

ANNUAL REPORT

of the COOMET Joint Committee for Measuring Standards for 2021¹

1. GENERAL DESCRIPTION OF COOPERATION, including information on carrying out the COOMET Strategy and COOMET Development Program

JCMS members are the TC 1.1 – TC 1.12 Chairpersons. In 2021, the COOMET D5.1 “*Regulations of the COOMET Joint Committee on Measurement Standards (COOMET JCMS)*” was updated (replacing COOMET D5.1/2018). The document is submitted for approval of the COOMET Committee in 2022.

In 2021, under the guidance of the JCMS the following activities were carried out, outlined in the COOMET Development Program for 2020 – 2022 and the Roadmap for Implementation of the COOMET Strategy for 2020 – 2025:

- **9. (Ind-a.1.9)** Analysis of timeframes of the COOMET comparisons and implementation of corrective measures to reduce them: joint work with the TC 1.1 – TC 1.11 Chairpersons was carried out on official completion of the KCB D comparisons.
- **16. (Ind-a.3.2)** Translation of new versions of the CIPM MRA documents into Russian and posting the translations on the COOMET information resources: the work was carried out within 794/RU/19 topic (see Section 3).
- **19. (Ind-a.4.1)** Development and realization of the Roadmap for TC 1.2 – TC 1.11 on implementation of decisions related to the redefinition of the SI basic units: work was carried out on the planned Roadmap events.
- **46. (Ind-e.1.3)** Development of two-year COOMET Training Plans: JCMS participated in the development of the COOMET Training Plan for 2021 – 2022².
- **56. (Ind-f.1.1)** Assessment of interest of the COOMET member-countries NMIs/DIs in innovative scientific projects; **57. (Ind-f.1.2)** Preparation of table of Metrological activity areas of the COOMET member-countries NMIs/DIs, where specific NMIs/DIs are active; **58. (Ind-f.1.3)** Identification of promising areas in innovative research in the field of metrology within the COOMET: JCMS representatives participated in the survey of COOMET member-countries NMIs/DIs and processing of the results. The results were submitted at the 27th meeting of the COOMET President’s Council (10-11 March 2021) and 28th meeting of the COOMET President’s Council (24-25 November 2021). The works continue.
- **78.** Development and realization of the COOMET Recommendations Development Plan containing requirements for calibration of different types of measuring instruments (Calibration Guidelines): a discussion was held on approaches to develop the Plan. The issue will be discussed further at the next JCMS meeting.
- **79. (Ind-g.2.6)** Verification of scientific and technical level (STL) of the COOMET publications, preparation by the COOMET Structural Bodies of schedule for updating the COOMET publications and its realization: in 2021, three COOMET publications within the framework of 828/RU/21 were updated; draft COOMET Publication “*Expression of expanded uncertainty in measurements (excess method)*” developed as a part of 796/UA/19 was recommended for approval by the COOMET Committee (see Sections 2 and 3).

Information on TC 1.1 – TC 1.12 meetings in 2021 is given in Table 1.

¹ The Report provides a summary of the JCMS activities in 2021. Detailed information on cooperation within the JCMS area of responsibility is given in the reports of the TC 1.1 – TC 1.12 Chairpersons.

² Detailed information on the training activities held in 2021 is provided in the TC 4 Annual Report.

Table 1

TC	Time and place of the meeting
TC 1.1	October 15, 2021, video conference
TC 1.2	September 29, 2021, video conference
TC 1.3	October 5-6, 2021, video conference
TC 1.4	March 24, 2021, video conference
TC 1.5	November 10–11, 2021, video conference
TC 1.6	not available
TC 1.7	October 12–13, 2021, Moscow, Russia and video conference
TC 1.8	October 28–29, 2021, St. Petersburg, Russia
TC 1.9	November 22–23, 2021, video conference
TC 1.10	November 17–18, 2021, video conference
TC 1.11	November 29, 2021, video conference
TC 1.12	August 25–26, 2021, Yekaterinburg, Russia and video conference

2. JCMS MEETING

The 20th JCMS meeting was held online on June 3, 2021.

The following issues were discussed:

- Implementation of the CIPM MRA.
- Assuring metrological traceability of the COOMET NMIs' measurement standards.
- Updating the COOMET Roadmap for implementation of decisions related to the redefinition of the SI basic units.
- COOMET concept on digitalization in the field of metrology, including using FAIR-data.
- Translation of the JCRB documents and COOMET publications.

The following decisions were made at the meeting:

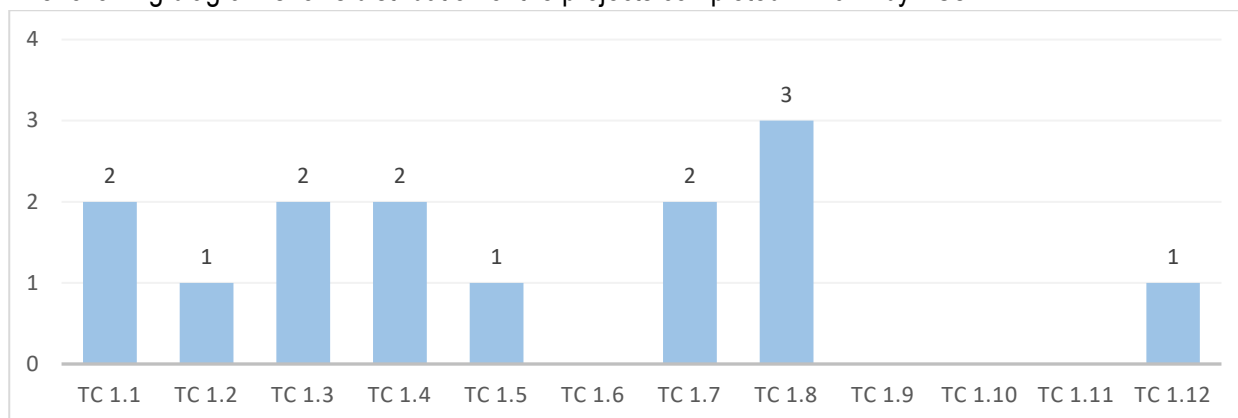
- To ask TC 1.1 – TC 1.12 Chairpersons to discuss the need to develop standard calibration techniques with the COOMET framework at the next TC meetings.
- To approve in general the draft of updated Roadmap taking the discussion into account, and to recommend it for approval as COOMET Program at the 31th online meeting of the COOMET Committee.
- To take into account information on posting translations of the CIPM MRA documents of P and G series (made within the topic 794/RU/19) on the JCMS web page at www.coomet.net. The topic will be closed.
- Based on the discussion, to approve changes to the COOMET Recommendations R/GM/7:2014, COOMET R/GM/11:2017, and COOMET R/GM/12:2015 prepared within the framework of 828/RU/21; to discuss the finalized projects by correspondence and submit them for approval at the 31th online meeting of the COOMET Committee.

3. REVIEW OF THE COMPLETED TOPICS AND INFORMATION ON THE USE OF OBTAINED RESULTS

Information on the COOMET projects completed in 2021 is given in the Table 2.

N	Project ID	Name	Pilot	Participants
1	828/RU/21	Updating of COOMET Recommendations COOMET R/GM/7:2014, COOMET R/GM/11:2017, and COOMET R/GM/12:2015	VNIIM	JCMS Chairperson, JCMS Deputy Chairperson, JCMS Secretary, TC 1.2 – TC 1.12 Chairpersons
2	618/RU-a/13	Pilot comparison "Analysis of elemental composition of Ni-based alloys"	VNIOFI	BelGIM (Belarus), Ukrmetrteststandart (Ukraine), VNIIOFI (Russia), VNIIM (Russia), SMU (Slovakia)
3	794/RU/19	Translation and updating of the new versions of the CIPM MRA documents, as well as the CIPM document "Recommendations of the Working Group on Implementation and Operation of the CIPM MRA"	VNIIM	VNIIM (Russia) - coordinator, COOMET TCs Chairpersons, other participants of cooperation concerned
4	756/RU-a/18	Pilot comparison in the field of measuring mass fractions of oxygen and nitrogen in steel	UNIIM	UNIIM (Russia), BAM (Germany)
5	267/RU-a/02	Supplementary comparison of electromagnetic energy flux density standards (W/m ²) at 2.45 GHz and 10.0 GHz frequencies	VNIIFTRI	VNIIFTRI (Russia), BelGIM (Belarus), Ukrmetrteststandart (Ukraine)
6	784/RU/19	Pilot comparison "Water content in crude oil"	VNIIM	VNIIM (Russia), NIM (China)
7	682/RU-a/16	Pilot comparisons of standards of pulse electric and magnetic field intensity units with pulse rise time in the range from 20 ps to 10 ns	VNIOFI	VNIOFI (Russia), KRISS (Republic of Korea), Tsinghua University (China)
8	736/RU/17	Diffuse absorbance of transmitted samples	VNIOFI	CJSC "NBSM" (Armenia), BelGIM (Belarus), NIM (China), INM-MD (Moldova), VNIOFI (Russia), UzNIM (Uzbekistan), NSC "Institute of Metrology" (Ukraine)
9	684/MD/16	Pilot comparisons of national standards of gas flow rate	INM-MD	INM-MD (Moldova), SE "Ivano-Frankivskstandartmetrology (Ukraine)
10	706/RU-a/16	Pilot comparison of longitudinal ultrasonic wave propagation velocity in solid media	Far Eastern Branch of VNIIFTRI	BelGIM (Belarus), NIM (China), Ukrmetrteststandart (Ukraine), Dnirostandartmetrology (Ukraine), Far Eastern Branch of VNIIFTRI (Russia)
11	406/UA/07	Supplementary comparisons of national standards of liquid flow	PTB	PTB (Germany), BelGIM (Belarus), VNIIR (Russia), LEI (Lithuania), SMU (Slovakia), NSC of the Republic of Uzbekistan (Uzbekistan)
12	529/RU/11	Comparisons of interferometers for measurement of tapes up to 20 m	VNIIM	VNIIM (Russia), BelGIM (Belarus), KazStandart (Kazakhstan)
13	599/RU-a/13	Comparisons of standards for unit of laser output average power at wavelength of 0.532 μm , 1.064 μm , and 10.6 μm	VNIOFI	VNIOFI (Russia), NIST (USA)
14	617/RU-a/13	Development of RM of composition of wolframite-hubnerite (hard-alloy) concentrate of KVG (T) grade	Vinogradov Institute of Geochemistry, Siberian Branch of RAS, Russia	Belarus, Bulgaria, Kazakhstan, Russia, Uzbekistan

The following diagram shows distribution of the projects completed in 2021 by TCs.



4. PARTICIPATION IN IMPLEMENTATION OF THE CIPM MRA

From January 1, 2021 to December 31, 2021 90 CMCs were published in the BIPM KCDB:

Area	Country	NMI	Number of CMCs
EM	UA	SE "Ukrmetrteststandard"	6
L	BY	BelGIM	10
	KZ	KazStandard	2
	RU	VNIIM	2
M	BY	BelGIM	6
	GE	GEOSTM	1
	KZ	KazStandard	4
	RU	VNIIM	6
PR	KZ	KazStandard	7
	UA	NSC "Institute of Metrology"	2
T	GE	GEOSTM	3
QM	RU	VNIIM	37
	RU	VNIIFTRI	2
	UA	SE "Ukrmetrteststandard"	1
		TOTAL	90

For implementation of the CIPM MRA in 2021, COOMET Structural Bodies formed the COOMET Comparisons Programme (P2/2021).

In 2021, works were performed (in different stages) on 88 comparisons.

In November 2021, an analysis was carried out on the number of COOMET key and supplementary comparisons, number of completed and published comparisons, and number and percentage of COOMET pilot comparisons by NMIs/DIs as part of the Progress report on realization of the Comparisons Programme to the COOMET President's Council.

Lists of the COOMET Technical Experts on CMC review were updated. The updated information is posted on the TCs web pages at www.coomet.net.

On October 15, 2021, JCMS members took part in the webinar "Practice of using the CIPM MRA documents and COOMET Publications on conducting and evaluating of calibration and comparisons results".

5. ISSUES OF COOPERATION WITH INTERNATIONAL AND REGIONAL ORGANIZATIONS IN THIS FIELD OF COOPERATION

JCMS representatives took part in 43th JCRB meeting (March 15–17, 2021) and in 44th JCRB meeting (September 14–16, 2021) as part of the official COOMET delegation.

Within the JCMS, Action Plan for cooperation between the COOMET and EURAMET was discussed.

JCMS Chairperson is a member of JCGM Working group on the International Vocabulary of Metrology (JCGM-WG2:VIM).

6. TIME AND PLACE OF THE NEXT MEETING

The next JCMS meeting was scheduled for June 2022 but was cancelled due to force-majeure. No decision has yet been made on the date and format of the next meeting.

7. PROPOSALS FOR THE COOMET COMMITTEE RESOLUTIONS

- To approve the updated document COOMET D5.1 “*Regulations of the COOMET Joint Committee on Measurement Standards (COOMET JCMS)*” replacing COOMET D5.1/2018 – Appendix 1.
- To approve the COOMET Recommendation “*Expression of expanded uncertainty in measurements (excess method)*” developed as a part of 796/UA/19 – Appendix 2.

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