

**WORLD METEOROLOGICAL ORGANIZATION**

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CBS/OPAG-IOS/ET-ABO/SG-RM/Doc 2

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

20.XI.2014

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

ITEM: 2

**SUB-GROUP ON WIGOS REGULATORY MATERIAL**

Original: ENGLISH

**FIRST SESSION**

Geneva, Switzerland, 2-5 December, 2014

## **REVISION OF PREPARATORY WORK**

WIGOD Regulatory Material  
(Submitted by the ET-ABO Chairman)

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

Provides background information on the preparation and final draft of the Regulatory Material for the Aircraft-Based Observing System by the ET-ABO Sub-Group on WIGOS Regulatory Material

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### **ACTION PROPOSED**

The Session is invited to note the information contained in the document

## Objective of the Meeting

The primary aim of this meeting of a sub-group of the CBS Expert Team on Aircraft Based Observing Systems (ET-ABO) is to complete the revision of the regulatory material for Aircraft-Based Observations (ABO) for inclusion in the WIGOS regulatory material. It is intended that the draft proposed ABO Regulatory Material developed by the sub-group will undergo further review by the wider ET-ABO before submission to the CBS/OPAG-IOS Implementation and Coordination Team on Integrated Observing Systems (ICT-IOS) for review and consideration for adoption by the technical commission following the prescribed process.

## Background and supporting information

This work is associated with Task 28 of the ET-ABO Work Plan 2014-2015, version 2014.1A: See: [http://www.wmo.int/pages/prog/www/OSY/WorkingStructure/documents/ET-ABO\\_Work\\_Plan\\_2014.1A.pdf](http://www.wmo.int/pages/prog/www/OSY/WorkingStructure/documents/ET-ABO_Work_Plan_2014.1A.pdf)

The Expert Team, at its first meeting of the ET-ABO in September 2013, decided:

*Given the requirement to address this urgent and high priority activity and to ensure harmonization of review processes and timelines with the WIP and TT-WRM it was recommended that ET-ABO should appoint a Regulatory Material Review Team consisting of Dr van der Meulen, Mr Frank Grooters, Dr Axel Hoff and Mr Dean Lockett to coordinate and finalise the review and reorganization of the ABO regulatory material. The timeline and tasks assignment for this activity would be determined at a first meeting to be held via Videoconference (WebEx) in early October.*

Mr Doug Body and Mr Stewart Taylor were added to this team at a later stage.

The Regulatory Material Review Team is acting as the ET-ABO Sub-Group on WIGOS Regulatory Material (SG-RM) and has reviewed and agreed on the related material, documents and references and elements for possible inclusion in the WIGOS regulatory.

The SG-RM has met several times by teleconference in the lead-up to this meeting and has developed a structural framework for the regulatory material, a basic policy for the inclusion of materials and assigned roles to SG-RM for compilation of initial draft material (see Attachment).

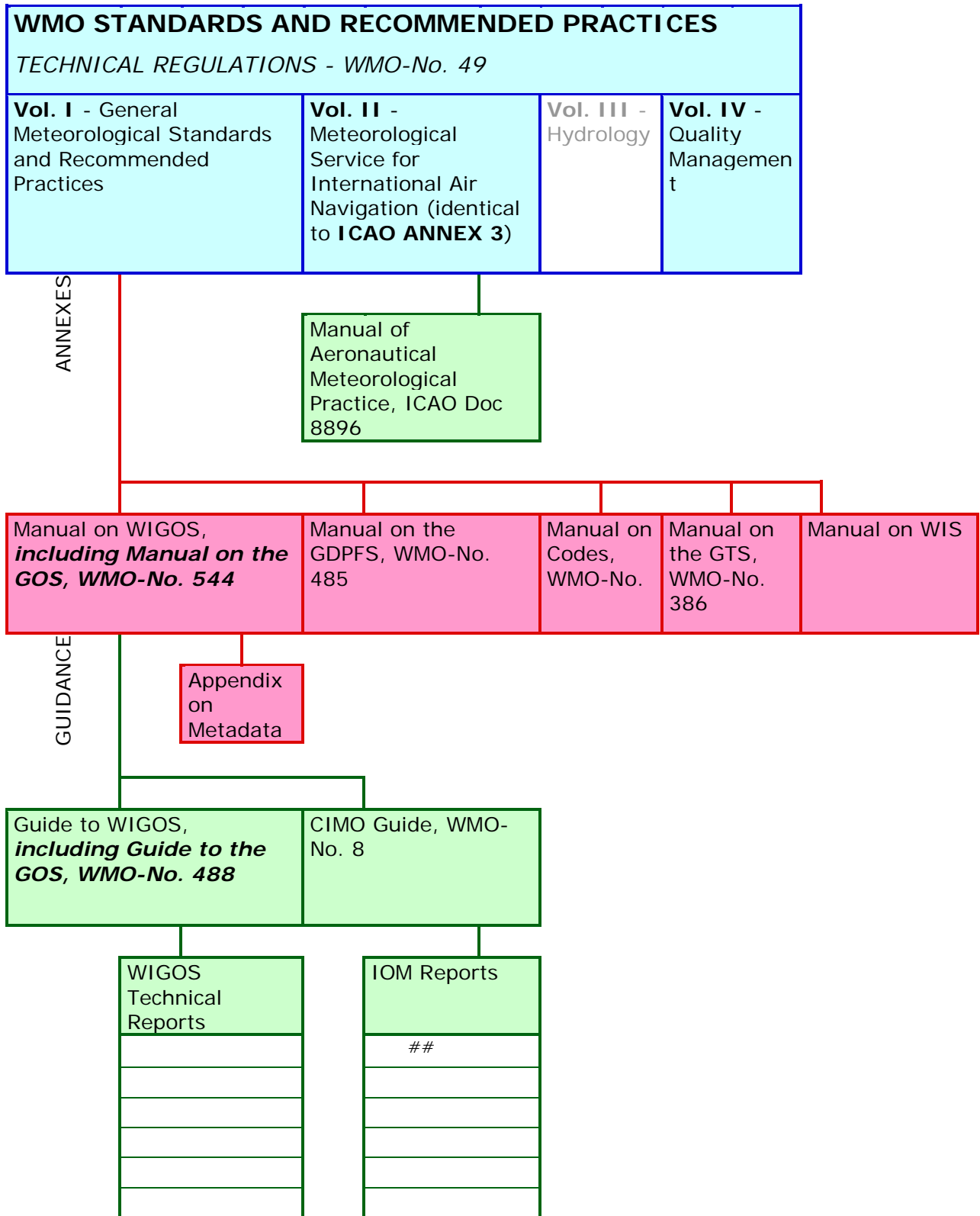
In the process of deliberating over text and material for inclusion in the regulatory material, the SG-RM will take into consideration several existing manuals, guides and technical documents including:

- The existing text in the Manual on the GOS (WMO-No. 544) and the Guide to the GOS (WMO No. 488)
- The CIMO Guide (WMO-No. 8)
- The AMDAR Reference Manual (WMO-NO. 9580)
- WMO Technical Regulations (WMO-No. 49, Volume II, Meteorological Service for International Air Navigation)
- WIGOS Technical Reports
- CIMO IOM Reports
- Various other manuals and guides associated with the World Weather Watch Programme

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# Aircraft Observations related Regulatory Material

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## Aircraft Observations Documentation and References

<i>What should be available</i>	<i>What is in the <b>AMDAR Reference Manual</b>, WMO-No.</i>	<i>What will be the Destination</i>	<i>Further Instructions</i>
<p><u>General statements on the needs and requirements</u> related to ABO, including General <b>Functional Requirements and Management issues</b></p>	<p>[no general reference to WMO requirements]</p>	<p><i>To be decided:</i> Appendix to Guide to WIGOS -or- dedicated WIGOS Technical Report, <b>taking into account existing WIGOS-TR 2014-1 and WIGOS TR 2014-2</b></p>	<p>Review of new text</p>
	<p><b>Par. 1, GENERAL.</b> [1] Explains what is AMDAR en why it is operational, [2] Historic Background</p>		<p>Study WIGOS TR 2014-1 and WIGOS 2014-2 and determine if text can be withdrawn or partially copied to update of one of the two TRs</p>
	<p>Statements on the management of the organization related to AOB (<b>ex. AMDAR Panel, see par. 1.2 and App. V</b>)</p>		<p>Rephrase (or completely rewrite) App. V. Result to be an Appendix in the Guide to WIGOS</p>
<p><u>Observing System, Derived Variables and Accuracy.</u> Based on what should be reported and with what performance. How will it be measured. How will the reported information be derived from the measured data. What will the performance expected to be.</p>	<p><b>Par. 2, SENSORS AND MEASUREMENTS.</b> Explains what is observed, derived and reported, including accuracy issues.</p>	<p>Move to CIMO Guide Part 2, Chap. 3, deleting overlap with already existing material.</p>	<p>Review of CIMO Guide Part 2, Chap 3 to include Par. 2 and App I, after deleting overlapping parts.</p> <p><b>ALSO:</b> Consider other Chapters in CIMO Guide, like Part I, Chap 12, 13 (upper air measurements), Chap. 17 (atmospheric composition), Part II, Chap 5 (profiling techniques of the atmosphere), Part III, Quality Assurance and Management of Observing Systems.</p>
	<p><b>APPENDIX I, AMDAR SENSOR DATA PROCESSING.</b> Detailed expansion of observing technology and calculation to derived requested variables, including accuracy per derived variables</p>		

<u>Transmission of Observational Data, from aircraft to groundstation</u>	<b>Par. 3, MESSAGE COMPILATION</b> , with user Requirements	<i>to be decided:</i> Par. 3 contains requirements, to be added to the Man. WIGOS and TR-VOL II (Annex 3). Other parts to go the Guide to WIGOS.	Review of text. Decision on parts of text to go to Man. WIGOS, ANNEX 3 and/or Guide to WIGOS.
	<b>APPENDIX II, containing 6 ANNEXES:</b> DOWNLINK DATA SPECIFICATIONS	App II contains details, which are in IOM Report 115. Other destination: new WIGOS TR	Review of IOM 115 to see if App II can be transferred to updated IOM -or- that revised App II + App II shall become a new WGOS TR
	<b>APPENDIX III,</b> downlink data control specifications	App III contains details, which are in IOM Report 115. Other destination: new WIGOS TR	
	<b>Par. 4, DATA FORMATS FOR AIRGROUND (DOWNLINK) COMMUNICATION</b>	Guide to WIGOS	In combination with Par. 3 (see above)
	<b>APPENDIX II, ANNEX IV.</b> See above	see above	see above
<u>Data management, Reporting message formats, Quality Control, Evaluation and Feed back</u>	<b>Par. 5, AMDAR DATA MANAGEMENT</b>	To move to Guide to WIGOS (after review and update). Appendix IV to be reviewed and updated and published as new WGOS TR.	Review and update text. Special attention for [1] BUFR code, [2] Quality Assesment, [3] Data Management as recommended by AMDAR DM workshop (2012)  note: Guide on World Weather Watch Data Management (WMO-No. 788)
	<b>APPENDIX IV, AMDAR DATA MANAGEMENT.</b> Includes CODE issues (substantial)		
	<b>Par. 6, Quality Control</b>		
	<b>APPENDIX IV, AMDAR DATA MANAGEMENT.</b> Includes Quality assesment issues		

## Summary of Elements for Possible Inclusion in the RM

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action #	action by:	comments
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### a) Manual on WIGOS

- Note on where regulatory material can be found.

- Description of ABO and the various known systems (or at least a reference to the description of the systems in the GtW). Unless this can be written as regulations, it may have to take the form of a note).

- Definition of the AMDAR observing system and its high level operation. (some limited input from WIGOS TR 2014-1, 2014-2?)

- Requirements for participation in the AMDAR programme

- Requirements for provision of AMDAR data (BUFR with ref. to Man on Codes)

Operation of other ABO systems

- Provision of data

- Provision of ICAO ABO data

Requirements for quality monitoring of ABO

Requirements for provision of metadata

Requirements for fault management

1	SG-RM	Once regulations are written this Note should be written and summarise all relevant references.
2	JvdM, DL	New material. Require identification of the following systems: 1) AMDAR; 2) ICAO ADS (mode-S); 3) ICAO AIREP; 4) corporate systems (e.g. TAMDAR) - Explanatory notes and also some high-level regulations relating to them. Also need to describe the relationship with ICAO "aircraft observations" - consider text in Annex 3 (WMO TR Vol II).
3	SC, DL	Regulation that Members shall implement AMDAR programs. Address regulation related to Res. 40. Address use of BUFR. Regulation to phase out use of FM42. Requirements for QC and QM (by reference to Guide on WIGOS on ABO & Man on GDPFS)
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5		
6	JvdM, FG	Provision of data under Res. 40. Provision of data on GTS.
7	JvdM	Short regulation that members must undertake QM of any ABO system that they operate. Specific requirements reference the Guide. (Guide should refer to the Man on GDPFS & Part III of CIMO Guide. Include requirements for monitoring by NWP and Lead Centre.
8	DL	Few regulations regarding the requirement for Members to provide metadata associated with AMDAR and other ABO systems they operate. Reference to the GtW and other relevant sections of the MoW.
9	DL	Short regulation relating to requirements to rectify faults.

<b>b) Guide to WIGOS</b>			
- Detailed description of ABO systems and their operation	10	SC	I have an earlier DRAFT here: <a href="https://docs.google.com/document/d/1ZEXhn-K87qib8woKZW77ryCE9FriaCudtuB3F3I5wX0/edit">https://docs.google.com/document/d/1ZEXhn-K87qib8woKZW77ryCE9FriaCudtuB3F3I5wX0/edit</a> . SCROLL DOWN and see pages 10-13 Items 1-3. This is a slight modification of the text on our AMDAR Web. Could be extended to cover ADS, Mode-S, TAMDAR and AFIRS in a similar way.
- General requirements for provision of ABO data on the GTS - use of BUFR	11	JvdM	See link at Task 10, scroll down to page 17-18 with references
- Detailed description of AMDAR observing system	12		I understand 12 more as a headline than a separate task?
- History and current governance under CBS and CIMO (App V from ARM)	13	FG	Use relevant part of ARM App V plus part of Introduction in ABOP Regional Implementation Plan Template (ET-ABO-1 INF5.2.3.1)
- Requirements for AMDAR onboard software (ref. to CIMO Guide, AOSFRS and new general guidance)	14	DL	See link at Task 10, scroll down to page 13-14. Also use Axel's draft Software Development Guidance for AMDAR, and refer to CIMO Guide and AOSFRS
- WIGOS TRs 2014-1 and 2014-2	15	SC	We certainly need to refer to these TRs. I am not convinced we should include in GoW any text from these TRs as the subjects will be covered by other tasks in our listing here.
- Detailed description of messages	16	DL	ARM Part 3-5, plus review AOSFRS and ARM Annex II (and III?) and make a synthesis
- Detailed description of data management requirements (ARM Part 3, 4, 5; ARM App II and III, IV; Final Report of Workshop on AMDAR DM).	17		See column E and Tasks 27-28
- Data QC	18	SC	See Task 17
- Monitoring and evaluation of data	19	SC	See Task 17
- Detailed description of ground-based data processing requirements (ARM App IV, Man on Codes & BUFR)	20	JvdM	See column E! See also link at Task 10 and scroll down to item 6 on page 16-17.
- Detailed description of use of BUFR AMDAR Template (replace the document in the Man on Codes)	21	JvdM	See column E!
- AMDAR data optimisation and use of optimisation systems (reference to new guidance).	22	DB, DL, ST	A proposal being drafted by Axel? See also link at Task 10 and scroll down to text on page 20
- Detailed description of ICAO data and its provision	23	JvdM	I understand 23 more as a headline than a separate task?
- Data QC	24	JvdM	We have a draft on this in the paper we wrote for the WMO/ICAO Met Divisional Meeting last July
- Provision of ADS data to WAFCS	25	JvdM, DL	See Task 24
- use of BUFR	26	JvdM	See Task 24
- Requirements for QC of ABO data before provision on the GTS	27	SC, DL	I think this duplicates with Task 18 and partly also with Task 11 ??
- Requirements for monitoring and evaluation of ABO data	28	SC, DL	Review and update/expand on ARM Part 6 and item 7 in Appendix IV. Also possible overlap with Task 17-19

**c) CIMO Guide**

- Revision of current content and inclusion of material from the ARM that does not belong in a) or b)

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**d) Other guidance materials**

- AOS general guidance (Axel)
- Requirements for AMDAR Optimisation (Doug)

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