



Form for Regular Reporting of Regional Instrument Centres

(please expand the cells as required to properly reflect your activities)

Terms of Reference for Regional Instrument Centres (RICs) are available under:

<https://www.wmo.int/pages/prog/www/IMOP/instrument-reg-centres.html>

Regional instrument Centre - General Information	
Name of RIC	Ljubljana
RIC's website	http://www.arso.gov.si/en/about%20the%20agency/laboratories/
Institute hosting RIC	Slovenian Environment Agency
City	Ljubljana
Country	Slovenia
Regional Association	RA VI

Contact Person for the Regional Instrument Centre	
Courtesy Title	Mr.
First name	Drago
Family name	Groselj
Street and number	Vojkova 1b
Postal code	1000
City	Ljubljana
State/Province	-
Country	Slovenia
Tel. number(s)	+386 1 478 4100
Fax number(s)	+386 1 478 4052
Email(s)	Drago.Groselj@gov.si
Has contact person changed since 2013?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

If yes, provide the previous contact person?

-

RIC's staff

(Please specify the number of your managerial and technical staff)

- Managerial: 1
- Technical: 4

Interlaboratory Comparisons

Have you organized any interlaboratory comparison? (If yes, please specify the event(s) and final reports, including their web links, if available):

- 2013: Bilateral interlaboratory comparison in the field of humidity standards between Slovenian and Serbian NMHS (protocol and report)
- 2014: Bilateral interlaboratory comparison in the field of humidity, pressure and temperature standards between Slovenian and Serbian NMHS (protocol and report)
- 2015: Bilateral interlaboratory comparison in the field of humidity and temperature standards between Slovenian and Serbian NMHS (protocol and report)
- 2016: Bilateral interlaboratory comparison in the field of pressure standards between Slovenian and Serbian NMHS (protocol and report)
- 2016: Intercomparison in the field of temperature, humidity and pressure in Regional Association VI in cooperation with MeteoMet 2 project
- 2017: Bilateral interlaboratory comparison in the field of pressure standards between Slovenian and Serbian NMHS (protocol and report)

Have you participated in any interlaboratory comparison? (If yes, please specify the event(s) and the report(s), including their web links, if available):

- 2016: Bilateral interlaboratory comparison in the field of temperature, humidity and pressure standards between Slovenian and Morocco NMHS; report presented at TECO 2016 Madrid: [http://www.wmo.int/pages/prog/www/IMOP/publications/IOM-125_TECO_2016/Session_3/O3\(10\)_Aziz_CIL-Morocco.pdf](http://www.wmo.int/pages/prog/www/IMOP/publications/IOM-125_TECO_2016/Session_3/O3(10)_Aziz_CIL-Morocco.pdf)
- 2016: Intercomparison in the field of temperature, humidity and pressure in Regional Association VI in cooperation with MeteoMet 2 project (MM-ILC-2015-THP); ILC finished; ILC report to be finished in May 2017

Applied International Standards/Norms

Is your RIC accredited according to ISO/IEC 17025?

Yes (please, specify the following):

Accreditation/certification body: Slovenian Accreditation

Date of the last audit: 10 February 2017

Link to the Certificate of Accreditation: <http://www.slo-akreditacija.si/accreditation/ministrstvo-za-okolje-in-prostor-agencija-republike-slovenije-za-okolje-lk/?lang=en>

No (please, indicate if you have already applied any quality management system, and provide a reason for a lack of accreditation, if possible)

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Assessment by a recognized authority other than accreditation body

Was your RIC assessed by a recognized authority other than an accreditation body? (e.g. certification body, NMI, another RIC)

Yes (please, specify the following):

Name of a recognized authority:

Date of the last assessment:

Standard against which the assessment was carried out:

No (please, explain why, if possible)

-

WMO/CIMO [Evaluation Scheme \(excel file\)](#)

Have you filled out the WMO/CIMO Evaluation Scheme (excel) and submitted it to the WMO Secretariat?

Yes (please, specify when):

No (please, explain why, if possible)

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Calibrations of the Members' Instruments

Which calibration services, were provided by your RIC for other Members/countries since 2013? (Please specify)

Year	Type of instruments	Number of calibrated instruments	WMO Member/Country
2013	Reference platinum resistance thermometers, capacitive hygrometer, reference barometer	4	Serbia
2014	Reference platinum resistance thermometers, capacitive hygrometer, reference barometers	5	Serbia
2015	Reference platinum resistance thermometers,	6	Serbia

	capacitive hygrometers, reference barometers		
2016	Reference platinum resistance thermometers, capacitive hygrometers, reference barometers	5	Serbia
2017	Reference platinum resistance thermometers, capacitive hygrometers, reference barometers	7	Serbia

Capacity Development and Training Activities

Which capacity development/training activities have been carried out by your RIC since 2013 within the Region? (please specify events, WMO Members that participated and the number of participants)

- 2013: In the frame of WMO project "Building Resilience to Disasters in Western Balkans and Turkey" two field verification kits were deployed. Initial calibration, instructions and training were provided by RIC Ljubljana for following countries: Montenegro, Kosovo (under UN resolution 1244/99), Albania, Bosnia and Herzegovina and Former Yugoslav republic of Macedonia
- 2013: Training seminar on relative humidity calibration; Serbia; 4 participants
- 2014: Training seminar on temperature, air pressure and relative humidity calibration; Serbia; 1 participant
- 2016: Training seminar on temperature and relative humidity calibration; Serbia; 1 participant

Has your RIC provided services on capacity development and training outside the Region? (If yes, please specify to whom and when)

- 2015; Invited lecturer at WMO training workshop on metrology for RA III & IV Spanish speaking countries; Argentina; 2-6 November 2015

Which guidance documents, standard procedures or other publications were developed and published by your RIC since 2013? (Please, include full reference and web-link if available)

- Quality assurance guide of measuring network; Internal document
- Standard operating procedures for temperature, relative humidity, air pressure, solar radiation calibrations were developed or upgraded

Utilization of Resources and Capabilities of the Region

(Have you collaborated with other RICs, RRCs, RTCs, NMHSs or NMIs on standardization of meteorological and other related environmental measurements? If yes, please specify when and how)

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Recent Changes in Circumstance

Have there been any changes in your RIC's capabilities since 2013? (If so, please specify)

- Implementation of new RIC Ljubljana laboratory instrumentation for temperature, relative humidity and air pressure led to significant improved accredited calibration and measurement capabilities (CMCs).

Have there been any significant changes in your RIC's infrastructure since 2013? (If so, please specify)

- RIC Ljubljana renewed and upgraded laboratory infrastructure (reference and working standards, medium generators, data acquisition units...) in the field of temperature, relative humidity, air pressure, solar radiation and precipitation calibrations in 2015. Also new laboratory building was build.

Have there been any changes in your staffing since 2013? (If so, please specify)

- New laboratory operator was employed in 2015.

Future Plans and any other relevant information

(Please provide plans/projects of your RIC for 2017, and add any other information you find relevant about your RIC)

- Chair of ET-OpMet
- Head of TDI TT on RICs in RAVI
- Member of BIPM CCT Task Group for Environment
- We plan to develop calibration procedures and uncertainty evaluation for solar radiation and precipitation calibrations in 2017.
- RIC Ljubljana also preforms accredited calibration for air quality parameters: CO, SO₂, NO_x and ozone.
- RIC Ljubljana was non-funding partner in MeteoMet and follow-up MeteoMet 2 project.

Are you in agreement with publishing this reporting form on WMO/CIMO website?

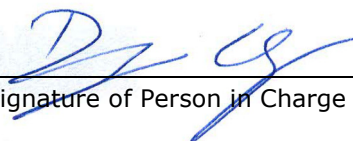
Yes

No

9 May 2017

Date

Name and Signature of Person in Charge of RIC



ANNEX

(Following information will be a part of your RIC's website as published on the [WMO/CIMO website](#))

Specific information on Instrument Calibration Capabilities					
Temperature:					
Instrument Undergoing Calibration	Calibration Range	Reference standard, Equipment	Calibration and Measurement Capability (CMC)*	Traceability of Reference equipment	
				Last standard calibration date	Calibration body
Platinum resistance thermometers	0.01 °C	Triple point of water cell, Isotech, 811L-32	0.7 mK	7 June 2015	LMK (Slovenia)
Platinum resistance thermometers	29.7646 °C	Gallium melting point cell, Isotech, ITL-M-17401	0.9 mK	7 June 2015	LMK (Slovenia)
Resistance thermometers	-50 °C to 50 °C	Standard platinum resistance thermometer (Isotech SPRT 419, Fluke 7381, DC bridge MI6010)	12 mK	7 June 2016	LMK (Slovenia)
Liquid-in-glass thermometers	-20 °C to 50 °C	Platinum resistance thermometer (Fluke 5626, Fluke 7381, Fluke 1595A)	25 mK	6 March 2017	Slovenian Environment Agency
Self-indicated thermometers	-50 °C to 50 °C	Platinum resistance thermometer (Fluke 5626, Fluke 7381, Fluke 1595A)	25 mK	6 March 2017	Slovenian Environment Agency
Mechanical thermometer with pen	-20 °C to 40 °C	Platinum resistance thermometer (Fluke 5626, Vötsch VC3 7100, Fluke 1595A)	0.65 °C	6 March 2017	Slovenian Environment Agency
Status of accreditation (date of the latest accreditation): 10 February 2017 Link to the accreditation certificate http://www.slo-akreditacija.si/accreditation/ministrstvo-za-okolje-in-prostor-agencija-republike-slovenije-za-okolje-ik/?lang=en Accreditation body: Slovenian Accreditation (SA)					
Relative Humidity:					
Instrument Undergoing Calibration	Calibration Range	Reference standard, Equipment	Calibration and Measurement Capability (CMC)*	Traceability of Reference equipment	
				Last standard calibration date	Calibration body
Hygrometer	10 to 95 %RH	Dew-point hygrometer (MBW 373LHX, Thunder Scientific 2500ST)	1.9 %RH (Ta=-10°C to 0°C) 1.6 %RH (Ta=0°C to 10°C)	18 August 2016	LMK (Slovenia)

			1.1 %RH (Ta=10°C to 40°C) 1.0 %RH (Ta=40°C to 50°C)		
Hygrometer	10 to 95 %RH	Dew-point meter (MBW 473,Vötsch VC3 7100)	4.2 %RH (Ta=-20°C to 0°C) 3.2 %RH (Ta=0°C to 40°C)	30 August 2016	LMK (Slovenia)

Status of accreditation (date of the latest accreditation): 10 February 2017
Link to the accreditation certificate <http://www.slo-akreditacija.si/accreditation/ministrstvo-za-okolje-in-prostor-agencija-republike-slovenije-za-okolje-lk/?lang=en>
Accreditation body: Slovenian Accreditation (SA)

Atmospheric pressure:

Instrument Undergoing Calibration	Calibration Range	Reference standard, Equipment	Calibration and Measurement Capability (CMC)*	Traceability of Reference equipment	
				Last standard calibration date	Calibration body
Digital barometer	500 to 1200 hPa	Digital piston gauge DH24610 (Generator DH type PPC1)	6 Pa + 1.3 10 ⁻⁵ P	15.04.2015	CMI (Czech Republic)
Barometer without tube connection	800 to 1050 hPa	Fluke RPM4 (barometric chamber Kambič VTK-02)	65 Pa	07.09.2016	Slovenian Environment Agency

Status of accreditation (date of the latest accreditation): 10 February 2017
Link to the accreditation certificate <http://www.slo-akreditacija.si/accreditation/ministrstvo-za-okolje-in-prostor-agencija-republike-slovenije-za-okolje-lk/?lang=en>
Accreditation body: Slovenian Accreditation (SA)

Wind:

Instrument Undergoing Calibration	Calibration Range	Reference standard, Equipment	Calibration and Measurement Capability (CMC)*	Traceability of Reference equipment	
				Last standard calibration date	Calibration body
-					

Status of accreditation (date of the latest accreditation):
Link to the accreditation certificate:
Accreditation body:

Precipitation:

Instrument Undergoing Calibration	Calibration Range	Reference standard, Equipment	Calibration and Measurement Capability (CMC)*	Traceability of Reference equipment	
				Last standard calibration date	Calibration body
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Status of accreditation (date of the latest accreditation):

Link to the accreditation certificate:

Accreditation body:

Other (please specify if applicable): AIR QUALITY

Instrument Undergoing Calibration	Calibration Range	Reference standard, Equipment	Calibration and Measurement Capability (CMC)*	Traceability of Reference equipment	
				Last standard calibration date	Calibration body
Cylinders or generators CO	300 to 15000 ppbv	Reference analyser, CRMs	240 ppbv + 0.028 • CCO	10. November 2016	CHMI (Czech Republic)
Cylinders or generators SO ₂	3 to 500 ppbv	Reference analyser, CRMs	2.3 ppbv + 0.055 • CSO ₂	10. November 2016	CHMI (Czech Republic)
Cylinders or generators NO _x	2 to 500 ppbv	Reference analyser, CRMs	1.9 ppbv + 0.063 • CNO	10. November 2016	CHMI (Czech Republic)
Cylinders or generators NO ₂	4 to 500 ppbv	Reference analyser, CRMs	3.7 ppbv + 0.062 • CNO ₂	10. November 2016	CHMI (Czech Republic)
Generators O ₃	6 to 500 ppbv	Generator/analyser O ₃	5.0 ppbv + 0.034 • CO ₃	9. November 2016	CHMI (Czech Republic)
Analyser CO	0 to 13700 ppbv	CRMs, zero air generator	170 ppbv + 0.02 • CCO	10. November 2016	CHMI (Czech Republic)
Analyser SO ₂	0 to 380 ppbv	CRMs, zero air generator	1.8 ppbv + 0.05 • CSO ₂	10. November 2016	CHMI (Czech Republic)
Analyser NO (NO _x)	0 to 427 ppbv	CRMs, zero air generator	1.5 ppbv + 0.047 • CNO	10. November 2016	CHMI (Czech Republic)

Analyser O ₃	0 to 500 ppbv	CRMs, zero air generator	4.9 ppbv + 0.03 • CO ₃	10. November 2016	CHMI (Czech Republic)
Status of accreditation (date of the latest accreditation): 10 February 2017 Link to the accreditation certificate http://www.slo-akreditacija.si/accreditation/ministrstvo-za-okolje-in-prostor-agencija-republike-slovenije-za-okolje-lk/?lang=en Accreditation body: Slovenian Accreditation (SA)					

* A **CMC (calibration and measurement capability)** is the smallest uncertainty (k=2) of measurement that can be expected to be achieved by the RIC during a calibration under normal conditions. This CMC is evaluated by the RIC itself and described in the scope of accreditation of the RIC, if available.