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| WEATHER CLIMATE WATER | **World Meteorological Organization**  **COMMISSION FOR OBSERVATION, INFRASTRUCTURE AND INFORMATION SYSTEMS**  **Third Session** 15 to 19 April 2024, Geneva | **INFCOM-3/Doc. 8.2(2)** |
| Submitted by: Chair of SC-MINT  26.II.2024  **DRAFT 1** |

**AGENDA ITEM 8: TECHNICAL DECISIONS**

**AGENDA ITEM 8.2: WMO Integrated Global Observing System – measurements**

# Evolvement of the operational measurement uncertainty requirements (Guide to Instruments and Methods of Observation (WMO-No. 8), Volume l, Chapter 2, Annex 1.A.)

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| **Summary** |
| **Document presented by:** Chair of Standing Committee on Measurements, Instrumentation and Traceability (SC-MINT),  **Strategic objective 2024–2027:** 2.1: “Optimize the acquisition of Earth system observation data through the WMO Integrated Global Observing System (WIGOS)”  **Financial and administrative implications:** Strategic and Operating Plans 2024–2027.  **Key implementers:** INFCOM/SC-MINT  **Time frame:** 2024–2026  **Action expected:** Review and approve the proposed draft decision |

# GENERAL CONSIDERATIONS

The evaluation of uncertainties in measurements, their interpretation and their representativeness are critical for measurement data quality, comparability and compatibility in different observing networks, for example, the Global Basic Observing Network (GBON) and the Global Climate Observing System (GCOS) Surface Reference Network (GSRN).

On the basis of this along with the targeting of the desired outcome ‘Users and providers understand measurement quality and how fit-for-purpose measurements are achieved’ (one of the desired outcomes of [Resolution 5 (CIMO-17)](https://library.wmo.int/idviewer/56292/13) – Vision for the future of environmental measurements), the INFCOM Standing Committee on Measurements, Instrumentation and Traceability (SC‑MINT) developed the [Measurement Quality Classifications for Surface Observing Stations on Land](https://library.wmo.int/viewer/68695/?offset=6#page=105&viewer=picture&o=bookmark&n=0&q=)(Volume l, Chapter 1, Annex 1.G. to the [*Guide to Instruments and Methods of Observation*](https://library.wmo.int/records/item/68695-guide-to-instruments-and-methods-of-observation?offset=9) (WMO-No. 8)) as endorsed through [Decision 6 (INFCOM-1)](https://library.wmo.int/idviewer/57371/180) – Inclusion of the Measurement Quality Classifications for Surface Observing Stations on Land in the *Guide to Instruments and Methods of Observation* (WMO-NO. 8).

Through [Decision 17 (INFCOM-2)](https://library.wmo.int/idviewer/66287/241) – Towards improved uncertainty evaluations and harmonization of the uncertainty terminology across key INFCOM-related WMO publications, INFCOM decided to intensify the activities relating to the assessment of uncertainty evaluation and to harmonize the related definitions and terminology and requested SC-MINT to further promote, organize and coordinate the field experiments and studies necessary to refine and improve the uncertainty evaluation and traceability of measurements, including collaboration with partners from the meteorology community.

Taking into account these recent developments, the existing operational measurement uncertainty requirements and instrument performance requirements, as given in Volume l, Chapter 1, Annex 1.A. to the [*Guide to Instruments and Methods of Observation*](https://library.wmo.int/idviewer/68695/49) (WMO-No. 8), have been found to be incomplete and not providing appropriate and easily and uniquely interpretable requirements and need to be updated.

# DRAFT DECISION

## Draft Decision 8.2(2)/1 (INFCOM-3)

**Evolvement of the operational measurement uncertainty requirements (Guide to Instruments and Methods of Observation (WMO-No. 8), Volume l, Chapter 1, Annex 1.A.)**

**The Commission for Observation, Infrastructure and Information Systems:**

**Notes with satisfaction** the efforts of its Standing Committee on Measurements, Instrumentation and Traceability (SC-MINT) towards ensuring applicable and unambiguous interpretations of measurement uncertainty requirements.

**Decides:**

(1) To endorse the proposal for the evolvement of the existing operational measurement uncertainty requirements and instrument performance requirements in Volume l, Chapter 1, Annex 1.A. to the [*Guide to Instruments and Methods of Observation*](https://library.wmo.int/viewer/68695?viewer=picture#page=49&viewer=picture&o=bookmark&n=0&q=) (WMO‑No. 8) into a comprehensive scheme that will be aligned with the [Measurement Quality Classifications for Surface Observing Stations on Land](https://library.wmo.int/viewer/68695/?offset=6#page=105&viewer=picture&o=bookmark&n=0&q=)(Volume l, Chapter 1, Annex 1.G. to the [*Guide to Instruments and Methods of Observation*](https://library.wmo.int/viewer/68695/?offset=6#page=105&viewer=picture&o=bookmark&n=0&q=) (WMO-No. 8)) and that will ensure unambiguous and interpretable linkages to the Observing Systems Capability Analysis and Review tool (OSCAR)/Requirements;

(2) To task SC-MINT to continue the evolvement as proposed and to lead the development of an appropriate tool, preferably within the OSCAR database, to accommodate the new scheme.

See [INFCOM-3/INF. 8.2(2)](https://meetings.wmo.int/INFCOM-3/InformationDocuments/Forms/AllItems.aspx) for more information.

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Decision justification:

The existing operational measurement uncertainty requirements and instrument performance requirements, as given in Volume l, Chapter 1, Annex 1.A. to the [*Guide to Instruments and Methods of Observation*](https://library.wmo.int/idviewer/68695/49) (WMO-No. 8) have been found to be incomplete and as not providing appropriate, easily and uniquely interpretable requirements because of the recent developments in uncertainty-related material, for example, the Measurement Quality Classifications for Surface Observing Stations on Land (MQC).It is also difficult to use the requirements in a way that is suitable for the development of tender specifications and to establish clear linkages with the observational user requirements specified in the [OSCAR/Requirements](https://space.oscar.wmo.int/observingrequirements) database.

SC-MINT, through its Expert Team on Measurement Uncertainty, has already initiated an update of Annex 1.A.to the [*Guide to Instruments and Methods of Observation*](https://library.wmo.int/idviewer/68695/49) (WMO-No. 8). One plan is to develop a comprehensive scheme that will provide an overview of the relevant uncertainty contributions that are missing in the current annex and ensure that the overall measurement uncertainty requirements are explicitly documented and aligned with the MQC. There is a need to find a suitable location for “a comprehensive scheme” that allows easy access and agile maintenance. The anticipated solution may involve a new module within the OSCAR family that could be dedicated to the surface-based measurement capabilities. Being placed within OSCAR, the measurement capabilities could easily serve as inputs to the gap analyses performed with the WMO Integrated Global Observing System (WIGOS) Rolling Review of Requirements.

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