

Infrastructure Commission (INFCOM)

Standing Committee on Measurements, Instrumentation and Traceability (SC-MINT)

Expert Team on Quality, Traceability and Calibration (ET-QTC)

Metrology in Meteorology

Part-2: WMO Regional Instrument Centres

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WMO Regional Instrument Centres

RA VI

Toulouse (France)

Bratislava (Slovakia) *

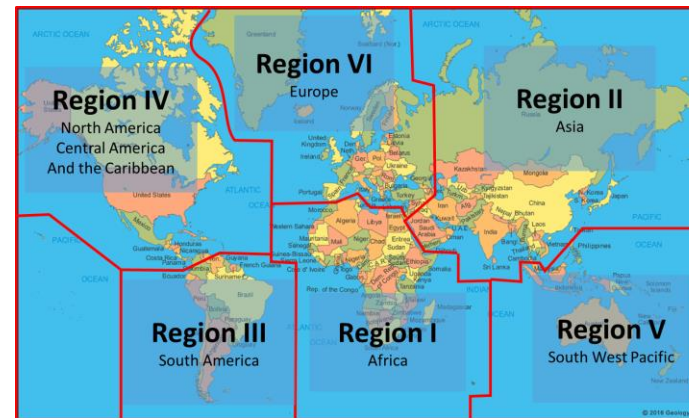
Ljubljana (Slovenia) *

Munich, Hamburg (Germany) *

Ankara (Turkey) *

RA IV

Bridgetown (Barbados)



RA II

Beijing (China) *

Tsukuba (Japan) *

RA V

Manila (Philippines)

Melbourne (Australia) *

RA III

Buenos Aires (Argentina)

RA I

Alger (Algeria)

Cairo (Egypt)

Casablanca (Morocco)

Nairobi (Kenya)

Gaborone (Botswana)

* RIC is accredited according to ISO/IEC 17025.

https://community.wmo.int/activity-areas/imop/Regional_Instrument_Centres

WMO Terms of Reference for RIC - capabilities

- A RIC shall have the necessary **facilities and laboratory equipment to perform** the functions necessary for the calibration of meteorological and related environmental instruments;
- A RIC shall **maintain a set of meteorological standard instruments** and establish the traceability of its own measurement standards and measuring instruments to the International System of Units (SI);
- A RIC shall have **competent managerial and technical staff** to fulfil its functions;
- A RIC shall have **technical procedures for calibration** of meteorological and related environmental instruments using calibration equipment employed by the RIC;

WMO Terms of Reference for RIC - capabilities

- A RIC shall **have and maintain a quality management system**, preferably according to the ISO/IEC 17025 standard;
- A RIC shall **participate in, and/or organize inter-laboratory** comparisons of standard calibration instruments and methods;
- A RIC shall, as appropriate, **utilize the available resources and capabilities to the Members' best interest**;
- A RIC shall, as far as possible, **apply international standards applicable for calibration laboratories, such as ISO/IEC 17025** standard;
- A RIC shall ensure it is assessed by a recognized authority or by a WMO evaluation team, at least every four years, to verify its capabilities and performance.

WMO Terms of Reference for RIC - functions

- A RIC shall assist **Members of the Region**, and possibly of **other Regions**, in **calibrating their national meteorological standards** and related environmental monitoring instruments;
- A RIC shall **participate in, and/or organize**, inter-laboratory comparisons, and support instrument intercomparisons following relevant WMO recommendations;
- According to relevant recommendations on the WMO Quality Management Framework, a RIC shall make a **positive contribution to Members** regarding the quality of measurements;
- A RIC **shall advise** Members on enquiries regarding instrument performance, maintenance and the availability of relevant guidance materials;

WMO Terms of Reference for RIC - functions

- A RIC **shall actively participate, or assist**, in the organization of **workshops on calibration and maintenance** of meteorological and related environmental instruments;
- A RIC **shall contribute to the standardization** of meteorological and related environmental measurements;
- A RIC **shall conduct or support the regular assessment of Members'** needs for RIC services;
- A RIC **shall regularly inform Members** and report, on an annual basis, to the WMO Secretariat on the services offered to Members and activities carried out.

RICs calibration capabilities

Region	Country	Quantity							
		Temperature	Relative humidity	Atmospheric pressure	Wind	Precipitation	Solar radiation	Other (air quality)	Other (electrical)
RA I	Algeria								
	Egypt								
	Kenya								
	Botswana	N/A							
	Morooco								
RA II	China								
	Japan								
RA III	Argentina								
RA IV	Barbados								
RA V	Australia								
	Philippines								
RA VI	France								
	Germany								
	Slovakia								
	Slovenia								
	Turkey								

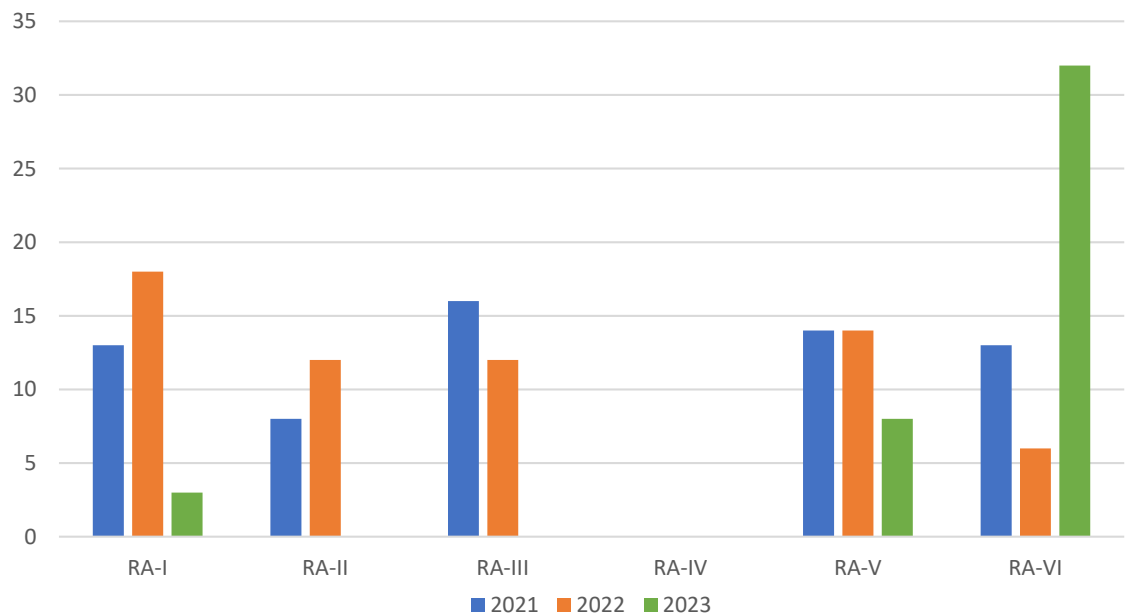
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Calibration capability without ISO/IEC 17025 accreditation

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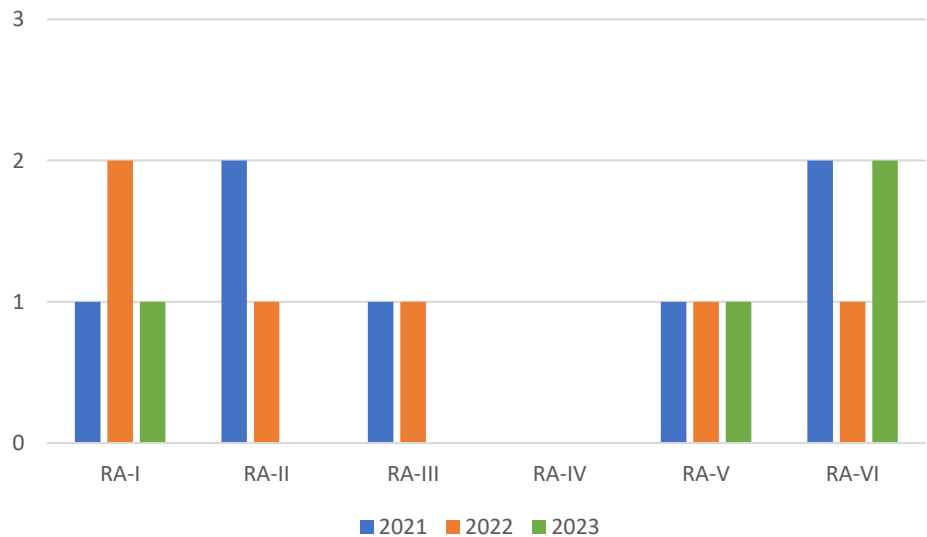
Calibration capability with ISO/IEC 17025 accreditation

RICs traceability assurance services for members



Number of annual Members' calibrated reference standards at RICs is 60 - 70.

Regional distribution on traceability assurance by RICs in last three years.



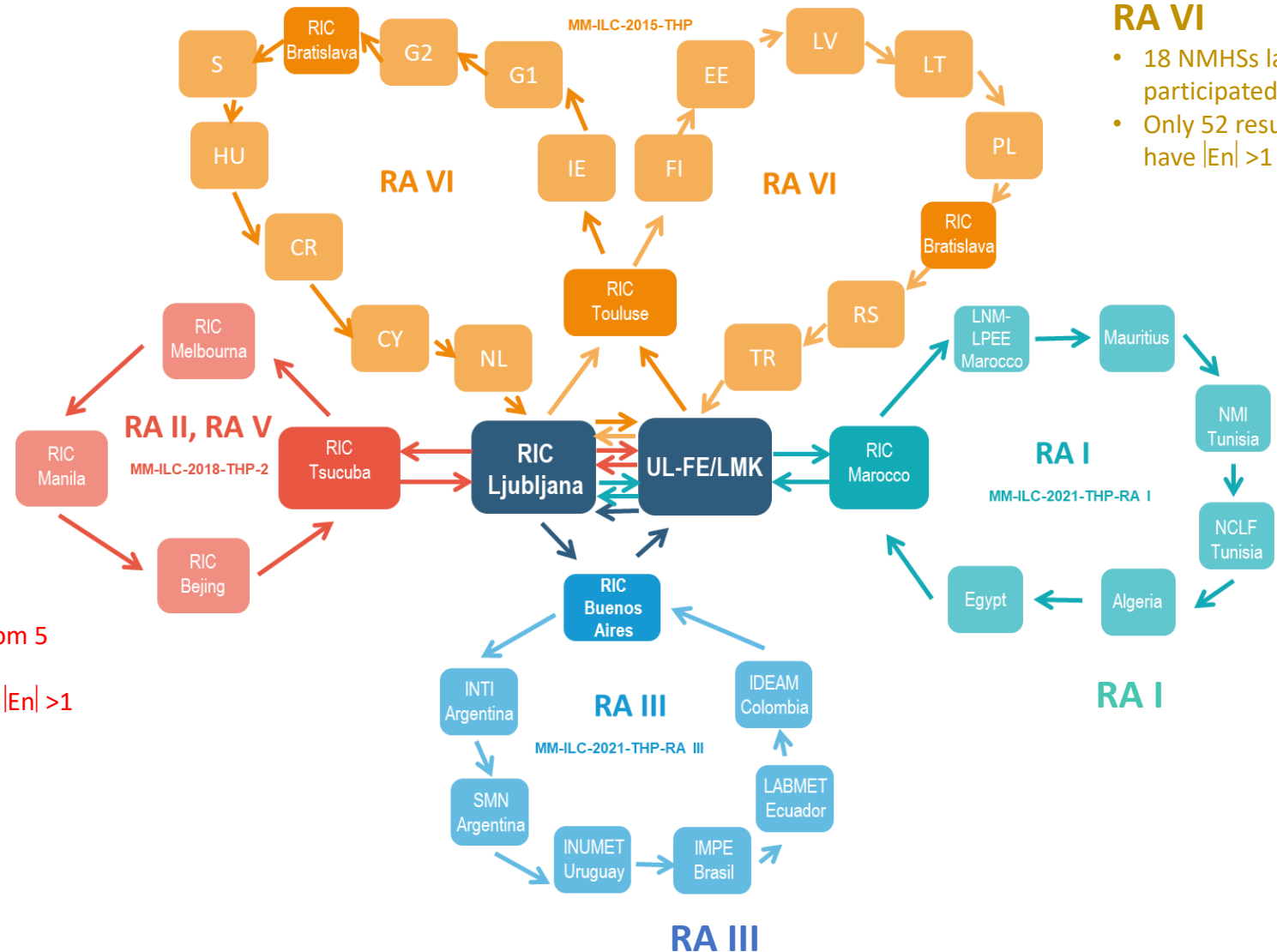
RICs capacity building

Training workshops on metrology within/beyond RA

Paris 2005,
Bratislava 2006,
Ljubljana 2006,
2010
Cairo 2006,
Casablanca 2008
Melbourne 2011,
Buenos Aires 2015,
Ankara 2018
Muskat 2019
WWW 2021
Cairo 2023



Organization of interlaboratory comparisons



Thank you.



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