

WORLD METEOROLOGICAL ORGANIZATION

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ET-AIR-3 and AMDAR Panel-14/Doc.4.3.4

(25.10.2011)

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**JOINT MEETING:  
CBS EXPERT TEAM ON AIRCRAFT BASED  
OBSERVATIONS  
(Third Session)  
AND  
AMDAR PANEL  
(Fourteenth Session)**

ITEM: 4.3

Original: ENGLISH ONLY

(QUEBEC CITY, CANADA, 2-4 NOVEMBER 2011)

**AMDAR Software Development**

B777 Software Development

*(Submitted by AMDAR Panel Chairman)*

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**Summary and purpose of document**

To summarise the status of the B777 software development as proposed by Air France for implementation in Air France and KLM B77 aircraft and to agree on a cost-sharing project between E-AMDAR, Météo France and the AMDAR Panel.

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**ACTION PROPOSED**

The Panel is invited to:

1. Note the information contained in the document.
  2. Consider the recommendations made in the document.
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## **Background**

1. On the request of Météo France, Air France has drafted a software specifications document for the development of AMDAR software for their B777 fleet;
2. The E-AMDAR Technical Advisory Group (TAG) has reviewed the draft and has proposed amendments to the draft in order to bring the specifications as close as possible to the ARINC 620 Version 4 specifications.
3. The E-AMDAR TAG further decided that an AMDAR software package for the B777 would be of global interest and requested the AMDAR Panel Chairman to include future development under the responsibility of the AMDAR Panel.
4. In July 2011 the AMDAR Panel Chairman requested Air France for a quotation of the work.
5. In response, Air France offered the preparedness to execute the work at an amount of 50,000 Euro.

## **Current Status**

6. Both Météo France and the E-AMDAR Programme Manager have expressed interest in a participation in the development of AMDAR software for the B777
7. Considered from the global perspective it would be advantageous to have the availability of B777 AMDAR software, considering the growing fleet of this type of aircraft.

## **Recommendations**

8. The Panel agrees in the development of AMDAR software for the B777 fleet as proposed by Air France, based on the software specifications as reviewed and agreed by the E-AMDAR TAG.
9. The Panel delegates to the AMDAR Panel Management Group to negotiate a cost-sharing scheme between the potential partners in the B777 Software Development Project.
10. Any future request for participation and/or cost-sharing in a specific AMDAR software development project will be individually reviewed by the Management group on a case-by-case basis.

## **Appendices:**

1. Air France B777 AMDAR Meteorological reports (Specification)
  2. AMDAR Panel Chairman letter to Air France
  3. Air France response with quotation
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**AIR FRANCE**

**ENGINEERING AND AIRFRAME DIVISION**

**PROJECT COORDINATION - MT.GT**

**TITLE: AIR FRANCE B777 AMDAR  
METEOROLOGICAL REPORTS**

Document Nr :	First issue	Revision
MT.US 80.02.09		

	NAME	FUNCTION	DEPT.	DATE	SIGNATURE
Prepared by :	A. de Feraudy	Project. Mgr	MT.GT	xx/xx/10	
	S Taylor	AMDAR		17/05/11	

## APPENDIX 1

### 1. **SCOPE**

1.1. Development of ACMS software on Air France and KLM B777s, in the purpose of meteorological reports for the AMDAR project (Aircraft Meteorological Data Relay).

### 2. **REFERENCE DOCUMENTS**

- 2.1. Eumetnet AMDAR - AAA AMDAR Software Developments; Technical Specification, version 3, 1/8/2000.
- 2.2. Program operation and standards observations specification 2007-2; AAA AMDAR Version 3, Data format specification, 17/4/2007.
- 2.3. Program operations and standards observations specification 2006-1; AMDAR AAA version 3.0 software requirements specification, 23/11/2006.
- 2.4. Amendments / Additions / Corrections to Specification 31-0001-07, dated 02/04/2003.

### 3. **DESCRIPTION**

- 3.1. This software will be used on Air France and KLM B777 fleets.
- 3.2. It should be installed on all Air France and KLM B777-200/300, AIMS 1 or AIMS 2.
- 3.3. It will be adapted from specification AAA (ACARS Aircraft AMDAR) version 3, to B777 AIMS.
  - 3.3.1. Data compression (base 40): decompression data algorithm will be developed on ground for the flight number and aircraft registration removal.
  - 3.3.2. Start triggers will be done by Air France Flight Selection System. Uplink trigger at beginning of flight or beginning of descent, depending of selected area. There will be a requirement for development of the AFR FSS to integrate the AFR and KLM B777 fleets to the FSS.
  - 3.3.3. Origin airport will be indicated by ICAO code.
  - 3.3.4. No geographical boxes or specific airports or time limiting function (only Air France FSS). As mentioned in 3.3.2, if no geographical box or specific airport loaded to the aircraft, FSS will need development. The current capability of FSS allows cruise data (L1) to be configured 30min after departure from selected airport (with no mention of when cruise stops). This will need to be enhanced to allow for "city pairing". The current configuration will report all departures from the selected airport irrespective where the destination is (this may be on routes and to areas where data is already being supplied by other AMDAR airlines).
  - 3.3.5. Observing frequency and flight levels: N, A1, A2, L1, D1, D2, TL1, and TL2 are defined in the AAAv3 as referenced in para 2 above.
  - 3.3.6. Downlink to Air France ACARS host only (for data propriety and security reasons). In the case of KLM aircraft, this will have to be agreed within the airline structures.
  - 3.3.7. The B777s are not equipped with water vapour sensing system.
  - 3.3.8. True height (GPS altitude) is not mentioned in AAAV3.
  - 3.3.9. The AMDAR community does not wish the removal of WVSS capability – it may become available in the future. Therefore, true height should not be considered within the scope of this development
  - 3.3.10. Transmission priority order: VHF first, Satcom second.
  - 3.3.11. Uplink commands, described in AAA spec dated 1/8/2000 §11, concern the management of geographical limits, time limiting periods and airports enabling. As triggers are done by Air France Flight Selection System, the FSS will need to provide some form of configuration to allow the adaptability for specific airports/geographical are reporting.
  - 3.3.12. Spec 2006-1 §2.4.3 and §2.4.4, mention optional smoothing functions. **The** arithmetic mean smoothing in 2.4.4 will be the default. (Parameter Int<sub>s</sub> =2)

### 4. **DELIVERY OF ACMS DATABASE**

- 4.1. Will be loadable on all existing and ordered Air France and KLM B777 aircraft.

## APPENDIX 1

- 4.2. The source code will be provided to Air France, for any subsequent evolution requested by E-AMDAR (number and intervals of snapshots, recorded parameters, addition of new parameters e.g. True Height, atmospheric/volcanic measurements ...).
- 4.3. Limitation: it will have to be compatible with the present memory and processing capacity of AFR and KLM B777s (AFR considers that operational and maintenance ACMS applications have high priority over AMDAR). An estimate will have been done by the data-base provider of the resources needed for this report.

### **5. PLANIFICATION**

- 5.1. KLM lead time : 5 months
- 5.2. Air France lead time: 3 months after 5.1.

## APPENDIX 2



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## AIRCRAFT METEOROLOGICAL DATA RELAY (AMDAR) PANEL

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France

Subject : Air France B777 AMDAR Meteorological Reports

De Bilt, 14 July 2011

Dear Mr Berthault,

At the meeting between Air France-KLM and the E-AMDAR Programme team (Toulouse, 29 March 2011) the development of AMDAR software for the Air France and KLM B777 fleet was discussed. This discussion was based on the B777 software specification drafted by Air France and commented on by E-AMDAR and KLM.

During the discussion on this subject a few number of small changes and additions were proposed and it was agreed that the final version of the B777 specification would be provided to Air France by the AMDAR Panel with the request to Air France for a quotation for the development of the B777 AMDAR software.

Enclosed to this letter you will find the final version of the B777 specification and, based on this specification, I would like you to provide me with a price quotation for the development of the software. I also would like to ask you to confirm the KLM and Air France lead time as indicated in the specification.

Thank you very much for the opportunity given by Air France and KLM to expand the potential of AMDAR through a possible future inclusion of the Air France and KLM B777 fleet into the Global AMDAR Programme.

I am looking forward to your earliest reply.

With kind regards,

  
Frank Grooters  
Chairman of the WMO AMDAR Panel

Cc: Mr Frédéric Giraud

Enclosure(s): 1

## APPENDIX 3

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### Grooters, Frank (KNMI)

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**Van:** Olivier Berthault [olberthault@airfrance.fr]  
**Verzonden:** donderdag 25 augustus 2011 14:54  
**Aan:** Grooters, Frank (KNMI)  
**CC:** Carlberg Stig; Taylor, Stewart; Antoine de Feraudy; Frédéric Giraud; Emanuele Trovato  
**Onderwerp:** Air France B777 AMDAR Meteorological Reports  
**Opvolgingsmarkering:** Opvolgen  
**Markeringsstatus:** Rood

Mister Frank Grooters, Chairman of the World Meteorological Organization, Aircraft Meteorological Data Relay (AMDAR) Panel.

Dear Mister Grooters,

Regarding the letter you sent me on July 14th, 2011, I am pleased to give you the following answer.

Air France is more than ever eager for being able to send AMDAR reports from its Boeing 777 fleet. As mentioned in your letter, the related specification has been clearly stated.

- The cost related to the development of AMDAR software for the Air France and the KLM B777 fleet as well is in an amount of euro 50,000.

- Unfortunately, we are not able to confirm the KLM and Air France lead time, as the KLM technical team is now fully occupied with the A330 coming into service by February 2012. We will do our utmost, but we think that we would not be able to create ACMS AMDAR for the B777 fleet before mid 2012; we will keep you informed.

We stay at your disposal.  
With my Best Regards.

Olivier Berthault  
Vice-President Marketing & Sales  
Information Systems



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