

**WMO AMDAR PANEL
(Fifteenth Session)**

(30.X.2012)

(BOULDER, USA, 6-9 NOVEMBER 2012)

ITEM: 4.3

Original: ENGLISH ONLY

PROJECTS, PLANNING AND WORK PROGRAMME

Research and Development of New Aircraft Observations Technologies

Future Avionics & Communications Risks & Opportunities

(Submitted by the Secretariat)

SUMMARY AND PURPOSE OF DOCUMENT

To highlight the need for the Aircraft-based Observations Programme to investigate risks and opportunities associated with current and future developments within avionics infrastructure, protocols and communications that might affect the AMDAR system.

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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BACKGROUND

1. The AMDAR system is currently largely embedded within the infrastructure framework of avionics and communications systems linked with ACARS and the Panel has worked towards the sustainability of that model through the development of AMDAR standards within the AEEC standards framework (ARINC 620 Meteorological Report) and within the WMO framework through the specification of the generic software specification (AMDAR Onboard System Functional Requirements Specification) – see agenda item 4.4.7.
2. Given that the AMDAR system is a core component and a sub-system of WIGOS, on which application areas and Data Users depend, it is important that the programme is maintained and has a secure future. This necessitates a process of continuous “horizon scanning”, particularly in regard to current and future developments in avionics and related communications that may either put at risk and/or offer improvement and efficiency to, the viability of the AMDAR system.
3. It is suggested that the best way to attempt to minimize risks to the AMDAR system, is to ensure that the standards and components upon which AMDAR is built are not only well embedded within the existing aviation and avionics standards and infrastructure but that AMDAR will also be migrated, accommodated or ported into future or alternative, appropriate aviation and avionics systems.
4. It is recommended that this technical horizon scanning activity is given a prominent place in the aircraft-based observation work programme and tasks and studies are activated as necessary.

FUTURE WORK ON INTEGRATION OF AMDAR STANDARDS

AMDAR Onboard Software Integration into Airframes

5. The Panel has previously (2008-2009) undertaken approaches to aircraft manufacturers Boeing and Airbus to ascertain their interest in enabling integration of AMDAR Onboard Software (AOS) into the airframe avionics as an option item for airline request in support of participation in the AMDAR programme. Potentially this could be supported as both a new delivery and retro-fit option.
6. This activity progressed to the point where quotations for AOS and WVSS-II integration by Airbus for a range of their 300 series aircraft were provided to the Panel in 2009. The subsequent attempts to raise the required funding to support this activity was not successful.
7. **Recommendation:** Given the near completion of the AMDAR Onboard Software Functional Requirements Specification, the update of the ARINC 620 Meteorological Report and the validation of the WVSS-II v3 unit, the Panel should consider a renewed approach to aircraft manufacturers regarding AMDAR software and water vapour sensor airframe integration.

AMDAR Onboard Software Integration into Avionics Systems

8. During AMDAR Panel Management Group Session 4, the APMG met with Ms Julia Rafailova from Teledyne Controls (TC) who provided a presentation on Teledyne technologies and possible services to, and collaboration on AMDAR. The APMG agreed that it would be highly desirable to work with TC towards the possible implementation of a generic AMDAR application that might be available from one or more of the Teledyne aircraft avionics systems, in particular through the Teledyne ACMS “Add-on” library. The APMG determined that the best approach for possible collaboration with TC would be to finalize the AMDAR software Generic Specification currently underway with the aim of providing it as the AMDAR software standard for implementation within avionics systems.

9. **Recommendation:** The Panel may like to consider development of a strategy for a wider approach to the key avionics vendors to seek support for AOS integration that better facilitates airline request for rapid AOS implementation within avionics systems, either from the factory floor or via retrofit.

ACTIVITY ON TECHNOLOGY HORIZON SCANNING

10. From the AMDAR Panel Management Group Session 4:

4.7.1. The Meeting discussed the issue of future risks and opportunities associated with current and potential future avionics and aviation communications developments that might present risks and or opportunities for the Aircraft-based Observations Programme. It was agreed that this issue should be more actively addressed within the programme.

4.7.2. Action: The Panel to consider the requirement and terms for a study on Future Avionics and Communications Technology Affecting AMDAR under a WMO SSA funded by the AMDAR Trust Fund.

11. It is clear that there are many technological and aviation project developments, both known and unknown to the Panel that may have the potential to affect the aircraft-based observations programme and the AMDAR system. The technology “knowns” include: Mode S, ADS-B and ADS-C, satellite communications (including IP), wifi, etc. The aviation project developments include: [NextGen](#) and [SESAR](#).

12. **Recommendation:** The Panel may like to consider funding a study to be undertaken in 2013 by a suitably qualified aviation or avionics expert to make an assessment of the current status and likely future developments in avionics and aviation communications that might effect, present opportunities or put at risk the aircraft-based observations programme and the AMDAR system.
