

**WORLD METEOROLOGICAL ORGANIZATION**

**COMMISSION FOR BASIC SYSTEMS**  
OPAG ON INTEGRATED OBSERVING SYSTEMS

**EXPERT TEAM ON**  
**OBSERVATIONAL DATA REQUIREMENTS AND**  
**REDESIGN OF THE GLOBAL OBSERVING SYSTEM**  
*Seventh Session*

Geneva, Switzerland, 12-16 July 2004

Dist.: RESTRICTED

CBS/OPAG-IOS/  
ODRRGOS-7/Doc. 7.3(1)

(10.VI.2004)

ITEM: 7.3

Original: ENGLISH

**UPDATE ON AMDAR PROGRAMME – JULY 2004**  
**for ET-ODRRGOS, 12-16 July 2004**

*(Submitted by J.J. Stickland, AMDAR Panel Technical Coordinator)*

---

**Summary and Purpose of Document**

This document summarises major AMDAR activities coordinated by the AMDAR Panel over the past 12 months.

---

**ACTION PROPOSED**

The meeting is invited to take into account information presented in this document when discussing issues related to evolution of surface and space-based components of the GOS.

**UPDATE ON AMDAR PROGRAMME – JULY 2004  
for ET-ODRRGOS, 12-16 July 2004**

**1. Introduction**

1.1 The AMDAR programme has achieved a number of milestones since the last meeting of the ET-ODRRGOS in September 2003 and substantial development work continues in a number of countries. This report contains a summary of these activities.

**2. System Development**

2.1 New AMDAR programmes have become operational in Saudi Arabia and Hong Kong China with a small volume of data being exchanged on the GTS. 2 SAUDIA aircraft were providing data in late May but the number is expected increase to 29 aircraft over coming months. Hong Kong, China is routinely producing data from one aircraft but the number will also increase in time. Initial evaluation shows data quality is good.

2.2 Canada and Japan are very close to going operational with both countries expected to commence exchanging between 4000 and 10,000 observations daily during the second half of 2004.

2.3 Work continues on the development of new AMDAR systems in China, Chile, Argentina and the United Arab Emirates. A number of additional countries continue to consider or plan program developments including Hungary, Poland, Morocco, Russian Federation, Oman, Egypt and several countries in Europe. India is the latest country to commence planning a programme with support being provided by the AMDAR Panel.

2.4 Development of targeted programmes continues, however the collaboration between E-AMDAR and ASECNA has slowed due to problems with configuring Air France aircraft that will form the core of the programme. A very short period programme was provided by E-AMDAR for India with several data profiles and over flight data being provided each day for 4 cities including New Delhi, Bombay, Bangalore and Madras.

2.5 The new ARINC 620 Version 4 specification for sophisticated onboard software for automated aircraft reporting of meteorological observations that has been under development over the past 3 years was approved by the Airlines Electronics Engineering Committee in November. The specification has become the new industry standard. It is planned for the specification to be used in a new development programme by Airbus that will include the software as a standard optional component across Airbus fleets.

2.6 A new proposal to develop a global AMDAR optimisation system by SITA, one of the main providers of global ACARS communications, will be reviewed in June. The proposed system will be similar to the very successful E-AMDAR EADOS system. A number of countries and regions developing new programmes have indicated interest in participating in the new commercial service.

2.7 The Operational ASDAR programme was formally terminated on 31 December 2003. Only one aircraft (from Air Mauritius) continues to report routinely with a second aircraft (from SAA) operating on rare occasions as a stand-by unit.

**3. Humidity Sensor**

3.1 The first WWVSSII humidity/water-vapour sensor was installed and certified in the US on a UPS B757 aircraft. Operational evaluation has commenced with up to 30 sensors being progressively installed. An impact study will also be undertaken. A number of countries including Australia and the E-AMDAR group propose to purchase these sensors for additional evaluation. The AMDAR Panel is helping to coordinate these same countries in collaboration with the sensor

developer and a senior avionics manager in a programme with Airbus to certify the sensor on the A320 family of aircraft. It is proposed that the sensor becomes a standard component (along with the ARINC 620 software) available for airlines to install. It is proposed that Airbus would then progressively certify the sensor across its entire range of aircraft types.

3.2 The UK humidity sensor is scheduled for evaluation testing on the UK research aircraft in the latter part of 2004 and work continues in Germany to adapt the MOZAIC humidity sensor for real time operational use.

#### **4 Alternative AMDAR Systems**

4.1 The US TAMDAR system that uses its own unique sensor package is undergoing 2 independent operational evaluation trials. Sensors have been installed on 2 Canadian regional aircraft and up to 60 US regional aircraft.

4.2 The Canadian AFIRS Up-Time system uses either existing aircraft sensors or TAMDAR sensors and supplements the aircraft computing and avionics system. It is being evaluated in Canada and is of interest to Australia for use in remote areas including Antarctic regions.

#### **5. Data Exchange**

5.1 Evaluation trials of the new FM94 BUFR tables for the exchange of AMDAR data on the GTS were completed by DWD in collaboration with KNMI and the Canadian Service. The June meeting of the CBS ET on Data Representation and Codes is expected to approve the code for operational use. A number of other data exchange matters, in particular lost data, are being addressed.

#### **6. Training**

6.1 Technical training workshops are forming an important part of the work of the AMDAR Panel. A small workshop was provided in South Africa (as part of the SASAS conference) in October 2003 and 2 successful mini-workshops were held in the United Arab Emirates with the National Meteorological Center and Emirates Airline in May 2004. Additional workshops in 2004 are planned for Hungary (August) for a Central and East European programme, Egypt (September) for a large group of Arab League countries, and Argentina. Other workshops are proposed for China, Morocco and the Russian Federation. Brief discussions with India to hold a workshop have also commenced. A science and AMDAR technology workshop will be held in Beijing in October as part of the 7<sup>th</sup> meeting of the AMDAR Panel.

#### **7. Documentation**

7.1 The AMDAR publicity flyer was completed and printed in February 2004 but preparation of a technical manual for airlines has been delayed due to the contractor's heavy workload. Guidance material on AMDAR development is being issued on request to interested countries.

7.2 The first draft of the AMDAR Panel's web site has been completed by the Hong Kong Observatory. When completed, the web site will be located on the WMO web site as a transparent link. In addition to information, it will contain a general public discussion forum and a separate area for operational users. It will also contain a secure section on data quality monitoring and control.

#### **8. Further Integration into the GOS**

8.1 The AMDAR Panel continues to explore ways to better integrate AMDAR into the Global Observing System. A number of steps have been taken including the nomination to EC of an AMDAR Rapporteur, increasing the number of training workshops and taking initiatives through the

ongoing participation in CBS, CAeM and CIMO OPAGs, Expert Teams, Regional Associations and other WMO agencies and specialist committees. The Panel also consults directly with users in national weather services to assess operational requirements and to publicise the availability and operational use of AMDAR data. The AMDAR data quality monitoring and control system continues to grow and improve. Less than 1% of AMDAR data exchanged on the GTS is flagged by monitoring centres to be of doubtful quality.

## **8. Data Impact**

8.1 In addition to the work undertaken by the ET-ODRRGOS, Dr. Ralph Petersen (University of Wisconsin) has prepared 2 very helpful documents summarising the impact of AMDAR data on NWP. Although one document at least will be published, it is hoped that together with other impact studies already available they will be placed on the Panel's temporary web site and can be circulated widely within the AMDAR community and to WMO Members.

8.2 Within a few days of gaining access to AMDAR data on the GTS (provided by visiting aircraft), operational forecasters in Chile and the United Arab Emirates reported on the immediate benefits of AMDAR data.

---