WORLD METEOROLOGICAL ORGANIZATION   AMDAR Panel-15/Doc.4.4.7
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WMO AMDAR PANEL   (29.X.2012)
(Fifteenth Session)   _____

(BOULDER, USA, 6-9 NOVEMBER 2012)   ITEM: 4.4

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PROJECTS, PLANNING AND WORK PROGRAMME

Development and Maintenance of the Aircraft Observing System QMS

AMDAR Software Development & Standardisation

(Submitted by the Secretariat)

SUMMARY AND PURPOSE OF DOCUMENT

Provides a summary and current status of known AMDAR onboard software developments and standardisation projects.

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.

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AMDAR SOFTWARE DEVELOPMENT

Australian AAA Version 3 Development

1.   See AMDAR Programme Status Report for Australia, agenda item 3.3.

AAA Development for Boeing 777

2.   Air France has made an offer for the development of an AMDAR software package for implementation into their B777 fleet. The specification for that software package was agreed and would be based on the AAAv3 software specification. Air France has requested KLM to develop the software, envisaging that the same software might also be applicable to the KLM B777 fleet. The quoted amount for the development was € 50,000 and will be shared (is confirmed by all stakeholders) between E-AMDAR, Météo France and the AMDAR Trust Fund.

At several meetings of the E-AMDAR TAG and at bilateral meetings between E-AMDAR and Météo France/Air France/KLM the issue of the development of the software package for the B777 fleet was discussed without any progress because of resource problems at the KLM Software Development Division.

The E-AMDAR Programme Management will continue to include this issue into the discussions with Air France/KLM at the next bilateral meeting with Météo France and Air France/KLM and at the 20st meeting of the E-AMDAR TAG (Norrköping, 4-6 December 2012).

ARINC 620 Version 2 Software Development for Aeromexico B737-700 Honeywell Avionics

3.   As part of the development of the Mexican AMDAR Programme, ARINC 620 Version 2 software for B737-800 Honeywell Avionics has been developed (October 2012) but was yet to be flight-tested and validated.

AMDAR SOFTWARE STANDARDISATION

WIGOS Pilot Project for AMDAR, Development of the framework for generic software specification for AMDAR

4.   A WMO Special Services Agreement (SSA) was put in place with consultant Mr Frank Tamis in October 2011 for the contracting of this work under the Statement of Work developed by the Panel and the Secretariat.

5.   From the Description of Work for the SSA:

At the current time, the Global AMDAR Programme is primarily based on three distinct software specifications:

1.   The ARINC 620-6, Datalink Ground System and Interface Specification, which contains versions 2 through 4 of the Meteorological Report Command Uplink specifications (Chapter 4) and version 1 though 4 of the Meteorological Report (downlink), which, together with Appendices G and H form the "ARINC620 AMDAR Specification".

2.   The ASDAR Aircraft to Satellite Data Relay (ASDAR) specification: Software Requirements Specification for the ASDAR Project, version 1 163-00016-44-4, October 1994, Matra Marconi Space; and,

3.   The ACARS ACMS AMDAR (AAA) Specifications, version 1 through 3.

The over-arching motivation for this project is to consolidate the above specifications and the additional information within the AMDAR Reference Manual into a generic functional software specification that provides all the functional requirements for AMDAR software in a single document.

6.   This specification is intended to provide a functional and meteorologically-based specification for onboard AMDAR software that will allow developers to implement AMDAR software for any avionics platform. Given the current reliance on ACARS communications infrastructure it is heavily geared to that particular communications application.

7.   The AOSFRS has the following features:

- Compatibility with ARINC 620 Meteorological Report Version 5 and can be utilized in conjunction with it;

- Supersedes the previous AAA versions 1 to 3;

- Provides a new standard ACARS downlink format that maximizes text-based reporting efficiency by specifying a variable length message allowing the "hiding" of characters for unused or unavailable parameters and allowing Base 40 compression; and,

- Incorporates both pressure-based and time-based reporting consistent with ARINC 620;

8.   While behind schedule due to the complexity of the task, work on this project has proceeded well and is expected to be finalized later in 2012 with the delivery of the AMDAR Onboard Software Functional Requirements Specification (AOSFRS).

9.   The most recent draft of the AOSFRS is provided as Information document INF.4.4.7.

10.   **Recommendations**:

1) All operational AMDAR programme managers should review this specification and provide their review to the Secretariat highlighting any issues or concerns;

2) The Panel should appoint a review team to review the final draft version;

3) Once completed, the AOSFRS should be offered to avionics vendors to implement as a standard avionics catalogue item (Teledyne have expressed an interest in this for their ACMS "Add-on Library";

4) The Panel may like to consider how best to coordinate future modifications to AMDAR onboard software standards.

AEEC ARINC 620 Meteorological Report Version 5 Completed

11.   The project to update the AEEC ARINC 620 Meteorological Report specification to version 5 has now been completed with the publishing of Supplement 7 to ARINC 620 (ARINC 620-7) in June 2012.

12.   The requirements for the update are documented within the specification:

Meteorological Report, Version 5 incorporates the following additional functionality to Version 4:

1. For the Ascent Data, the Series 1 duration (seconds), the allowable maximum range has been extended from 200 to 600 seconds and the Top of Climb allowable maximum range from 250 to 350 (ftx100).

2. For the Descent Data, the Descent Interval allowable minimum range has been extended from 20 to 10 seconds and the Top of Descent allowable maximum range has been extended from 250 to 350 (ftx100).

3. The Turbulence parameter has been added to both series of the Ascent Report.

4. The data width of the turbulence parameter, Eddy Dissipation Rate (EDR), has been extended from 4 characters to 8 characters.

5. The Time Message Assembled parameters in all reports have been extended to a resolution of seconds

6. The resolution of the Time of Observation parameter has been increased from minutes to seconds.

7. The resolution of reporting of Latitude and Longitude has been increased from tenths of minutes to 1 second for all reports in all flight phases.

8. Global Navigation Satellite System (GNSS) Altitude has been added as a parameter to be reported in all flight phases.

9. The resolution of the Water Vapor (WV) /Humidity parameter has been increased.

10. The parameter Icing has been added to report the status of ice accretion within the Meteorological Report.

13.   Mr Dean Lockett attended the AEEC DataLink Sub-Systems Committee (DLK SSC) held in Luxembourg over 14-16 February, 2012 and presented to the DLK SSC, the AMDAR Panel's update of the Meteorological Report (to version 5) contained within the ARINC 620 specification after which several iterations of minor revisions was required to ready the update for final publication.

14.   ARINC 620-7 and the specification of Meteorological Report Version 5 should be considered to be a primary standard for AMDAR reporting within ACARS communications protocols.

15.   The Secretariat and the Chairman wish to thank Mr Axel Hoff, Mr Hans-Rudi Sonnabend and Mr Stewart Taylor for input to the review and update process.

16.   **Recommendations**:

1) The Panel should consider any future requirements for AMDAR onboard software specifications.

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