	COOMET RECOMMENDATION	
	CALIBRATION PROCEDURES. GENERAL REQUIREMENTS	**COOMET** R/GM/31:2024
Approved at 26th meeting of the COOMET Committee (Erevan ,Armenia 20-21 April 2016) *Clarified and supplemented:* *at __ meeting of the COOMET Committee (_____)*		

1. FIELD OF APPLICATION

This recommendation lays down the main requirements for the structure, drafting, layout and contents of calibration procedures for measurement standards and measuring instruments. The Recommendation has been developed taking into account the requirements of ISO/IEC 17025:2017 [1], COOMET Recommendations R/GM/20:2009 [2], COOMET R/GM/21:2011 [3], COOMET R/GM/15:2020 [4], Publication Reference EA-4/02 M:2022 [5] and Joint BIPM, OIML, ILAC and ISO declaration on metrological traceability, 9th November 2011 [6].

The recommendations contained in this document apply to calibration procedures developed and applied by national metrology institutes (NMIs) and other national metrology organizations.

The developers of the calibration procedures can be:

- national metrology institutes;
- metrology centers or institutes specializing in the development of new methods and measuring instruments in specific areas of application;
- manufacturers (developers) of measuring instruments;
- users of measuring instruments (customers of the calibration laboratory);
- calibration laboratories.

2. ABBREVIATIONS

COOMET – Euro-Asian Cooperation of National Metrological Institutions;

CMCs – Calibration and Measurement Capabilities. Calibration and measurement capability available to the customer under normal conditions;

NMI – National Metrology Institute;

CP – calibration procedure;

MI – measuring instruments.

3. TERMS AND DEFINITIONS

This Recommendation uses the following basic terms with associated definitions and notes in accordance with JCGM 200:2008 (VIM) [7], CIS Standardization Recommendation 29-2013 [8] и ISO/IEC 17025:2017 [1].

3.1.

measuring instrument: a technical device intended for measurements, which has standardized (established) metrological characteristics
[8, art. 6.2]

3.2.

calibration: a set of operations that establish the ratio between the value of a quantity obtained using a given measuring instrument and the corresponding value of the quantity determined using a measurement standard in order to determine the metrological characteristics of this measuring instrument.
N o t e 1 – An example of a metrological characteristic is a calibration diagram, which carries information about the instrumental measurement uncertainty. During calibration, other metrological characteristics of measuring instruments can be determined.
N o t e 2 – The calibration results make it possible to determine the values of the measured quantity based on the indications of the measuring instrument or corrections to its indications, or to estimate the error of these instruments.
N o t e 3 – In VIM3 [7], the term calibration is defined as an operation that, under specified conditions, in a first step, establishes a relation between the quantity values with measurement uncertainties provided by measurement standards and corresponding indications with associated measurement uncertainties and, in a second step, uses this information to establish a relation for obtaining a measurement result from an indication.
[8, art. 9.6]

3.3.

calibration procedure (CP): an established logical sequence of operations, the implementation of which ensures the transfer of a unit of magnitude or scale from a measurement standard to a calibrated measuring instrument or measurement standard in accordance with the accepted method of transferring a unit or a measurement scale. Performing these operations ensures the establishment of the metrological characteristics of the calibrated measuring instrument or measurement standard with the corresponding uncertainty.
N o t e 1 – Calibration procedure is an element of documented confirmation of the metrological traceability chain.
N o t e 2 – If necessary, calibration procedure may contain rules for checking the compliance of the object under calibration with the established requirements, taking into account uncertainty and information about the stability of its metrological characteristics. For example, confirmation of compliance with the classes of reference and working weights in international standards (OIML R 111).

3.4.

measurement accuracy, accuracy of measurement, accuracy: closeness of agreement between a measured quantity value and a true quantity value of a measurand.
N o t e 1 – The concept ‘measurement accuracy’ is not a quantity and is not given a numerical quantity value. A measurement is said to be more accurate when it offers a smaller measurement error.
N o t e 2 – The term “measurement accuracy” should not be used for measurement trueness and the term “measurement precision” should not be used for ‘measurement accuracy’, which, however, is related to both these concepts.
N o t e 3 – ‘Measurement accuracy’ is sometimes understood as closeness of agreement between measured quantity values that are being attributed to the measurand.
[8, art. 5.7]

3.5.

measurement uncertainty: non-negative parameter characterizing the dispersion of the quantity values being attributed to a measurand, based on the information used
N o t e 1 – Measurement uncertainty includes components arising from systematic effects, such as components associated with corrections and the assigned quantity values of measurement standards, as well as the definitional uncertainty. Sometimes estimated systematic effects are not corrected for but, instead, associated measurement uncertainty components are incorporated.
N o t e 2 – The parameter may be, for example, a standard deviation called standard measurement uncertainty (or a specified multiple of it), or the half-width of an interval, having a stated coverage probability.
N o t e 3 – Measurement uncertainty comprises, in general, many components. Some of these may be evaluated by Type A evaluation of measurement uncertainty from the statistical distribution of the quantity values from series of measurements and can be characterized by
standard deviations. The other components, which may be evaluated by Type B evaluation of measurement uncertainty, can also be characterized by standard deviations, evaluated from probability density functions based on experience or other information..
N o t e 4 – In general, for a given set of information, it is understood that the measurement uncertainty is associated with a stated quantity value attributed to the measurand. A modification of this value results in a modification of the associated uncertainty.
[7, art. 2.26]

3.6.

target measurement uncertainty, target uncertainty: measurement uncertainty specified as an upper limit and decided on the basis of the intended use of measurement results.
[8, art. 5.45]

3.7.

validation: the process of establishing analytical requirements and confirming that the capabilities of the method under consideration are adequate for the task at hand. An integral part is evaluating the characteristics of the method. An important point in this definition is the assessment of the suitability of the method.

3.8.

verification: provision of objective evidence that a given item fulfils specified requirements.
N o t e 1 – The laboratory may implement a validated procedure, such as one published as a standard, or purchase a complete measurement system designed for a specific application. In both cases, the validation work has already been completed, but the laboratory must demonstrate its ability to use the procedure.
[1, art. 3.8]

3.9.

measurement standard, etalon: A measuring instrument designed to reproduce, store and transfer a unit of quantity or a measurement scale.
N o t e 1 – VIM3 [7] uses the term measurement standards: realization of the definition of a given quantity, with stated quantity value and associated measurement uncertainty, used as a reference.
N o t e 2 – A "realization of the definition of a given quantity" can be provided by a measuring instrument, a material measure, or a reference material.
N o t e 3 – The metrological characteristics of the measurement standards are similar to the metrological characteristics of the measuring instruments (for example, accuracy and stability characteristics).
[8, art. 8.1]

3.10

metrological traceability: property of a measurement result whereby the result can be related to a reference through a documented unbroken chain of calibrations, each contributing to the measurement uncertainty.
N o t e 1 – For this definition, a 'reference' can be a definition of a measurement unit through its practical realization, or a measurement procedure including the measurement unit for a non-ordinal quantity, or a measurement standard.
[8, art. 9.2]

3.11.

metrological traceability chain, traceability chain: sequence of measurement standards and calibrations that is used to relate a measurement result to a reference
N o t e 1 – A metrological traceability chain is defined through a calibration hierarchy or verification scheme (diagram).
N o t e 2 – A metrological traceability chain is used to establish metrological traceability of a measurement result.
[8, art. 9.13]

3.12.

calibration hierarchy: sequence of calibrations from a reference to the final measuring system, where the outcome of each calibration depends on the outcome of the previous calibration.
N o t e 1 – Measurement uncertainty necessarily increases along the sequence of calibrations.
N o t e 2 – The elements of a calibration hierarchy are one or more measurement standards and measuring systems.
N o t e 3 – For this definition, the 'reference' can be a definition of a measurement unit through its practical realization, or a measurement procedure, or a measurement standard.
[8, art. 9.14]

4. BASIC PRINCIPLES

4.1 Calibration procedures can be presented as:

- an international, regional, interstate or national standard;
- a document issued as recommendations approved by the state scientific metrological institute;
- a document developed and approved by the enterprise;

– a document approved by the enterprise using the CP.

4.2 By area of application, calibration procedures are divided into:

– calibration procedures intended for calibration of measuring instruments of one or more types;
– calibration procedures intended for calibration of measuring instruments belonging to one or more groups of measuring instruments;
– calibration procedures intended for calibrating single copies of measuring instruments;
– calibration procedures intended for calibrating measurement standards of units of quantities and groups of measurement standards reproducing a unit of quantity.

4.3 In accordance with ISO/IEC 17025 [1], the laboratory must apply appropriate calibration procedures for all laboratory practice and maintain them up to date.

If a calibration procedure is described in an international, regional, national standard or other recognized specification that contains sufficient and accurate information for laboratory personnel to use the procedure, it does not need to be supplemented or rewritten as an internal calibration procedure. To implement variable steps of the method or to provide additional detailed description of the calibration procedure contained in the standard, the calibration procedure must be issued in the form of a separate document with references to the sections of the standard used.

4.4 All calibration procedures introduced into the laboratory's activities must undergo a suitability assessment procedure in accordance with the requirements of clause 7.2 ISO/IEC 17025 [1].

5. MAIN REQUIREMENTS FOR STRUCTURE, DRAFTING, LAYOUT, AND CONTENT OF CALIBRATION PROCEDURES

5.1 A calibration procedure, documented as an independent document, must contain:

a) title page (see Appendix A);
b) identification number of CP;
c) scope of CP;
d) normative references;
e) terms and definitions (if necessary);
f) calibration instruments;
g) calibration conditions;
h) safety requirements;
i) calibration operations;
j) procedure for processing measurement results;
k) estimation of measurement uncertainty of the calibration result;
l) procedure for assessing compliance with established requirements (if necessary);
m) registration of calibration results;
n) appendix with a calibration protocol form;
o) method for determining the calibration interval (for in-house calibration) (if necessary);

Recommended names and sequence of sections for a calibration procedure are presented in Appendix B.

Where justified, it is allowed to combine or exclude individual sections, and, if necessary, add additional sections.

5.2 The title page must contain information about the person(s) who developed the calibration procedure, the head of the organization that developed the procedure (if any), words "Calibration procedure", name of the measuring instruments being calibrated, the assigned identification number of the calibration procedure, year of publication of the procedure and the number of editors. It is allowed to supplement the title page with other information.

5.3 In the identification number, it is recommended to indicate the document number corresponding to the quality system of the enterprise (if any), number of the department that developed the calibration procedure, number of the procedure and the indication "T" for typical calibration procedures and "S" for

special calibration procedures. For example, CP-03-202-001-T, where “CP” is “calibration procedure”, “03” is the document number corresponding to the enterprise’s quality system, “202” is the number of the department that developed the calibration procedure, “001” is the number of the procedure, “T” indicates typical calibration procedure.

5.4 For the scope, it is necessary to establish the purpose of the calibration procedure, scope of its application, groups/type of calibrated measuring instruments, measurement range, assessed metrological characteristics, method of transferring of the unit, corresponding CMCs (if any), as well as the degree of compliance of the calibration methodology with international documents, regional, interstate and (or) national standards.

The scope also needs to specify the requirements for the measurement uncertainties determined during the calibration process — target measurement uncertainty (TMU).

5.5 In the “Normative references” section, it is necessary to indicate references to international and national regulatory documents that were used for the development of this CP.

5.6 In the “Terms and Definitions” section, if necessary, the terms used in the calibration procedure are indicated, with links to the documents that regulate them.

5.7 In the section “calibration instruments” it is necessary to indicate a list of main and supporting calibration instruments, measurement standards, reference materials, equipment and materials for which metrological and main technical characteristics and/or regulatory documents regulating these requirements are indicated.

Special attention should be paid to requirements that ensure traceability of measurements performed by calibrated measuring instruments to primary measurement standards or national primary measurement standards of foreign countries, or to a primary reference measurement procedure.

The list can be presented in the form of Table 1.

Table 1 – Recommended form for providing a list of calibration instruments

CP item number	Name and type (symbol) of the main or supporting calibration instruments	Measuring range with units of measurement	Metrological and main technical characteristics of the calibration instruments
...	...	...	...

This section must also contain instructions on the possibility of using measuring instruments that are not listed, but ensure determination with the required accuracy of the metrological characteristics of the measuring instruments being calibrated.

5.8 The section “calibration conditions” must contain a list of quantities that affect the metrological characteristics of the measuring instruments or calibration instruments being calibrated, indicating their standardized nominal values and permissible deviations, within which the characteristics attributed to this calibration procedure remain unchanged.

5.9 The “safety requirements” section specifies requirements that ensure occupational safety, industrial sanitation, environmental protection during calibration, as well as conditions or requirements which, if violated, prevent calibration from being carried out or deem its results unreliable. In some cases, instructions may be included on the need to classify the calibration process as work in hazardous or extremely hazardous conditions.

This section also specifies the qualification requirements for persons performing the calibration.

5.10 The “Calibration Procedure” section must contain a list and methods of performing the following:

- preparations for calibration;
- necessary checks before starting work (for example, checking the completeness and appearance of the measuring instrument to be calibrated);
- checks of the normal operation of the measuring instrument being calibrated, interaction of its individual parts and elements, and, if necessary, adjustment procedure before each use;
- calibration procedures (determining metrological characteristics).

The section should contain a list of names and description of operations to determine the actual values of metrological characteristics of the measuring instrument being calibrated.

The description of each operation is divided into separate paragraphs or subparagraphs, where it is necessary to indicate the following: name of the metrological characteristic of the measuring instrument being calibrated; the calibration method used; connection diagrams, drawings; instructions for carrying out operations; formulas, graphs, tables with explanations of the symbols included; recommendations on the number of significant figures recorded in the protocol; etc.

If during calibration it is necessary to record measurement results in a certain form, this must be indicated, and the appendix must include the form for the protocol indicating the amount of information contained in it.

5.11 In the “procedure for processing experimental measurement results” section, it is necessary to indicate the algorithms for calculating the metrological characteristic being determined, indicating the input and output quantities.

If the processing of measurement results is carried out using software, in this section it is necessary to indicate the software used, and, if necessary, calculation algorithms and their structural diagrams. The appendix to the calibration procedure must provide all the data necessary to identify this software. The list of documents accompanying the software can be adjusted based on technical feasibility and customer requirements for calibration. At the customer's request, the software can be evaluated for compliance with established requirements.

If any current regulatory document establishes methods for processing measurement results, this section must provide a link to this document.

5.12 “Estimating the uncertainty of the calibration result” section must specify the algorithm for estimating the expanded measurement uncertainty during calibration, which is the uncertainty of establishing the metrological characteristics of the measurement standard or measuring instrument being calibrated.

When estimating measurement uncertainty during calibration, all components of the uncertainty that are relevant in a given situation must be taken into account using appropriate methods of analysis.

When estimating measurement uncertainty, the following should be taken into account:

- purpose of the measuring instruments being calibrated and risks when assessing the reliability of the metrological characteristics being determined;
- customer requirements;
- requirements included in the calibration procedure by the developers of the procedure.

After describing the uncertainty estimation algorithm, an example of an uncertainty budget table corresponding to this algorithm must be given. The recommended form of the uncertainty budget is given in Appendix C.

5.13 If the metrological characteristics determined during calibration have accuracy requirements, then the procedure for verifying compliance of these characteristics with the established requirements is described in the section “l) procedure for assessing compliance with established requirements”. The algorithm for deciding on compliance must be specified in the calibration procedure. Possible decision rules are given in the COOMET Recommendation R/GM/32:2017, and OIML Recommendations G 19:2017 and G1-106 [9,10,11].

Report on the conformity of the metrological characteristics with the specified requirements can be drawn up in the form of a table, which must indicate the following:

- determined metrological characteristic;
- metrological characteristic obtained during calibration;
- requirements for metrological characteristics;
- conclusion on the compliance of the metrological characteristics obtained during calibration with the established requirements;
- uncertainty of the metrological characteristic estimated during calibration,
- target uncertainty (if any),
- conclusion on compliance of the uncertainty of the metrological characteristic with the target uncertainty (if required);

- algorithm for checking the compliance of a metrological characteristic with established requirements, taking into account measurement uncertainty.

If calibration cannot be carried out, this is reported to the customer, indicating specific reasons.

5.14 Requirements for registration of calibration results are given in the “Registration of calibration results” section. When the calibration is completed, a calibration certificate is issued in accordance with the current editions of ISO/IEC 17025 and COOMET Recommendation R/GM/15 “Rules of Completion of the Form of Calibration Certificates issued by National Metrology Institutes and Designated Institutes within the scope of the CIPM MRA”.

5.15 The Appendix “Calibration procedure protocol form” specifies the recommended form for providing information about the calibration performed, containing:

- name of the organization and department that carried out the calibration procedure of the measuring instrument;
- number and date of the calibration protocol;
- name of the measuring instrument being calibrated, its type, serial number and other necessary information;
- customer data;
- date of the previous calibration (if available);
- date of calibration;
- identification number and name of the calibration procedure;
- using calibration instruments;
- calibration conditions;
- registration of measurement results during calibration, assessment of measurement uncertainty;
- report on the conformity of the metrological characteristics with the specified requirements (if carried out);
- signature of the person who performed the calibration.

Other Appendixes to the calibration procedure can be added:

- Software for processing the measurement results;
- methodology for calculating the uncertainty of parameters researched during calibration;
- examples of calculations when processing measurement results, tables of calculated values, dependency diagrams of values and other calculated data;
- explanations of terms;
- methodology for obtaining certified mixtures and sampling;
- scientific and technical justification of the requirements to the elements of the calibration procedure (target measurement uncertainty, the number of points at which calibration is carried out, the number of measurements at each point, etc.);
- technical descriptions of supplementary devices and accessories;
- additional information about the measuring instruments being calibrated, main and supplementary calibration instruments, reference materials of the composition and properties of substances and materials;
- additional special instructions on methods of applying calibration stamps;
- other requirements that help eliminate errors during calibration and increase its productivity, for example, instructions for using computer equipment.

5.16 After developing a calibration procedure, it is necessary to perform its validation, which is carried out by the developer of the calibration procedure or a specialist authorized to perform validation at a given metrological institute, state regional metrology center or calibration laboratory, etc.

After validating the calibration procedure, a validation protocol is prepared and signed. The recommended form for a validation protocol for a calibration procedure is given in Appendix D.

To carry out calibration of measuring instruments, it is possible to use standardized calibration procedures, calibration procedures described in regulatory documents or calibration procedures of other organizations with established uncertainties (uncertainty calculation algorithms). In such cases, it is

necessary to confirm the ability of the organization (laboratory) to apply a validated/standardized calibration procedure and obtain reliable results from it, i.e. to carry out a verification procedure for the calibration procedure. Verification is documented in a protocol, the recommended form of which is given in Appendix E. The protocol is signed by the employee responsible for the verification and the head of the department.

If changes were made to the calibration procedure that do not affect the change in metrological characteristics, then it is necessary to carry out a re-verification as needed. If changes were made to the procedure that affects the change in metrological characteristics, then it is necessary to carry out a validation for the modified calibration procedures.

5.17 Calibration procedures should be updated periodically, as well as when the equipment used and/or national and international standards change.

Appendix **A** (recommended).
The form of title page of calibration procedure

Number of pages _____
Editorial_____

AGREED

Head of the enterprise that ordered the calibration procedure
_____ First Name Last Name
«____» _____ 20__ г.

APPROVED

Head of the company that developed the calibration procedure
_____ First Name Last Name
«____» _____ 20__ г.

CALIBRATION PROCEDURE

_____
measuring instruments being calibrated

CP-...-XXX-X

Developed by: Position: First Name Last Name	Checked: Position: First Name Last Name
Signature: Date:	Signature: Date:

City
20XX

Appendix B (recommended).
Recommended names and sequence of sections of the calibration procedure.

The calibration procedure may contain the following sequence of sections:

1. The scope of CP;
2. Normative references;
3. Terms and definitions (if necessary);
4. Calibration instruments;
5. Requirements for calibration:
   5.1 calibration conditions;
   5.2 safety requirements;
   5.3 qualification requirements for personal;
6. Calibration operations;
   6.1 Preparation for calibration;
   6.2 Calibration procedure (determining metrological characteristics);
7. Procedure for processing experimental measurement results;
8. Estimating the measurement uncertainty of the calibration result;
9. Procedure for assessing compliance with established requirements (if necessary);
10. Registration of calibration results.

Appendix C (recommended).
Recommended form of measurement uncertainty budget.

Source of Uncertainty	Value, Units	Standard Uncertainty	Type	Probability Distribution	Sensitivity Coefficient	Contribution to Uncertainty	Percentage contribution
1	2	3	4	5	6	7	8
Output value		Combined Standard Uncertainty =					100%

N o t e 1 – The measurement uncertainty budget may be presented in a shortened format: columns may be omitted if the lack of relevant information would not lead to ambiguous interpretation of the results. In this case, the heading of column 1 may indicate: “components of uncertainty” or “sources of uncertainty”.

N o t e 2 – Standard uncertainty (column 3) is indicated in absolute form in units of the input quantity or in relative form (%).

N o t e 3 – The contribution to uncertainty (column 7) is indicated as standard uncertainty (the product of the values indicated in columns 3 and 6) in units of the output quantity or in relative form, %).

N o t e 4 – The percentage contribution (column 8) is reported as a percentage of the standard uncertainty value in column 8 to the Combined standard uncertainty.

Appendix D (recommended).
Recommended form of validation protocol.

PROTOCOL
for validation of calibration procedure

№_____ _____
Date

1 Calibration procedure information _____
Designation, name, developer, purpose

2 Requirements for the determined characteristics of the calibration object and measurement uncertainty

Calibration object	Defined characteristic	Requirements for the values of the determined metrological characteristic (nominal value, range of values, limit)	Expanded measurement uncertainty (“target”)	Note
1	2	3	4	5

N o t e 1 – Column (2) indicates the metrological characteristic being determined (for example, the value of the measure, the error of the measuring device, the measurement range, the calibration coefficient, etc.

N o t e 2 – In column (3) for the listed characteristics indicate, based on the purpose of the calibration procedure, the use of calibration results (in particular, checking the compliance of the calibrated measurement standards with a certain level according to calibration hierarchy), the use of the calibrated measurement standard or measuring instrument.

N o t e 3 – Target uncertainty (column 4) may be specified in the following cases (but not limited to those listed):

- if calibration results are intended to be used to confirm compliance and the uncertainty value is important in risk assessment;
- if justification of measurement uncertainty is necessary to indicate in the scope of accreditation for calibration;
- upon requirement and agreement with the calibration customer.

The specified target uncertainty cannot be less than that specified in the CMS or in the scope of accreditation, which gives the smallest realizable uncertainty that the laboratory can provide when performing calibrations using this procedure.

N o t e 4 – Column (5) provides, if necessary, additional information to clarify the previous columns (for example, a link to a document establishing the requirements.

3 Experimental Characterization Results (if provided)

Defined characteristic	Method (document section)	Results of measurements and calculations	Date, performer

Note: It is possible to attach a calibration protocol(s) to the extent sufficient to verify the requirements of Section 2 of this Protocol.

4 Estimation of measurement uncertainty

Measurement model:_____

Equation for calculating uncertainty _____(*if it is needed*)

Measurement Uncertainty Budget:

Source of Uncertainty	Value, Units	Standard Uncertainty	Type	Probability Distribution	Sensitivity Coefficient	Contribution to Uncertainty	Percentage contribution
1	2	3	4	5	6	7	8
Output value		Combined Standard Uncertainty =					100%

"The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95 %."

The calculation was carried out _____ _____ _____

Position *Signature* *Last name first name*

5. Compliance Check

Defined characteristic	Characteristic value			Measurement uncertainty *			Note
	Required	Received	Conclusion	Required	Received	Conclusion	
1	2	3	4	5	6	7	8
* This column can indicate both the target uncertainty requirement and the compliance decision rule.							

Note: This table is completed only if there are requirements for the determined characteristics and/or measurement uncertainty.

6. Conclusion

Calibration procedure regulated in the document _____

_____, suitable for calibration

designation, name

_____

name, designation of the calibration object

in the department/enterprise _____

Validation _____ _____ _____

Position *Signature* *Last name first name*

Supervisor _____ _____ _____

Department *Signature* *Last name first name.*

Appendix E (recommended).
Recommended form of verification protocol.

PROTOCOL

confirmation of correct use _____
Designation and name of the document described the calibration procedure
*in*_____
name of the enterprise (division of the enterprise)
№_____ _____
Data

Document Section	Requirement (standard)	Evaluation method	Data, employee	Conclusion on compliance with the requirement (standard)
...	*Examples:* *A) Characteristics of the measurement standard - XXX* *B) Room temperature: from 18 °C to 22 °C* *C) Target expanded uncertainty (with coverage coefficient k=2) when establishing corrections to the nominal value of the measure: XXXXX* *D) Range of permissible values of the calibration coefficient:* *from to*	*Examples:* *A) Document verification* *B) Measurement* *B) Calculation* *D) Comparison with the experimentally found value of the coefficient*		
...	...	...	...	...

Conclusion:

Correct application of_____
Designation and name of the document described the calibration procedure
confirmed/not confirmed.

Verification _____ _____ _____
Position *Signature* *Last name first name*
Supervisor _____ _____ _____
Department *Signature* *Last name first name.*

Appendix F
Bibliography

[1] ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories.

[2] COOMET R/GM/20:2009 Scales of measurements. Terms and definitions.

[3] COOMET R/GM/21:2011 Use of concepts “error of measurement” and “uncertainty of measurement”. General principles materials.

[4] COOMET R/GM/15:2020 Rules of Completion of the Form of Calibration Certificates issued by National Metrology Institutes and Designated Institutes within the scope of the CIPM MRA.

[5] EA-4/02 M: 2022 Evaluation of the Uncertainty of Measurement in calibration.

[6] Joint BIPM, OIML, ILAC, and ISO Declaration on metrological traceability. 9th November 2011.

[7] JCGM 200:2008 International vocabulary of metrology – Basic and general concepts and associated terms (VIM).

[8] CIS Standardization Recommendation 29-2013 Metrology. Basic terms and definitions.

[9] COOMET R/GM/32:2017 Calibration of measuring instruments. Algorithms of processing measurement results and uncertainty evaluation

[10] OIML G 19:2017 The role of measurement uncertainty in conformity assessment decisions in legal metrology.

[11] OIML G 106:2014 Evaluation of measurement data – The role of measurement uncertainty in conformity assessment.

Information data

Recommendation **COOMET R/GM/31:20**XX

1. Development coordinator: D.I. Mendeleyev Institute for Metrology (VNIIM)

2. COOMET topic: 422/RU-a/08 (project coordinator –Anna Chunovkina).

3. The recommendation was updated and approved at a ___ meeting of the COOMET Committee (20XX).

4. Information on the application of the publication by COOMET member countries.