

WORLD METEOROLOGICAL ORGANIZATION

Workshop on Aircraft Observing System Data
Management/Doc. 4.

**WMO AMDAR PANEL WORKSHOP ON AIRCRAFT
OBSERVING SYSTEM DATA MANAGEMENT**

(29.V.2012)

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ITEM: 4

Original: ENGLISH ONLY

AIRCRAFT OBSERVATIONS (AO) METADATA MANAGEMENT

AO Metadata Requirements

(Submitted by Stewart Taylor, E-AMDAR Technical Coordinator)

SUMMARY AND PURPOSE OF DOCUMENT

Summary of current situation regarding AO Metadata, review requirements – taking into account other activities e.g. WIGOS AMDAR Pilot Project.

Define and recommend a framework for management of AO Metadata.

ACTION PROPOSED

1. The Workshop is invited to note the information contained in the document.

References:

1. AMDAR Metadata Practice (WIGOS-PP-5-AMDAR-MG/Doc 2.2).
<http://www.wmo.int/pages/prog/www/OSY/Meetings/WIGOS-PP-5-AMDAR-MG/DocPlan.html>
 2. Definition of Metadata searches applicable to a wide variety of WMO Datasets.
http://www.wmo.int/pages/prog/www/WIS/metadata_en.html
 3. Data and metadata representation.
http://www.wmo.int/pages/prog/www/WDM/wdm_representation.html
 4. Development of the WMO Core Profile of the ISO Metadata standard.
<http://www.wmo.int/pages/prog/www/WDM/Metadata/documents.html>
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1. BACKGROUND

- a. The requirements for Metadata management can be found in discussions at previous meetings and more recently documentation relating to the WIGOS Pilot Project for AMDAR.
 - i. WIGOS PP agreed on components of metadata and in particular, identified Metadata required to describe data and products, Metadata required for the usage of the data and Metadata required for the operation of the AMDAR observing system – see Appendix 1.
 - ii. Within the E-AMDAR Programme, the airlines were presented with the provisional dataset and invited to provide comment. Most of the airlines commented that the initial dataset was “ambitious” and would probably not be manageable. The majority of the airlines responded that a slimmed down version would be more appropriate and manageable.
 - iii. Following the responses from the airlines, one airline was asked to provide the parameters for the Metadata.
 - iv. The Metadata Template was therefore designed to meet AMDAR requirements for quality control (QC) and asset tracking. In the 5th Session Meeting, the WIGOS PP for AMDAR agreed that a subset of the AMDAR Metadata database should be used for integration into WMO for WIS data recovery.

2. METADATA FOR AIRCRAFT OBSERVATIONS (AO)

- a. Metadata (data about data), for Aircraft Observations (AO), provides information on the aircraft, the instrumentation, software/hardware configuration, method of observation, quality, and other characteristics of data. Metadata also provides the information on the origins of the meteorological values themselves.
- b. As mentioned in several WMO documents, Metadata can be considered as an “administrative and historic record” containing all possible information related to a specific aircraft.
- c. Metadata are dynamic. Onboard software, processing methods and sensors may change over time. A Metadata system needs to have the ability to track these changes.

3. ELEMENTS/PARAMETERS REQUIRED FOR AO METADATA DATABASE

- a. The metadata database will contain detailed information to provide adequate background knowledge about the aircraft, its observational data and historical change record.
- b. Individual sensor information including scheduled maintenance and calibration should also be available. Of relevance, Metadata should include:
 - i. Sensor type, manufacturer, model, serial number,
 - ii. Method of measurement,
 - iii. Resolution, data acquisition, sampling interval, averaging interval and type,
 - iv. Maintenance schedule.
- c. Information on the data processing methods should also be included:
 - i. Data-processing methods, algorithms,
 - ii. Processing interval;
 - iii. Onboard Quality Control (QC) flags,
 - iv. Data format, transmission frequencies.

4. RESPONSIBILITIES

- a. There are several responsibilities relating to Metadata management and these should normally be taken on by a Metadata Manager – with delegation as appropriate.

- i. Maintenance of metadata and population of database.
- ii. Investigation of problems with data, including consulting with Airlines, Data Service Providers (DSP) and NMHS.
- iii. Resolution of identified problems and issues.
- iv. Ensure data meets user requirements.
- v. Co-ordinates any amendments or future development of the Metadata database.
- vi. Publication of guidelines and instructions for Metadata database (WMO documentation).

5. CONCLUSION

- a. There is a clear need for a standardised Metadata database for AO.
 - b. Regional AMDAR Programmes have their own database that will differ from one another.
 - c. Databases will be of varying standards – some only covering basic aircraft information and not providing information that could be used for QC management.
 - d. The implementation of a standard Metadata database will assist with current and new AMDAR Programmes as well as providing a platform for developing regions to initiate quality information and ensure QC management of aircraft.
 - e. This document provides a starting point for discussions.
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Appendix 1 – Aircraft Metadata

Parameter	Description	Examples	Additional Comments
Programme	AMDAR Programme responsible for the AMDAR report	E-AMDAR	
Country/Member	Country Member responsible for AMDAR report	UK	
Originating Centre	Centre for issuing the AMDAR report (ICAO Code)	EGRR	
Metadata File Identifier		amdar-bulletin-eamdar-en	
Metadata Publication Date		yyyymmdd	
Resource Name		AMDAR data	
Publisher Person Name		Stewart Taylor	
Publisher Organization Name		Met Office	
Publisher Phone		+44 (0)1695 555 128	
Publisher Fax		+44 (0) 1392 88 5681	
Publisher Street Address			
Publisher City		Exeter	
Publisher Post Code		EX1 3PB	
Publisher Country		United Kingdom	
Publisher Person Email		stewart.taylor@metoffice.gov.uk	
Resource Publication Date		2012	
Airline Contact Name	Person (s) responsible - aircraft calibration & maintenance	A N Other	Contact details should include deputy contacts.
Airline Organization Name		British Airways	
Airline Phone		Contact details at airline	
Airline Fax		Contact details at airline	
Airline Street Address		Contact details at airline	
Airline City		Contact details at airline	
Airline Post Code		Contact details at airline	

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Airline Country		Contact details at airline	
Airline Person Email		Contact details at airline	
Airline operating ISO Standard	Do the airline's calibration procedures conform to ISO Standards.	Yes/No (Standard #)	Airline responsible for updating the AMDAR Programme on any amendments to their Standards.
AMDAR Programme Identifier	Unique AMDAR aircraft identifier	EU1234	
Date Aircraft was activated for AMDAR		yyyymmdd	
Aircraft Manufacturer		Boeing/Airbus/Embraer	All AMs to be included
Aircraft MSN	Airframe unique identifier	nnnn	
Aircraft Model		B747	All types to be identified, Next Gen aircraft and beyond
Aircraft Series		4nn	
Avionics manufacturer		Teledyne/Honeywell/Rockwell Collins	All vendors to be included
Avionics Hardware part no.		222-100-3-45	Airline to update if any changes to aircraft.
Avionics Software part no.		212-100-2-44	Airline to update if any changes to aircraft.
Navigation System	(GPS or Inertia)	GPS	
GNSS reporting		Yes/No	
AMDAR Software	Software type/format.	AAA	
AMDAR Software Version		v3	
Ascent/Descent interval (reporting resolution)		nnn seconds nnn hPa	
En-route interval (reporting resolution)		nnn seconds	
AMDAR Software Temperature Smoothing	Yes/No	Yes	
AMDAR Software Wind Speed & Direction Smoothing	Yes/No	Yes	
AMDAR Software Humidity Smoothing	Yes/No	Yes	
Aircraft Temperature Sensor Manufacturer	All information relating to the measurement of temperature	Rosemount	Requirements for multiple sensors?
Aircraft Temperature Sensor Type	Is the sensor "aspirated or non-aspirated"?	A/NA	This could be a large factor for QC.
Aircraft Temperature Sensor Part no.		PT100	Which sensor(s) is used for AMDAR – primary

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			etc?
Aircraft Temperature Sensor Serial no.		nnnn	
Aircraft Pressure Sensor Manufacturer	All information relating to the measurement of Pressure	Rosemount	
Aircraft Pressure Sensor Part no.		PT100	
Aircraft Pressure Sensor Serial no.		nnnn	
Aircraft Pitot Sensor Manufacturer	All information relating to the measurement of Pitot	Rosemount	
Aircraft Pitot Sensor Part no.		PT100	
Aircraft Pitot Sensor Serial no.		nnnn	
Aircraft Humidity Sensor Manufacturer	All information relating to the measurement of Pitot	Spectrasensors	
Aircraft Humidity Sensor Part no.		PT100	
Aircraft Humidity Sensor Serial no.		nnnn	
Aircraft Turbulence Sensor Manufacturer	All information relating to the measurement of Turbulence	??	
Aircraft Turbulence Sensor Part no.		PT100	
Aircraft Turbulence Sensor Serial no.		nnnn	
Aircraft Turbulence (EDR software) Version		??	
Aircraft Icing Sensor Manufacturer	All information relating to the measurement of Icing	??	
Aircraft Icing Sensor Part no.		PT100	
Aircraft Icing Sensor Serial no.		nnnn	
Model correction applied	This could be a future entry – dependant on agreement between NWP and AMDAR communities	Yes/No	Provide information on what has been applied?