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| **World Meteorological Organization****Commission for Instruments and Methods of Observation** **Second Session of the Expert Team on Operational Metrology (ET-OpMet)**Tokyo, Japan, 27-30 November 2017 | **CIMO/ET-OpMet-2/Doc. 3**  |
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# UPDATE ON WIGOS DEVELOPMENT, INCLUDING OVERVIEW OF RIC-RELATED DECISIONS

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| **Summary and purpose of document**This document provides information on the status of the development and implementation of WIGOS relevant to the work of ET-OpMet, and on RIC-related decisions of the sessions of CIMO Management Group and of the WMO Executive Council, held since 2015. Decisions that are most directly relevant to the work of the ET-OpMet are para 4.c) and 7. |

**Action proposed**

The Meeting is invited to consider how it can provide support to the implementation of these decisions and more generally to WIGOS.

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**Appendix:** I [Recommendations to CIMO MG from ET-OpMet.](#AppendixI)

# UPDATE ON WIGOS DEVELOPMENT, INCLUDING OVERVIEW OF RIC-RELATED DECISIONS

1. An [Overview of RIC relevant resolutions and recommendations](https://www.wmo.int/pages/prog/www/IMOP/meetings/CB/ET-OpMet-1/INF-4_Strengthening_RICs_Bkgrd-Info.doc) for the period from 2010 to 2015 was submitted to the first session of ET-OpMet held in Ljubljana (Slovenia) in December 2015. Since then, two sessions of the WMO Executive Council (EC) and one session of reduced CIMO Management Group were held. Outcomes of these meetings relevant to the work of ET-OpMet are summarized below.

***The sixty-eight session of the WMO Executive Council (2016) – WIGOS related outcomes***

1. [The sixty-eight session of the WMO Executive Council (EC-68)](https://mail.google.com/mail/u/0/#inbox) was held from 15 to 24 June 2016, in Geneva, Switzerland. EC-68 adopted:
2. Resolution 2 (EC-68) – *Plan for the WMO Integrated Global Observing System pre-operational phase 2016-2019*

 With this resolution EC requested Members:

(1) To continue to provide resources, including through the WIGOS Trust Fund and/or seconded experts, to help support the implementation of WIGOS, in particular to assist with the operational deployment of the Observing Systems Capability Analysis and Review Tool (OSCAR)/Surface, and to support the translation of all WIGOS guidance material and user manuals into all official WMO languages;

(2) To liaise with non-meteorological organizations that already transmit oceanographic-related information to the JCOMM In Situ Observations Programme Support Centre to make more frequently available (4 times per day) the MET-Ocean data from these platforms. National Meteorological and Hydrological Services may be able to help in the assignment of WIGOS identifiers to these stations.

The Commission for Basic Systems and the Commission for Instruments and Methods of Observation were requested to provide the technical lead in WIGOS pre-operational activities.

1. Resolution 3 (EC-68) – *Inter-commission Coordination Group on the WMO Integrated Global Observing System*

EC approved updated Terms of Reference, including leadership, of the Inter-commission Coordination Group on the WMO Integrated Global Observing System (ICG-WIGOS).

1. Decision 30 (EC-68) – *Regional WMO Integrated Global Observing System Centres*

EC endorsed a concept of Regional WIGOS Centres and urged regional associations and Members to familiarize themselves with the concept and to actively participate in its implementation.

***The sixty-ninth session of the WMO Executive Council (2017) – WIGOS related outcomes***

1. [The sixty-ninth session of the WMO Executive Council (EC-69)](https://library.wmo.int/opac/doc_num.php?explnum_id=3645) was held from 10 to 17 May 2017, in Geneva, Switzerland. A short summary of the adopted decisions and resolutions, relevant to the Instruments and Methods of Observation Programme and to the WMO Integrated Global Observing System, is provided in the following text.
2. Decisions relevant to the Instruments and Methods of Observation Programme:
3. Decision 5.1(3)/1 (EC-69) – *Translation of the International Cloud Atlas*

The new edition of the *International Cloud Atlas – Manual on the observation of clouds and other meteors* (WMO-No-407) was released in the form of a website ([www.wmocloudatlas.org](http://www.wmocloudatlas.org)) on the occasion of the World Meteorological Day 2017. EC requested the Secretary-General to arrange for translation of the Atlas into official WMO languages.

1. Decision 5.1(3)/2 (EC-69) – *Update of the Guide to Meteorological Instruments and Methods of Observation*

WMO and ISO have developed a second common WMO/ISO standard: Ground-based remote sensing of wind by heterodyne pulsed Doppler lidar. The Secretary-General is requested to publish the CIMO Guide, updated with this standard, in all official WMO languages.

1. Decision 5.1(3)/3 (EC-69) – *Discontinuation of the concept of Regional Standard Barometer*

The traceability of atmospheric pressure measurements to the International System of Units (SI) should be ensured through accredited RICs, or other laboratories that are either accredited or designated by National Metrology Institutes. WMO Members hosting Regional Standard Barometers (RSBs) supported the above-mentioned concept of traceability assurance and agreed that maintaining the RSB concept, in addition to the RIC concept, creates a duplication of work and is uneconomical and inappropriate. They also supported the discontinuation of the RSB concept. EC-69 agreed to discontinue the concept of Regional Standard Barometer and requested CIMO to update the CIMO Guide and other relevant WMO guidance and regulatory documents, ensuring their consistency.

1. With respect to the WMO Integrated Global Observing System (WIGOS) following decisions were adopted by EC-69:
2. Decision 5.1(1)/1 (EC-69) — *Regional Basic Observing Network;*

The Regional Basic Observing Network (RBON) concept was endorsed by EC-69 and Members are requested to actively participate in the further development of this concept. Members are invited to propose inclusion of additional surface-based observing stations, such as weather radars, wind profiler systems, lightning detection systems, data buoys, voluntary observing ships and aircraft, in the Pilot RBON established by the regional association.

1. Decision 5.1(1)/2 (EC-69) — *Vision for the WMO Integrated Global Observing System in 2040;*

A draft Vision for WIGOS in 2040 was presented to EC-69. EC-69 provided guidance towards its finalization and decided that ICG-WIGOS takes ownership of the further development of the Vision, with a view to have it approved by the Eighteenth World Meteorological Congress in 2019.

(c) Decision 5.1(1)/3 (EC-69) — *Standardization of observing systems installed on ships;*

Members are invited to collaborate in the European and others efforts, to facilitate standardization of AWS systems and their observations installed on ships as well as the maintenance of such systems by port meteorological officers (PMOs).

(d) Decision 5.1(1)/7 (EC-69) — *Developing the WIGOS “Standardization of Observations” Reference Tool (SORT);*

Standardization of Observations Reference Tool (SORT) is being a tool to electronically navigate complex regulatory and guidance material with multiple cross references. As it would address an overall need for the Organization, the Secretary-General is requested to make the development of SORT an Organization-wide activity rather than something unique to WIGOS;

(e) Decision 5.1(1)/10 (EC-69) — *Guidance on establishing Regional WIGOS Centres (RWCs) in Pilot Phase;*

EC-69endorsed the Guidance on establishing a WMO Regional WIGOS Centre (RWC) in a pilot phase (RWC guidance) as technical guidance to regional associations for establishing a RWC and its implementation arrangements. Regional associationsare requestedto support the establishment of RWC(s) in their Region, while the presidents of regional associations are authorized to approve the pilot RWC(s). EC-69 urged Members to familiarize themselves with the RWC guidance and to actively participate, together with regional partner organizations, in the implementation of RWC. The Secretary-General is requested to provide the necessary assistance and Secretariat support for the establishment of RWCs in the WMO Regions.

(f) Decision 5.1(1)/11 (EC-69) — *Indicators for monitoring the progress in the WIGOS national implementation;*

Addressing the need for a regular assessment of the progress achieved in the national implementation of the WIGOS by Members, ICG-WIGOS has developed: Guidance on the National WIGOS Implementation and Guidance on WIGOS Data Partnerships. The material should assist Members with the implementation of the WIGOS technical regulations. EC-69 endorsed the indicators of monitoring the progress of the WIGOS national implementation as an initial version of the Key Readiness Indicators to assist Members with a regular assessment of the progress achieved in the national WIGOS implementation. ICG-WIGOS is requested to further develop this monitoring tool to be used by Members. The Secretary-General is requested to assist Members with a regular assessment of the progress achieved in the national implementation of the WIGOS, while Members are urged to collaborate with the Secretary-General in this assessment.

(g) Decision 5.1(1)/12 (EC-69) — *Way forward for transitioning WIGOS from the current project structure into the WMO programmatic structure;*

WIGOS, as an operational system which supports all WMO Programmes and activities, will assist in improving the integrated operations of Members and in building productive partnerships to sustain and improve their ability to provide weather, climate, water and other relevant environmental services. The unique nature of WIGOS as a cross-cutting infrastructure will require well-developed collaboration and coordination mechanism between regional and technical working structures. EC-69 recognized the need to start planning for the future of WIGOS after the current project phase, which is scheduled to end in 2019, and requested ICG-WIGOS to develop a proposal for WIGOS in the WMO programmatic structure. The Secretary-General is requested to coordinate collaboration with partners responsible for co-sponsored and non-WMO observing systems in the development of the proposal, in order to address their requirements.

(h) Decision 68 (EC-69) — *WMO Constituent Body Reform*

EC-69 decided to proceed with the development of separate recommendations, for consideration of EC-70 and ultimately the Congress, for restructuring of the Executive Council, the technical commissions and the regional associations with associated terms of references, implementation schedules and other relevant details;

EC Working Group on Strategic and Operational Planning with support from the Secretariat was requested to develop, for consideration by EC-70, a set of recommendations for Cg-18, which address the key issues identified in the current proposal for WMO constituent body reform, including:

* + Prepare separate recommendations pertaining to each of the structures: the Executive Council, the technical commissions and the regional associations, including terms of reference of proposed bodies, step-by-step transition schedules and other relevant details explaining in particular inter-relations between various bodies in a holistic manner;
	+ Draft amendments to General Regulations supporting structural changes and updating processes and functionalities to bring them in line with the current realities;
	+ Clearly articulate on how the proposed structures would realize opportunities and bring benefits to WMO, the key risks, which could be introduced both during and after the transition period, and issues which will not be resolved by the proposals;
	+ Prepare a communication strategy, including consultations with Members and relevant external constituencies, such as IOC/UNESCO, FAO, ICAO;
	+ Review the WMO Programmes with the aim of streamlining and better alignment with the key foundational elements of WMO; and
	+ Elaborate the transition and change management processes.
1. EC-69 adopted following WIGOS-related resolutions:
2. Resolution 5.1(2)/1 (EC-69) *—* *Manual on the WMO Integrated Global Observing System (WMO-No. 1160), Section 2 and Section 8;*

EC-69 adopted the updated Appendix 2.4 (The WIGOS Metadata Standard) and its attachment, and the updated Section 8 (Attributes specific to the observing component of the Global Cryosphere Watch) of the [*Manual on the WMO Integrated Global Observing System* (WMO-No. 1160)](http://library.wmo.int/pmb_ged/wmo_1160_en.pdf) with effect from 1 January 2018. Furthermore, it was decided that the attachment to Appendix 2.4 will be extracted from the Manual and be processed separately as a stand-alone attachment in order to facilitate frequent updating of its technical content. The code tables from the current annex to the attachment to Appendix 2.4 will be removed and included in the [*Manual on Codes* (WMO-No. 306);](https://library.wmo.int/opac/doc_num.php?explnum_id=3361)

1. Resolution 5.1(2)/2 (EC-69) *— Initial Version of the Guide to the WMO Integrated Global Observing System;*

EC-69 adopted the initial version of the [*Guide to the WMO Integrated Global Observing System*](http://www.wmo.int/pages/prog/www/wigos/WGM.html) with effect from 1 July 2018. ICG-WIGOS is requested to finalize the initial version of the Guide with additional guidance material. The Secretary-General is requested: to publish the Guide in all WMO official languages, to ensure the editorial consistency of the relevant documents, to publish the specification of the Binary Universal Form for the Representation (BUFR) of meteorological data code table entries that support WIGOS station identifiers on the WMO website in advance of their formal approval through the fast track procedure, to maintain *Weather Reporting* (WMO-No. 9) and the associated 5-digit WMO station identifiers until the Eighteenth World Meteorological Congress, when Members receive training and have sufficient time to transition to the WIGOS station identifiers.

Members are requested to inform the Secretary-General of the intended date to transition to the WIGOS identifiers with sufficient lead time to enable operational changes by other Members to manage the impact of the change to identifier.

1. Resolution 5.1(2)/3 (EC-69) *— Revised Manual on the Global Observing System (WMO-No. 544) and Guide to the Global Observing System (WMO-No. 488);*

EC-69 decided to amend *Manual on the Global Observing System (WMO-No. 544) and Guide to the Global Observing System (WMO-No. 488)* as proposed by CBS-16.

1. Resolution 5.1(2)/5 (EC-69) *— Guide to Aircraft-Based Observations;*

EC-69 adopted the *Guide to Aircraft-Based Observations* as formal guidance on regulations for Members in replacement of the AMDAR Reference Manual: Aircraft Meteorological Data Relay (WMO-No. 958).

***Response of CIMO MG to the recommendations submitted by ET-OpMet in February 2017***

1. In February 2017, ET-OpMet submitted to CIMO MG, through the WMO Secretariat, a document titled as [Recommendations to CIMO MG from ET-OpMet](#AppendixI). CIMO MG considered the document via correspondence and supported all the recommendations, except the one under bullet four. CIMO MG advised to retain the text dealing with mercury-based instruments in the CIMO Guide until after 2020, but giving it less prominence. A proposal was to put the text to the end of a chapter or in an annex, as appropriate.

***Strategic Planning Meeting of CIMO MG*** **(2017)**

1. A reduced CIMO MG meeting on strategic planning was held in Geneva, from 27 to 29 July 2017. The meeting dealt with CIMO vision in the context of the WIGOS vision and of the WMO Constituent Body reform. As stressed at the meeting, main goal of CIMO is to sustain measurement programmes, whatever a new structure of WMO constituent bodies will be. A proposed mission of a future commission responsible for measurements is: *Fit-for-purpose environmental measurements through leadership, standards and guidance*, while a vision is: *The WIGOS measurement community is the recognized source of information and guidance on performing measurements for environmental intelligence*.
2. The meeting also sourced possibilities for a new structure of CIMO. It was agreed that a new structure should be in line with the proposed mission and vision, and flexible to enable integration of different types of measurements. A preference was given to smaller teams, dedicated to particular, well defined tasks.

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# APPENDIX I

# Recommendations to CIMO MG from ET-OpMet

Regional Associations designated Regional Standard Barometers (RSBs) (Annex I), as barometric standards to support WMO Members in ensuring the traceability of pressure measurements in the period from 1960s to 1980s. RSBs were designated with tasks to organize regional comparisons of the national standard barometers with the mercury-based regional standard barometers. Later on, the concept of Regional Instrument Centres (RICs) has been introduced to assist Members in calibrating their national meteorological standards and related environmental monitoring instruments.

As described in the calibration strategy (developed by ET-OpMet and approved by CIMO MG), measurements should be traceable to an internationally defined and accepted reference, in most cases the International System of Units (SI). Technical and organizational infrastructure was developed and is maintained by the *Bureau International des Poids et Mesures* (BIPM). Maintenance of national standards and dissemination of traceability at the national level relies on National Metrology Institutes (NMIs), or Designated Institutes (DIs). Nowadays, the traceability of atmospheric pressure measurements to the SI units using modern electronic instruments, can be efficiently and economically provided through an unbroken traceability chain, starting from BIPM, through NMIs/DIs, accredited RICs, or other accredited laboratories to the field instruments.

The CIMO Expert Team on Operational Metrology (ET-OpMet) is aware that the concept of RSBs was needed in the past but also expressed its concern that the current existence of these two parallel systems for traceability assurance of atmospheric pressure measurements can be uneconomical and inappropriate. ET-OpMet also noted the absence of information on activities and outcomes of intercomparisons using RSBs.

In this context, the WMO Secretariat organized on request of ET-OpMet the survey “Assessment of the current status and future role of the Regional Standard Barometers (RSBs)” focused on WMO Members hosting RSBs, seeking a clarification on the status of their RSBs, recent activities, traceability and their view on role and possible discontinuation of the RSB concept.

The assessment form (Annex II) was sent to all WMO Members hosting RSBs (23), while feedbacks were received from twelve Members. Eleven RSB hosts did not respond to the survey. Additional clarification with some Members hosting RSBs (Argentina, Kenya and Egypt) was also provided.

The outcome of the survey (Annex III) led ET-OpMet to develop recommendations related to the amendments of relevant WMO Manuals and Guides, accordingly.

Following recommendations are submitted by ET-OpMet to CIMO-MG for consideration and endorsement before ET-OpMet embarks on implementing those changes:

* As decided on CIMO MG-14 the calibration strategy should be included in the CIMO Guide Part I, Chapter 1.
* The concept of RSB should be discontinued. Functionalities should be transformed to RIC concept where traceability is assured in accordance with the calibration strategy.
* Consequently, the concept of the RSB should be removed from CIMO Guide Part I, Chapter 3.
* Considering the Minamata convention on mercury, a text that deals with mercury barometers should be removed from the Chapter 3 and the chapter should be updated accordingly.

(Note: Removed text will remain accessible to Members still using mercury barometers through the previous editions of the CIMO Guide, that are available from the WMO library.)

* Other documents (such as the Manual on the GOS) referring to the concept of the RSB from the CIMO Guide should be updated.

After endorsement of the proposed recommendations by CIMO MG, further steps will be taken in line with the procedure and the guidelines for updating the CIMO Guide.

ET-OpMet wants to bring to the attention of CIMO MG that it has started to restructure first four Chapters of Part I of the CIMO Guide, in a way to provide a uniform structure throughout these chapters.

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