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**INFORMAL CONFERENCE OF SOUTH-EAST EUROPEAN NMHSs  
DIRECTORS (ICEED) – 9<sup>th</sup> Session  
Ljubljana, 10-11 December 2009**

**WMO Regional Instrument Center  
CALIBRATION LABORATORY SERVICE**

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Head of Calibration Laboratory Service**



# Introduction of Calibration laboratory

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**Accreditation** was achieved in 1999 in the field of **temperature** (joint assessment of COFRAC and SA).

Scope of accreditation (ISO/IEC 17025 standard) was extended in the field of **air pressure** in 2002.

**National reference** laboratory for **air quality parameters** in 2004.

**WMO Regional instrument centre** appointment in 2005 in the RAVI (France, Slovakia and Slovenia).

Last extension of accreditation domain was in 2005 in the field of **relative humidity** and **air quality quantities**: CO, SO<sub>2</sub>, ozone and NO<sub>x</sub>.

## Accredited calibration methods

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Quantity	Range	BMC* (k=2)
<b>Temperature</b>		
Water triple point	0.01 °C	0.6 mK
Gallium melting point	29.7646 °C	0.9 mK
Resistance thermometers	-40 °C ÷ 50 °C	13 mK
Liquid-in-glass thermometers	-20 °C ÷ 50 °C	50 mK
Thermographs	-20 °C ÷ 40 °C	0.65 °C
<b>Relative humidity</b>	10 % ÷ 95 % at Ta= -10°C ÷ 40°C	1.3% to 2.3%
<b>Air pressure</b>	500 hPa ÷ 1200 hPa	$1.3 \cdot 10^{-5} \cdot p + 6 \text{ Pa}$

**BMC - Best measurement capability**

## Other meteorological quantities - non accredited

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**Calibration of solar radiation instruments** using Sun as a light source (pyrheliometer and two pyranometers as a reference).

**Wind speed and wind direction instruments testing** (cup anemometers testing device).

**Testing of precipitation instruments** (set of weights and rain intensity generator).

**Calibration of water level sensors.**

**Calibration of automatic meteorological and hydrological stations.**

## WMO terms of reference (ToR) for RIC

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(1)

A RIC must assist Members of the Region in **calibrating their national meteorological standards** and related environmental monitoring instruments.

A RIC must **participate in or organize**, WMO and/or regional **instrument intercomparisons**, following relevant CIMO recommendations.

According to relevant recommendations on the WMO Quality Management Framework a RIC **must contribute positively** to Members regarding quality of measurements.

A RIC **must advise** Members on inquiries regarding instrument performance, maintenance and the availability of relevant guidance materials.

## WMO terms of reference (ToR) for RIC

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(2)

A RIC **must actively participate** in, or **assist** in the organization of regional workshops on meteorological and related environmental instruments.

The RIC **must cooperate** with other RICs in standardization of meteorological and related environmental measurements.

A RIC **must regularly inform** Members and report, on an annual basis, to the president of the Regional Association and to the WMO Secretariat on services offered to Members and activities done

**Training workshop on Metrology for RAVI – South-Eastern Europe, Ljubljana, April 2006.**

Participants: Bulgaria, Bosnia and Herzegovina, Croatia, Cyprus, FYR Macedonia, Serbia and Montenegro, Romania and Turkey.

**Training workshop on Metrology for RAVI - Central and Eastern Europe, Bratislava, April 2006**

**Training workshop on Metrology for RAI, Cairo, April 2006**

RIC has **organized intercomparison** of basic metrology quantities (temperature, relative humidity, air pressure) for NHMS in the South- Eastern Europe in 2007.

Participants: Croatia, Hungary

## Past activities of EARS RIC

(2)

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- ✓ EARS RIC participated in **subregional pyranometer** intercomparison of the RAVI members from South-eastern Europe, organized by DHMZ in Split, 2007
  - ✓ Participation in **intercomparison of basic metrology quantities within RICs**  
Participants: Australian Bureau of meteorology, Meteo France, Hydrometeorological institute of Slovakia, 2008
  - ✓ **On-job training** for calibration personal of **Cyprus** NHMS in 2008
  - ✓ In 2008 we also hosted Serbian colleagues for 2 days metrology training and we have **calibrated** their **air pressure standard**.



# **RIC related actions within the SEE/DRR project**

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## **Metrology expert mission to the SEE NHMSs.**

Objective:

- straighten cooperation in the field of quality assurance (calibration laboratory)
- discuss the calibration traceability issues
- evaluation of calibration capabilities of the NHMS.

Concluded: Serbia, FYR Macedonia, Bosnia and Herzegovina, Montenegro

To be visited: Albania, Croatia and Turkey

## **On- job training workshop for calibration laboratory personnel at EARS RIC.**

Objective:

5-day metrology training in temperature, relative humidity and air pressure calibrations for target countries: Albania, Serbia, Montenegro, FYR Macedonia, Bosnia and Herzegovina

## Proposed future activities of EARS RIC

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**Basic activities of the RIC** (traceability and calibration of reference standards, quality assurance issues).

**Sharing experiences on new calibration methods and equipment.**

**Organizing specific on-job training on metrology.**

**Experiences and know-how transfer on quality assurance issues.**

# EARS RIC premisses

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Laboratory for temperature and relative humidity



Air pressure laboratory



Air quality laboratory

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**THANK YOU  
FOR YOUR ATTENTION**