan (RK) and from RK to Kandahar (KN). In order to reduce the congestion of traffic over-flying Delhi, there is a critical need to lower the MEA on L333 from FL310 to FL280 which would allow two levels on this route westbound during the night-time rush period. The present lowest available westbound level of FL310 on L333 has resulted in aircraft at FL280, who have been unable to climb to FL310 due to conflictions, being rerouted via Delhi, which forced the aircraft to fly an additional 63 NM as well as adding to the traffic congestion at Delhi. To add to this penalty, such reroutes have sometimes resulted in the flight no longer having a FL310 slot into Afghanistan causing them to have a further reroute via G452 and I. R. Iran. This has sometimes caused the aircraft to land at an intermediate airport to refuel which is operationally inefficient and costly to the airlines. IATA therefore requested India to give urgent consideration in coordination with their military counterparts to lower the MEA on L333 to FL280.

2.10.5 The meeting was also advised that flights across Iran face a bottleneck at Zahedan. There needs to be an option that provides an additional corner-cutting route north of Zahedan. There are several options that should be considered, such as a Kandahar to SOKAM (UL333); or a GASIR (G452) direct SOKAM; or a SOKIR (G452) direct Birjand (See Appendix B).

2.10.6 With respect to this request, the meeting considered that as several requests for additional routes and levels had previously been requested from the coalition forces in Afghanistan which resulted in one additional route, B466/V390 being approved for use, the chances of any additional route requests involving Afghanistan airspace should be deferred until such time as the Middle East conflicts stabilized and a clearer picture of operations in Afghanistan became evident.

Air-Ground Communications

2.10.7 There are still some significant deficiencies in air-ground communications in Myanmar, India and Afghanistan. IATA recently performed an air-ground communication survey over the Bay of Bengal and India and concluded that HF and some of the VHF air-ground communication required serious attention. In addition to HF, there is a significant capability by Bay of Bengal States and airlines in the use of CPDLC. However, the needed assessment by the FANS Action Team for the Bay of Bengal (FATBOB), which was established in 2000 has never occurred. Therefore, IATA urgently requests ICAO and States to re-establish FATBOB so that the benefits can be realised from the investments made by States and airlines.

Traffic management for flights transiting the Kabul FIR Westbound

2.10.8 IATA expressed the view that there were two options that had to be addressed with regard to the westbound traffic flows across the Bay of Bengal and into Afghanistan. These were

a) The need for an air traffic flow management (ATFM) centre. Such a centre would require concerned States to coordinate all planned and actual departures to Europe.

b) That some States do not want to coordinate departures and therefore desire a static procedure that would be under their control alone and not require any pre-coordination phone calls.

2.10.9 The Middle East conflict has pointed to the fact that there is no mechanism to manage the flow of flights transiting Afghanistan. This would be required if situations dictate additional closures of airspace that could elevate the demand for flights transiting Afghanistan.

2.10.10 IATA advised the meeting that the issues that concerned its member airlines are as follows:

a) The need for a procedure that guarantees a departing aircraft a slot through Afghanistan. Re-routes assigned to flights that are already en route are very costly to airlines and usually results in an unplanned stop to take on additional fuel. .

b) A procedure that maximises the frequency of departures without regard to potential enroute bottlenecks would defeat any benefit that may be gained from the reduction in ground delays.

c) Airlines are willing to assist with the management of air traffic and are for the most part willing to participate in restricting a single track to M.84. However, this would only be for FL280 & 310 and should include the ability to flight plan on adjacent track without such speed restriction.

d) Opportunities for overflights in Afghanistan must be fair and equitable. This would include addressing departures from Singapore, Kuala Lumpur, Hong Kong, Bangkok, Phuket, Delhi and Mumbai that flight plan over Afghanistan.

e) Airlines urgently need FL280 for Afghanistan operations during the westbound rush. Even a small window, such as from 2000-2400 UTC, would provide major relief to the existing capacity of Afghanistan.

2.10.11 Taking note of discussions mentioned in para. 2.9.4 above regarding independent traffic flows through Afghanistan to the Caspian and Black Sea, three tracks are now available with the

implementation of N644, L750 and B466/V390 in Afghanistan. IATA expressed the view that a rational plan must be implemented which will allow ATC to issue departure clearances that will guarantee access onto these three routes. Such a plan could either be a tactical air traffic flow management plan or involve a traffic orientation scheme (TOS) to be used during peak hours. A TOS for Afghanistan would need to consider the following:

a) **N644**

N644 is the northernmost track in Afghanistan that caters to traffic to the Black Sea. Traffic destined to N644 must route over Delhi A466 DI. Being the northernmost track, it would support Bangkok departures (or flights that over-fly Bangkok).

b) **L750**

L750 is the middle track through Afghanistan to the Caspian and Black Seas. This track caters primarily to departures from Singapore and Kuala Lumpur.

c) **V390**

V390 was implemented in March 2003. Although it is too early to predict the traffic loads or demand for V390, it will be an attractive route for departures out of Mumbai. It is also likely that this route could be a favoured seasonal route for departures out of Singapore and Kuala Lumpur. Nevertheless, Mumbai departures should be given priority access to this route and a procedure developed to allow SIN/KUL departures to fill the additional slots.

d) **Delhi Departures**

Departures out of Delhi face several difficulties. First of all Delhi departures are the last to depart and many times usable levels have already been taken by departures from Singapore, Kuala Lumpur or Bangkok. In addition, the non-availability of FL280 in Afghanistan has prompted ATC to place requirements on Delhi departing aircraft to reach FL310 by waypoints that cannot be achieved, such as BUTOP (100NM from Delhi). However, the MEA of A466 is FL280 until Dera Ismail Khan – an additional 335 NM beyond BUTOP. Some airlines have given up on flight planning A466 and file G452 instead just to get airborne and save excessive ground delays, even though routing via G452 and I.R. Iran adds an additional 10-15 minutes to their flight time.. However they then frequently request a reroute to either L750 or B466/V390 while on their way to TIGER in an endeavour to reduce this additional flight time. Through Iran. This works in that the departures are now more on time and if a L750 reroute is successful, then there is a 10-15 minute savings in flight time to destination. A more efficient procedure needs to be put in place to overcome these route change requests.

Flights into Russia

2.10.12 IATA reiterated that flights into Kazakhstan and Russia need to fly over Delhi A466 to Afghanistan. A466 tracks over Dera Ismail Khan (DI), which is also the anchor point for the heavily travelled N644. Although A466 and N644 both fly over DI, the westbound degree divergence of 22 degrees facilitating the application of procedural air traffic control and flow management. There would be capacity on A466 to accommodate the flows to N644 and A466 if both India and Pakistan permits aircraft to fly at the MEA of FL280.

2.10.13 Taking the preceding points into consideration, IATA proposes the following as a trial traffic orientation scheme. The Notice to Airmen would read as follows:

> FOR FLIGHTS INTO AFGHANISTAN THE FOLLOWING TRAFFIC ORIENTATION SCHEME AND FLOW CNTL SHALL APPLY.
>
> BKK DEPTS BTN 1430-2200 UTC TO EUR VIA AFGHAN AND BLK SEA MUST FILE BKK L507 CEA R460 DEL A466 DI N644 FLT PLN RTE; OR BKK G463 PTN P646 BBN R460 DEL A466 DI N644 FLT PLN RTE. ROUTINGS VIA L750 OR V390 IN AFGHAN NOT AVBL.
>
> BKK/SIN/KUL DEPTS BTN 1430-2200 UTC TO EUR VIA KAZAKISTAN AND RUSSIA MUST FLT PLN VIA DEL A466 DI. AFTER DI VIA A466, M881 OR P500.
>
> SIN/KUL DEPTS BTN 1430-2200 UTC TO EUR THAT FLT PLN AFGHAN AND BLK SEA SHOULD FILE M770-KAKID- JJS B209 KKJ L333 TIGER DCT BASER G202N ZB L750; OR L759 KKJ L333 TIGER DCT BASER G202N ZB L750; OR N877 OR P628 TO PRA THEN A791W KE B210 NH B466 KN V390. NOTE L759 SPEED RESTRICTED TO M.84 BTN 1430-1930 UTC AT FL280/310. FLTS TO V390 FLOW 10 MIN RGDLESS OF ALT. ROUTINGS VIA DEL OR N895 NOT AVBL.

ATC Procedures

2.10.14 A chart outlining the TOS and considerations is at **Appendix E** of the report. ATC from Singapore, Kuala Lumpur and Bangkok would each have control of slots for a specific entry point. If necessary, Mach Number Technique may be required to ensure that a 10-minute spacing between aircraft is ensured entering into Afghanistan. For aircraft flying the speed restricted track L759, ATC must pay careful attention to the fact that once aircraft climb to FL350 that speeds are monitored and managed to ensure 10 minute spacing into Afghanistan. Discussion is still required on how to manage Delhi departures. An accurate traffic sample of Delhi departures during the nighttime rush (1900 – 2300 UTC) would help determine the traffic demand for departures into Afghanistan.

2.10.15 An agreed spacing needs to be determined for Bangkok, Kuala Lumpur and Singapore that would satisfy the demand for Delhi departures.

Other Issues

2.10.16 **L333.** The MEA on L333 is FL310. There have been occasions when an aircraft at FL280 could not get a higher altitude from ATC – which forces a reroute on L759 to Delhi. This in turn penalises the aircraft with an additional 9 minutes of flight, creates additional traffic to the bottleneck, adds competition with the Bangkok traffic flow and Delhi departures, and has on occasions resulted in the flight loosing its slot into Afghanistan. The resulting reroute then usually means that the flight can no longer make it to its destination. Lowering the MEA on L333 to FL280 would alleviate this problem.

2.10.17 There are several issues on a fix speed track. The purpose of fix speed tracks is to reduce departure delays. However, ATC must ensure 10 minute spacing at the Afghan border. L759 speed restriction normally ends at KKJ and aircraft then resume their normal speed. This means that if aircraft are only spaced 10 minutes apart, then there may be an overtake situation, that if not controlled could reduce the spacing to less than 10 minutes at the Afghan border – which could prohibit a flight from entering into Afghanistan. Therefore, ATC should be careful when departing aircraft a bare 10 minutes in trail.

2.10.18 The meeting welcome the initiatives by IATA in an attempt to solve the problems for aircraft transiting the Kabul FIR westbound, however, there appeared to be one issue which had not been adequately addressed. This issue is the question of under utilization of available westbound levels thorugh the Kabul FIR.

2.10.19 The meeting recalled that FL310/350/390 were the only levels available on 5 of 6 routes through the Kabul FIR for westbound flights. These routes were B466, V390, L750, N644 and A466. M881 is only available to FL280 westbound the majority of aircraft are departing Malaysian Peninsular ports with maximum weights which limit their climb to either FL280 or FL310.

2.10.20 In order for aircraft flying at FL280 to gain access to FL310 through the Kabul FIR on the five routes mentioned in para 2.10.17, there needs to be an airline flight management process whereby aircraft operating a FL310, restricting the climb of the aircraft operating at FL280, have the ability to climb to FL340 by the India/Pakistan border.

2.10.21 If this does not occur, the chances are that the aircraft at FL280 will be unable to proceed via Afghanistan and would be required to re-route via I.R. Iran.

2.10.22 IATA was requested to study this procedure, taking into account aircraft types and payloads so that FL310 and FL350 could be utilized on the most popular routes through Afghanistan.

2.11 IFATCA

2.11.1 IFATCA believes that there should be a critical examination of the specific problem areas, eg the Delhi chokepoint and the Afghanistan airspace. If these cannot be solved directly (by new routes or altitudes) then there would be a need to look further back down the routes, perhaps even as far as the departure points. It may well be that there is, or will be, a need for some form of strategic traffic management, eg a tactical flow management centre or a traffic orientation scheme.

2.11.2 IFATCA expressed the view that all concerned parties should use all available resources to assist the traffic. In this regard, IFATCA would not be in favour of isolating V390 for Delhi/Mumbai traffic but recommended that it should be kept available for other traffic flows as well. In this area, IFATCA generally supports the IATA views on traffic handling, that is sharing this route with other aircraft. If controllers were given clear direction and adequate tools, the traffic can be managed.

2.11.3 IFATCA would like to see an overall plan for traffic management in this area and supports the creation of a flow management plan and is more than willing to assist in the development of the same.

2.12 SITA

2.12.1 The meeting recalled that modern aircraft are capable of using datalink communications based on the Aircraft Communications Addressing and Reporting System (ACARS). SITA supports communications for suitably equipped aircraft who fly the EMARSSH routes through the presence of VHF radio stations and satellite communications using the INMARSAT Satellite constellation's

aeronautical mobile safety service.

2.12.2 SITA provided the meeting with an overview of plans to supplement VHF communications to aircraft flying EMARSSH routes by adding VHF stations to the global SITA VHF AIRCOM service. Currently, SITA's VHF AIRCOM air-ground communications network presently consists of seven hundred and thirty three (733) VHF radio stations of which fifty eight (58) are the new generation VHF Ground Stations (VGS) which are capable of housing up to seven (7) VHF analogue and digital VDL Mode 2 radios.

2.12.3 The meeting was informed that over the next twelve months, SITA plans to provide additional services in support of aircraft operating on EMARSSH routes through the installation of VHF ground stations as follows:

a) Port Blair (IXZ), Andaman Islands, 11 39N 92 45E, frequency 131.550 MHz; and
b) Trivandrum (TRV), India, 08 28N 76 55E, frequency 131.725 MHz

2.12.4 The meeting was also informed that SITA's Enhanced Ground to Air Voice Service supports ground to air Satellite voice communications for ATS Providers to INMARSAT priority Q12. This new service had recently been tested with South African Airways and other Operators.

2.12.5 SITA also informed the meeting of developments in the provision of secure communications between aircraft, ATS Providers and Airlines, through the implementation of a fully automated "click and dial" capability in the AIRCOM Service called "SATPHONE", whereby the user is able to click on an aircraft's symbol on the Air Situation Display (ASD) and easily place a Satellite Ground to Air Voice call. The meeting noted that the preloading of the aircraft AESID phone number was a security feature of this new technology.

2.13 Jeppesen

2.13.1 Jeppesen presented the meeting with a detailed report on AIS issues relating to EMARSSH implementation. In presenting its report, Jeppesen acknowledged the pro-active involvement of the ICAO Asia/Pacific regional office and commended the CAA of Singapore for its assistance in the calculation and compilation of data associated with the EMARSSH route structure.

2.13.2 In completing a review of AIS issues relating to EMARSSH implementation, Jeppesen reminded the meeting that the dissemination of AIP documents in advance of an intended effective date and in adherence to the pre-determined AIRAC schedule was very important to the aviation industry.

2.13.3 The meeting recalled previous advice from Jeppesen in relation to operators using automated navigation systems that are dependent on databases for navigation. Jeppesen emphasized the difficulties that can arise when a recipient does not receive data according to the AIRAC concept, especially where new or changed information cannot be applied to navigation databases for the intended effective dates. This can result in pilots, airlines, flight planners and simulator operators using out-dated information when the ATS Provider is expecting operators to have current information.

2.13.4 In relation to major changes, Jeppesen reminded the meeting that ICAO recommends a publication date of at least 56 days in advance of the effective date. Allowing 14 days shipping time, recipients may not receive the data until approximately 42 days in advance of the effective date. According to Jeppesen, and based on experience gained through previous major changes (e.g. South China Sea route restructure), this is not sufficient time for the components of industry to manage all major changes especially those involving several States or FIRs such as the EMARSSH project.

2.13.5 Jeppesen strongly recommended to the meeting that wherever possible, the AIRAC publication schedule for major changes should be moved from the current 56 days to 84 days with the objective of reaching recipients 70 days in advance of an effective date, rather than the current 42 days.

2.13.6 The meeting was also urged to consider the merits of distributing advance notification of AIS data associated with major changes, by means of Email or website notification in addition to the regular means of notification.

Agenda Item 3: Future Action Plan

3.1 An Action Plan was developed and agreed to capture outstanding issues which still need to be address. The Action Plan is at **Appendix F** to the Report

Agenda Item 4: Any other business

4.1 There was no other business.

5. **Date and venue of next meeting**

5.1 The meeting agreed that the one year post implementation review of the EMARSSH route structure should be held in the November/December 2003 period. The location was yet to be decided but most probably would be Bangkok, Thailand.

6. **Closure of the Meeting**

6.1 In closing the meeting, Mr. John Richardson, Chairman of the EMARSSH Task Force, thanked all participants for their attendance and their worthwhile contribution in dealing with the outstanding issues which had been raised during discussions. He expressed the view that this large task in developing a route structure across three ICAO regions as well as the implementation in less than two years from commencement, was a landmark in aviation cooperation and willingness to achieve success, not only for the aviation users but also the States who provide the service. He remarked that there were several important issues which required immediate attention mentioned in the report and urged the parties concerned to work together as in the past, to overcome these deficiencies.

6.2 Mr. Richardson advised the meeting that this would be his last meeting of EMARSSH as he intended to retire from ICAO at the end of April. He thanked all State representatives from the three ICAO Regions as well as representatives of the international aviation community for their devoted assistance in providing the experts necessary to accomplish the task. He further gave special mention to the EMARSSH Core Team whose responsibility lay in bringing the development of the EMARSSH plan together to gain the efficiencies of this large project. Without their dedicated professional assistance, this would not have been possible.

6.3 The meeting thanked Mr. Richardson for his contribution to the aviation industry, and in particular, the last 13 years of his career which he has dedicated to the ICAO Regional Offices of Cairo and Asia/Pacific and wished him a well deserved retirement, good health and prosperity.

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LIST OF WORKING PAPERS (WPS) and INFORMATION PAPERS (IPS)

WORKING PAPERS

WP No.	Agenda Items	Presented by	Subject
1		Secretariat	Provisional Agenda
2	1	Secretariat	History of EMARSSH
3	2	Thailand	ATS operational consideration for the EMARSSH Route Structure
4	2	IATA	IATA Proposals
4 Sup.	2	IATA	EMARSSH PIR-WP 4- Supplemental com survey-Appendix A
5	2	Singapore	Proposal for Enhancements
6	2	Nepal	Nepalese Air Safety Improvement Plan
7	2	IATA	IATA proposal to a Traffic Orientation Scheme for Westbound Departures to Europe

INFORMATION PAPERS

IP No.	Agenda Items	Presented by	Subject
1	-	Secretariat	List of Working and Information Papers
2	2	Jeppesen	E MARSSH Implementation – AIS Issues
3	1 & 2	Malaysia	EMARSSH Implementation in the Kuala Lumpur FIR
4	2	Malaysia	Dual Flight Planning for EMARSSH Routes
5	2	IATA	Airline Feedback on EMARSSH
6	2	Australia	Implementation of EMARSSH routes within the Australian FIRs
7	2	Pakistan	ATS Routes Interfacing/Connectivity
8	2	SITA	SITA Support of Communications for EMARSSH Routes.
9	2	Indonesia	Evaluation Implementation EMARSSH Route Phase 1 & Phase 2
10	2	India	Implementation of EMARSSH ATS Routes in Indian Airspace – Bay of Bengal Area.

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AGENDA

Agenda Item 1:	Review Implementation Actions Prior to 28 November 2002
Agenda Item 2:	Review operations after 28 November 2002
Agenda Item 3:	Future Action Plan
Agenda Item 4:	Any Other Business

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EMARSSH Post Implementation Review Meeting (PIRM)

Address by Mr Bernie Smith Chief Executive Officer, Airservices Australia

Monday 31st March 2003

Mr John Richardson, EMARSSH Task Force Chairman and representing Mr Lalit Shah, Regional Director-Asia Pacific, ICAO,

Mr Dhiraj Ramdoyal, Regional Officer (ATM), representing Mr Ahmed Zerhouni, Regional Director – Middle East, ICAO

Mr Dave Behrens, Director, Safety, Operations & Infrastructure, IATA Asia Pacific,

Distinguished Delegates, Ladies & Gentlemen,

1 Without a doubt, the last 18 months have presented the greatest threats and challenges to the safety, security and sustainability of the international aviation industry. As we meet here today, events elsewhere in the world are severely impacting on airline operators, Air Navigation Service Providers, tourism operators and our industry in general.

2 The Civil Air Navigation Organisation, the International Air Transport Association and many of the worlds leading Airlines are responding to the challenges that we are all currently facing. In the past 18 months, fuel costs have risen by up to 30% and carriers are struggling against an overall reduction in passenger numbers. The message from the carriers is clear – "we must drive the costs down".

3 Never before has there been such a demand on Air Navigation Service Providers and Airline Operators to safely deliver enhanced route capacity and operating efficiencies. This is where the International Civil Aviation Organisation (ICAO) has been able to deliver on it's principle aim which is to *"develop the principles and techniques of international air navigation and to foster the planning and development of international air transport"*

4 In particular, I refer to the initiative taken by ICAO in establishing the EMARSSH Task Force, following some initial work which had been undertaken by IATA's Joint Route Development Group. Under the Chairmanship of Mr John Richardson, the EMARSSH Task Force has delivered on the development and implementation of an enhanced ATS Route Structure between Australia, Asia, the Middle East and Europe.

5 According to IATA figures, flight times between Asia and Europe have been shortened by up to 30 minutes as well as a significant reduction in the amount of ground delays. Whilst these figures have been widely publicised, the more exciting initiative of the EMARSSH Project has been the implementation of RNP10 airspace over the Bay of Bengal and the Arabian

Sea areas. The increased route capacity in these Oceanic areas will be further enhanced through the introduction of RVSM toward the end of this year. Looking further ahead, it is quite likely that these busy Oceanic areas will see the introduction of 30/30 separation standards as a final enhancement to the EMARSSH Route Structure.

6 There is another benefit directly attributable to the EMARSSH Project – the Environment. Conservative estimates put the likely savings in fuel at somewhere in the order of 25,000 tonnes per year – and that is calculated just on the shorter routes and one would expect that these savings will be much higher, taking into consideration that more aircraft are now able to access their optimum cruise levels at a much earlier stage of flight, thanks to the enhanced route capacity provided through EMARSSH. The flow on effect in terms of reduced exhaust gas emissions is truly of benefit to all.

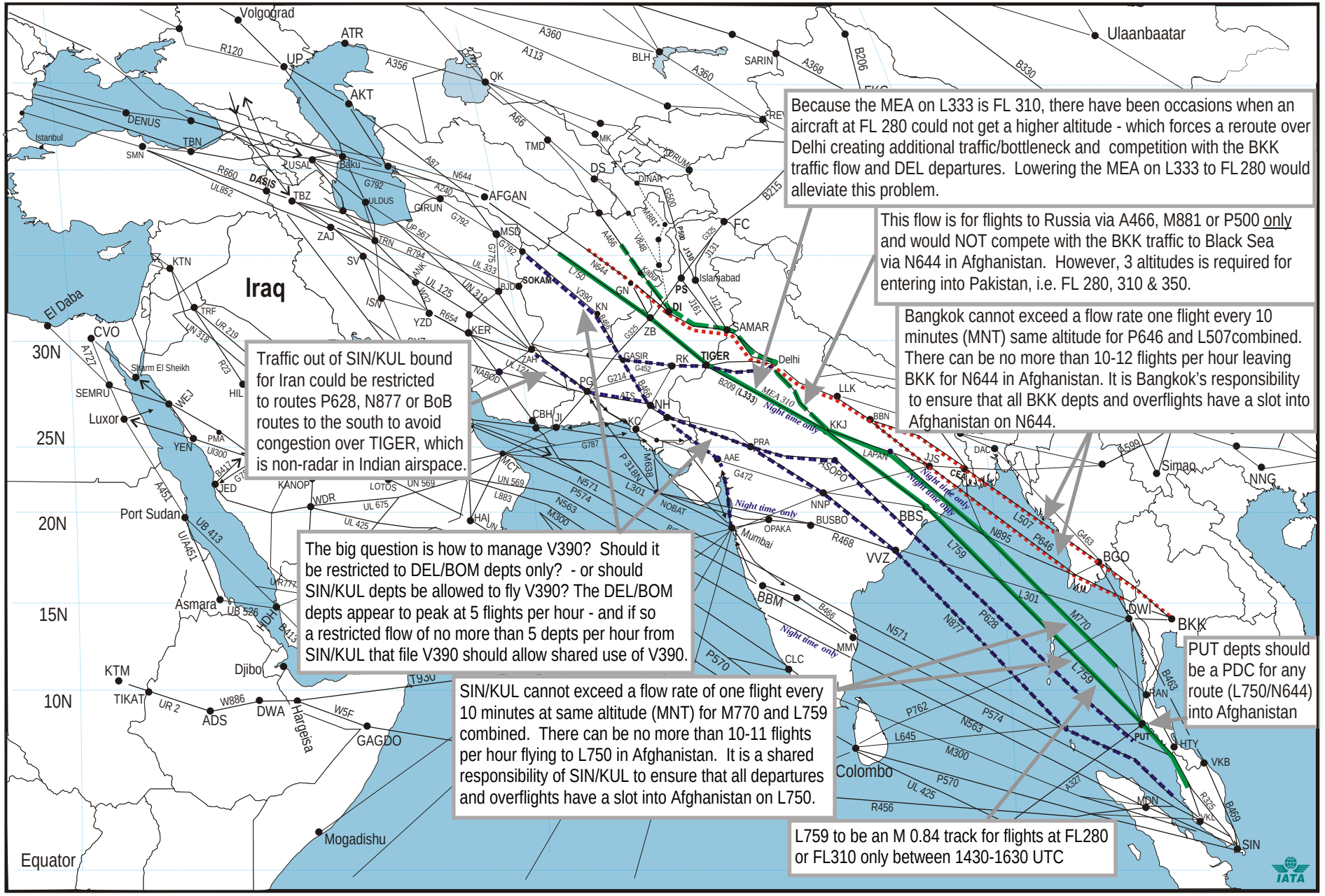
7 The EMARSSH Project is a success story and one that characterises the benefits that can be achieved through close cooperation between ICAO, the Air Navigation Service Providers, IATA and its partner airlines. We should also recognise the outstanding cooperation that has been clearly evident between the various Military and Civil stakeholders in determining the most effective alignment for these new EMARSSH routes.

8 The EMARSSH Post Implementation Review Meeting will provide all of you with the opportunity to conduct a formal review and evaluation of the Project. This has been the largest ever route overhaul in civil aviation and it is not unreasonable to expect that there may be some aspects of the implementation that will now need to be revisited in the light of the experience gained during the last four months since implementation. I am sure confident that the PIR Meeting will successfully resolve these few outstanding matters.

9 Once again, I am pleased to see the initiative being taken by ICAO in allowing this meeting the opportunity to discuss issues relating to the Contingency Routing Scheme for Asia/Middle East/Europe – 03 (CRAME-03), which I understand was developed in consultation with IATA and recently approved by the President of the ICAO Council for operations within the Middle East Region.

10 In conclusion, I wish to thank you for your dedicated participation in this meeting. I know that some of you have travelled many miles to be here with us today and for some, this journey has not been made without some difficulties. For the time being, you are a guest in our country, welcome to Australia and please enjoy this wonderful Gold Coast weather.

11 On behalf of Airservices Australia, I have much pleasure in officially opening the EMARSSH Post Implementation Review meeting and I would also like to take this opportunity to wish you well with your deliberations and discussions and above all, I wish you a safe and happy journey home to your loved ones. Thank you.



Appendix E - IATA proposal for Traffic Orientation Scheme

PROPOSED CHANGES TO CURRENT ROUTE STRUCTURE – TASKS ASSIGNED

	ACTION ITEM	TIME FRAME	RESPONSIBLE PARTY	REMARKS
1.	Review the route description of L333 to include FL280	4 Weeks	India	Report to ATS/AIS/SAR SG
2.	(Add new words re India) Establishing a new route linking ASOPO to RK	4 Weeks	India and Pakistan	Report to ATS/AIS/SAR SG
3.	Create a procedure whereby a fixed mach number requirement is applied on a route	4 Weeks	All concerned States, ICAO and IATA	Report to ATS/AIS/SAR SG
4.	The development of a westbound flow management plan	2 Months	All concerned States, ICAO, IFATCA, IFALPA, IATA and ATS/AIS/SAR SG	Report to ATS/AIS/SAR SG
5.	Pursue additional flight levels in Kabul FIR	4 months	ICAO	Report to ATS/AIS/SAR SG
6.	Investigate the capability of some flights climbing to FL350 before Kabul FIR	4 months	IATA and airlines	Report to ATS/AIS/SAR SG
7.	Pursuit of consistent application of proper MNT	2 months	All concerned States	Emphasis on the faster in back application To provide updates to the ATS/AIS/SAR SG
8.	Follow-up implementation of BB17 and BB18 with States concerned	4 months	All concerned States	Two additional EMARSSH proposed routes which need further examination