*International Civil Aviation Organization*

**Tenth Meeting of the APIRG Air Traffic Services, Aeronautical Information Services and Search and Rescue Sub-Group**
**[Dakar, Senegal 12– 15 May 2009]**

**Agenda Item 8:** **Review of the ATS route network, including updating of the AFI ANP Table ATS1 (ICAO Doc 7474)**

*(Presented by the International Air Transport Association)*

| SUMMARY |
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| This paper addresses the implementation of the ATS route network, and highlights the need for a comprehensive review and rationalization of the air route structure in the AFI Region. |
| References:<br><br>• APIRG/14, APIRG/15, APIRG/16 Reports.<br>• SP AFI 2008 Report.<br>• AFI Air Navigation Plan (ICAO Doc 7474) |

**1.     Introduction**

1.1.     In order to accommodate traffic demand in the Region, the AFI Planning and Implementation Regional Group (APIRG) has adopted a number of conclusions related to the implementation of air routes, as defined in the Air Navigation Plan (ICAO Doc 7474). **Appendix A** to this paper reproduces APIRG Conclusions *14/19, 15/27, 15/28* and *16/46*. With some exceptions, most of the recommended air routes have not been implemented as of yet. Meanwhile, airspace users have identified new ATS route requirements with potential savings (flight times, fuel burn, CO2 emission), which need to be addressed, mindful of the aviation industry crisis.

**2.     Discussion**

**Traffic Statistics and Forecast**

2.1.     Table below provides AFI regional traffic forecasts for 2004 – 2020 for each of the six (6) routing areas defined in the Region, as contained in ICAO Doc 9879.

| Area of routing | | 2005 | 2020 | Growth % 2005-2020 |
|---|---|---|---|---|
| AR1 | Europe - South Atlantic (EUR/SAT) oceanic routes | 26203 | 53820 | 4.9 |
| AR2 | Atlantic Ocean interface between AFI, NAT and SAM | 2029 | 5000 | 6.2 |
| AR3 | Europe - Eastern Africa routes including the area of the Indian Ocean (EUR/AFI East) | 46268 | 84522 | 4.1 |
| AR4 | Europe - Southern Africa routes (EUR/AFI South) including Continental Southern Africa routes | 77995 | 138208 | 3.9 |
| AR5 | Continental Western Africa routes including coastal areas | 39935 | 201923 | 11.4 |
| AR6 | Trans-Indian Ocean area interface with ASIA/PAC Region | 4607 | 8535 | 4.2 |

2.2.     It shows that the aircraft movements will increase significantly over the next decade. The operational improvements that could address the growth include:

a)     Shortening, realignment and deletion of existing ATS routes,
b)     Implementation of user requirements for new ATS routes,
c)     Implementation of performance-based navigation (PBN),
d)     Flexible use of airspace (FUA), user preferred routes (UPR), and
e)     Introduction of random RNAV routing in selected areas.

**User Requirements for New Air Routes**

2.3.    Airpace users have developed requirements for new air routes to be established, in order to assist them in battle the industry crisis. These requirements are provided in detail in **WP/18** of this meeting. The meeting may wish to agree on ways of addressing these new user requirements, such that the expected efficiencies be achieved in the short-term.

**Implementation of PBN operations**

2.4.    The airspace users urged the Special RAN AFI 2008 (SP AFI/08) to find out expeditious ways of implementing the ATS Route Project called for by APIRG, taking into consideration the introduction of PBN operations in the Region. The SP RAN AFI/08 agreed that the PBN Task Force established by APIRG was the most suitable body to address the regional ATS route structure, and adopted its *Recommendation 6/9* (see **Appendix A**).

**Introduction of Random RNAV Routing**

2.5.    The Atlantic Ocean Random Routing Aera (AORRA) is being implemented in Areas of Routing AR-1 *(Europe - South Atlantic (EUR/SAT) oceanic routes)* and AR-2 *(Atlantic Ocean interface between AFI, NAT and SAM)*, in conformity with AFI FASID CNS/ATM System Evolution Tables, which contain a requirement for progressive introduction of random RNAV routing in selected airspace portions.  The deployment of AORRA affects existing fixed routes (such as UA302, UA572, UG433, UA560, UG853, UR991, and UL435), or portions thereof, which need to be deleted from the Air Navigation Plan.

**Need for an Implementation Mechanism**

2.6.    To support the effort, APIRG/15 had identified the need to establish an internationally funded project to review and rationalize the air traffic services (ATS) route structure in the AFI Region (*Conclusion 15/27 refers)*. It was expected that this action would enhance planning for implementation of supporting facilities and services and identify any further possible savings in flight times for users, which would translate directly into financial savings and environmental benefits.

2.7.    Arrangements are being made to set up a project as a follow up to APIRG Conclusion 15/27. However, based on experience gained in MID Region (see **Appendix D**), it is proposed that a Working Group be tasked with carrying out a comprehensive revision of the AFI ATS route network, with the terms of reference shown in **Appendix C**.

**3.      Action by the meeting**

3.1.    The meeting is invited to:

a)   Review and update as necessary the implementation status of ANP route requirements provided at **Appendix B** to this paper**;** and

b)   Agree to establish a Working Group on Air Route Network tasked with the terms of reference at **Appendix C** to this paper.

-END-

**Appendix A**

**APIRG CONCLUSION 14/19:**     **IMPLEMENTATION OF THE NON-IMPLEMENTED ROUTES INCLUDING RNAV ROUTES**

That States that have not yet done so, implement, as soon as possible and in any case not later than the AIRAC date of 10 June 2004 ATS routes in their FIR as shown in Appendix E to this report.

**APIRG CONCLUSION 15/27:**     **AIR TRAFFIC MANAGEMENT AND AIR ROUTE STRUCTURE IMPROVEMENTS**

That ICAO develop a comprehensive planning document for overall ATM and air route structure improvements in the AFI Region; through the special implementation project (SIP) mechanism, use the planning document as the basis for obtaining the funds from the donor organizations to fund the project.

**APIRG CONCLUSION 15/28:**     **FUEL EFFICIENCY MEASURES**

That States:

a) Identify, with IATA and local airlines, actions that would provide fuel efficiency;
b) Establish and promulgate a program to implement fuel efficiency measures; and
c) Nominate a "fuel champion" who would liaise with IATA, airlines, ANS providers and other stakeholders to ensure that all possible fuel conservation strategies are evaluated and implemented.

**APIRG CONCLUSION 16/46:**     **IMPLEMENTATION OF THE NON-IMPLEMENTED ROUTES INCLUDING RNAV ROUTES**

That States concerned implement the ATS routes at Appendix I as soon as possible, but not later than AIRAC date of 3 July 2008.

**APIRG RECOMMENDATION 6/9:  PERFORMANCE-BASED NAVIGATION (PBN) PERFORMANCE OBJECTIVES**

That APIRG adopt the Performance Objectives as contained in the performance framework forms in Appendix D to the Report on Agenda Item 6:

a)   Optimization of the air traffic services (ATS) route structure in en-route airspace;
b)   Optimization of the ATS route structure in terminal airspace; and
c)   Implementation of vertically guided required navigation performance (RNP) approaches.

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**Appendix B1 – APIRG/14 (2003)**

**ATS Routes in the ICAO AFI ANP (Doc. 7474) requiring implementation**

| Route Designator | Segment(s) | States | Observations/Remarks |
|---|---|---|---|
| UA293 | Ibiza | Algeria | Required Northbound |
| | Tiaret | | |
| UA411 | Jerba | Libya | Implemented at variance with the Plan via: |
| | Tripoli | | A411 - Jerba/Zawia/Tripoli/Misurata |
| | Benina | | A411N - Jerba/TANLI/Mitiga/Misurata |
| UA617 | Kinshasa | D. R. Congo | |
| | Windhoek | | |
| UA618 | SAGBU | Sudan | |
| | Malakal | | |
| UA748 | (GOZO) | Libya | |
| | Tripoli | | |
| | Mizda | | |
| UA861 | Lagos | Nigeria | |
| | Garoua | Cameroon | |
| UB525 | Addis Ababa | Sudan | |
| | Luxor | | |
| UB607 | El Obeid | Sudan | |
| | Dongola | | |
| | Abu Simbel | | |
| UG207 | Mogadishu | Somalia | |
| | Karachi | | |
| UG623 | Annaba | Algeria | Segment of the route suspended since 1980. |
| | Tebessa | Libya | |
| | Ghadames | | |
| UG855 | Tripoli | | |
| | Ghadames | | |
| | B. Omar Driss | Libya | |
| UG864 | Tunis | Algeria | |
| | Ghardaia | | |
| | Timimoun | | |
| UG979 | Bordj Omar Driss | | |
| | Bou Saada | Algeria | |
| | Zemmouri | | |
| UL612 | Goma | D. R. Congo | Egypt can accept implementation via ATMUL New Valley/KATAB/DBA |
| | El Dhaba | Sudan | |
| | | Egypt | |
| UM220 | Lodwar | | Implemented by Kenya on segment from AVAGI to Lodwar. |
| | Abu Simbel | Sudan | |
| UM665 | Addis Ababa | Sudan | |
| | Merowe | | |
| UM994 | Beni Walid | | |
| | ORNAT | Libya | RNAV |
| UM999 | Casablanca | Morocco | |
| | Errachidia | Algeria | |
| | El Golea | | RNAV |
| | Zarzaitine | | |
| | Sebba | | |
| | Sarir | Libya | |
| | New Valley | Egypt | |
| | Luxor | Sudan | |
| | Jeddah | Saudi Arabia | |

| Route Designator | Segment(s) | States | Observations/Remarks |
|---|---|---|---|
| UR400 | Abu Simbel | Sudan | |
| | Kassala | | |
| UR613 | Pantelleria | Libya | Implemented in Malta FIR via SARKI. Not implemented in Tripoli |
| | Lampedusa | | |
| | Tripoli | | |
| UR780 | Mogadishu | Somalia | |
| | Dire Dawa | Ethiopia | |
| | Asmara | Eritrea | |
| UR981 | Casablanca | Morocco | |
| | Marraketch | Algeria | |
| | BULIS | | |
| | Gao | | Not implemented segment Casablanca/Gao |
| UR986 | Tunis | Algeria | |
| | Ghadames | Libya | Not implemented due to restriction by Libya |
| | In Amenas | | |
| UR991 | ILDIR | Namibia | |
| | BOPAN | | |
| UR995 | Addis Ababa | Sudan | |
| | Merowe | | |

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**Appendix B2 - APIRG/15 (2005)**

### LIST OF NEW ATS ROUTES INCLUDING RNAV ROUTES TO BE ADDED TO THE ICAO AFI ANP (Doc. 7474)

| SERIAL NO. | ROUTE DESIGNATOR | SEGMENT(S) |
|---|---|---|
| 1. | UG 745 | Johannesburg<br>Nelspruit<br>Maputo |
| 2. | UG 404 | Casablanca<br>Niamey |
| 3. | UG 615 | Nouakchott<br>Mopti |
| 4. | UG 616 | RIPOL<br>Kano |
| 5. | UG 622 | Khartoum<br>RIPOL<br>Zinder |
| 6. | UG 624 | Bangui<br>Garoua |
| 7. | UG 625 | Libreville<br>MOROS<br>Bangui |
| 8. | UG 629 | CBA<br>OZT<br>Gao<br>Lagos |
| 9. | UG 402 | Gao dct<br>Tye dct<br>Tamanrasset |
| 10. | UG 981 | Gao dct<br>Pot dct<br>Lv |
| 11. | UG 403 | MNA dct<br>Hogar dct<br>Tobouk dct<br>Edara dct<br>FL |

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**Appendix B3 - APIRG/16 (2007)**

## IMPLEMENTATION OF NON-IMPLEMENTED ROUTES INCLUDING RNAV ROUTES

| Route Designator | Segment(s) | States | Observations/Remarks |
|---|---|---|---|
| UA618 | Lumbumbashi<br>Bukavu<br>SAGBU<br>Malatal | DRC<br>Sudan | |
| UB525 | Addis Ababa<br>Luxor | Ethiopia<br>Sudan | |
| UB527 | Malakal<br>Kenana | Sudan | Implemented at variance with AFI Plan via Kenana |
| UB607 | Goma<br>El Obeid<br>New Valley<br>El Dhaba | Sudan | |
| UG424 | Dar-es-Salaam<br>Lubumbashi | Tanzania | |
| UL612 | Goma<br>El Dhaba | DR. Congo<br>Sudan<br>Egypt | Egypt can accept implementation via ATMUL New Valley/KATAB/DBA |
| UM220 | Lodwar<br>Abu Simbel | Sudan | RNAV |
| UM365 | Geneina<br>Port Sudan | Sudan | RNAV |
| UM665 | Addis Ababa<br>Merowe | Sudan | |
| UR400 | Abu Simbel<br>Kassala | Sudan | |

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**Appendix C**

| AFI ATS Route Network Working Group (ARN WG) |
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**A) Terms of Reference**

1. Review the AFI ATS route network in order to assess its capacity and constraints.

2. Based on the airspace user needs and in coordination with stakeholders (States, International Organizations, user representative organizations and other ICAO Regions), identify requirements and improvements for achieving and maintaining an efficient route network in the AFI Region.

3. Propose a strategy and prioritized plan for development of improvements to the route network, highlighting:

   a. Areas that require immediate attention.

   b. Interface issues with adjacent ICAO Regions.

4. 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 WG should explore the utility that can be realized from the route catalogue concept/ATS route database.

5. Engage the necessary parties regarding routes under consideration, especially the Military Authorities.

6. In coordination with the AFI RMA, carry out safety assessment of the proposed changes to the ATS route network.

7. After adoption by the ATS Sub-Group, or as delegated by the same, submit completed route proposals for amendment of the Basic ANP Table ATS-1, to the relevant ICAO Regional Office for processing.

**B) Composition**

The ARN WG will be composed of:

1. Experts nominated by AFI Provider States from both Civil Aviation Authority and Military Authority;

2. ICAO, IATA, IFALPA, IFATCA and AFI RMA.

3. Other representatives from adjacent States and concerned international organizations (on ad-hoc basis).

**C) Working Arrangements**

The Working Group shall:

1. Carry out its work through electronic correspondence and teleconferences as appropriate;

2. Meet as required and at least once a year.

3. Report to the ATS Sub-Group and to APIRG

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**Appendix D**

Second Meeting of MID ATS Route Network Task Force (ARN TF/2)

**Report on Agenda Item 3: Comprehensive ATS Route Network Review**

3.1 The meeting recalled that the MIDANPIRG/10 meeting, Doha 15-19 April 2007 agreed that a comprehensive revision of the MID ATS route network, which is contained in the MID Basic ANP Table ATS 1, was necessary, and accordingly charged the ATM/SAR/AIS Sub-Group with the task to revise the network. The MIDANPIRG/11 meeting, Cairo, 9-13 February 2009 noted that the ATM/SAR/AIS Sub-Group had established the ARN Task Force with the objective to discharge on the mandate to review the Regional ATS route network. Accordingly, MIDANPIRG/11 had adopted Decision 11/14: *Terms of Reference of the MID ATS Route Network Task Force (ARN TF)*.

3.2 The meeting also noted the MIDANPIRG/11 Conclusion 11/15: *Amendment and editorial changes to the Regional ATS Route Network* and Conclusion 11/16: *MID ATS Route Catalogue.*

3.3 The meeting recalled that, at its first meeting in July 2008, the ARN Task Force agreed that the ATS route network users, represented by IATA, would submit a comprehensive network proposal for consideration by the ARN TF/2 meeting, in order to facilitate the Task Force to deliver on its terms of reference with regard to a comprehensive ATS route network development.

3.4 The meeting acknowledged that, in order to facilitate manageable consideration of the comprehensive user requirement package, an approach that permitted consideration of portions of the total package would be beneficial. One of the options could be to consider route proposals that represent major traffic flows or trunk routes, separately from those serving short segments that are highly associated with Regional arriving and departing traffic.

3.5 The meeting was apprised on some of the latest statistical information regarding present traffic in the MID Region as well as expected/forecast growth. Amongst others, the meeting noted the forecast that the aircraft count among operators in the Gulf Cooperation Council (GCC) States will increase by 50% over the next five years, increasing the existing fleet of nearly 700 aircraft to well over 1,000 aircraft. Furthermore, the traffic volume in the area is expected to grow by at least the same percentage as the aircraft fleet.

3.6 In this context, the meeting noted that operational improvements that could address the growth would include: shortening of ATS routes, flexible flight planning, performance-based navigation (PBN), the Reduced Vertical Separation Minimum (RVSM), Flexible Use of Airspace (FUA), flex-tracks, and user preferred routes. The meeting discussed the ATS route proposals presented by IATA in the context of the comprehensive network proposal and identified as MID/RC-501 to MID/RC-521 as at **Appendix A** (ATS Route Catalogue) to the Report on Agenda Item 3, and agreed that this would form part of the comprehensive user requirements. It was agreed that the route proposals would be captured in the MID ATS Route Catalogue and that the users, in particular IATA, would continue to develop the list and complete a comprehensive all inclusive network as soon as possible, in order to facilitate consideration of each route segment in the context of others, and avoid repeated adjustments and consequential renegotiations with the parties concerned. However, the meeting acknowledged that States could proceed towards implementation of those ATS route proposals which the States consider feasible.

3.7 The meeting recalled that, amongst others, in considering the implementation of the route proposals the continued safe implementation of RVSM in the MID Region was paramount. It was noted that this requirement underscores the need for completeness of the comprehensive route network, in order to facilitated non-fragmented safety assessments.

3.8 The meeting noted that it was complex to consider that ATS route proposals without the support of appropriate charts, and was of a strong view that a charting tool was necessary to support the ATS route catalogue and enable the Task Force and States to adequately evaluate route proposals and determine necessary action.

3.9 It was recalled that the ATM/SAR/AIS SG/10 meeting recognized the need for a charting tool, and that ICAO electronic ANP would address this role, albeit that in this regard it was still under development. It was also recalled that during the discussion of the matter by the ATM/SAR/AIS SG/10, Saudi Arabia offered to assist with regard to the proposed chart support process. The need for the charting tool was reaffirmed by the MIDANPIRG/11 meeting.

3.10 In this context, Saudi Arabia and other members of the Task Force (States and International Organizations) were encouraged to make available charting tools at their disposal to support the work of the Task Force.

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