Infrastructure Commission (INFCOM)

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

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

Competencies of laboratory personnel

Drago Groselj (ARSO)

WORLD METEOROLOGICAL ORGANIZATION

Content

1. Competencies of laboratory personnel
2. Calibration operator
3. Responsible of the calibration unit
4. Manager of the calibration laboratory

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Competencies

Calibration services within a NMHS or related services might be accomplished by a variety of skilled personnel, including meteorologists, instrument specialists, technicians and engineers.

Calibration: High Level Competencies

1. Calibrate instruments
2. Check instrument performance
3. Manage the laboratory work programme
4. Manage the laboratory infrastructure
5. Develop and maintain standard operating procedures
6. Manage the archiving of data and records
7. Maintain a safe work environment and laboratory security

- **Calibration operator**
- **Responsible of the calibration unit (related to one or more parameters)**
- **Manager of the calibration laboratory**

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Calibration operator

Execute **routine calibrations on a day-to-day basis** in accordance with standard calibration procedures, from item handling instruments to editing of calibration certificates.

Competency description

- Execute routine calibrations on day-to-day basis in accordance with standard calibration procedures,
- Compute the calibration uncertainty in conformity with the standard operating procedures,
- Prepare a draft of calibration certificate (not including approval or issuance)
- Handle calibration items appropriately,
- Conduct intermediate checks of working standards in calibration laboratory,
- Cooperate at internal and external audits.
- Check instrument performance in the laboratory using measurement standards in accordance with SOPs.

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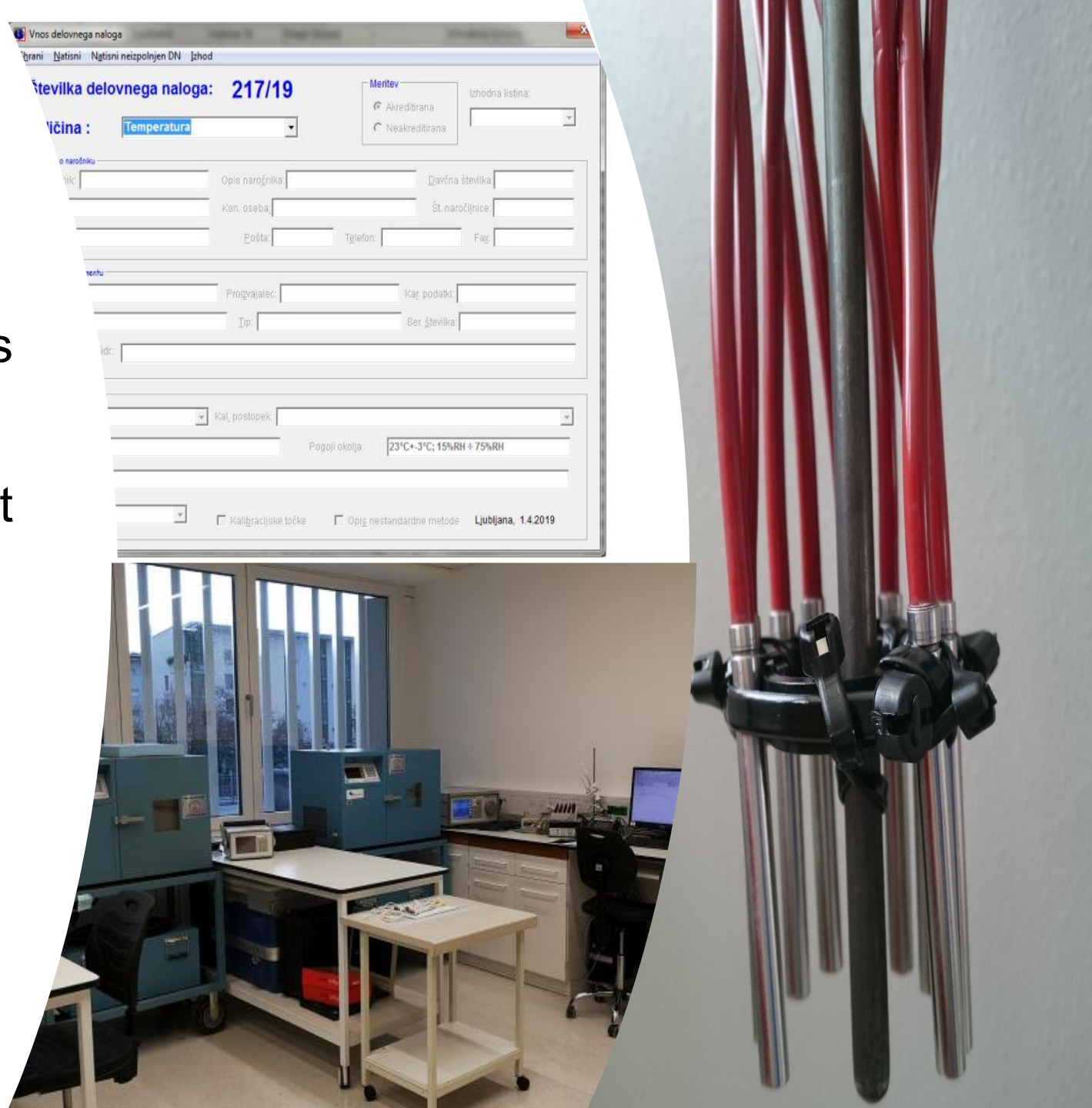
Calibration operator

Knowledge and skill requirements

- Laboratory facilities and standards (including software),
- Standard operating procedures, practices and quality management systems,
- Care in handling instruments,
- The basics of metrology and uncertainty computation,
- The basics of meteorological instrumentation.



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Responsible of the calibration unit

The calibration laboratory could be organized in several calibration units. Each calibration unit deals with one parameter (pressure, temperature, etc).

Competency description

- Manage the laboratory infrastructure: prepare, plan, design, procure, implement, operate and maintain the infrastructure for calibration activities (test chambers, standards, …) and the applications required to conduct calibration activities.
- Develop, assess and maintain standard operating procedures, uncertainty evaluations, traceability issues necessary for executing calibration activities in the unit.
- Ensure archiving of calibration activity measurements, calibration certificates and records.

Responsible of the calibration unit

Performance components

- Execution of top quality (lowest uncertainty level) standard operation procedures,
- Manage external traceability of reference standards,
- Develop, maintain and upgrade standard operating procedures,
- Responsible for uncertainty budget calculation for standard operating procedures,
- Validate the results of calibrations in conformity with the standard operating procedures,
- Ensure data continuity and system security

Knowledge and skill requirements

- Advanced skills related to laboratory facilities and standards
- Advanced skills related to the use and maintain of calibration equipment
- Advanced and extensive skills related to metrology and uncertainty computing
- Advanced skills related to quality requirements (ISO 17025, ISO 9001)
- General skills related to meteorological instrumentation (WMO-No.8)
- General skills related to instruments in the national observing network
- Insight in current technologies and emerging trends

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Manager of the calibration laboratory

Competency description

- Manage the laboratory work programme: Develop, prepare, organize and manage the calibration activities of the calibration laboratory.
- Organise activities related to ISO/IEC 17025 accreditation process

Performance components

- Organize and manage the work of the calibration laboratory, including quality and technical aspects (covering traceability of standards, uncertainty budget evaluation)
- Ensure the competencies of the calibration laboratory staff (training, review, documents...)
- Plan and organize external calibrations of reference standards
- Communicate with customers on calibration issues, and to explain appropriately the result of calibrations to the customers
- Monitor the quality of the laboratory calibration activities
- Assume technical responsibility for the documents issued by the calibration laboratory,
- Conduct regular internal audits and manage external audits as required

Manager of the calibration laboratory

Knowledge and skill requirements

- Laboratory facilities and standards (including software)
- Standard operating procedures, practices and quality management systems
- Advanced metrology and uncertainty computation
- Quality-related requirements (e.g. ISO 9001, ISO/IEC 17025, Good Laboratory Practice (GLP))
- Meteorological instrumentation
- Instruments in the national observing network
- Current technologies and emerging trends

SLOVENSKA AKREDITACIJA

št. / no. LK - 006

akreditacijska listina
accreditation certificate

Ministrstvo za okolje in prostor, Agencija Republike Slovenije za okolje, Urad za monitoring
Umerjevalni laboratorij, Vojkova 1 b, 1000 Ljubljana

Organizacija je akreditirana pri Slovenski akreditaciji (SA), kot kalibracijski laboratorij. S to listino se priznava izpolnjevanje zahtev standarda
SIST EN ISO/IEC 17025:2002
za dejavnosti, ki so opisane v prilogi te listine, označeni z isto številko.

Datum prve podelitve akreditacije: 25. maj 1999

Akreditacijska listina velja do: 24. maj 2008
Ta akreditacija velja do navedenega datuma pod pogojem, da akreditirani organ izpolnjuje zahteve SA za akreditacijo.

Slovenska akreditacija (SA) je podpisnica sporazumov o medsebojnem priznavanju akreditacij na področju kalibracijskih in preskuševalnih laboratorijev pri Evropskem združenju za akreditacijo (EA) in pri Mednarodnem združenju za akreditiranje laboratorijev (ILAC).

The above entity has been accredited by Slovenian Accreditation (SA) as a calibration laboratory. This is to signify compliance with the requirements of the Standard SIST EN ISO/IEC 17025:2002 for the approved scope of accreditation as described in the Annex hereto marked with the same number.

Initial accreditation date: 25 May 1999

This certificate is valid until: 24 May 2008
This accreditation shall remain in force until the above date subject to continuing compliance with SA accreditation requirements.

Slovenian Accreditation (SA) is a signatory of the Multilateral Agreements of the European Co-operation for Accreditation (EA) and International Laboratory Accreditation Co-operation (ILAC) for calibration and testing.

Ljubljana, 4. april 2005

dr. Bostjan Godec
Direktor / Director

SLOVENSKA AKREDITACIJA

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Reference

Guide to Instruments and Methods of Observation (WMO-No.8), 2023 edition - Volume V: Quality Assurance and Management of Observing Systems, Vol V, Ch 5, Annex 5.C, Competency framework for personnel performing instrument calibrations, https://library.wmo.int/viewer/68663?viewer=picture#page=120&viewer=picture&o=bookmark&n=0&q=

Compendium of WMO Competency Frameworks (WMO-No.1209), 2019 edition, https://library.wmo.int/idurl/4/56877

Thank you.

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wmo.int