

INTERNATIONAL CIVIL AVIATION ORGANIZATION



**REPORT OF THE SECOND MEETING OF THE
ADVANCED INTER-REGIONAL ATS ROUTE DEVELOPMENT TASK FORCE
(AIRARD/TF/2)**

ASTANA, KAZAKHSTAN, 26 – 27 OCTOBER 2017

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

Approved by the Meeting and published by the
ICAO Asia and Pacific Office, Bangkok,
ICAO Middle East Office, Cairo and the
ICAO European and North Atlantic Office, Paris

AIRARD/TF/2
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INTRODUCTION

Meeting

1.1 The Second Meeting of the Advanced Inter-Regional Air Traffic Services Route Development Task Force (AIRARD/TF/2) was kindly hosted by the Kazakhstan Civil Aviation Authority at Astana, Kazakhstan, from 26 to 27 October 2017.

Attendance

2.1 The meeting was attended by 53 participants from 17 States and three International Organizations, including Armenia, Azerbaijan, Estonia, Finland, India, Islamic Republic of Iran (I. R. Iran), Iraq, Kazakhstan, Kyrgyzstan, Mongolia, Norway, Russian Federation, Sweden, Turkey, Ukraine, United States, Uzbekistan, EUROCONTROL, IATA and ICAO and two flight plan service providers. A list of participants is provided at **Appendix A** to this Report.

Officers and Secretariat

3.1 Mr. Len Wicks, Regional Officer Air Traffic Management (ATM), ICAO Asia and Pacific (APAC) Office and Mr. Elie El Khoury, Regional Officer ATM, ICAO Middle East (MID) Office provided Secretariat support to the meeting. They were supported by Ms. Patricia Cuff, Technical Assistant, ICAO European and North Atlantic (EUR/NAT) Office.

Language and Documentation

4.1 The working language of the meeting was English for all documentation and this Report. Translation into English was provided by meeting participants when the meeting was addressed in the Russian and Chinese languages by delegates.

4.2 A total of fifteen working papers (WP), six information papers (IP), three presentations and one Flimsy were considered by the meeting. The list of WPs and IPs is attached at **Appendix B** to this report (IP01).

Opening of the Meeting

Meeting Modalities

5.1 The AIRARD/TF Co-Chairs Mr. Ahmad Kavehfiroz, Deputy Director of Tehran Area Control Centre (ACC), I. R. Iran and Mr. Wiedo Mulder, Flight Support Manager, Middle and Far East Airport and Routes, ATM, KLM Airlines welcomed everyone to the meeting.

REPORT ON AGENDA ITEMS

Agenda Item 1: Adoption of Provisional Agenda

Tentative List of Working and Information Papers (IP01)

1.1 The tentative list of Working and Information Papers was noted by the meeting.

Provisional Agenda (WP01) and AIRARDTF Agenda Comment (WP02)

1.2 The provisional agenda was read in conjunction with Flimsy 1 from the ICAO APAC Office, which proposed changes to the agenda in response to WP02 (withdrawn by EUROCONTROL). After discussion, the meeting adopted a revised agenda (shown by **highlight**) as follows:

- Agenda Item 1: Adoption of Provisional Agenda
- Agenda Item 2: Background, Concept and Drivers
- Agenda Item 3: ~~Performance Frameworks and Metrics~~ Short/Medium Term Inter-Regional Route Developments
- Agenda Item 4: ANS and Aircraft **Capability and** Performance Expectations
- Agenda Item 5: Identification of Key Stakeholders and Actions (Gap Analysis, etc.)
- Agenda Item 6: Free Route Airspace Concept Implementations ~~within the EUR Region~~
- Agenda Item 7: ~~Duplicated SLNCs~~ Aeronautical Data and Other Relevant ~~Related~~ ATM Safety Issues
- Agenda Item 8: Any Other Business
- Agenda Item 9: Task List
- Agenda Item 10: Date and Venue of Next Meeting

Agenda Item 2: Background, Concept and Drivers

2.1 IP02 provided the Report from the First Meeting of the Advanced Inter-Regional Air Traffic Services Route Development Task Force (AIRARD/TF/1, Tbilisi, Georgia, 21 October 2016) as background information for the meeting.

Agenda Item 3: Short/Medium Term Inter-Regional Route Developments

MID ATS Route Proposals (WP04)

3.1 WP04 provided an update on Air Traffic Services (ATS) route development within the MID Region, including proposals to improve the ATS route network at the interface with adjacent ICAO Regions. The MID Route Development Working Group (RDWG) had been established to support route development within the MID Region and at the AFI, APAC and EUR interfaces.

3.2 The AIRARD/TF/2 meeting reviewed route proposals developed by the RDWG (**Appendix C**), and agreed to include these in the work plan of the AIRARD/TF. The APAC Region would also update the Asia/Pacific ATS Route Catalogue accordingly.

3.3 The meeting noted that based on the outcome of the MID ATM SG/3 (Cairo, Egypt, 22-25 May 2017), EUROCONTROL approached Cyprus for their feedback on the route proposal with Egypt (SERMA-KAROL). However, no response had been received by EUROCONTROL.

3.4 The meeting noted with concern that the contingency route between Karachi and Tehran FIRs (PEKES-New Boundary Point-IDEBA-NH), agreed upon during the SCM on Afghanistan Contingency Planning (Dubai, UAE, 25 August 2016) had not been implemented.

3.5 Based on the above, the meeting invited ICAO to arrange a Special Coordination Meeting (SCM) for Egypt, Cyprus and Lebanon and a SCM for Afghanistan, Iran and Pakistan to discuss the relevant ATS Route proposals and address the ATM issues at the two interfaces and provide feedback to the AIRARD TF/3 meeting.

Agenda Item 4: ANS and Aircraft Capability and Performance Expectations

Asia/Pacific Seamless ATM Plan Performance Expectations (WP05)

4.1 The ICAO APAC Office provided a summary of the performance framework expected by the Asia/Pacific Seamless ATM Plan within the APAC Region, which could be modified for purpose and utilized as planning principles for PBN Highways.

4.2 The meeting discussed the performance expectations in WP05 in terms of the minimum communication, navigation, surveillance and ATM standards that would be necessary where PBN Highways were being implemented (except where Free Route Airspace was in place or being planned). The meeting agreed with the performance expectations at **Appendix D**, with the exception of the RNP2 navigation specification used by the APAC Region.

4.3 EUROCONTROL commented that RNAV5 was the standard en-route specification used in Europe, and that this was part of the EUR Air Navigation Plan. IATA asked for clarification as to the benefit of RNP 2. Noting that the PBN Highways concept was not planned to be implemented until at least 2022 and RNP 2 was expected to be commonly utilised by then, ICAO APAC recalled that RNP2 was a much higher performing navigation specification than RNAV5 because:

- RNP 2 required a database and waypoint sequencing (unlike RNAV5), which together with on-board monitoring provided greater track-keeping assurance;
- RNP 2 required a Global Navigation Surveillance System (GNSS) sensor input, unlike RNAV 5, which normally relied on a terrestrial navigation aid-rich environment and the correct geometry of those aids to service the entire route;
- RNP 2 had been proven to allow route spacing as close as 8NM within airspace served by ATS surveillance and 15NM without ATS surveillance, providing major benefits for airspace designers and users;
- RNP 2 was not dependent on ATS surveillance, so may provide a safety mitigation for potential ATS surveillance outages.

4.4 The meeting also noted the human performance expectations in AIRARD/TF/2/WP05; in particular, the need for training of controllers to ensure the correct application of ATS surveillance-based separations and tactical measures.

4.5 The Russian Federation commented that they would need to conduct further analysis of the PBN Highway concept.

Iraq ATM Developments (WP06)

4.6 WP06 provided a brief summary of recent ATM developments in Iraq, including ATC automation and surveillance upgrades. The enhanced ATM capability was expected to enable a major increase in trans-regional overflights of Iraq.

4.7 The meeting recognised the efforts of Iraq to enhance ATM capability. The meeting also noted that there would be trans-regional effects from the changes in air traffic flow resulting in overflight of Iraq.

4.8 The meeting noted that some airspace users might resume operations through Baghdad FIR in case the FAA relaxed the prohibition posed on the US air carriers. Accordingly, the meeting encouraged States concerned to work collaboratively toward safe and efficient accommodation of the rerouted traffic via Iraq Airspace.

Radar Longitudinal Separation (WP07)

4.9 The meeting emphasised that the horizontal separation minimum based on radar and/or ADS-B and/or MLAT systems shall be 5 NM.

4.10 The meeting noted that the applicable longitudinal separation in a surveillance environment at the interfaces between MID/EUR and MID/APAC had been affecting the efforts to reduce the longitudinal separation to 10 NM within the ICAO MID Region (i.e. 50 NM between Karachi and Tehran ACCs, 30 NM between Cairo and Nicosia ACCs, etc.). Accordingly, the meeting requested ICAO to include the subject in the agenda of the SCMs.

4.11 The meeting requested ICAO APAC to urge Pakistan to implement a minimum spacing of 20NM longitudinally between the Karachi and Tehran Flight Information Regions (FIRs), instead of the 50NM requirement currently in place.

4.12 The ICAO APAC Office recalled that the Asia/Pacific Seamless ATM Plan's performance expectations for minimum horizontal separation at Transfer of Control (TOC) points between FIRs was between 5 – 10NM (dependent on ATS surveillance capability), to allow tactical measures such as coordinated vectoring when required.

EUR/MID Interface SSR Code Issues (WP08)

4.13 In WP08 the ICAO MID Office highlighted Secondary Surveillance Radar (SSR) Code issues at the EUR/MID interface. According to the MIDANPIRG/15 (Bahrain, 8 – 11 June 2015), *Conclusion 15/23 MID SSR Code Management Plan (CMP)*, States should comply with the procedures included in the MID SSR CMP and report any interference or conflict cases.

4.14 The meeting noted actions being taken to minimise SSR Code interference at the interface between the ICAO EUR and MID Regions, in particular regarding codes used by Greece, Libya and Malta. The meeting urged States at the interface between EUR/MID report interference/conflict cases, if any, to the relevant Regional Office related to the misuse of SSR codes, and support as deemed necessary a review of the initial 2009 SSR Code Allocation Study.

4.15 The meeting noted that there was a need to coordinate assistance between the EUR/NAT, MID and APAC Offices regarding SSR code allocation issues.

ATFM Implementation in the MID Region (IP02)

4.16 The ICAO MID Office presented an update related to Air Traffic Flow Management (ATFM) implementation in MID Region. IP02 described the MIDANPIRG/16 (Kuwait, 13-16 February 2017) *Decision 16/6* to establish an ATFM Task Force, so ATFM measures and operational capability such as Cross Border Arrival Management (XMAN) could manage rapidly growing traffic volumes in the MID Region, and special events like the World Cup 2022.

4.17 The main task of the MID ATFM Task Force was the development of an ATFM Concept of Operation for the MID Region. The first meeting of the ATFM Task Force was tentatively planned to be held in Muscat, Oman either from 16-22 February or from 15-19 April 2018.

4.18 India provided a presentation (PPT01) entitled Traffic Analysis – Indian Airspace. The presentation discussed the challenges of traffic growth in South Asian airspace and some of the initiatives undertaken by India to manage this, such as RNP2 routes.

Agenda Item 5: Identification of Key Stakeholders and Actions (Gap Analysis, etc.)

Next Steps (WP09) and PBN Highways GIS Project (WP10)

5.1 The ICAO APAC Office presented information on the possible steps to implement the PBN Highways initiative. The meeting agreed to the basic project management steps outlined in WP09.

5.2 Regarding Step 1 (*assignment of a project manager for each PBN Highway and identification of concerned project members*), the AIRARD/TF/2 noted that this action was not yet able to be undertaken because IATA's assessment of data to identify the optimum pathways had not been completed (reference Task List 1/2).

5.3 ICAO HQ apprised the AIRARD/TF/2 on matters related to Step 2 (*using the optimum pathway and advanced Geographic Information Systems (GIS) to determine the most appropriate terminal or congested airspace entry/exit gates and the draft amended PBN Highway necessary to avoid obstacles or reduce ATM complexity*).

5.4 A request for funding had been developed internally within ICAO, in order to support the initial GIS work for the proof-of-concept trials. In this regard, WP10 provided information on a possible funding source for initial development and trials of the PBN Highway concept.

5.5 IATA and airlines were invited to assist the development of PBN Highways, particularly with regard to research on the possible benefits, including financially and environmentally, in order to provide States with information that assists decision-makers in both the civil and military parts of government. IATA was also urged to consider a financial partnership with other key stakeholders, in order to retain sufficient funding for on-going PBN Highway development work after any proof-of-concept trials.

5.6 States are also invited to consider the financial and environmental benefits for their airlines and those that pass through their airspace, which supports the development of the economy and assists States to meet their obligations with regard to:

- UN Sustainable Development Goals (SDGs); and
- environmental targets such as under the Paris Agreement (Paris Climate Accord).

5.7 IATA made two presentations to the AIRARD/TF, in order to provide more information on airspace user needs for long range operations:

- PPT02 User Preferred Routes Core between Europe and SE Asia; and
 - PPT03 Operational Improvements Across Major Traffic Flows.
-

Agenda Item 6: Free Route Airspace Concept Implementations

User Preferred Routes – North America (WP03)

6.1 IATA presented information on the development of Free Route Airspace (FRA) within North America. The meeting recalled that improved operations through enhanced en-route trajectories was an Aviation Safety Block Upgrade (ASBU) Block 0 module. Point-to-Point navigation in North America above FL290 is triggered by insertion of ‘NRP’ in Field 18 of the ICAO flight plan. Planning a PBN trajectory from the end of the SID to the waypoint anchoring the STAR at destination is allowed but required at least one waypoint for each ACC. In the event that a NRP aircraft has to be re-cleared due to weather or tactical reasons, ATC will attempt to return the aircraft to the original NRP routing as soon as practical.

6.2 IATA commented that from experience in North America, the main barrier for FRA implementation was the need for acceptance by Air Traffic Control (ATC) in terms of culture change.

Free Route Airspace Design (IP03)

6.3 EUROCONTROL provided information on European FRA Design Procedures, focusing on the main principles of the FRA concept and requirements for Aeronautical Information Publication (AIP) publication.

Agenda Item 7: Aeronautical Data and Other Relevant ATM Safety Issues

Duplicated Five-Letter Name Codes Requiring Resolution (WP11)

7.1 The ICAO APAC Office provided a list of duplicated Five-Letter Name Codes (5LNCs) extracted from the ICAO International Codes and Route Designators (ICARD) application, and proposed resolution actions by ICAO Regional Offices and States.

5LNC Uniqueness (WP12)

7.2 WP12 aimed to raise awareness of the issue of 5LNCs uniqueness and worldwide non-compliance with Annex 11. EUROCONTROL recalled ICAO State Letter Reference: AN 11/45.5-17/101 dated 11 August 2017, which referred to the ICARD database system, and more specifically, updates to the database and 5LNC duplicate resolution rules.

7.3 The meeting noted that in the MID Region it was agreed to include in MID ANP provisions mandating the use of ICARD as the only mean for managing 5LNCs and enforcing the application of the agreed procedure for the resolving of 5LNCs duplicates.

7.4 The meeting agreed that the ICAO Regional Offices coordinate with the States concerned the resolving of 5LNCs duplicates and present progress reports to the AIRARD TF/3 meeting.

ATS Route Designators (WP13)

7.5 The ICAO MID Office presented information on appropriate procedures for allocation of ATS route designators, as prescribed by the provisions of ICAO Annex 11, Appendix 1. The meeting was informed that the MID Region had taken actions to request amendment of Annex 11 to remove the differentiation between RNAV and conventional route designators to manage the expected shortage of RNAV route designators.

7.6 Regarding the PBN objective stated in WP13 to accomplish a 100% RNAV ATS route network worldwide, the APAC Office advised that the Asia/Pacific Region was not actively changing conventional ATS route designators unless there was an operational advantage, or conventional navigation aids supporting the route were no longer available. This was due to the fact that RNAV aircraft Flight Management Systems (FMS) could operate on conventional routes as long as the aeronautical data was available in the FMS database.

7.7 Based on the above, the meeting agreed that the allocation of the additional letters and/or the Letters A, B, G, R for RNAV/Regional ATS routes could be a solution to resolve the foreseen shortage of route designators, which would hinder the implementation of PBN routes in the future. The meeting encouraged the use of the same route designator in a more effective and collaborative manner.

SIDs and STARs New Phraseology (WP14)

7.8 The ICAO MID Office highlighted the provisions of Amendment 7 to ICAO Doc 4444 related to the Standard Instrument Departures (SIDs) and Standard Terminal Arrival Routes or Standard Instrument Arrivals (STARs) radiotelephony phraseology, in order to agree on necessary measures to ensure an effective and harmonized implementation within the MID Region.

7.9 IATA expressed concern about the safety issues from an inconsistent implementation of the new standards), which had been creating confusion to pilots who had been using the old phraseologies within some FIRs and the new phraseologies in other FIRs. The meeting noted that an Initial MID Region Transition Plan for the implementation of the SIDs and STARs new phraseology would be developed and presented to the MID ATM SG/4 meeting (Cairo, Egypt, 29 April-3 May 2018) for endorsement.

Implementation of New SID STAR Phraseologies (IP04)

7.10 The ICAO APAC Office provided information on the Asia/Pacific Region's new SID/STAR radiotelephony phraseology implementation strategy.

Agenda Item 8: Any other business

Civil Military Cooperation (IP05)

8.1 ICAO recalled the importance of civil/military cooperation regarding the optimisation of ATS route networks. IP05 noted the establishment of joint civil/military coordination entities for airspace organization and management was essential for the effective implementation of the Flexible Use of Airspace (FUA) concept, which enabled FUA by optimising airspace access when available. Moreover, air transport infrastructure like new airports supported economic development.

8.2 The meeting noted that the Workshop on Civil/Military Cooperation organized jointly by ICAO (MID and EUR/NAT Offices), Arab Civil Aviation Commissions (ACAC) and CANSO would be held in Algiers, Algeria (26 – 28 March 2018) and would include a session on free route concept. Accordingly, the meeting encouraged States and stakeholders to actively participate in the Workshop.

Agenda Item 9: Task List

Terms of Reference

9.1 The AIRARD/TF draft Term of Reference (TOR, **Appendix E**) had been endorsed by the MID Region but would also be presented to the ATM Groups in the EUR/NAT and APAC Regions for endorsement.

AIRARD/TF Task List (WP15)

9.2 The Task List was reviewed by AIRARD/TF/2, as appended in **Appendix F**.

Agenda Item 10: Date and Venue of Next Meeting

10.1 AIRARD/TF/3 was tentatively planned to be held at the ICAO MID Regional Office in Cairo, Egypt 29 – 30 April 2018, in conjunction with the MID ATM/SG/4 meeting.

Closing

10.2 The Co-Chairs thanked participants for their contributions and closed the meeting.

AIRARD-TF/2
Astana, Kazakhstan, 26-27 October 2017

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ESTONIA

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Teppo ASANTI

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Appendix B to the Report

LIST OF WORKING AND INFORMATION PAPERS

Working Papers

No.	Agenda	Subject	Presented by
01	1	Provisional Agenda	ICAO APAC
02	1	AIRARDTF Agenda Comment (withdrawn)	EUROCONTROL
03	6	User Preferred Routes – North America	IATA
04	3	MID ATS Route Proposals	ICAO MID
05	4	Asia/Pacific Seamless ATM Plan Performance Expectations	ICAO APAC
06	4	Iraq ATM Developments	Iraq
07	4	Radar Longitudinal Separation	ICAO MID
08	4	EUR/MID Interface SSR Code Issues	ICAO MID
09	5	Next Steps	ICAO APAC
10	5	PBN Highways GIS Project	ICAO APAC
11	7	Duplicated Five-Letter Name Codes Requiring Resolution	ICAO APAC
12	7	5LNC Uniqueness	ICAO EUR/NAT; EUROCONTROL
13	7	ATS Route Designators	ICAO MID
14	7	SIDs and STARs New Phraseology	ICAO MID
15	9	AIRARD/TF Task List	ICAO APAC

Information Papers

No.	Agenda	Subject	Presented by
01	–	Tentative List of Working and Information Papers	ICAO APAC
02	4	ATFM Implementation in the MID Region	ICAO MID
03	6	Free Route Airspace Design	EUROCONTROL
04	7	Implementation of New SID STAR Phraseologies	ICAO APAC
05	8	Civil Military Cooperation	IATA
06	2	AIRARD/TF/1 Report	ICAO APAC

Flimsies

No.	Agenda	Subject	Presented by
01	1	WP02 ICAO Response	ICAO APAC

Presentations

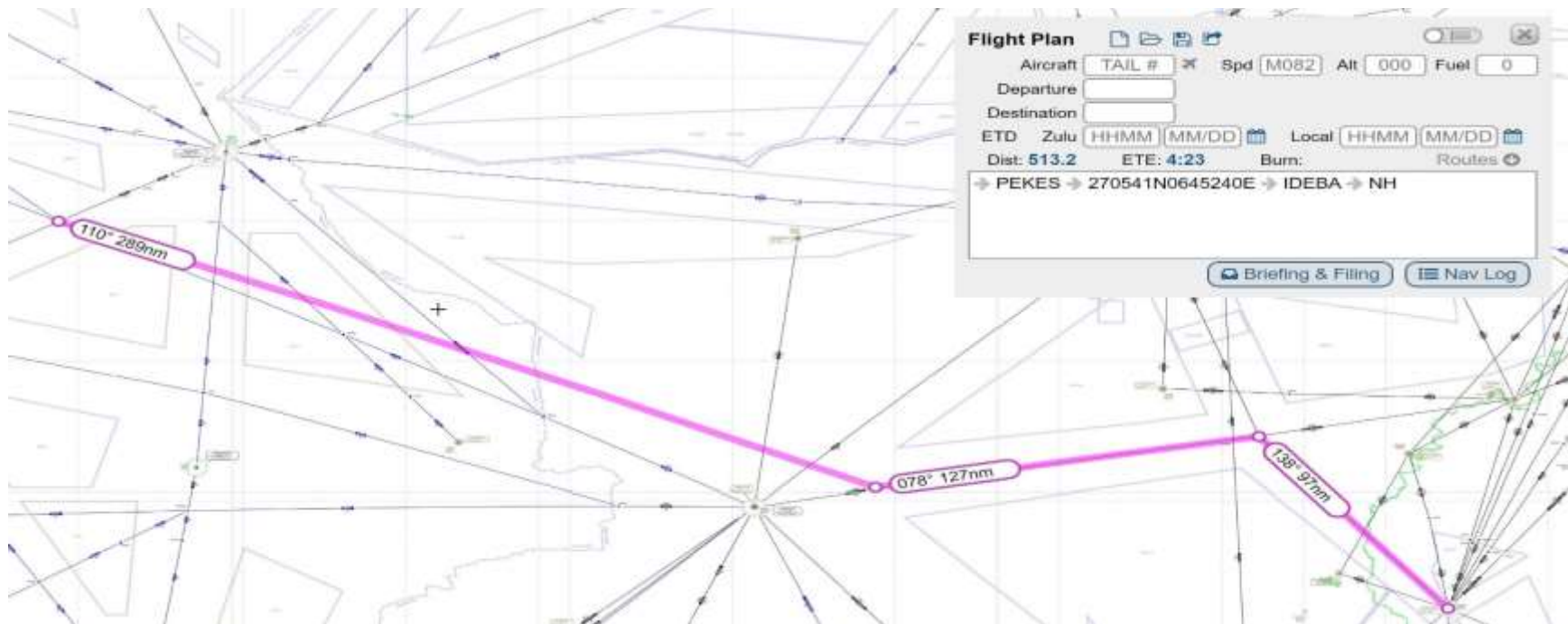
No.	Agenda	Subject	Presented by
01	4	Indian Airspace Presentation	India
02	5	User Preferred Routes Core between Europe and SE Asia	IATA
03	5	Operational Improvements Across Major Traffic Flows	IATA
04	6	European Free Route Airspace	EUROCONTROL

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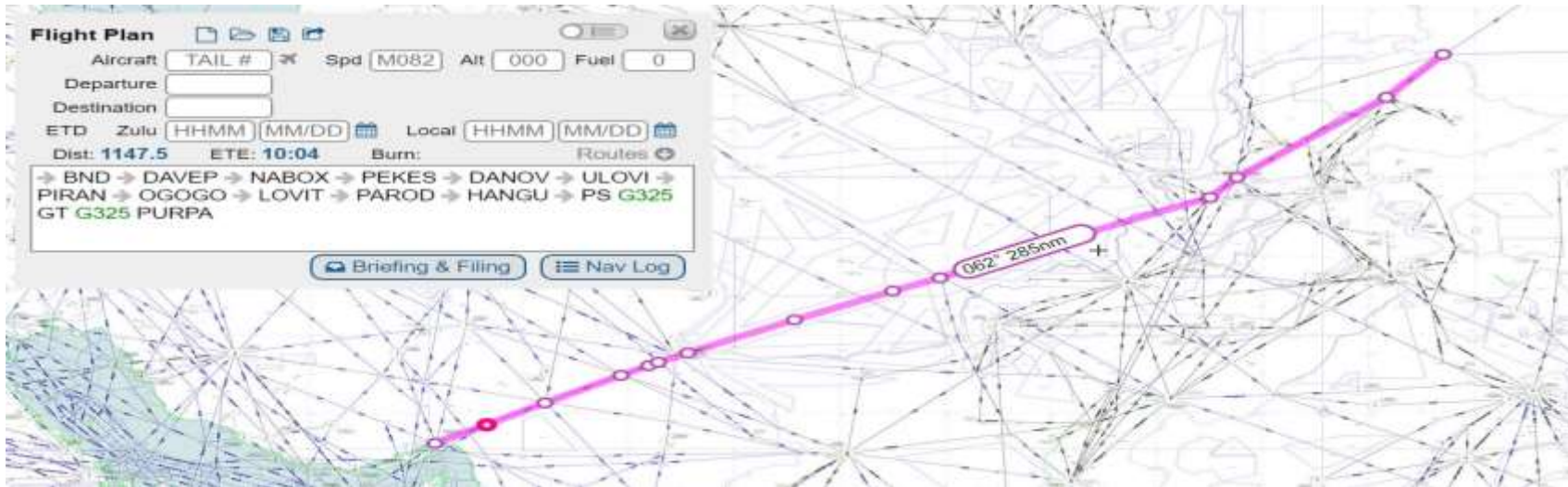
MID ATS Route Catalogue-Inter-regional

MID/RC-8	ATS Route Name: New Route	Inter-Regional Cross Reference if any	APAC	Users Priority	High	Originator/Date	RDWG/1	Last updated	New Proposal
Route Description		States Concerned	Implementation Status		MID ANP Status		Action Taken / Required		Expected time frame for each Action
PEKES-NH Flight Level Band: Bidirectional		Iran Pakistan	Not established		Not in the Plan		<ul style="list-style-type: none"> - To be addressed with Iran and Pakistan - To be presented to AIRARD TF/2 meeting 		<ul style="list-style-type: none"> - Quarter 4-2017 - Oct. 4-2017
Potential traffic flow: Europe to East through Tehran FIR.									
Justification	Agreed upon during the Afghanistan Contingency Coordination meeting								
Benefits									
Remarks	Contingency Route								



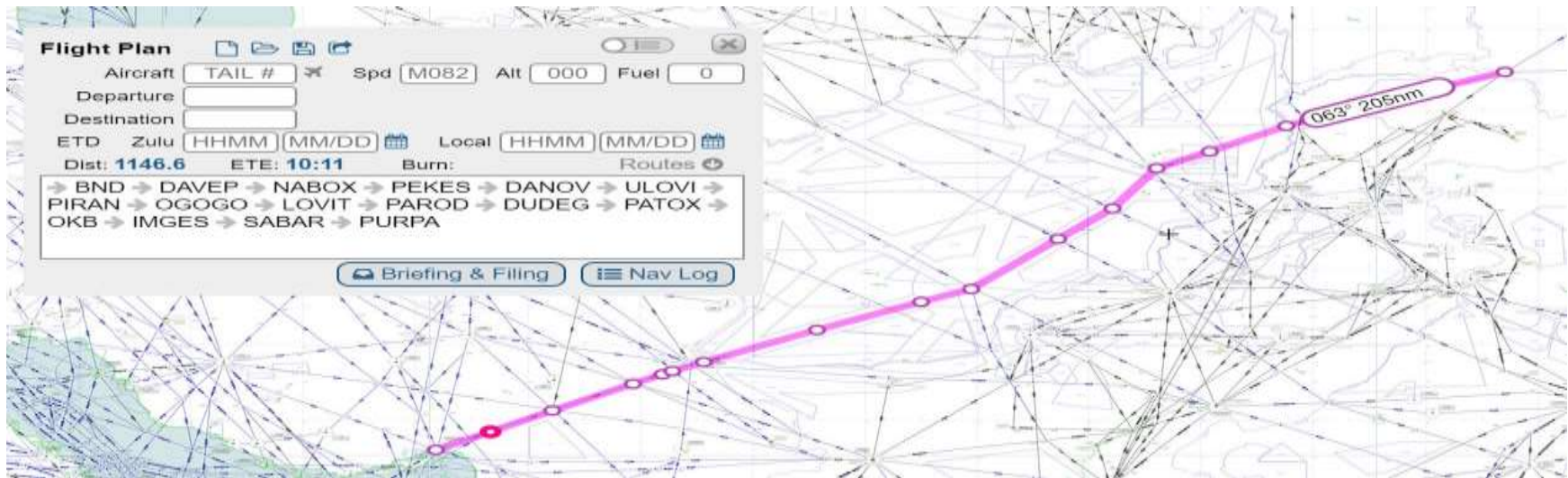
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MID/RC-9a	ATS Route Name: New Route	Inter-Regional Cross Reference if any	APAC	Users Priority	High	Originator/Date	RDWG/1	Last updated	New Proposal
Route Description		States Concerned	Implementation Status		MID ANP Status		Action Taken / Required		Expected time frame for each Action
A453-PAROD-HANGU-G325-PURPA		Afghanistan	Not Implemented		Not in the Plan		<ul style="list-style-type: none"> - To be addressed with Afghanistan. - To be addressed to the AIRARD TF/2 meeting 		<ul style="list-style-type: none"> - Quarter 4-2017 - Oct. 2017
Flight Level Band: FLAS TBD									
Potential traffic flow: Gulf Traffic from/to Fareast									
Justification		Fuel and CO2 reduction							
Benefits		Distance reduction between 72nm to 84nm							
Remarks		9a and 9b are high priority. However, in case only one option could be implemented 9a has preference							



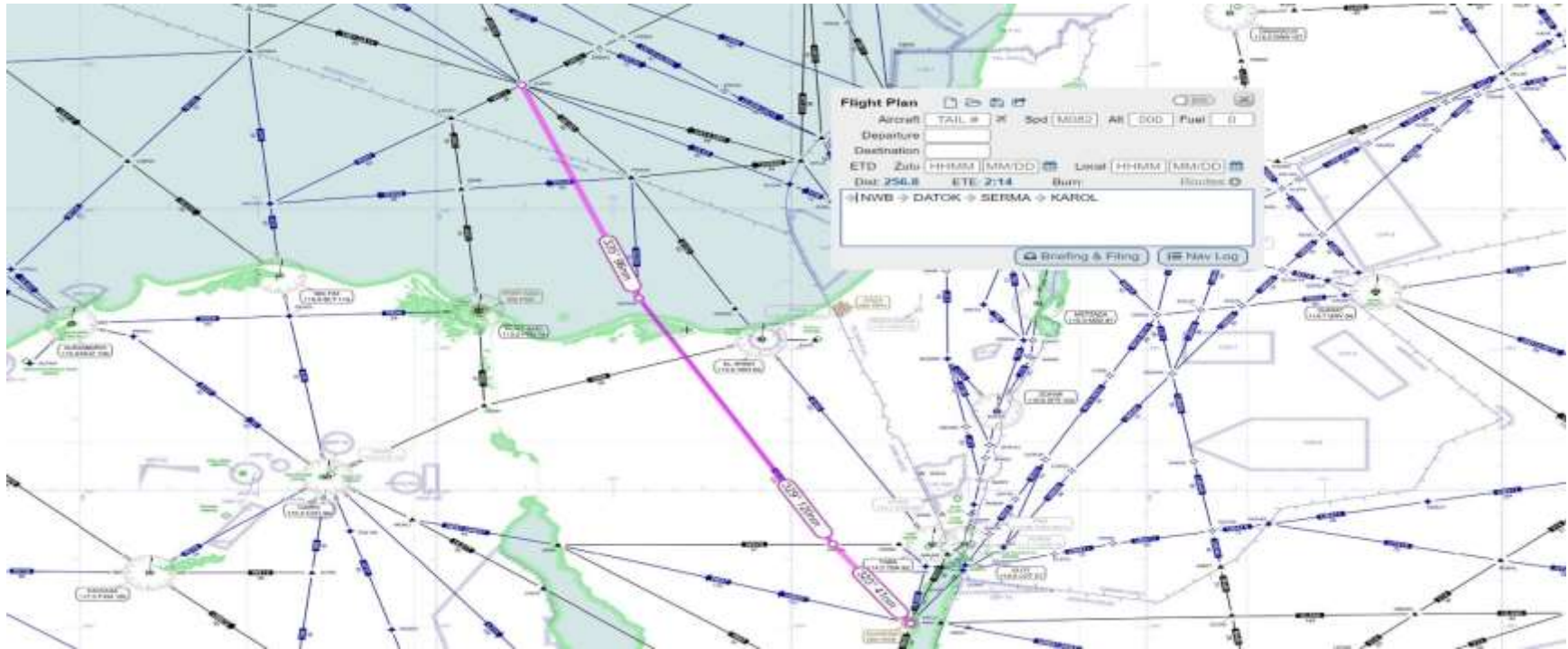
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MID/RC-9b	ATS Route Name: New Route	Inter-Regional Cross Reference if any	APAC	Users Priority	High	Originator/Date	RDWG/1	Last updated	New Proposal
Route Description		States Concerned	Implementation Status		MID ANP Status		Action Taken / Required		Expected time frame for each Action
A453-PAROD-DUDEG-PATOX-OKB-IMGES-SABAR then G206 to PURPA Flight Level Band: FLAS TBD		Afghanistan	Not Implemented		Not in the Plan		<ul style="list-style-type: none"> - To be addressed with Afghanistan. - To be addressed to the AIRARD TF/2 meeting 		<ul style="list-style-type: none"> - Quarter 4-2017 - Oct. 2017
Potential traffic flow: Gulf Traffic from/to Fareast									
Justification	Flights from Saudi Arabia/UAE/Iran/Doha/Bahrain to destination Far East can be benefited significantly with the as the total mileage of the route decrease by approx. 90 NM								
Benefits	12 Minutes and 3300 Kg of Fuel per flight								
Remarks	9a and 9b are high priority. However, in case only one option could be implemented 9a has preference								



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MID/RC-10	ATS Route Name: New Route	Inter-Regional Cross Reference if any	EUR	Users Priority	High	Originator/Date	ATM SG/2 Dec 2015	Last updated	May 2017
Route Description		States Concerned	Implementation Status		MID ANP Status		Action Taken / Required		Expected time frame for each Action
NWB-DATOK-SERMA-KAROL Flight Level Band: FLAS TBD		Cyprus Egypt	Not Implemented		Not in the Plan		- To be addressed with Egypt and Cyprus		- Quarter 4-2017
Potential traffic flow: Gulf Traffic to Cyprus, Lebanon and EUR									
Justification	Would facilitate the implementation of 10 or 15 NM longitudinal separation between Cairo and Jeddah ACCs.								
Benefits									
Remarks	NWB-DATOK (J981 currently suspended)								



-END-

PBN HIGHWAYS PERFORMANCE EXPECTATIONS

States should consider the following performance expectations where PBN Highways are being implemented (excepting where Free Route Airspace is in place or being planned):

COM

1. ATM systems should enable **AIDC** (version 3 or later, or the OLDI equivalent) between ATC units where transfers of control are conducted unless alternate means of automated communication of ATM system track and flight plan data are employed. The following AIDC messages types should be implemented:
 - Advanced Boundary Information (ABI);
 - Coordinate Estimate (EST);
 - Acceptance (ACP);
 - TOC; and
 - Assumption of Control (AOC);
2. Direct **speech circuits** or digital voice communications, meeting pre-established safety and performance requirements, and appropriate handoff procedures should be implemented between controllers providing ATS surveillance in adjacent airspace. All States should upgrade their ATM voice communication systems or implement analogue/digital VoIP converters in compliance with the EUROCAE ED-137 standards (interoperability standards for VOIP ATM components);
3. **Air-ground communication systems** and the performance of those systems, should support the capabilities of PBN navigation specifications (RNP 2) and ATC separation standards applicable within the airspace concerned;

SUR

4. ADS-B (using 1090ES) or MLAT or radar **surveillance systems** should be used to provide coverage of all upper airspace. Data from ATS surveillance systems should be integrated into operational ATC aircraft situation displays (standalone displays of ATS surveillance data should not be used operationally). Subject to appropriate filtering, ATS surveillance data, particularly from ADS-B, should be shared with all neighbouring ATC units;
5. Unless supported by alternative means of ATS surveillance (such as radar, where there are no plans for ADS-B), all upper controlled airspace should be designated as non-exclusive or exclusive as appropriate **ADS-B airspace** requiring operation of ADS-B using 1090ES with DO-260/260A and 260B capability;
6. All upper controlled airspace should require the carriage of an operable **mode S transponder** within airspace where Mode S radar services are provided;
7. In areas where ADS-B based separation service is provided, the mandatory carriage of **ADS-B OUT** using 1090ES with DO260/60A or 260B should be prescribed.
8. All upper controlled airspace wholly served by Mode S SSR and/or ADS-B surveillance should implement the use of a standard **non-discrete Mode A code** for Mode S transponder equipped aircraft to reduce the reliance on assignment of discrete Mode A SSR codes and hence reduce the incidences of code bin exhaustion and duplication of code assignment;

AIRARDTF/2

Appendix D to the Report

9. Mode S surveillance and the use of Mode S Downlinked Aircraft Parameters (**DAPS**) should be enabled in all upper airspace. ATM automation system specifications should include the processing and presentation in ATC human-machine interfaces and decision support and alerting tools, the communications, navigation and approach aid indicators received in items 10 and 18 of FPL and ATS messages, where applicable, and the following Mode S or ADS-B downlinked aircraft parameters as a minimum:

- a) Aircraft Identification;
- b) Aircraft magnetic heading;
- c) Aircraft indicated airspeed or Mach Number; and
- d) Pilot selected altitude.

Note 1: DAPS may not be present in downlinked reports from some aircraft ADS-B applications.

Note 2: Downlinking of correct Aircraft Identification (Flight ID) enables automated coupling of ATS surveillance system information with the flight plan.

10. ATS surveillance systems should enable:
- a) Short Term Conflict Alert (**STCA**)/Medium Term Conflict Alert (**MTCA**);
 - b) Area Proximity Warning **APW**;
 - c) Minimum Safe Altitude Warning **MSAW**;
 - d) Route Adherence Monitoring (**RAM**);
 - e) Cleared Level Adherence Monitoring (**CLAM**); and
 - f) where practicable, Conflict Prediction and Resolution (**CPAR**).

NAV

11. All upper controlled airspace should be designated as non-exclusive or exclusive PBN airspace as appropriate.

Note 1: Europe was utilising the RNAV 5 navigation specification, while the MID Region was using RNAV 5 and RNAV 1 for certain en-route applications; therefore, the RNP 2 navigation specification specified in the APAC Region was not able to be universally agreed at AIRARD/TF/2.

Note 2: APAC recognised a temporary equivalence for aircraft approved for RNAV 2, RNP 1 and GNSS in lieu of RNP until RNP 2 approval processes were in place.

Note 3: Non-exclusive means that non-PBN aircraft may enter the airspace, but may be accorded a lower priority than PBN aircraft, except for State aircraft.

ATM

12. The ICAO **Table of Cruising Levels** based on feet as contained in Appendix 3a to Annex 2 should be used;
13. All ATC Sectors within the same ATC unit with ATS surveillance capability should have **automated hand-off procedures** that allow the TOC of aircraft without the necessity for voice communications, unless an aircraft requires special handling;

14. All ATC units should authorise the use of the **horizontal separation** minima stated in ICAO Doc 4444 (PANS ATM), or as close to the separation minima as practicable, taking into account such factors as:
- a) the automation of the ATM system;
 - b) the capability of the ATC communications system;
 - c) the performance of the ATS surveillance system, including data-sharing or overlapping coverage at TOC points; and
 - d) ensuring the competency of air traffic controllers to apply the full tactical capability of ATS surveillance systems.

Note: the PANS ATM horizontal separation is 5NM minimum en-route.

15. The efficacy, continuity and availability of ATM services should be supported by adherence with regional planning and guidance material regarding **ATM automation** and **ATM contingency** systems;
16. Paper **flight progress strips** should not be used in automated ATM environments due to efficiency and transcription error/data mismatch issues. Electronic flight progress strips should be utilised;
17. ATM systems should be supported by digitally-based **AIM** systems through implementation of Phase 1, 2 and 3 of the AIS-AIM Roadmap in adherence with ICAO and regional AIM planning and guidance material;
18. Each component of an ATM systems should be supplied with the **meteorological information** necessary for the performance of its respective functions, including *inter-alia*, meteorological reports, forecasts, warnings alerts, advisory and briefing information;
19. Where a minimum aircraft equipage is specified, any aircraft that does not meet specified equipage requirements should receive a lower **priority**, except as prescribed (such as for State aircraft). States should require State aircraft to comply with equipage requirements as far as practicable.
20. All FIRs should implement ATFM incorporating CDM to enhance capacity, using bi-lateral and multi-lateral agreements;

**TERMS OF REFERENCE (TOR) OF
Advanced Inter-Regional ATS Route Development Task Force (AIRARD/TF)**

1. TERMS OF REFERENCE

1.1 The terms of reference of the AIRARD Task Force are to:

- a) identify requirements and improvements for achieving and maintaining an efficient route network across the ICAO APAC, EUR/NAT and MID Regions based on the airspace user needs and in coordination with stakeholders (States, International Organizations, user representative organizations and other ICAO Regions);
- b) ensure harmonized planning and implementation of ATS routes and airspace improvement projects at the interfaces between the three ICAO Regions;
- c) monitor the status of implementation of the agreed ATS routes and airspace improvement projects;
- d) in case of implementation problems, identify the associated difficulties and propose/agree to solutions to further progress with the implementation;
- e) review and amend the components of the ATS route structure and airspace description in order to ensure their compliance with ICAO provisions (e.g. five-letter name-code (5LNC) uniqueness, ATS route designators, WGS-84 coordinates, flexible use of airspace (FUA) implementation);
- f) discuss and support the implementation of new concepts, such as the PBN Highway concept;
- g) determine the CNS requirements, interoperable entry/exit points or areas, connections into the TMAs, weather related issues, terrain aspects, airspace organisation which would be needed in order to support the implementation of the new concepts;
- h) achieve common understanding and support from all stakeholders involved in or affected by the ATM developments/activities in the three ICAO Regions; and
- i) use the AIRARD/TF meetings as a forum for bilateral and multilateral discussions (such as review of ANS Letters of Agreements).

1.2 In order to meet the Terms of Reference, the AIRARD Task Force shall:

- a) Discuss and review the ATS route network and airspace improvement projects which involve States (including the Military) and all aviation stakeholders (airspace users, international organisations and Computer Flight Plan Software/Service Providers (CFSPs)) across the three Regions;
- b) propose a strategy and prioritized plan for development of improvements to the route network and/or airspace structure, highlighting:
 - areas that require immediate attention (solution of safety, capacity or complexity constraints);
 - interface issues with adjacent ICAO Regions;
- c) monitor and report on the implementation status of the prioritized plan;
- d) develop a roadmap for the implementation of new concepts such as the PBN highways;

- e) develop a working depository for route proposals that will be used as a dynamic reference document for ongoing discussions on routes under development/modification. In this respect, the Task Force should explore the utility that can be realized from the route catalogue concept/ATS routes database; and
- f) address CNS and ATM interface issues with other regions and make specific recommendations to achieve a harmonized and interoperable environment in the interface areas between the regions.

2. In order to effectively perform its tasks and responsibilities:

- a) The AIRARD TF shall elect Co-Chairpersons (one from a State and one from the airspace users) for a cycle of three meetings, unless otherwise re-elected.
- b) The TF shall meet at least once a year and/or when deemed necessary.
- c) The TF meetings should be hosted by its members on rotation basis.
- d) The TF shall report to the relevant ATM Groups in the APAC and MID Regions under the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG), the European Air Navigation Planning Group (EANPG), North Atlantic Systems Planning Group (NAT SPG) and the Middle East Air Navigation Planning and Implementation Regional Group (MIDANPIRG).

3. COMPOSITION

The AIRARD Task Force is composed of:

- a) States from APAC, EUR/NAT and MID Regions, or States providing services in the APAC, EUR/NAT and MID Regions;
- b) concerned International and Regional Organizations; and
- c) other representatives from provider States and Industry may be invited on ad hoc basis, as observers, when required.

Draft – to be endorsed by APANPIRG and EANPG
Endorsed by MIDANPIRG

AIRARD/TF — TASK LIST

(Last update 27 October 2017, amendments are shown in highlight)

ACTION ITEM	DESCRIPTION	TARGET DATE	RESPONSIBLE PARTY	STATUS	REMARKS
1/1	IATA nomination for industry Co-Chair to be submitted within one month of the AIRARD/TF/1	01 April 2017	IATA	OPEN CLOSED	Mr. Wiedo Mulder nominated as Co-chair
1/2	IATA advised the meeting that they would study the PBN Highway concept and provide data and analysis to the AIRATD/TF/2	AIRARD/TF/2-3	IATA	OPEN	
1/3	The draft TOR would be circulated among the Secretariat and the Co-Chairs, then presented to the ATM Groups in the EUR/NAT, MID and APAC Regions for consideration	AIRARD/TF/2-3	ICAO EUR/NAT/MID/APAC, Co-Chairs, ATM Groups	OPEN	
2/1	Update the Asia/Pacific ATS Route Catalogue with the MID proposals from AIRARD/TF/2/WP04 and the EUR/NAT proposal from RDGE/27.	01 December 2017	ICAO APAC	OPEN	
2/2	AIRARD/TF to review the MID proposals from AIRARD/TF/2/WP04	AIRARD/TF/3	ICAO MID	OPEN	
2/3	Special Coordination Meetings (SCMs) should be held between EUR/NAT and MID States, and between MID and APAC States to discuss MID trans-regional ATS route proposals	AIRARD/TF/4	ICAO APAC, ICAO EUR/NAT, ICAO MID, IATA States concerned	OPEN	
2/4	Coordinate assistance between the EUR/NAT, MID and APAC Offices regarding SSR code allocation issues	AIRARD/TF/3	ICAO APAC, ICAO EUR/NAT, ICAO MID	OPEN	
2/5	ICAO Regional Offices coordinate with the States concerned the resolving of 5LNCs duplicates and present progress reports	AIRARD/TF/3 and 4	ICAO APAC, ICAO EUR/NAT, ICAO MID	OPEN	