

THIRD MEETING OF THE AMDAR PANEL

GENEVA, 19-22 SEPTEMBER 2000

ENGLISH only

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WORLD METEOROLOGICAL ORGANIZATION

AMDAR Panel/Doc. 1
(09.05.2000)

THIRD MEETING OF THE AMDAR PANEL

Item: 2.1

GENEVA, 19-22 SEPTEMBER 2000

ENGLISH only

PROVISIONAL AGENDA

1. OPENING OF THE MEETING

2. ORGANIZATION OF THE MEETING

- 2.1 Adoption of the agenda
- 2.2 Working arrangements and other organisational matters

3. WORKSHOP ON SCIENCE AND TECHNOLOGY

- 3.1 Observation requirements and data management
- 3.2 Performance specifications
- 3.3 AMDAR data impact studies
- 3.4 Turbulence issues
- 3.5 Code matters
- 3.6 Meteorological sensors and measurements

4. AMDAR IMPLEMENTATION

- 4.1 Reports of the Chairman of the AMDAR Panel and the Technical Co-ordinator
- 4.2 Action items from the previous AMDAR Panel meeting
- 4.3 Status reports on AMDAR projects and plans for future activities
- 4.4 Requirements and technical developments

5. FINANCIAL AND ADMINISTRATIVE MATTERS

- 5.1 Status of the AMDAR Trust Fund and review of related contracts
- 5.2 Future AMDAR work programme
- 5.3 Review of established rules and procedures
- 5.4 Election of officers

6. ANY OTHER BUSINESS

7. DATE AND PLACE OF NEXT MEETING OF THE PANEL

8. CLOSURE OF THE MEETING

**REPORT OF THE WORKSHOP ON SCIENCE AND TECHNOLOGY
19 September 2000**

1. Observation Requirements

1.1 Observations from commercial aircraft play an important role in the upper air observing network. Presentations showed that with increasing horizontal and vertical resolution of the numerical weather prediction models, more accurate data are needed even in countries with extensive radiosonde networks. The future requirement will be for a combination of many types of data where wind and moisture observations are more important for regional or local forecast models. It was pointed out that future activities will involve the combination of aircraft, satellite and other observational data in a composite observing system and that "targeted observations" could be used to improve the forecast of extreme weather situations. Here AMDAR data with high temporal and spatial resolution can be used as input to the models and as real-time forecasting aids.

1.2 The presentations identified additional data sparse areas. These included parts of the former Soviet Union in addition to other areas of the world already identified by the CGC/WMO Workshop on the Impact of Various Observing Systems, namely, South America, Africa, the Middle East, Asia, the West Pacific, Siberia, the Canadian arctic plus all major oceanic regions.

1.3 The evaluation of flight data recorder observations were presented which permitted studies of the impact of AMDAR data for planning studies. The data archive contains higher resolution observations which will be useful in showing the unique role of AMDAR data in the coming era of second generation atmospheric sounders.

2. Impact Studies

2.1 Results from impact studies were presented that demonstrate the general positive impact of aircraft measurements. The largest impacts are seen in individual weather events. The studies show that radiosonde and aircraft measurements complement each other and that there is a strong need for humidity data.

2.2 Observing system simulation experiments for aircraft observations with high-resolution flight recorder data show that large volumes of globally available observations would have substantial positive impacts.

3. Technical Specifications and Developments

3.1 A presentation was given on relevant parts of an AMDAR manual for onboard measurement systems which includes functional specifications for data requirements and onboard processing. It is intended that the Manual will be completed early in 2001 for adoption by the Panel and made widely available to WMO members. It is planned also that it will be placed on the future Panel web site.

3.2 The Workshop noted the recommendations of the E-AMDAR Programme to ensure that various aircraft software specifications and air-to-ground messages should be standardised and made as cost effective as possible through the use of a range of data compression techniques. Also, operational flexibility needed to be included in such software specifications.

4. Sensors and Measurements

4.1 The Workshop was advised of progress in the USA with the use of Eddy Dissipation Rate (EDR) as the measure of turbulence in automated aircraft observations. The system is to be extended to additional aircraft. It was noted that action items from the Second Meeting were still outstanding.

4.2 A presentation of changes to Annex 3 – Meteorological Service for International Air Navigation/WMO Technical Regulations (C.3.1) was presented by ICAO. The attention was drawn to additional modifications to proposed changes to the document describing the characteristics of routine air-reports made in accordance with the ICAO Annex. The changes refer to the inclusion of the wind quality flag, increased temperature resolution and the inclusion of the specification for “light”, and “nil” turbulence.

4.3 A detailed description was given of development by the USA of the second generation water vapour sensor (WVSS-II) for use on commercial aircraft. System development and proof of concept trials have been completed. Certification of the WVSS-II is expected to be completed for the B-757 aircraft by November 2001. Certification on other aircraft types will follow in a serial manner based upon available funds. The USA will welcome further funding from individual Panel member countries who might wish to help accelerate type certification through the existing WVSS-II contract options.

4.4 In considering the topic of the accuracy of AMDAR measurements, an analysis was presented to show the significance of the various sources of error in the onboard measurements, particularly of temperature, wind speed, pressure, and humidity. These potential errors need consideration when studying the quality of AMDAR data and its applications.

4.5 With respect to future developments in observing systems, the Workshop was informed on the development of new remotely sensed observation systems that will be complementary to AMDAR such as a very high resolution geostationary sounder (GIFTS) being developed by the USA. Nevertheless AMDAR data from commercial aircraft are likely to remain the only viable source of high accuracy in-situ observations that can be used for validation for many parts of the world.

5. Codes

5.1 The Workshop discussed some aspects of AMDAR data exchange including coding issues.

5.2 Regarding coding issues, the need was identified to liaise with CBS on a number of items. Areas of particular interest were:

- (i) the need to increase temporal and spatial resolution;
- (ii) the need to accommodate additional types of reported observations; and
- (iii) constraints on the use of existing text codes beyond 2005 that might result from a CBS proposal.

PROPOSED CONTENT

AMDAR REFERENCE MANUAL

Contents

1. General.
 - 1.1 What is AMDAR
 - 1.2 Historical background.
 - 1.3 Purpose of this manual.

2. Sensors and Measurements.
 - 2.1 Sensors for basic measurements.
 - 2.2 Derived variables.
 - 2.3 Other measurements.
 - 2.4 Data Integration.
 - 2.5 Measurement Accuracy.

3. Message compilation.
 - 3.1 Meteorological Requirements.
 - 3.2 Aeronautical Requirements.

4. Air-ground (downlink) communication.
 - 4.1 ACARS.
 - 4.2 ADS.

5. Ground Processing and data dissemination.
 - 5.1 GTS coding.
 - 5.2 Data management.

6. Quality Control.
 - 6.1 Real- time Q/C.
 - 6.2 Quality evaluation.

References

Appendices

- I AMDAR sensor data processing
- II AMDAR down-link data specifications
- III AMDAR down-link code specifications (ACARS)
- IV AMDAR down-link code specifications (ADS)
- V AMDAR down-link data control specifications
- VI AMDAR ground data processing and GTS codes.
- VII AMDAR Quality Control Guidelines
- VIII Acronyms

ASDAR SUB-GROUP

Future work programme
(2001-2002)

1. In accordance with past decisions by the OCAP Programme Board and the AMDAR Panel, the principal task is to provide continued support for the operational ASDAR programme for the next 2 years. The rationale for this decision is documented in detail in the records of meetings of the two bodies, but briefly, it is recognised that the remaining 12 ASDAR units provide cost effective upper air observations in data sparse regions of the world. These data will continue to be the major source of automated aircraft observations in these parts of the world over the next two years.
2. The work programme consists of the following tasks:
 - a) Renew the current maintenance support contract and resolve out-standing technical issues;
 - b) Continue to monitor the health and viability of the system and liase with owners and operators to ensure operational needs are met;
 - c) As appropriate, assist with the replacement or decommissioning of aging units;
 - d) Maintain through the ASDAR Centre ongoing system performance monitoring and coordinating appropriate action where units fail to meet operational performance standards;
 - e) Manage the ASDAR line in the AMDAR Trust Fund to ensure resources are appropriately dispersed in accordance with the wishes of the ASG and the AMDAR Panel.

ANNEX VI

ASDAR BUDGET 2001-2002 (GBP, 000) AS PROPOSED BY THE SUB-GROUP

ITEM	WMO STATEMENT	ESTIMATE (2001/2002)	BALANCE	REMARKS
Available Funds	137.1			From WMO statement of ASDAR funds as at 31 August 2000.
Expenditure				
Carriage of US unit on KLM		26.5		Subject to verification by KNMI
OCAP Decommissioning		20.3		Decommission charges for 2 OCAP units
Maintenance:				
(1) Maintenance contract		40.0		New maintenance contract with Astrium (ex Matra Marconi)
(2) Repairs (committed)		34.4		Existing obligations with Astrium
(3) Additional repairs		10.0		Unspecified new maintenance
Other		5.9		For support of operations and other contingencies
Total	137.1	137.1	0	

Notes:

1. Negotiations with Astrium on a new maintenance contact have commenced.
2. An amount of £81,200 from the available funds is already committed.
3. The budget is framed to apply all available funds by the end of 2002.

ANNEX VII

AMDAR PANEL

BUDGET ESTIMATE FOR 2001/2002 (AS AT SEPTEMBER 2000) (SWISS FRANCS)
(based upon WMO account and as proposed by the ASG)

LINE NO.	ITEM	Anticipated Income 2001	Obligation for 2001	Balance at 31/12/2001	Anticipated Income 2002	Obligations for 2002	Balance at 31/12/2002
	Balance Brought Forward	217,085			91,585		
50.22.000	AMDAR Operating fund	256,400			270,000		
50.22.035	AMDAR Technical Coordinator		260,000			265,000	
	Consultant for Data Improvement		33,900			0	
	Provision of AMDAR Data		0			25,000	
	Travel for Technical Consultants		10,000			10,000	
	Software Development		68,000			25,000	
	Development AMDAR Website		10,000			0	
	Total (non ASDAR)	473,485	381,900	91,585	361,585	325,000	36,585
ASDAR	Balance brought forward	346,786			168,256		
	Carriage		33,530			33,530	
	Decommissioning		0			51,340	
	Maintenance contract		50,600			50,600	
	Repairs		87,100			25,300	
	Other		7,300			7,400	
	Total ASDAR	346,786	178,530	168,256	168,256	168,170	86
	Grand Total	820,271	560,430	259,841	529,841	493,170	36,671

Estimated Contributions for 2001 based on previous contributions. Additional contributions that may come from Saudi Arabia, Switzerland and other countries are not included.

Australia	15,200
Austria	5,000
Canada	10,000
Germany	40,700
Netherlands	7,000
New Zealand	2,500
United Kingdom	26,000
United States	150,000
Total	256,400

REVISED TERMS OF REFERENCE FOR THE ASDAR SUB-GROUP

1. GENERAL

1.1 The ASDAR Sub-group (ASG) is a sub-group of the WMO AMDAR Panel with responsibility for maintaining the operational ASDAR programme, after the transfer of the relevant responsibilities of the Operating Consortium of ASDAR Participants (OCAP) to the AMDAR Panel (see below).

1.2 The ASDAR Programme provides for the automated collection of meteorological data from aircraft avionics equipment, the transmission of data through the International Data Collection System of the geostationary meteorological satellites and their insertion into the WMO Global Telecommunication System.

2. BASIC GOAL OF THE PROGRAMME

The basic goal of the programme is to provide high quality and timely meteorological observations from ASDAR equipped aircraft, in order to meet stated requirements of the World Weather Watch.

3. MEMBERSHIP

Members of the ASG are those members of the AMDAR Panel who support and maintain at least one operational ASDAR unit including those supplied under VCP arrangements

4 RESPONSIBILITIES OF ASG

4.1 To manage the operation of ASDAR flight units including aspects of system maintenance and repair.

4.2 To arrange for the provision of resources for the aforementioned functions.

4.3 To co-operate with and encourage the continued operation of the ASDAR Centre.

4.4 To assume those additional tasks relevant to ASDAR deemed necessary to assist in achieving the basic goal of the AMDAR programme as adopted by the AMDAR Panel.

4.5 In fulfillment of its responsibilities ASG shall in particular:

- (a) Propose its programme and budget as part of the AMDAR Panel programme;
- (b) Provide guidance to the ASDAR Centre;
- (c) Receive and review relevant financial reports annually or at such other shorter intervals as deemed appropriate in special instances;
- (d) Decide on relevant technical matters referred to it;
- (e) Assess, at least annually, its budgetary requirement for submission to and approval by the AMDAR Panel;
- (f) Arrange for maintenance contracts on behalf of interested ASG members;
- (g) Carry out, within available resources, those tasks which the AMDAR Panel may agree are necessary to fulfil the responsibilities of ASG;
- (h) Review the Terms of Reference and Operating Procedures of the ASG and propose amendments, as necessary, to the AMDAR Panel.

5. TECHNICAL SUPPORT TO THE ASG

Technical support on a day-to-day basis to the ASG is provided by the Technical Co-ordinator (TC) to the AMDAR Panel on terms and conditions determined by the AMDAR Panel.

6. OPERATING PROCEDURES OF THE ASG

6.1 As ASG members will be responsible for their own travel expenses, the meetings will be so arranged as to incur the minimum of expenditure, preferably by holding them in conjunction with meetings of the AMDAR Panel.

6.2 At meetings, the ASG will elect its chairman. The chairman and the AMDAR TC will manage the work of the ASG until the next meeting.

6.3 A recorded decision in the report of an ASG meeting, or a decision agreed by correspondence, will suffice to allow expenditure of funds within the budget approved by the AMDAR Panel. Payments will be subject to final authorisation by the Chairman of the AMDAR Panel and in accordance with the rules of the AMDAR Fund.

7. DECISIONS

Decisions of the ASG shall be by consensus of its members.

8. WORKING LANGUAGE

The working language of the ASG will be English.

9. TERMINATION OF MEMBERSHIP

Termination of membership of the ASG shall be a matter for consideration of the ASG at its meetings where any outstanding obligations affecting other members of the ASG or the AMDAR Panel shall be determined. Termination shall be approved by the ASG only after any such obligations, including disposal of any assets, have been cleared.

10. TERMINATION OF ASG

The ASG may be terminated at any time by direction of the AMDAR Panel, or by mutual agreement between ASG members and endorsement by the Panel, noting the provisions of paragraph 9 above.