

**WORLD METEOROLOGICAL ORGANIZATION**

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**COMMISSION FOR BASIC SYSTEMS**  
OPEN PROGRAMME AREA GROUP  
ON INTEGRATED OBSERVING SYSTEMS

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**EXPERT TEAM ON AIRCRAFT-BASED OBSERVING SYSTEMS**  
**FIRST SESSION**

ITEM: 5.2.2

Original: ENGLISH

Geneva, Switzerland, 10-13 September, 2013

## **ET-ABO WORK PLAN & PROGRAM DEVELOPMENT**

AMDAR Onboard Software Specification  
*(Submitted by the Secretariat)*

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### **SUMMARY AND PURPOSE OF DOCUMENT**

To advise the session on the publishing of the AMDAR Onboard Software Functional Requirements Specification (AOSFRS) and to make recommendations on the future management of AOS specifications.

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### **ACTION PROPOSED**

The Session is invited to note and discuss the information and consider the recommendations made in the document.

#### References

1. AMDAR Onboard Software Functional Requirements Specification, Version 1:  
[http://www.wmo.int/pages/prog/www/IMOP/publications/IOM-114\\_AOSFRS\\_v1/IOM-114\\_AMDAR\\_AOSFRS\\_V1.pdf](http://www.wmo.int/pages/prog/www/IMOP/publications/IOM-114_AOSFRS_v1/IOM-114_AMDAR_AOSFRS_V1.pdf)
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## AMDAR ONBOARD SOFTWARE SPECIFICATION

### 1. Background

1. A WMO Special Services Agreement (SSA) was put in place with consultant Mr Frank Tamis in October 2011 for the contracting of the work of developing a “Generic Specification” for AMDAR onboard software under the Statement of Work developed by the Panel and the Secretariat.

2. 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 through 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.*

3. 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 weighted to that particular communications application.

4. The AMDAR Onboard Software Functional Requirements Specification (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.

### AOSFRS Now Published

5. While the finalisation of the specification as a deliverable of the contractor was behind schedule due to the complexity of the task and the additional review iterations required, draft version 10 of the AOSFRS was delivered by the consultant in April 2013. Subsequently, the newly formed CIMO Task Team on Aircraft-based Observations (TT-AO) undertook a final review and revision of the specification, after which draft version 12 was produced and approved for publication as a CIMO Instruments and Observing Methods report by the Chairs of ET-ABO and TT-AO in July 2013.

6. The Secretariat then undertook final approval of the specification as a CIMO IOM report in consultation with CIMO Management Group. The AOSFRS has now been published as CIMO IOM NO. 114 and is available from the CIMO IOM series website at:

<http://www.wmo.int/pages/prog/www/IMOP/publications-IOM-series.html>

It is also available via the WMO AMDAR website Resources area at:

[http://www.wmo.int/pages/prog/www/GOS/ABO/AMDAR/resources/index\\_en.html#amdar\\_stds](http://www.wmo.int/pages/prog/www/GOS/ABO/AMDAR/resources/index_en.html#amdar_stds)

7. Future updates to the AOSFRS will be handled through its reissue with a new IOM number.

#### **Future Management of AOS Specifications**

8. While responsibility for the development and maintenance of AMDAR onboard software (AOS) specifications lies with TT-AO, it is the responsibility of the Aircraft-based Observations Programme (ABOP) to together determine the general strategy for their management and use. In particular, the ABOP should determine the future strategy and process for maintaining the AOSFRS and its alignment and consistency with the AEEC ARINC 620 standard.

9. While it may appear that the development of the AOSFRS (superseding the AAA specification series) continues the requirement for the maintenance of two WMO standards for AOS, it is suggested that this can be rationalised, simplified and made more efficient in the future. Conceptually, this can be achieved by regarding the AOSFRS as the primary meteorological and functional specification for AOS, while the specification of the AEEC ARINC 620 Meteorological Report is, in the future, limited to specification of the uplink and downlink format requirements only for application of the AOSFRS. In practice, this would mean that:

- a) The AOSFRS would be the primary reference for, and specification of, the meteorological and functional requirements for applications development associated with the ARINC 620 Meteorological Report and changes to meet new or altered requirements for AOS would be first initiated through an update to the AOSFRS; and,
- b) The ARINC 620 could be updated to include Meteorological Report, Version 6 to be consistent with the AOS format specifications (AOSFRS Version 1, Appendix A) and the supporting text in the ARINC 620 reduced to a minimum through reference to the AOSFRS. It is possible that Version 1 to 5 could be moved to an Appendix of the ARINC 620 to avoid the further use of these older format standards in the future.

10. This proposed arrangement would require discussion with, and approval of, the AEEC DLK SubSystems Committee.

11. **It is recommended** that the Session discusses the future management of AOS specifications and considers the above proposed strategy.