
**WMO AMDAR PANEL
(Fifteenth Session)**

(28.X.2012)

(BOULDER, USA, 6-9 NOVEMBER 2012)

ITEM: 4.1

Original: ENGLISH ONLY

PROJECTS, PLANNING AND WORK PROGRAMME

Enhancement of AMDAR Observing System Coverage

Extension of Global AMDAR Coverage

(Submitted by the Secretariat and the Panel Chairman)

SUMMARY AND PURPOSE OF DOCUMENT

To provide a summary of activities, developments and issues relating to national and regional development of AMDAR programmes and make recommendations for future activities and tasks.

ACTION PROPOSED

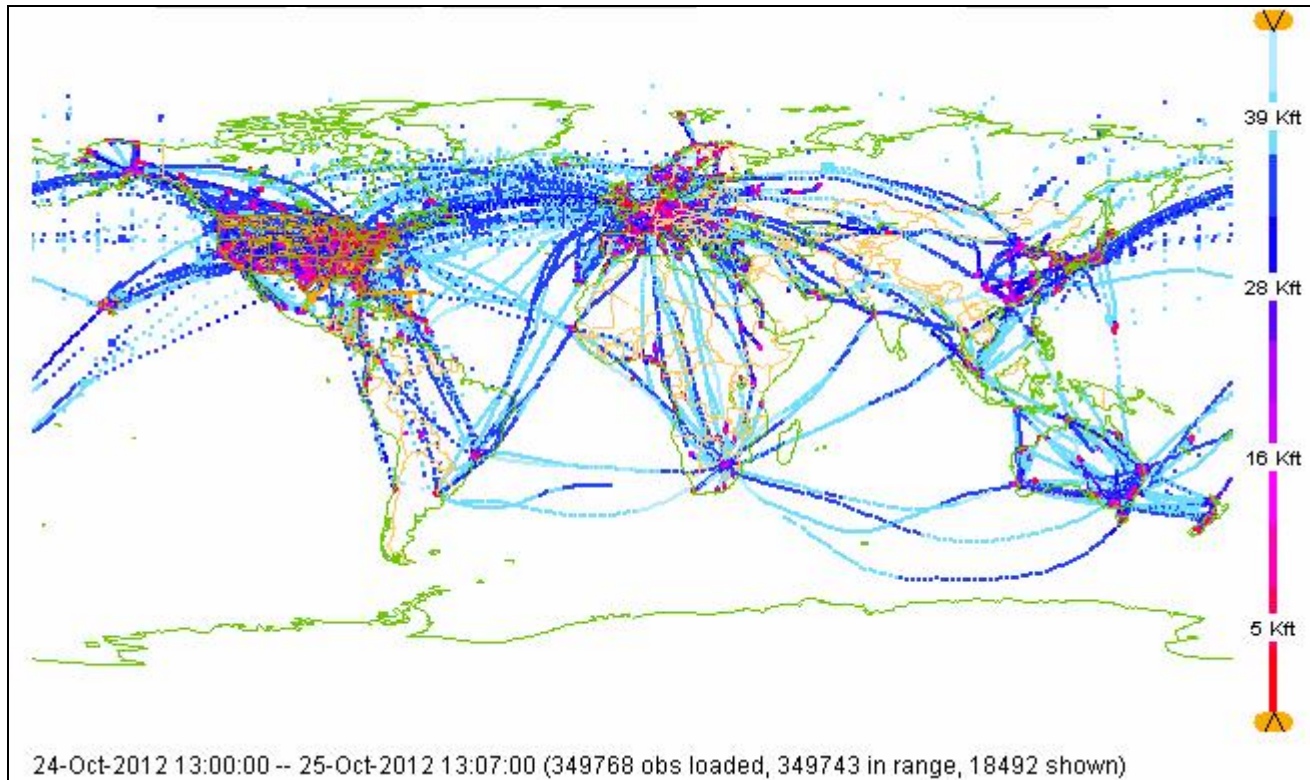
1. The Panel is invited to note the information contained in the document.
2. The Panel is invited to consider the recommendations made in the document.

References:

1. [Final Report, AMDAR Panel Management Group Session 4 \(August 2012\)](#)
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CURRENT AMDAR COVERAGE

1. The figure below provides a depiction of the global coverage (filtered 24 hour period shown) of AMDAR data as at October 2012.



Aircraft-based observations on the GTS as received by the NOAA Global Systems Division.

2. In relation to AMDAR data coverage, the following are clear from the figure and from data statistics:

- Coverage is very good over Northern America, Western Europe and parts of Eastern Asia;
- Coverage is good over Australasia with some recent improvement in coverage over the SW Pacific with the advent of Jetsar Asia (Australian Programme);
- Coverage is limited over southern Africa; and,
- Coverage is poor to negligible elsewhere.

RECENT ACTIVITIES AND DEVELOPMENTS RELATING TO IMPROVEMENT TO GLOBAL AMDAR COVERAGE

National & Regional Developmental Activities

RA I

3. The AMDAR Panel Management Group (Session 4) considered the invitation from Airlines Association Of Southern Africa (AASA) and the South African Weather Service for WMO and the AMDAR Panel to participate in the Annual General Meeting of the AASA (Mozambique, 18-21 October) as a member of a panel on aviation safety, which would afford a limited opportunity to promote the AMDAR Programme as a contributor to improvement to weather-related aviation safety.

4. While the APMG had agreed that the priority for development of AMDAR over Region I and the opportunity to liaise with important airline industry operators in Southern Africa should be taken, the APMG was subsequently advised by the Secretariat (Director of Observations) that this activity should be supported and attended by appropriate Region I representatives.

5. Mr Stewart Taylor had reported that Ethiopian Airlines and Rawandair are considering fleet expansion in the future and that these airlines, in addition to Kenya Airways should be considered when targeting airlines for programme development.

6. AMDAR Focal Point for Kenya, Mr Sospeter Muiruri requests the following:

- We have been unable to download AMDAR data for a while. Could there have been any changes?
- Kindly consider a proposal in the meeting: **For one or two members of the AMDAR team to visit Kenya to fast track the discussion our national carrier Kenya Airways and Meteorological Department.**

RA II

7. There has been a recent contact Qatar Airways in participating in the AMDAR Programme. Contacts in both the Airline and the meteorological service have been established.

8. The APMG had discussed that countries such as Saudi Arabia and the United Arab Emirates that had shown strong interest and progress in developing AMDAR programmes but had not come to fruition, underlining the need for ongoing and continued collaboration with WMO and AMDAR experts.

RA III

Argentina

9. The AMDAR Focal Point for Argentina, Mr Juan Horler met with the APMG in August 2012 and advised that Argentina was currently receiving test AMDAR data from Aerolineas from the Airline's Embraer fleet and sought and received advice from the APMG on the matter of requirements for reporting frequency and transmission on the GTS. Mr Horler provided the APMG with avionics surveys from both Aerolineas and LAN Argentina with the latter also having expressed an interest in participating in the AMDAR Programme.

Brazil

10. The Panel has also been advised that Brazil was now receiving and utilizing ADS data and that Brazil was seeking to develop an AMDAR Programme with national airlines. A report from the focal point for Brazil is provided in Appendix II.

RA IV

11. The development of the AMDAR Programme with the Mexican meteorological service (SMN) and Aeromexico in collaboration with ARINC has progressed with the terms for a programme and contract largely agreed between ARINC and WMO/Aircraft Observation Unit, however, the process of meeting the requirements of the WMO Procurements and Contracts Committee was still to be concluded.

12. The Panel was advised of the interest of Hawaiian Airlines in developing an AMDAR Programme in cooperation with NOAA and within the USA MDCRS Programme.

RA V

13. Since Panel-14 (November 2012), the significant change to the global AMDAR fleet has been the addition of 2 airlines and over 20 aircraft to the Australian programme, namely, Jetstar Australia and Jetstar Asia operating out of Singapore. The addition of Jetstar Asia has enabled the collection of observations from many Southeast Asian locations and areas within a relatively data sparse region.

Study on AMDAR Coverage and Targeting for Future Airline Recruitment

14. A WMO Special Services Agreement (SSA) was put in place (Feb 2012) with a consultant, Mr Graham Bruce, Canada, to carry out the Study on AMDAR Coverage and Targeting for Future Airline Recruitment. The Statement of Work and monthly reports from the SSA Consultant are available from the Projects & Collaboration website. The latest monthly report is provided in Appendix I.

15. From the Statement of Work for this SSA:

The contractor will, in consultation with and under guidance from the AMDAR Panel Chairperson and the WMO Scientific Officer (Aircraft and Remotely-sensed Observations) undertake the work as described below.

The aims of the project are the following:

1. *To analyse and define the current status of the WGAP and the data coverage provided by it;*
2. *To undertake a global survey of the airline industry to determine and define those airlines and aircraft that are technically suitable candidates for AMDAR Programme development (for technical details of AMDAR see the AMDAR Reference Manual);*
3. *Produce a report containing rationalised statements and recommendations for the development and evolution of the WGAP based on consideration and assessment of:*
 - a. *The gaps identified within the current coverage of the WGAP (1 above);*
 - b. *The requirements for development of upper air observations systems and measurements as defined within the WMO Commission for Basic Systems (CBS) Rolling Review of Requirements (RRR) and related documentation, including the Vision and Implementation Plan ;*
 - c. *The airlines and aircraft fleets that are suitable candidates for AMDAR Programme implementation (2 above).*

16. The SSA is expected to be completed and the deliverables available by the end of 2012. The results of this study should be utilized by the Aircraft-based Observations programme to guide future developments and activities associated with global AMDAR programme development.

FUTURE PLANS AND ACTIVITIES FOR GLOBAL AMDAR PROGRAMME DEVELOPMENT

Strategy and Planning for Global AMDAR Programme Development

17. From AMDAR Panel Management Group, Session 4 (Aug, 2012):

4.4.1. The APMG considered the past approach of the AMDAR Panel to development of AMDAR over data-sparse areas, particularly within Regions I and III and agreed that, while there had been many promising leads and commencements of AMDAR programme developments in various countries arising from the workshops that the Panel had conducted and local independent initiatives, there appeared to be a requirement for a more centrally coordinated and ongoing approach to such budding AMDAR developments in order to sustain them and provide the required technical support and advice to the relevant NMHS and airline contacts and stakeholders. It was proposed that the APMG and the AMDAR Panel consider the appointment of an AMDAR Development Officer (ADO) funded from the AMDAR Trust Fund through a WMO Special Services Agreement and reporting to the Aircraft Observation Unit in the Secretariat. While one approach to this appointment might be the employment of an appropriately qualified consultant, another that might be considered would be for the AMDAR Trust Fund to fund resources for the functions of the AMDAR Development Officer to be carried out within an existing National or Regional AMDAR Programme. It was agreed that Global AMDAR Programme development should be based on the outcomes of the Study on

Data Coverage and Airline Capabilities currently underway and expected to be completed in the 2nd half of 2012.

4.4.2. While it was agreed that it was advisable and necessary to work through the relevant Regional Associations to encourage and nurture AMDAR programme development and growth and all RAs should develop and maintain AMDAR Development Plans, it was also acknowledged that the approach of working directly with national NMHS and airline representatives, once identified, offered the most likely chance of success.

4.4.3. Action: The Secretariat and the Panel Chairman to draft a Description of Work for an AMDAR Development Officer to potentially be employed part-time for 12 months commencing in 2013 and with the primary role of international coordination of AMDAR programme development.

4.4.4. Action: The Panel Chairman to draft letters to all Regional Associations regarding Regional AMDAR Development plans and the possibility of working with an ADO.

18. In order to develop further the plans to undertake a more coordinated approach to Global AMDAR Programme development, it is recommended that the Panel supports a new, three-tiered approach:

- 1) At the international level, an AMDAR Programme Development Officer (APDO) is appointed to facilitated coordination and development of new AMDAR Programme development based on the outcomes of the Study on AMDAR Coverage and Targeting for Future Airline Recruitment. (see draft proposed terms & conditions and duties in Appendix III);
- 2) The APDO will develop and nurture/facilitate Regional and AMDAR Programme development plans and projects: and,
- 3) The APDO will develop and nurture/facilitate National AMDAR Programme development plans and projects.

19. Rather than WMO and CBS (ET-SBO) maintaining and administering these programmes and projects, the emphasis will be on assisting and nurturing self-initiated and administered Regional or National project developments according to:

- a) Priority for development (e.g. RA I and RA III);
- b) Availability of Regional and/or National expertise and technology; and,
- c) Greatest likelihood of success.

20. There have been a number of reports of interest by airlines, e.g Kenya Airways, Qatar Airways and others in contributing to the AMDAR Programme but indicating that there has not been sufficient information given and interest shown from WMO (the Panel) or the relevant NMHS. One of the roles of the APDO would be to ensure that such leads and interests are followed up on, maintained and that appropriate NMHS or Regional contacts are made and bear fruit.

21. **Recommendation:** The Panel endorses the above approach to Global AMDAR Programme Development

22. **Recommendation:** The Panel reviews and revises the draft proposed terms & conditions and duties for an AMDAR Programme Development Officer -see Appendix III.

ENHANCING DATA COVERAGE FROM THE GLOBAL AMDAR PROGRAMME

Global Approach to Administration of Supplementary AMDAR Data

23. From AMDAR Panel Management Group, Session 4 (Aug, 2012):

4.5.1. *The APMG discussed the issue of what has previously been referred to as “targeted” AMDAR data, meaning AMDAR data made available by an AMDAR Programme outside of its normal mandated observing programme and region through an arrangement with another NMHS. The APMG agree that this data should be referred to as “supplementary” AMDAR data to avoid confusion with the term and practice relating to targeted data or observations, which is the generation of additional data from an observing system in order to meet the requirements of meteorological applications to monitor or predict a particular weather event. The Meeting agreed that it would be advantageous and more efficient to take a more formal and, perhaps WMO led approach to the international administrative aspects related to generation of supplementary AMDAR data.*

4.5.2. *Mr Stewart Taylor provided a report on the current status of the various agreements and arrangements with other NMHS for the provision of Supplementary AMDAR Data from the E-AMDAR Programme, particularly over Africa.*

4.5.3. *The following actions arose from this report and the subsequent discussion:*

- 1) *Action: E-AMDAR Management Team to discuss SAWS requirements for data provision in support of their Regional Programme. Any changes to requirements will be amended in the Data Licence Agreement.*
- 2) *Action: The Secretariat to liaise with the AMDAR FP for ASECNA and ascertain the requirement for provision of supplementary AMDAR data from E-AMDAR and identify the funding source for the required data.*
- 3) *Action: The Secretariat to survey operational AMDAR Programme Managers to determine the extent and availability of potential supplementary AMDAR data.*
- 4) *Action: The Secretariat to investigate the potential for WMO to administer an “International Supplementary AMDAR Data Programme”.*

24. **Recommendations:**

- 1) The Panel reviews the suggested survey to be undertaken by AMDAR Programme Managers (Appendix IV) in order to address determining the extent and availability of potential supplementary AMDAR data.
 - 2) The survey is activated by the Secretariat so as to ensure completion before the first meeting of ET-SBO.
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APPENDIX I

**Study on AMDAR Coverage and Targeting for Future Airline Recruitment, September 2012
Monthly Report from Consultant**

Regarding the Airline Database, the data compiled to date has been acquired from numerous open source databases located on the internet. The data required to produce the desired results has proven to be a significant chore, with over 1000 airlines identified around the world and over 50,000 routes located from these airlines. This added to the aircraft types used has made this a massive undertaking.

The data obtained from the various sources, although detailed and valuable for this study, has required a fair amount of work to correct entry errors and the validation of route data. A region has also been added to each airline entry, so that the end result will yield a breakdown of potential target airlines by targeted region (such as Africa, Russia, South America, etc). The resulting culled dataset will be hopefully run through a visual mapping program to provide a usable report for airline evaluation and recommendation purposes.

The available information has been collected regarding FANS/CPDLC changes to the industry which will be added to the report along with any feedback we have been able to collect from first hand discussions with a few airlines.

We are working to complete the majority of this project this month and wrap up the report as soon as possible. Please let us know if you need any further information at this point.

APPENDIX II

BRAZIL PROGRAMME DEVELOPMENT STATUS UPDATE

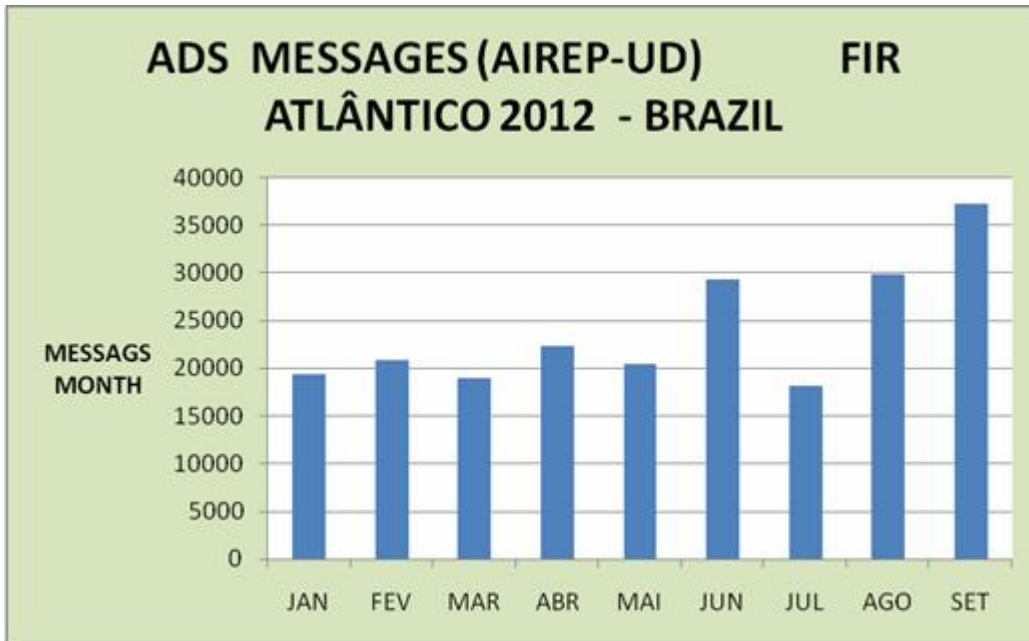
In Atlantic Flight Information Region (FIR-AO), Brazil has provided the Air Traffic Services based on Automatic Dependent Surveillance System (ADS-C). All aircraft in this operational scenario transmit messages by satellite data link.

At regular intervals of fifteen minutes, positions messages are generated for all aircraft in FIR-AO which are also included weather information from sensors on board the aircraft.

In 2011 was developed an automatic application to classify and to encode meteorological information contained in ADS message (AIREP-UD). The system went through a period of testing and finally came into operation in December 2011.

Processed messages are transmitted via the AMHS to the Brasilia OPMET Bank and by the INMET (Instituto Nacional de Meteorologia) through the GTS.

Significant increase in number of these messages occurred. Below are the monthly statistics of received messages from January to September 2012.



FUTURE PLANS

The next step will be to implement the collection of data on the continental FIR, by VHF DATACOM.

The deployment project BR-AMDAR is scheduled to start in 2013 and be completed in 2014.

APPENDIX III

DRAFT PROPOSED TERMS & CONDITIONS AND DUTIES OF A AMDAR PROGRAMME DEVELOPMENT OFFICER

Proposed Terms & Conditions for the Appointment of a AMDAR Programme Development Officer

1. The APDO be supervised and directed by the Head of the Aircraft Observations Unit (SO/ARO) in the Secretariat.
2. Employed under either a WMO SSA or a temporary employment contract and funded from the AMDAR Trust Fund.
3. Work activities and duties will have a fundamental focus on facilitating the new development of national or regional AMDAR Programmes and related technical activities or tasks, based on the activities of the Aircraft-based Observations Work Programme.
4. Priority will be for the development of programmes for data sparse areas and will be guided by the outcomes and recommendations of the Study on AMDAR Coverage and Targeting for Future Airline Recruitment.
5. May be located physically within the Secretariat (Geneva) or elsewhere as appropriate.
6. Consideration might be given to placement and sponsorship of the position under a Member NMHS or organization.
7. Initial appointment to be 12-months part-time, subject to negotiation and 6-monthly review by CBS and the Secretariat.

Proposed Duties of a AMDAR Programme Development Officer

1. Assist SO/ARO and ET-SBO in working with Regional Associations in the development of Regional Association AMDAR Development and Implementation Plans (I to VI).
2. Provide technical and project management assistance and direction as appropriate in the specific implementation and development of national and regional AMDAR Programmes.
3. Develop a contacts database for Regional Associations, Met. Services and appropriate Airlines and facilitate collaboration between contacts as appropriate.
4. Assist in and oversee the development, documentation and provision to stakeholders, of technical regulatory material relevant to the implementation of AMDAR Programmes, including: business cases for airlines, business cases for NMHSs, specifications for onboard software, specifications for ground-based data processing systems; and, other.
5. Documentation and reporting to CBS of national and regional project developmental status.

APPENDIX IV

PROPOSED SURVEY OF AMDAR PROGRAMME MANAGERS ON AVAILABILITY OF GLOBAL AMDAR SUPPLEMENTARY DATA

Airline	Country	Airport (City, IATA)	Vert. Profiles per day (>=1)	Establishment Requirements	Establishment Costs	Ongoing Cost (Monthly, CHF)

- Airline - Name of airline
- Country - Country of Airport
- Airport (City, IATA) - City of Airport & IATA ID of Airport
- Vert. Profiles per day (>=1) - No. of flights per day able to be provided, considering only destination providing 1 or more profiles per day.
- Establishment Requirements - e.g. Modification to onboard software, modification to optimization system, etc.
- Establishment Costs - estimated cost of activating this data provision.
- Ongoing Cost (Monthly, CHF) - estimated monthly cost (preferably in Swiss Francs) of maintaining this data provision.