

Sixth Workshop of the Regional Marine Instrument Centre-Asia Pacific (RMIC-RA-II-6)

WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

Experience with WMO RIC System and Potential for Improvement



WMO OMM

World Meteorological Organization

Organisation météorologique mondiale

Drago Groselj

13 – 17 December 2021



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.



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

WMO Terms of Reference for RIC – capabilities 1/2

1. An RIC shall have the necessary **facilities and laboratory equipment** to perform the functions necessary for the calibration of meteorological and related environmental instruments;
2. An 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);
3. An RIC shall have **competent managerial and technical staff** to fulfil its functions;
4. An 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 2/2

5. An RIC shall have and **maintain a quality management system**, preferably according to the ISO/IEC 17025 standard;
6. An RIC shall **participate in, and/or organize inter-laboratory comparisons** of standard calibration instruments and methods;
7. An RIC shall, as appropriate, **utilize the available resources** and capabilities to the Members' best interest;
8. An RIC shall, as far as possible, **apply international standards applicable for calibration laboratories**, such as ISO/IEC 17025 standard¹;
9. An 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.

¹ For calibrating one or more of the following variables: temperature, humidity, pressure or others specified by the Region.

WMO ToR for RIC – corresponding functions 1/2

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

WMO ToR for RIC – corresponding functions 2/2

5. An RIC **shall actively participate, or assist**, in the organization of workshops on calibration and maintenance of meteorological and related environmental instruments;
6. An RIC **shall contribute** to the standardization of meteorological and related environmental measurements;
7. An RIC **shall conduct or support the regular assessment** of Members' needs for RIC services;
8. An RIC **shall regularly inform Members** and report², on an annual basis, to the WMO Secretariat on the services offered to Members and activities carried out.

² A Word file available here: [RIC-Reporting Form \(.docx\)](#), is recommended.

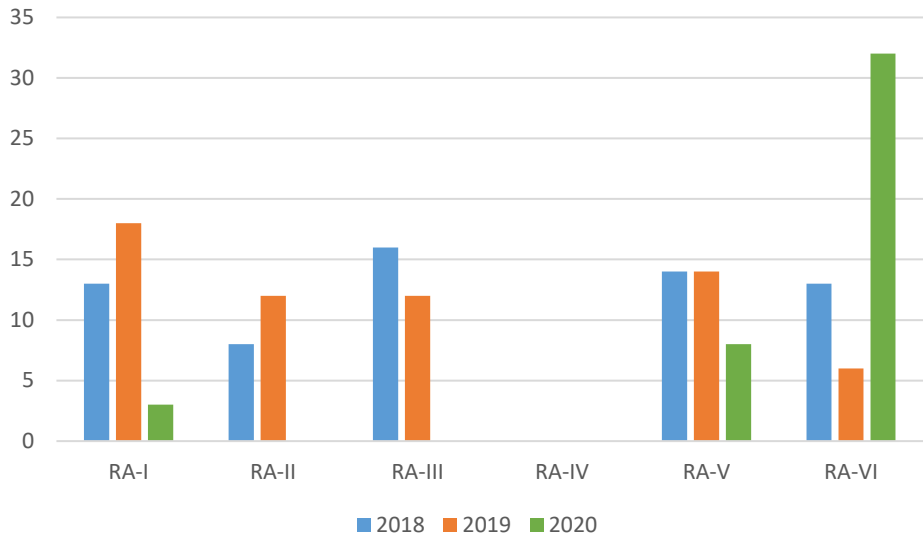
RICs calibration capabilities

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							
	Morocco								
RA II	China								
	Japan								
RA III	Argentina								
RA IV	Barbados								
RA V	Australia								
	Philippines								
RA VI	France								
	Germany								
	Slovakia								
	Slovenia								
	Turkey								

46	Calibration capability without ISO/IEC 17025 accreditation
29	Calibration capability with ISO/IEC 17025 accreditation

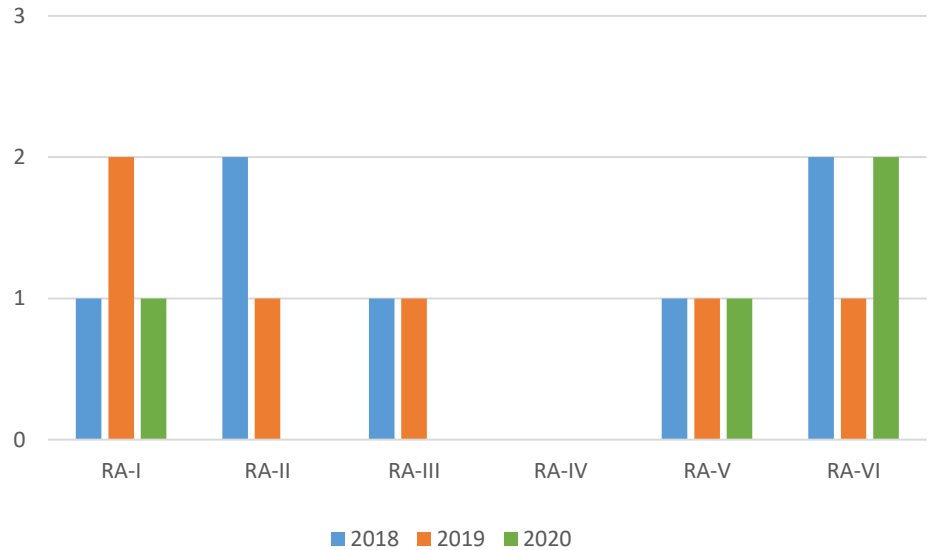
https://community.wmo.int/activity-areas/imop/Regional_Instrument_Centres

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

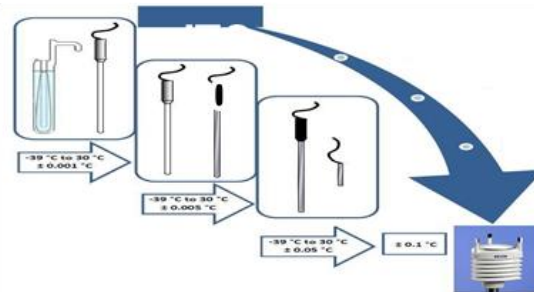
Training workshops on metrology within/beyond RA

France 2005,
Slovakia 2006,
Slovenia 2006, 2010
Cairo 2006,
Morocco 2008
Melbourne 2011,
Argentina 2015,
Turkey 2018

Bilateral/multilateral trainings on metrology, traceability calibration and maintenance

Slovenia 2013, 2014, 2016, 2019
Morocco 2013, 2015, 2018, 2019
Kenya 2013, 2014, 2015, 2016
Japan 2013, 2015, 2016, 2017, 2018, 2019
Turkey 2018
France 2013, 2014, 2015, 2016
China 2013

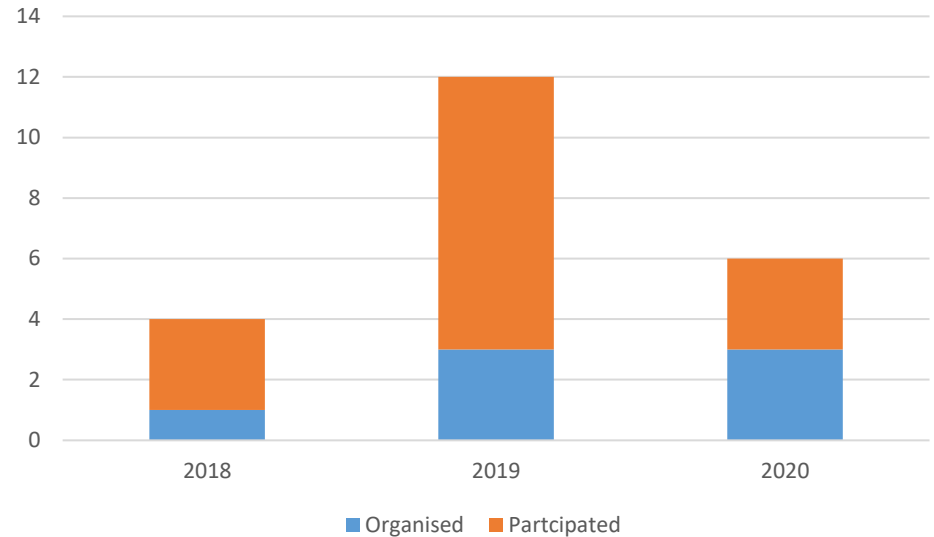
Recent web based Training on quality, traceability and calibration in June 2021 for RIC&RMIC members (21 participants, from 14 countries (14 RICs and 1 RMIC)).



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RICs interlaboratory organisation/participation

Number of bilateral/multilateral interlaboratory comparisons were organised in last couple of years for basic meteorological parameters

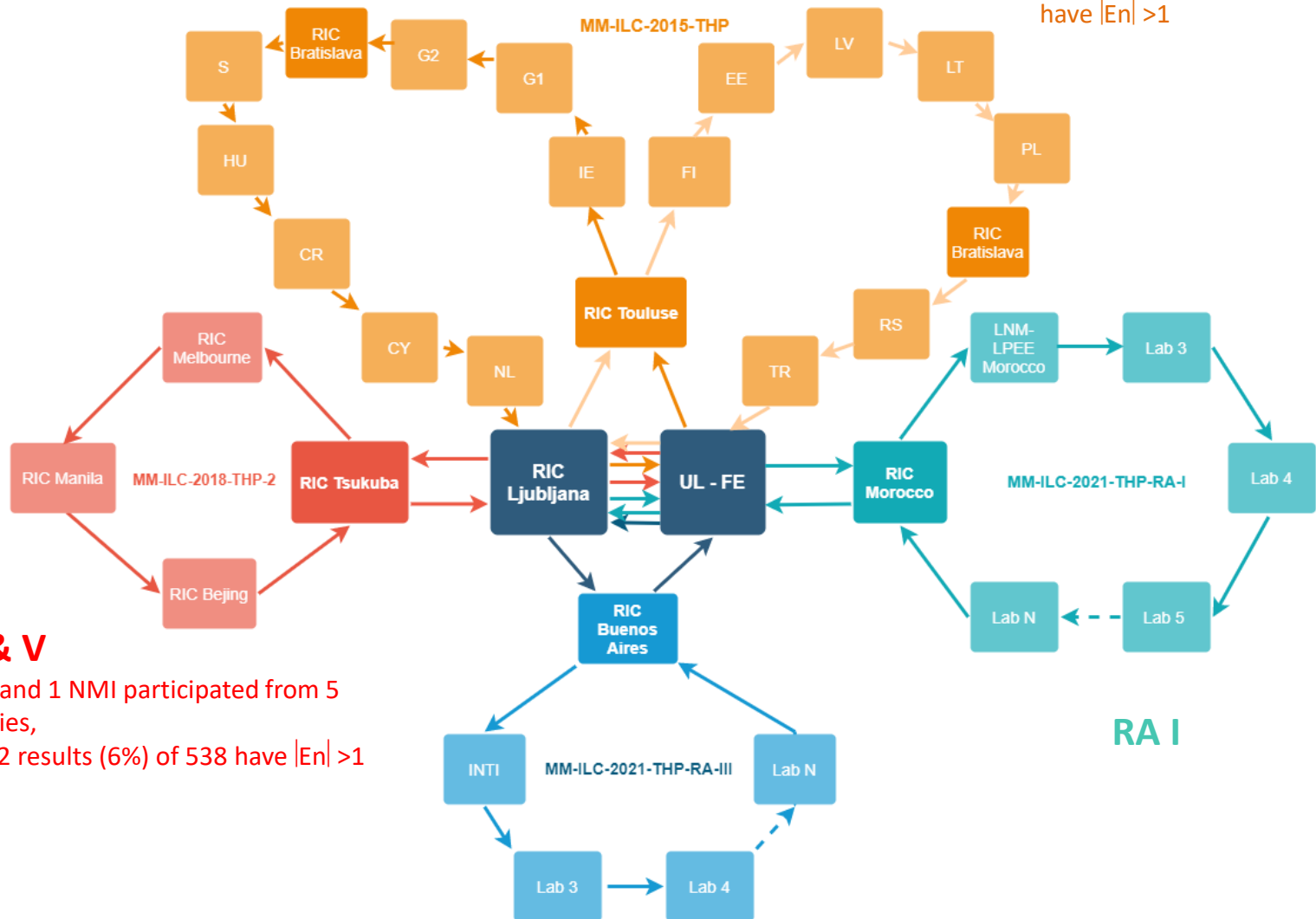


- ✓ RA VI: MM-ILC-2015 THP
- ✓ RA II&V: MM-ILC-2018 THP-2
- ☐ RA I: MM-ILC-2021 THP RA I
- ☐ RA III: MM-ILC-2021 THP RA I

RICs interlaboratory organisation/participation

RA VI

- 18 NMHSs labs and 1 NMI participated from 17 countries,
- Only 52 results (4%) of 1171 have $|En| > 1$



RA II & V

- 5 RICs and 1 NMI participated from 5 countries,
- Only 32 results (6%) of 538 have $|En| > 1$

RA III

RA I

RICs other services provided

- 9 representatives of RICs participate in WMO Expert Teams (ET-Quality, traceability and calibration, ET on Measurement Uncertainty, ...) and BIPM;
- 6 RICs have published documents externally (guidelines, calibration methods, ...);
- 5 RICs organised experts visits form NMHSs & RICs;
- 7 RICS organised technical trainings for NMHSs personnel;

RICs potential for improvement

- 44% of RICs granted accreditation according to ISO/IEC 17025 standard for at least one domain. Typically, accredited RICs are accredited for 4 calibration domains. Many of RICs without accreditation are in the preparation stage for accreditation. **Non-accredited RICs are encouraged to grant accreditation as soon as possible.**
- Potential to increase the annual rate of calibrations of Members' standards. Potential reasons for current situation:
 - unawareness of RIC capabilities in certain regions,
 - unawareness of importance of traceability assurance system in certain regions,
 - well established national metrology systems, providing traceability dissemination and delivering similar services to Members.

Based on regional needs, **RICs to promote their functions and capabilities in collaboration with RAs to increase awareness of RICs capabilities** and missions.

RICs potential for improvement

- Based on potential different needs throughout Regions and unbalanced distribution of RICs between the different Regions, it is encouraged that **RICs support Members also beyond their region.**
- Establish cooperation between RIC of developing and developed countries (partnership, forums...)

Thank you Merci



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