

ANNUAL REPORT

TC 1.9 “Ionizing Radiation and Radioactivity” for 2019

The main goal of TC 1.9 is to coordinate of COOMET national metrological institutes activities in the field of ionizing radiation measurements according to decisions taken at the previous TC meeting. The main attention is paid to the organization and conduct of key and supplementary comparisons to support the national metrological institutes measuring capabilities, the SMS expertise and collaborators advanced training.

1. TECHNICAL COMMITTEE MEETING

The 16th meeting of TC 1.9 “Ionizing radiation and radioactivity” was held on September 17-19, 2019 in Chisinau, Republic of Moldova.

Representatives of Belarus (BelGIM), Germany (RTV), Cuba (CENTIS, CPHR), Georgia (GEOSTM), Kazakhstan (AF National Association of National Examinations), Moldova (INM), Russia (VNIIM, VNIIFTRI), Ukraine (NIM) were present.

E. Shahverdiyev, Azstandart (Azerbaijan) could not take part in the meeting.

THE MAIN TOPICS

1.1 Information on the COOMET projects in the thematic field "Ionizing radiation and radioactivity" implementation is presented in Section 2 of the report.

1.2 Information on the International Metrology Organizations Activity

Information is presented on the main decisions of the COOMET Joint Standards Committee 17th meeting and the COOMET Committee 29th meeting - creation of a working group to develop a COOMET evolution strategy, this group tasks and staff, changes in the structural bodies of COOMET, the seminar “COOMET Tasks in the Light of the redefinition of the International System of Units (SI)”

Information on changes in the world metrological community (Uzbekistan became an associate member of the CGPM and signed the MRA, Ukraine signed the Metric Convention, COOMET Vice President Pavel Neyezhnikov was elected a member of CIPM).

Information on the main results of the General Conference on Weights and Measures (CGPM) 26th meeting, on the 4 basic units of International System of SI redefinition, on the International System of Units (SI) revision.

Information about the VIII International Competition "The Best Young Metrologist of COOMET-2019" held in Kazan on June 5-6, 2019. The ionizing radiation section was presented at this competition by two reports.

Discussion of the CIPM Consultative Committee on Ionizing Radiation (CCRI) 27th meeting solutions and its sections - the interregional metrological organizations working group (CCRI RMOWG), key comparisons working groups (CCRI (I) -KCWG (I), CCRI (II) - KCWG (II), CCRI (III) -KCWG (III)), the CCRI Strategy Working Group (CCRI-SWG), CCRI sections (CCRI (I) - dosimetry, CCRI (II) - radioactivity, CCRI (III) - neutron measurements).

Information about training courses arranged by BIPM: EURAMET-BIPM course on organizing and conducting comparisons in the field of ionizing radiation, NPL, October 9-

11, 2019 and the course "Optimization CIPM MRA - KCDB 2.0 ", to train experts on the rules for using the " optimized "CIPM MRA and KCDB 2.0, BIPM, November 4-8, 2019.

1.3. Организационные вопросы

In accordance with the 29th COOMET Committee meeting decisions, APMP proposals on the organization of hybrid comparisons were considered. A general opinion is formulated on the advisability of using the proposed procedure in some cases.

The draft document COOMET D5 / 2020 "Model Regulation on the COOMET Structural Body" was considered. It was decided to develop a new regulation on TK-1.9 based on this draft and submit it for approval at the next TK meeting.

The list of TC members and experts on types of measurements is clarified.

2. THE PRESENT STATUS OF THE COOMET PROJECTS IN THE FIELD OF IONIZING RADIATION AND RADIOACTIVITY

2.1. Review of ongoing and completed topics and information on the results.

135/RU/99 Status of the measurement standards in the field of ionizing radiation and radioactivity in the countries-members of the COOMET

Permanent project. The aim of this work is to create a COOMET database on standards in the field of ionizing radiation and radioactivity. Participants - representatives of all COOMET member countries.

Within the framework of the implementation of the theme, representatives of COOMET member countries regularly provide information on the state of the reference base and the ongoing changes:

- list of national and other standards;
- metrological and technical characteristics of standards;
- information on conducted and planned comparisons;
- information about the work on the improvement of standards .

Participants of the meeting (L. Buyer mann (PTB), A. Orobinsky (NSC "IM"), S.Soroka (BelGIM), P.Oropesa (CENTIS), G.Salas (CPHR), E.Lukyan (INM), N.Mamyrbek (AF NACE JSC), M.Krivosik (SMU), S.Biryukov (VNIIFTRI)), I.Dvali (GEOSTM), described the reference measurement tools available at their NMI and the measurement capabilities of ionizing radiation, changes in the composition of equipment and laboratory personnel.

635/DE/14 Comparison of the national standards of air kerma for x-rays qualities used in radiation protection, general diagnostic radiology, computed tomography and mammography COOMET.RI(I)-S4 (bilateral PTB and CPHR, pilot – PTB, Germany)

The aim of this comparisons is to support CPHR CMC entries for air kerma, air kerma-length products for selected X-ray qualities used in radiation protection, general diagnostic radiology, computed tomography and mammography.

Three spherical cameras for protective levels (type TM32002), two cameras for mammography (such as Radcal 10x5-6M), two CT cameras (types TM77336 and TW30009), and one camera dose per area (type TA34028) were used.

Comparisons are completed with positive results. Considered Draft B is sent to the BIPM for placing in the database. At present it has the status "Approved".

641/BY/14 Comparison of the national standards of air kerma for x-rays qualities used in radiation protection and diagnostic radiology COOMET.RI(I)-S3 (pilot – BelGIM, Belarus).

Supplementary comparison of the national standards of air kerma for ISO 4037 narrow spectrum series (ISO 4037-1) and IEC 61267 RQR series (IEC 61267). The aim of the comparison is to publish new and/or support existing CMC entries for air kerma for the selected x-rays qualities used in radiation protection and diagnostic radiology.

The comparison procedure consists in calibrating three ionization chambers in terms of air kerma using X-ray radiation modes N-40, N-60, N-80, N-100, N-120, N-150, N-200, N-250, RQR3, RQR5, RQR7, RQR9, RQR10. It is preferable to calibrate the cameras in all selected modes. It is allowed to calibrate chambers on five modes with a narrow spectrum and on three modes of the RQR series at a minimum. If a participant does not have RQR series modes in his laboratory, he can take part in comparisons only on modes with a narrow spectrum.

Comparison participants: VNIIM (Russia), BelGIM (Belarus), PTB (Germany), GEOSTM (Georgia), CPHR (Cuba), NIM (Moldova), Azstandart (Azerbaijan), IAEA, (NIM) Ukraine, (AF NACEKS) Kazakhstan.

The measurements are completed, preliminary results are presented, the coordinator is instructed to finalize Draft A and send it to the participants.

410/UA/07 COOMET regional comparison of the national standards of absorbed dose to water for Co-60 gamma-radiation (pilot – VNIIFTRI, Russia)

The aim of the project is to provide traceability of absorbed dose to water measurements in the COOMET national laboratories to the BIMP key comparison reference value.

Participants expected: VNIIFTRI (Russia), CPHR (Cuba), BelGIM (Belarus), SMU (Slovakia), PTB (Germany) and the IAEA.

When the comparison was announced, the Kharkov Metrology Institute was planned to be the coordinator, in 2015 the FSUE “VNIIFTRI” assumed the role of coordinator.

Equipment for comparisons by the VNIIFTRI: national standard for the Co-60 gamma radiation absorbed dose and the absorbed dose rate, participated in the BIMP key comparisons.

It was decided to entrust the comparison coordinator A. Berland (FSUE VNIIFTRI) to complete the Technical Protocol by the end of 2019.

2.2. Предложения по организации сличений

1. The VNIIFTRI representatives suggested to establish a new comparison in the field of radon volumetric activity. VNIIFTRI has the necessary equipment and experienced qualified personnel for carrying out comparisons. It was decided to instruct VNIIFTRI (S. Biryukov) to hold consultations with potential participants of comparisons by the end of 2019, evaluate the prospects for such comparisons, and, in case of a positive result, develop and send a draft Technical Protocol to potential participants.

2. BelGIM representatives suggested starting a new cycle of comparisons on radionuclide solutions specific activity measuring.

It was decided to arrange comparisons on the radionuclide Barium-133 solution activity measure. The Technical Protocol draft was presented at the meeting. It was decided

to instruct I. Alekseev (VNIIM) to clarify the time schedule for the comparisons, register them in the database and send the draft Technical Protocol to the participants.

3. The VNIIM representative Grigory Zhukov proposed to carry out comparisons on measuring the activity of point spectrometric sources of gamma radiation of the OSGI type. Interest was expressed by representatives of Belarus, Kazakhstan, Cuba, Slovakia, Russia. It was decided to instruct G. Zhukov (VNIIM) to develop and send to participants a draft Technical Protocol.

2.3. Further training of experts and novice metrologist.

1. At the VIII International Competition “The Best Young Metrologist of COOMET-2019” held in Kazan on June 5–6, 2019, two reports were presented in the field of ionizing radiation:

Fedorov Sergey, VNIIFTRI. Development and research of methods for measuring the absorbed dose in order to ensure the required level of accuracy in the clinical dosimetry of neutron radiation.

Fedorov Ivan, VNIIM "Metrological support for the control of internal human exposure".

2. VNIIM, VNIIFTRI and CPHR representatives attended the training courses organized by BIPM on the organization and conduct of comparisons in the field of measurements of ionizing radiation, which took place on October 9-11, 2019 in the territory and under the leadership of NPL.

3. INTERACTION WITH INTERNATIONAL AND REGIONAL ORGANIZATIONS

TC 1.9 members actively participates in the CIPM Consultative Committee on Ionizing Radiation (CCRI) and its sections - the interregional metrological organizations working group (CCRI RMOWG), key comparisons working groups (CCRI (I) -KCWG (I), CCRI (II) - KCWG (II), CCRI (III) - KCWG (III)), the CCRI Strategy Working Group (CCRI-SWG), CCRI sections (CCRI (I) - dosimetry, CCRI (II) - radioactivity, CCRI (III) - neutron measurements).

TC 1.9 member Efimia Lukyan takes part in the EURAMET Technical Committee on Ionizing Radiation meetings.

4. ACTIVITIES IN FIELD OF IMPLEMENTATION OF MUTUAL RECOGNITION OF NATIONAL MEASUREMENT STANDARDS

The SMS reviewing current state

The following CMCs were reviewed

EURAMET.RI.31.2019 – Serbia (VINS)

EURAMET.RI.32.2019 – Belgium (SCK.CEN/LNK)

EURAMET.RI.33.2019 – Netherland (VSL)

SIM.RI.20.2019 – Brasilia (LNMRI)

APMP.RI.11.2019 – Thailand (OAP)

IR CMC REVIEW WORKING GROUP

Field	Expert	NMI or DI
Radioactivity	Alekseev Ilya	VNIIM (Russia)
Radioactivity	Pilar Oropesa Verdecia	CENTIS (Cuba)
Radioactivity	Ivanukovich Alexander	BelGIM (Belarus)
Radioactivity	Evseev Vladimir	NSC IM (Ukraine)
Dosimetry	Soroka Sergey	BelGIM (Belarus)
Dosimetry	Oborin Alexander	VNIIM (Russia)
Dosimetry	Gonzalo Walwyn Salas	CHPR (Kyba)
Neutron Measurements	Moiseev Nikolay	VNIIM (Russia)
Neutron Measurements	Didyk Andrey	VNIIM (Russia)

5. THE NEXT TC MEETING TIME AND PLACE

The next TC meeting will be held in September 2020 in Russia (FSUE VNIIFTRI).

TC 1.9 Chairperson
N.Moiseev