	COOMET Recommendation	**COOMET** R/TR/24:202Y
	Programs of COOMET trainings. Content and design requirements. Development procedure	
Approved *at the 24th COOMET Committee meeting (Yekaterinburg, Russia, 16–17 April 2014)* *updated and amended* *at the _____ COOMET Committee meeting (_____)*		

1. SCOPE

This Recommendation provides general requirements for the content and design of programs of the following COOMET trainings, aimed at training and upgrading qualifications of specialists of national metrology institutes (NMIs) of COOMET member countries:

- seminar;
- theoretical training course (hereinafter – training course);
- traineeship under the auspices of COOMET.

The Recommendation also defines the procedure for preparing programs of COOMET trainings.

2. REFERENCES

In this Recommendation, references are made to the following COOMET publications[1]:

Document COOMET D2/2021 "COOMET Rules of Procedure";

Recommendation COOMET R/TR/27:2023 "Procedure for preparing certificates issued based on the results of trainings within COOMET".

3. TERMS AND DEFINITIONS

The following terms with the corresponding definitions are used in this recommendation:

Organizing NMI is the national metrology institute acting as the initiator and/or organizer of a COOMET training.

Note: The COOMET Committee, COOMET Presidential Council, COOMET Secretariat or a COOMET structural body/task group can also be a training initiator.

Customer NMI is the NMI acting as the customer of a COOMET training in the form of a traineeship.

Coordinator of a COOMET training from the organizing NMI (hereinafter referred to as coordinator from the organizing NMI) is the NMI representative acting as the organizer of a training course, seminar or traineeship under the auspices of COOMET.

[1] When using this publication, it is advisable to check the year of approval of the referenced publications on the website www.coomet.org (section "COOMET Publications") or the portal www.coomet.net (section "Publications").

4. PROCEDURE FOR PREPARING THE PROGRAMS OF TRAININGS

4.1. Procedure for preparing the program of a seminar or training course

4.1.1. Seminars and training courses can be held physically or online.

4.1.2. It is appropriate to launch a COOMET project for holding a seminar or a training course; in this case, the program is prepared under the project.

The coordinator from the organizing NMI is generally the COOMET project proposer; the form of the proposed project is submitted to the COOMET Secretariat according to document COOMET D2.

For a training course, the objective and tasks of the course are stated in the form of the COOMET project.

4.1.3. The program of a seminar, initiated by the COOMET Committee, Presidential Council or COOMET Secretariat, is prepared by the COOMET Secretariat in conjunction with TC 4 "Information and Training" and the Chair of the structural body/task group, within whose area of responsibility the topic of the seminar falls.

A draft seminar program is discussed within the COOMET Presidential Council, as required (at a meeting or by correspondence with its members).

4.1.4. The program of a seminar or training course, initiated by a structural body/task group, is prepared by the Chair or appointed representative of the structural body/task group in conjunction with TC 4 "Information and Training" and COOMET Secretariat.

It is appropriate to discuss the topic and draft program of a seminar or training course at a structural body/task group meeting (or by correspondence with its members), within whose area of responsibility they fall.

The final version of the program of a training course should be approved at a structural body/task group meeting.

4.1.5. The program of a seminar or training course, initiated by an NMI of a COOMET member country is prepared by the Coordinator from that organizing NMI in conjunction with TC 4 "Information and Training".

It is appropriate to discuss the topic and draft program of a seminar or training course at a structural body/task group meeting, within whose area of responsibility they fall.

4.1.6. Records of the programs of seminars and training courses are kept by TC 4 "Information and Training" in electronic form; information about the held trainings is presented at annual TC 4 meetings.

4.2. Procedure for preparing the programs of traineeships under the auspices of COOMET

4.2.1. The program of a traineeship is prepared by the traineeship Coordinator from the organizing NMI in conjunction with interested representatives of the customer NMI.

4.2.2. The draft program of a traineeship can be submitted for agreement to the Chair of the structural body/task group, within whose area of responsibility the topic of the traineeship falls.

5. REQUIREMENTS FOR THE CONTENT ANS DESIGN OF THE PROGRAMS OF TRAININGS

5.1. Seminar program

A seminar program shall contain the seminar topic, date, venue/format and time, theoretical part (list of issues) and information about speakers.

5.2. Training course or traineeship program

5.2.1. A training course or traineeship program generally consists of the following sections:

- introduction (where required);
- theoretical part;
- practical classes (where required);
- procedure for knowledge verification;
- recommended scientific and technical literature.

5.2.2. General requirements for the content of program sections are given in Annex 1.

5.3 Examples of the theoretical part of a training program are given in Annex 2.

5.4 Design of a training course or traineeship program

5.4.1. The following information shall be given on the title page: full title of the training course or traineeship, information about the organizing NMI and Coordinator from the organizing NMI, its approval or agreement (where required) by the structural body/task group, within whose area of responsibility it falls (only for a training course).

5.4.2 It is recommended to type text in the MS WORD (doc) format, Times New Roman font, normal; the font size of the main text to be 14, with 1.5 line spacing, full justification, 1.25 cm indentation. Headings should be in semibold, center aligned. Page setup: 210×297 (margins: upper – 1.5 cm, lower – 2.0 cm, left – 2.5 cm, right – 1.0 cm).

5.4.3. In preparing programs of trainings, in particular traineeships, it is appropriate to take into account the corresponding requirements of COOMET publications and documents of international metrology organizations.

The list of some documents of international metrology organizations is given in Annex 3.

Annex 1

Requirements for the content of program sections of a training course or traineeship under the auspices of COOMET

(recommended)

Content of program sections.

1 Section "Introduction" contains general information about the objective and tasks of the program, about the relevance of the program topic when dealing with general (specific, global) tasks of metrology, about the duration and methodology of the training and/or traineeship. The requirements for students are also set out: their education and work experience, knowledge and practical skills, inter alia in terms of their self-guided work with documents and scientific and technical literature.

2 Section "Theoretical part" includes specific topics of lectures, with sections logically arranged from the basic concepts to explaining the essence of issues of each of the topics considered. The duration of the training program in hours shall be given for each topic, including demonstration of the training material (films, slides), and the link shall be provided to the literature for self-study.

3 Section "Practical classes" includes the topic and description of the ultimate objectives of each class, format and venue, duration of the training program in hours, workplaces used, auxiliary technical facilities, office equipment, textbooks, list of recommended literature. The methodology for conducting a practical class, actions of students to achieve the ultimate objectives set, criteria for assessing the progress in mastering the training material are to be laid down.

4 Section "Knowledge verification" includes description of the form and method of verification and assessment of knowledge (test exam, writing of an essay, participation in a business game etc.) gained in taking the training course or traineeship under the specific program.

5 Section "Recommended scientific and technical literature" represents a list of international documents, technical literature, special methodical textbooks, articles in periodicals etc., recommended to students for self-study. Each item of the list has its own number that can be referenced in the text of the program.

Annex 2

Examples of the theoretical part of the program of trainings
(recommended)

1 Program of the training on "Main provisions of the CIPM MRA[2] and mechanism for its implementation":

1.1 Tasks and objectives of the CIPM MRA.

1.2 Participants of the CIPM MRA.

1.3 Mechanism for the implementation of the CIPM MRA.

1.4 Role of CIPM, BIPM and JCRB in the implementation of the CIPM MRA.

1.5 Databases, published on the BIPM website according to the CIPM MRA.

1.6 Participation of RMOs in the implementation of the CIPM MRA.

1.7 Procedures for intra- and interregional review of calibration and measurement capabilities of participants of the CIPM MRA.

1.8 Functions of COOMET structural bodies in the implementation of the CIPM MRA.

1.9 Participation of OIML and ILAC in the implementation of principles, regulated by the CIPM MRA.

1.10 Possibility to implement the principles, regulated by the CIPM MRA, by calibration and measurement laboratories that cannot be participants of the arrangement.

2 Program of the training on "Measurement standards comparisons":

2.1 The purposes of comparisons of measurement standards.

2.2 Types of measurement standards comparisons and methods for conducting them.

2.3 Form, role and significance of the Technical Protocol.

2.4 Procedure for the determination of the degree of equivalence of the measurement standard.

2.5 Procedure for processing and presentation of comparison results.

2.6 JCRB flowchart for the process of conducting key and supplementary comparisons.

2.7 Role and functions of COOMET structural bodies, Consultative Committees, CIPM and JCRB in conducted comparisons;

2.8 Procedure for the registration of comparisons in the COOMET and BIPM (KCDB) databases.

2.9 Rules of drawing up, maintenance and update of the COOMET Program of Comparisons.

2.10 Monitoring of impact of the results of key and supplementary comparisons on the declared CMCs.

2.11 Evaluation of data of key and supplementary comparisons, conducted within COOMET.

2.12 Presentation of results (reports) of key and supplementary comparisons, as well as pilot comparisons.

2.13 Procedure for the registration of comparison results in the COOMET and BIPM databases.

3 Program of the training on "Calibration of measuring instruments":

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[2] *CIPM MRA - Mutual Recognition Arrangement of National Measurement Standards and of Calibration and Measurement Certificates issued by National Metrology Institutes*

3.1 A set of procedures performed in calibrating measuring instruments.

3.2 Basic requirements for measuring instrument calibration procedures.

3.3 Main provisions of the Guide to the expression of uncertainty in measurement.

3.4 General principles of using the concept of "measurement uncertainty".

3.5 Traceability of the results obtained in measurement calibration to the measurement standards that underwent the recognition procedure according to the CIPM MRA.

3.6 Procedure for drawing up certificates of calibration issued by NMIs under the CIPM MRA.

3.7 Accreditation for the right to calibrate measuring instruments.

3.8 Forms of monitoring of activities of the laboratories, accredited for the right to calibrate.

4 Program of the training on "Implementation, maintenance and evaluation of performance of the NMI quality system":

4.1 General requirements for the QMS of calibration laboratories, specified in international standard ISO/IEC 17025.

4.2 General requirements for the QMS of reference materials producers, specified in international standard ISO 17034.

4.3 Practice and procedure for peer review of the NMI QMS, established by the BIPM and COOMET.

4.4 Main principles of the JCRB in the field of RMO monitoring of the state of the NMI QMS.

4.5 Functions of the COOMET Quality Forum and its Technical Committee.

4.6 Requirements for written and oral presentations of the NMI QMS.

4.7 Requirements for the structure and content of documentation of the NMI QMS and for the management of documents regulating the QMS functioning.

4.8 Procedure for reporting by COOMET NMIs on the effectiveness of their QMS.

4.9 Organization and content of internal and external peer reviews of the NMI QMS.

4.10 Criteria for selecting technical experts on QMS peer review and QMS auditors and procedure for their training. The content of questionnaires for technical experts and QMS auditors.

4.11 COOMET requirements for scientists-custodians of national measurement standards.

Annex 3

List of documents of international metrology organizations
(informative)

1. CIPM Mutual Recognition Arrangement of National Measurement Standards and of Calibration and Measurement Certificates issued by National Metrology Institutes (CIPM MRA)
   Translation into Russia:
   https://www.coomet.net/fileadmin/user_files/DOCUMENTS/PUBLICATIONS/Translations_into_Russian_international_organizations/CIPM_MRA_ru.pdf
2. Document CIPM MRA-G-11 Measurement comparisons in the CIPM MRA: Guidelines for organizing, participating and reporting
3. Document CIPM MRA-G-12 Quality management systems in the CIPM MRA: Guidelines for monitoring and reporting
4. Document CIPM MRA G-13 Calibration and measurement capabilities in the context of the CIPM MRA: Guidelines for their review, acceptance and maintenance
5. Document CIPM MRA-P-11 Overview and implementation of the CIPM MRA
6. Document CIPM MRA-P-12 Coordination within the CIPM MRA: Consultative Committees, Regional Metrology Organizations, JCRB
7. Document CIPM MRA P-13 Participation in the CIPM MRA: National Metrology Institutes, Designated Institutes, International organizations
   The original documents in English: https://www.bipm.org/en/cipm-mra/cipm-mra-documents/
   Translation of documents into Russian: https://www.coomet.net/ru/navi-main/organizacija/tk-1-obedinennyi-komitet-po-ehtalonam/dokumenty/
8. Classification of services by the areas of measurements available on the KCDB website *(https://www.bipm.org/kcdb/)*
9. Joint BIPM, OIML, ILAC and ISO declaration on metrological traceability
10. *Translation into Russian:*
    https://www.coomet.net/fileadmin/user_files/DOCUMENTS/PUBLICATIONS/Translations_into_Russian_international_organizations/Joint_BIPM__OIML__ILAC__and_ISO_Declaration_on_Metrological_Traceability_RU_EN_2018.pdf
11. International standard ISO/IEC 17025 "General requirements for the competence of testing and calibration laboratories"
12. International standard ISO 17034 "General requirements for the competence of reference material producers"
13. ISO/IEC Guide 98-3:2009 Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement
14. ISO/IEC Guide 99 International vocabulary of metrology. Basic and general concepts and associated terms (VIM)
    The official translation is available on the ISO website (free of charge for ISO members).
    (Publishing house: Saint Petersburg, SPA «Professional», 2009).
15. OIML V1 (edition 2013 (E/F) International vocabulary of terms in legal metrology (VIML)
    Translation into Russian:
    https://www.coomet.net/fileadmin/user_files/DOCUMENTS/PUBLICATIONS/Translations_into_Russian_international_organizations/OILM/OIML_V_1_2013-RU-2018.pdf

INFORMATION

Recommendation C**OOMET** R/TR/24:202Y

1. Development coordinator: TC 4 "Information and Training".

2. COOMET project: 860/RU/22 (coordinator – Katerina Kozmina, VNIIMS, Russia).

3. The recommendation was updated and approved at _____ COOMET Committee meeting.

Since this COOMET publication has an organizational and methodological content and reflects the procedural issues of COOMET activities in the field of knowledge transfer, it should be used by all participants of cooperation within COOMET.