

Report of the 48th Meeting of the JCRB

Held on 24/ 25 September 2024

BIPM

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Participants

BIPM / CIPM

Dr Martin Milton

Mr Ibrahim Ahmed

Dr James Olthoff, CIPM representative to the JCRB (online)

Dr Anna Cypionka – In attendance

Mr Anderson Maina – Agenda item 1 of day 2

Dr Janet Miles – Agenda item 3 of day 2

Mr Chingis Kuanbayev – Agenda item 4 of day 2

Mr Jose Angel Moreno Hernandez – Agenda item 5 of day 2

AFRIMETS

Prof Dr Noha Khaled

Mrs Lerato Ntatomala

Mrs Soumaya Chaieb (online)

Mr Abdellah Ziti (online)

APMP

Dr Sam Yong Woo (Online)

Dr Chunhui Li

Ms Rugkanawan Wongpithayadisai

Ms Tae-Yi Hong

COOMET

Mr Nikita Zviagin

Mr Lazizbek Furkatjanovich Saidoripov (online)

Mr Evgeny Lazarenko (online)

Mr Marat Ravilievich Yunusov

EURAMET

Dr Dolores del Campo Maldonado

Dr Jaroslav Mucha

Mr Robert Gunn

Mr Omer Altan

GULFMET

Eng Amina Hassan AlBastaki

Dr Ismail A. AlFaleh

Mr Abdulelah Alqarnas

Ms Asma Al Hosani

Mr Jon Greg Bartholomew

SIM

Mr Javier Arias

Mr Lucas Di Lillo

Ms Sally Bruce (online)

Ms Isabelle Amen

Ms Elizabeth Ferreira

The 48th meeting of the JCRB was conducted at the BIPM in a hybrid format over two days, between 10:00 and 17:00 (UTC+2) on day one and 09:00 and 13:00 (UTC+2) on day two. The items were addressed in the order indicated on the adopted Agenda. The only exceptions were discussion on EURAMET's proposal on validity of CMCs after subsequent comparisons and the 25th anniversary of the signing of the CIPM MRA which were addressed on day one.

1. Welcome by the Chairman and confirmation of delegations' representatives with voting rights

The JCRB Chair, Dr Milton, opened the meeting by introducing himself and welcoming all to the 48th meeting of the JCRB meeting including those participating online. He then went ahead to ask the rest of the participants to introduce themselves and all complied. The JCRB was informed that Dr Henry Rotich had sent his apology that he would not make it to the meeting and that Dr Noha would represent him as AFRIMETS head of delegation. Dr Sam Yong Woo conveyed the apology of Dr Hyun-Min Park and that he would stand in as head of APMP delegation.

2. Approval of the agenda

The Chair read through the agenda noting the order of presentations starting with reports from the BIPM, CIPM and RMOs on day one as listed. He indicated that if time allowed, some items from day two could be discussed on day one. Day two would be dedicated to reports on the KCDB and status of CMCs submission and review, a presentation on digital transformation activities and an update on CBKT and the "Young metrologists' 2050+ vision", and an update on the 2023 BIPM QMS review. Additional items were to be addressed under AOB as listed on the agenda.

The Chair then invited further agenda items from the delegates. Dr Del Campo introduced an item for discussion concerning flow measurement CMCs from accredited laboratories with lower uncertainties than those of NMIs/DIs. Dr Noha introduced a statement to from ARAMET to be shared in the meeting. The Chair accepted that the two items form part of the agenda under AOB. With that, the agenda was unanimously approved by the delegates.

3. Approval of the minutes of the 47th meeting of the JCRB and review of actions

The JCRB Chair recalled that the draft minutes of the 47th meeting of the JCRB had been circulated after the meeting. The Secretary informed the JCRB that there were no comments on the minutes and thus the final report was uploaded to the restricted JCRB webpage as a working document. Since no further comments were raised during the 48th meeting of the JCRB, the minutes were approved.

[The report of the 47th JCRB meeting is available on the unrestricted BIPM website <https://www.bipm.org/en/committees/jc/jcrb>]

The Chair went on to review the actions from the 47th meeting:

Action JCRB/47-1 (2023) *The JCRB Executive Secretary and the KCDB Office will review and improve the guidance materials relating to the use of the column "CMC comments" for example by providing "pop-ups" on the KCDB platform.*

This action has been completed.

Action JCRB/47-2 (2023) *The JCRB noted that there are sometimes multiple iterations of comments between reviewers and writers during the JCRB review. The JCRB encourages:*

- *the RMOs to ensure that the intra-RMO review is always carried out thoroughly so that points of detail are resolved before the JCRB review,*
- *the CC WGs on the CIPM MRA and RMO TC/WGs to consider providing a mechanism to exchange comments during the JCRB review in a way that is transparent, and*
- *the sharing of best practice between CC WGs on the CIPM MRA for efficient JCRB review.*

This action is ongoing.

Action JCRB/47-3 (2023) *The JCRB recalled that each RMO can approve each CMC before it is published and has the opportunity to indicate whether it will review a CMC or not. The CMC review process is tied to the deadline of the latest review date indicated by an RMO. The JCRB requests the RMOs to respond promptly even if they do not plan to review, and to remind Reviewers that agreeing to carry out a review of a CMC but not completing the review causes delays to the CMC review process.*

This action is ongoing.

Action JCRB/47-4 (2023) *The JCRB requests the RMOs to encourage all member NMIs and DIs to register with the Research Organization Registry (ROR) (ror.org) to facilitate the BIPM in using the RORs as digital references for them.*

This action is completed.

Resolution JCRB/47-1 (2023) *The JCRB recalled its previous decision (JCRB/32-2 of 2014) that a second JCRB meeting should only be held in any year when it is considered necessary. The 48th meeting will be held in week 38 (beginning 16th September) of 2024 at the BIPM.*

This resolution is completed.

4. Comments on the BIPM progress since the 47th JCRB meeting

Dr Milton presented the BIPM report, uploaded as **JCRB/48-D1_4**. He started by sharing the current status of Member States and Associates, indicating that there were no changes in membership of the CIPM MRA since the 47th meeting. The CIPM MRA has been signed by 64 Member States, 36 Associates of the CGPM and 4 international organizations. A further 150 designated institutes form part of the CIPM MRA community.

He emphasized the importance of World Metrology Day, which was recognized by UNESCO as a UNESCO day, and shared details about a launch event at UNESCO headquarters on 14th May 2024 that included promotion of World Metrology Day on the UNESCO website and using 35 events and 56 posters in various States including four that are not currently part of the BIPM system that is Bahrain, Jordan, Nigeria and Tajikistan.

Dr Milton continued by touching on the importance of promoting the use of a continuous Coordinated Universal Time (UTC) system and the progress made in collaboration with the International Telecommunications Union (ITU) and other international organizations. Resolution 655 of the ITU recognized the responsibility of the BIPM in the establishment of the SI second and

the reference timescale, the UTC. The resolution further acknowledged the steps to be taken to have a continuous timescale probably by 2035.

On universal adherence to the Metre Convention, he highlighted the challenges of engaging with 85 UN States that do not currently participate. He indicated that there is discussion ongoing towards a new status of “Observer” for a group of States and intergovernmental organizations that are committed to the use of the International System of Units (SI) and the Coordinated Universal Time (UTC). Resolutions towards this were expected in the 2026 CGPM but it could take a while before the proposal is implemented fully.

Plans for the 150th anniversary of the signing of the Metre Convention celebration in 2025 were also announced. This would include a big event at UNESCO headquarters on May 20th, a two-day conference with keynote speakers on 21st and 22nd May, roundtable discussions, and an online poster event. Other promotional material in the pipeline includes publication of a book on the history of the BIPM and printing of a special stamp.

Reacting to the BIPM’s report, Mr Abdulelah Alqarnas reported that Bahrain already got approval to become a Member State and that had already been communicated to the BIPM. Mr Javier Arias enquired if government authorities would be invited to the 150th anniversary celebrations and Dr Milton responded that since the main event would be held at UNESCO, the UN States would automatically be invited through their embassies and their representatives to UNESCO.

5. Comments on the report from the CIPM

Dr Olthoff presented the report from the CIPM, uploaded as **JCRB/48-D1_5**. He reported that the CIPM had met three times since the 47th meeting of the JCRB. The upcoming 113th meeting (Session III) would be held from 14th to 16th October 2024.

Following the demise of one CIPM member and planned retirement of two others, three new members were appointed namely Prof. Dr. C. Denz (PTB – Germany), Mr H.A Frøystein (JV – Norway) and Dr J Qu (NIM – China). The CIPM accepted NSC-IM (Ukraine) as a member of CCPR, IPQ (Portugal) as a member of CCQM and NIS as an observer of CCAUV. Appointments were also made in committees and subcommittees.

Since the Director of the BIPM would be retiring, the CIPM decided to establish two committees to assist with the recruitment of the next Director of the BIPM – a Search Committee to identify possible candidates and a selection committee to interview the leading candidates and to recommend a preferred final candidate(s) to the CIPM for a final decision.

The CIPM approved a new version of the 9th edition of the SI Brochure (V3.01) and decided that the 28th meeting of the CGPM will be convened during the week beginning 12 October 2026 and held over three days.

6. Comments on the RMO reports to the JCRB

The RMO presentations in the agenda were made in the alphabetical order as reported below.

6.1. AFRIMETS (uploaded as JCRB/48-D1_6.1.1, -2 and -3)

In the absence of Dr Rotich, Mrs Ntatamala took the responsibility of presenting the AFRIMETS report.

She presented the current status of the organization's membership, highlighting an increase in members and associates since 2007 in both scientific and industrial metrology under AFRIMETS and legal metrology under AFRIMEL. AFRIMETS has 49 full members, 9 associates and 11 observers. From the membership, she added that 5 are signatories of the Metre Convention while 8 are associates of the CGPM. Further discussion was on the AFRIMETS structure, including principal membership and voting rights for each category. Mrs Ntamatamala also mentioned the roles of the chair, vice chairs, and the interim head of the Secretariat, as well as the Technical Committees and their respective chairs. This included two horizontal task groups on digitalization and medical devices. She reported that following the retirement of Dr Wynand Louw, Dr Henry Rotich would be the Chair of AFRIMETS while Mr Donald Masuku would be the interim Chair of the Secretariat. She also shared the statistics on CIPM MRA activities.

Mrs Ntamatamala reported that the AFRIMETS GA was held on 29th July to 2nd August 2024 in Nairobi Kenya in hybrid format. In GA, there was a workshop on sustainability supported by PTB which discussed the organization's progress, future plans, and challenges, including political and economic issues, human resource loss, and financial constraints. The AFRIMETS service database project was suspended due to financial constraints. She reported that plans were underway to register AFRIMETS as a legal entity in 2025.

Dr Noha Khaled shared the AFRIMETS quality report that touched on the structure of the AFRIMETS TC QS leadership team. The report highlighted changes in leadership and the latest meeting's attendance from various full members, associates and invited members who made presentations on their quality systems. She concluded by presenting a summary of the changes in quality systems since the 47th meeting of the JCRB that included the results of internal/ external audits in the NMIs/DIs.

There were various reactions from the general reports. Dr Del Campo asked if AFRIMETS was considering coming up with more horizontal task groups such as the one on environment. Dr Noha responded that some NMIs were considering them but had not been raised at the GA and that AFRIMETS was at the moment working on the two that had already been set up. Mr Alqarnas queried on the issuance of digitalized conformity assessment certificates and Dr Noha responded that the task group on digitalization would deal with that, clarifying that it was a legal metrology issue.

From the quality system report, Dr Milton queried about the three Associates of the CGPM who had no approved quality system by AFRIMETS. Dr Noha responded by saying that it was the case since they had not applied for the peer review. Ms Wongpithayadisai observed that AFRIMETS had various modes of conducting peer review of the quality systems and presumed that the dominant mode was onsite peer review. Dr Noha clarified that in fact the dominant mode was hybrid for sustainability purposes and limitation of other factors. With the hybrid mode, the peer review was usually conducted online with at least one site visit. Mr Arias mentioned that he was aware that chemical metrology was not practiced in many countries in AFRIMETS and wanted to know about the experience on the practice for benchmarking with SIM. Dr Noha responded by saying that it was true that only three countries had CMCs published in chemical metrology field with three more building capacity to have their CMCs published. She added that the matter was being handled by TC QM. Mrs Ntamatamala added that AFRIMETS sought the assistance of other RMOs such as SIM whenever there was need of peer review in chemical metrology.

6.2. APMP (uploaded as JCRB/48-6.2.1 and -2)

Dr Chunhui Li presented the APMP's report on behalf of Dr Hyun-Min Park.

She started with an overview of the current APMP membership which comprised 47 members from 28 economies and 12 associates from 12 economies. She gave the highlights on APMP's structure that included the usual Executive Committee and Technical Committees. In addition, there were 6 focus groups to drive horizontal topics activities and a Developing Economies Committee (DEC) to continually support developing economies in the implementation of the CIPM MRA and sensitizing them on APMP practices and activities. She reported that 6 of the TC Chairs and 3 of the Focus Group Chairs would complete their terms at the 2024 APMP GA.

Dr Li continued by informing the JCRB that the last GA was held in November 2023 in Shenzhen, China while the mid-year meeting was held in June 2024 in Boho, Philippines. The upcoming 40th GA would be held at New Delhi, India. On the sidelines of last year's GA there was an international symposium titled "Establishing traceability in time and frequency measurements". On the Young Metrologists' Vision, she reported that APMP was active having submitted 140+ responses from all RMOs and 32 from the APMP Young Metrologists. In addition, there was an inter-RMO online workshop held in conjunction with the APMP Young Metrologists workshop for the participants to share their views on the future of metrology. She concluded her talk by sharing the latest news from APMP and the statistics on CIPM MRA activities since the 47th meeting of the JCRB.

The APMP quality system report was presented by Ms Wongpithayadisai. She shared the structure of the technical committee and its role. She mentioned that the TC organized a refresher quality systems hybrid workshop in November 2023 to raise awareness about compliance with CIPM MRA and APMP practices. She went on to report that the TC worked very closely with the DEC to enhance developing economies quality systems implementation which started with an introductory webinar on the implementation of ISO/IEC 17025 standard held in July 2024. Ms Wongpithayadisai informed the JCRB that other RMOs could access resources from their TC under TCQS "Open area". She went on to highlight the quality system reviews of CMCs submitted by APMP from December 2023 to August 2024 including the process. She continued by stating that the TC monitors the quality systems annually. Her report was concluded with an update on the peer reviews. She pointed out the issue of some NMIs not conducting peer reviews within the required 5-year period and the efforts to address this, including greying out affected CMCs.

The discussion continued with the reactions from the two reports. Mr Zviagin asked if countries from other RMOs were allowed to participate in the APMP quality system workshops and Ms Wongpithayadisai responded that all are welcome to participate so long as they communicate with the TC. Dr Del Campo asked if there was a reason for NMIs to miss the quality system peer reviews. Ms Wongpithayadisai clarified that it was purely because of a misunderstanding by the NMIs on the requirements of the CIPM MRA and the APMP quality systems. On access to the useful resources, Ms Wongpithayadisai informed Dr Noha that was available on the APMP website. Mr Kuanbayev added that all the CBKT resources from RMO programmes were available via the links available in the BIPM CBKT webpage. Ms Isabelle Amen asked about collaboration and future plans regarding the digital transformation of APMP's quality system processes. Ms Wongpithayadisai reported that there was a workshop held on digital transformation where NMIs that were advanced in that aspect presented.

6.3. COOMET (uploaded as JCRB/48-D1_6.3.1 -2 and -3)

Mr Zviagin presented the joint general information and quality system reports for COOMET. He started by sharing the statistics on the CIPM MRA activities which included a special mention of UzNIM the NMI of Uzbekistan having published her first CMCs. within the period, only five countries from COOMET had published CMCs after Georgia and Ukraine moved to EURAMET. He

mentioned that he looked forward to reinstatement of Cuba as an Associate of the CGPM so that it can continue participating in CIPM MRA activities. There were 78 ongoing KCs/SCs since the 47th JCRB meeting.

All NMIs/DIs quality systems were approved except for Cuba's which had expired in 2023 but had not resubmitted their documents. Mr Zviagin reported that UzNIM would extend its measurement scope in 2025. He added that 4 NMIs from COOMET had their quality systems approved under ISO 17034

On COOMET membership, he reported that it had 13 full members and 5 associates. 8 members were full Members of the BIPM and 5 were Associates to the CGPM with a total of 14 signatories to the CIPM MRA. Other than Cuba which is close to being reinstated to the CIPM MRA, three countries from COOMET were not associated with the Metre Convention or the CGPM. Currently there are 8 members participating in the CIPM MRA

He continued by stating that the COOMET GA was held in June 2024 where changes to the presidency and vice presidents were made. Mr Lazizbek Furkatjanovich Saidoripov was appointed as the new COOMET President assisted by four vice presidents. Mr Marat Yunusov was appointed as head of the COOMET Secretariat. He then presented the latest changes in the COOMET TC Chairs.

Regarding training, Mr Zviagin mentioned that there were four courses uploaded on the BIPM e-learning platform. He added that COOMET had issued 70 actual certificates to trainees who had successfully completed the e-learning courses. He concluded by saying that he looked forward to making COOMET as open as possible to all and he and shared the social media links to that effect.

6.4. EURAMET (uploaded as JCRB/48-D1_6.4.1)

The EURAMET's joint general and QMS reports were presented by Mr Omer Altan.

He started by sharing an update on the status of EURAMET membership. EURAMET is composed of 39 member NMIs, 76 Associate DIs and 16 liaison organizations. The latest entrants were GEOSTM from Georgia as a full Member while VFCL from Czechia was accepted as Associate DI. Three DIs were delisted from EURAMET.

He reported that the 18th GA was held in June at the NPL in the UK. The term of the new Chairperson, Dr Dolores del Campo, began at the 18th GA, while Maguelonne Chambon and Dr Miruna Dobre continued their terms as Vice Chairpersons for Research and Membership Affairs, respectively. He then explained changes that had occurred to the composition of the Secretariat Management Board, the Board of Directors and among the chairs of the various technical committees. He then highlighted the 4 KCs and 3 SCs registered by EURAMET since the last JCRB meeting. 1 more KC and 3 SCs were accepted and would be registered with the KCDB soon. This was followed with a highlight on the published CMCs during the period.

Mr Altan discussed the development and importance of European Metrology Networks (EMNs) over the last seven years, with 12 networks currently in operation and three more in consideration for development. The possible new ones would focus on medical device regulation, medical ionizing radiation and autonomous transport. Some EMNs had strategic research agendas available on EURAMET's website. He also highlighted the annual call cycle of the Partnership of Metrology which will run till 2031. These were open to other NMIs and DIs from other RMOs for more collaboration, with SASO, KRISS and NRC as examples of such participation. The 2024 cycle included funding for various areas such as green deal, digitalization, normative research, and capacity building. The 2025 cycle would involve research in health, integrated European metrology, support for regulation and capacity building in research. Mr Altan also mentioned a new coordination and

support action funded within the Partnership program on capacity building, which will support research mobility, mentoring schemes and training events similar to the recently concluded summer school on flow metrology and the upcoming EURAMET-BIPM training on National Time Scale in October 2024. On digitalization, he mentioned that all TCs and EMNs have components working on them, but with activity concentrated in TC Interdisciplinary Metrology (TC-IM) and EMN Mathmet. TC-IM has current projects on DCCs, research data management and sensor network metrology.

Mr Altan continued with the discussion on EURAMET QMS review processes. He started with the introduction of the technical committee structure and its new Chair Dr Jaroslav Mucha. He continued by presenting the QMS review process including the initial and reevaluation process. He mentioned that the guides, templates and status of the QMS reviews were publicly available on the website. The presentation then focused on the outcome of the 19th TCQ held in March 2024. He pointed out that the next meeting would be held in March 2025 in Norway in hybrid mode and that representatives from other RMOs were invited as observers. He concluded by mentioning the upcoming courses starting with the 2nd edition of the EURAMET-BIPM technical exchange on the review of QM, the e-learning courses on QMS operations and review and a webinar on QMS for members and associate DIs.

Responding to Ms Wongpithayadisai's query on the composition of the steering committee, Mr Altan mentioned that in as much as the TC-Q membership was voluntary, members need to have some experience on quality systems operations and are subjected to vetting before acceptance. Dr Mucha clarified Mrs Ntatamala's query on the presentations of initial review and the 5-year review. He pointed out that the initial review presentation was more detailed than the 5 year one though they followed the same structure. Mr Altan confirmed to Dr Milton that Georgia's quality system was presented in 2023 and accepted. Ms Amen queried if institutes were just supposed to present their quality systems every 5 years since SIM has more frequency every 18 months. Dr Mucha clarified that other than the 5 years review there was an annual report on the quality system from all institutes that the committee relies on.

6.5. GULFMET (uploaded as JCRB/48-D1_6.5.1 and -2)

The GULFMET's general report was presented by Mrs Amina Albastaki. She started with the highlights on membership status noting that there were no changes in the numbers of Member States and Associates with each category remaining at 7.

She then outlined GULFMET's structure and mentioned the establishment of two new Technical Committees on Acoustics, Ultrasound & Vibration and Time & Frequency. She mentioned that the terms of the current TC Chairs had been extended by two years and the new TCs had their Chairs elected. She reported on the activities undertaken by GULFMET starting with the GAs held on 6th to 16th November 2023 and 26th May to 6th June 2024. She added that the 7th meeting of TC Chairs and Secretaries was held in February 2024. The meeting reviewed and monitored GULFMET's TC work progress for 2023, reviewed the 2024 TC action plans, discussions on ILCs and CMCs review and finally on research and development proposals. She also highlighted the outcomes and recommendations from the Second Gulf Metrology Forum, appreciating Dr Cypionka and Mr Kuanbayev for gracing the meeting. The forum focused on GULFMET's support for research and development initiatives, increased youth participation in metrology activities supporting emerging economies on training programmes. She reported that GULFMET also participated in international and regional meetings in 2024 which included signing of two MOUs with eurolab and IMEKO in addition to the provision of technical assistance to member states. The statistics on CMCs and measurements comparisons were presented. The report was concluded with highlights on current research and development programmes and capacity building initiatives.

Ms Asma Al Hosani presented the QS report, first by reporting the changes since the last meeting. She mentioned that Saudi Arabia published new CMCs, EMI of the United Arab Emirates was granted accreditation while PAI of Kuwait was peer reviewed by the TC QS. She reported that the peer reviewers qualification scheme would be repeated. She added that plans were underway to digitize the TC QS platform. Ms Al Hosani concluded by sharing the status of the quality systems of members pointing out that Oman and Qatar do not have an approved quality system.

6.6. SIM (uploaded as JCRB/48-D1_6.6.1, -2and -3)

Mr Lucas Di Lillo presented the general SIM report.

On SIM membership, he indicated that there were 33 active Members, 15 Associates and 4 Affiliate Members. He mentioned that Suriname and Cuba's membership processing was pending. He then presented a list of organizations liaising with SIM.

Mr Di Lillo continued by presenting the leadership structure of SIM where the current leadership is headed by the SIM President Mr Javier Arias who is assisted by Dr Claire Saundry as the Vice President, Mr Luis Omar Becerra as the Project Coordinator and the sub regional coordinators. This section was completed with the structure of the 14 Metrology Working Groups, the highlights of the changes in their Chairs and the introduction of the SIM Quality System Task Force.

Prior to the discussion on the SIM activities, Mr Di Lillo shared the statistics on measurement comparisons and published CMCs for all metrology areas. He then highlighted the ongoing projects within SIM and the major sources of support such as NIST, IADB and PTB including the joint SIM-NCSLI early career metrology project. He mentioned that the Summer School held every 5 years, the latest was held in August in Colombia and that the recordings of the lectures would be uploaded on the BIPM e-learning platform. Mr Di Lillo added that SIM collaborates with PAQI, QICA and IMEKO on common areas of interest. He pointed out that future SIM projects and activities were listed on their website and Facebook account. He concluded by presenting a few upcoming SIM activities with the next SIM week scheduled for November 2024 in Panama.

Mr Bartholomew asked if the SIM school was for people already working at NMIs or from universities. Mr Di Lillo responded by saying that each NMI nominates two students to the school, and it was for all metrologists and not just the young ones. Mr Arias added the NCSLI early career project targeted young metrologists who were less than 5 years old since joining their NMIs.

Dr Sally Bruce presented the QSTF report, explaining that the reporting period for SIM coincides with the fiscal year from 1st July to 30th June but this one covered the period from 1st January 2023 hence the 18 months. She discussed the structure and responsibilities of the 16-delegate QSTF that reviews members QMS and that they review QMS related to any measurement service, not just QMS for CMCs. She added that the QSTF also reviews IGOs QMS such as the BIPM, IAEA, NOAA etc. She described how QSTF meetings are conducted and listed the documents used including the ones under development. She mentioned that the QSTF together with MWG 12 on Quality Systems held a remote seminar in March 2024 titled "A Look at the QSTF".

To capture major issues with institutes Dr Bruce reported that the QSTF uses a more comprehensive template on quality systems. She then provided an overview of the quality systems reviewed and approved in the past 18 months. Of the 59 reviews, 10 % were initial reviews. She concluded by mentioning upcoming events that included an online seminar on ISO/IEC 17043 and a training course on ISO IEC 17043 and the QSTF meeting in Panama City in November 2024.

Dr Milton commended the QSTF for the very good job they were doing, especially on greying out CMCs that were not complying with their quality systems.

7. Comments on the KCDB report: providing statistical insights

Dr Milton introduced Mr Anderson Maina, a new team member in the KCDB Office, who presented the KCDB report in place of Dr Stephanie Maniguet and mentioned the other presenters for the day.

Mr Maina highlighted the number of published CMCs whose increase is attributed to CMCs in chemistry published over the last five years. Overall, there were over 26,029 CMCs published in the KCDB. He then presented the implementation of Action JCRB/47-1 (2023) on the use of the CMC comments section of the KCDB. This was followed with an update on the progress of measurement comparisons and noted a significant reduction in the number of uncompleted Key comparisons that were 5 years or older while Supplementary comparisons numbers remained largely unchanged. The JCRB discussed the delay in the completion of comparison reports. The JCRB was also informed of the protocols implemented in COOMET and EURAMET that aim to avoid or improve the problem of “stale” comparisons. The JCRB agreed to develop an action to request the RMOs and CCs to provide in the 49th meeting of the JCRB an explanation and a declaration of their next actions regarding the incomplete comparisons.

The discussion ended with a transition to Mr Ahmed’s presentation on the statistics on CMCs review durations for RMOs and the 9 metrology areas. Overall, both the intra-RMO and JCRB review durations have remained low when compared to with the old KCDB system, 85 days using KCDB 2.0 compared with 140 days using KCDB 1.0. Mr Ahmed mentioned that two CMCs from APMP were to be reinstated and encouraged RMOs to sensitize staff and other stakeholders on the CIPM MRA guidance and policy documents. He pointed out that the KCDB 2.0 system was working smoothly in supporting CIPM MRA activities. Mr. Bartholomew asked about the number of CMCs reviewed since the last JCRB meeting to which Mr Ahmed responded that the numbers would be presented in the next presentation. He then clarified that the short-term statistics were affected by a small sample of data and the annual cycle of review by chemistry metrology area.

The action on incomplete comparisons is indicated under outcomes section of this report.

8. Status of CMC submissions and review

Mr Ahmed presented three issues regarding CMC reviews, the loss of rights by RMOs, “hanging” CMCs and “slipped through” CMCs. He mentioned that the current statistics focused on the number of submitted and published CMCs versus loss of rights rather than the monthly evolution of the loss of rights for each RMO. He noted that GULFMET numbers were not factored in metrology areas where they had no published CMCs.

He then presented the evolution of the processing of hanging CMCs since the last JCRB meeting. He emphasized the need for RMO’s supportive role in communicating about hanging CMCs to Writers. He noted that quite a number had already been published but new ones were added to the statistics. Mr Ahmed then presented a checklist developed to assist Writers in submitting CMCs. He informed the JCRB that it was already available on the KCDB webpage. He then highlighted scenarios where CMCs could slip through JCRB reviews and shared the numbers since the last JCRB meeting. He mentioned that the KCDB added a 3-week extension for RMOs to acknowledge the intention to review CMCs when the first 3 weeks lapse with loss of right to review or a negative response to review. This was to be formalized by adding a note to the CIPM MRA-G-13 as presented to the JCRB. Dr Milton noted progress on reduction of slipped CMCs and clarified that hanging CMCs were laboratories’ responsibility and that there was no need for further email

reminders to the TC Chairs. Mr Kuanbayev asked the persons overseeing TC/WG Chairs to use the RMO Secretariat accounts to monitor CMC reviews.

9. Update on digital transformation of BIPM services

Dr Janet Miles, Head of Digital Transformation, BIPM gave an update of digital transformation activities since the 47th JCRB meeting after introducing herself. This was followed by a presentation prepared by Dr Stephanie Maniguet on the digital transformation of the KCDB but delivered by Mr Kuanbayev.

Dr Miles discussed the progress of the ROR digital identifiers project for NMIs/DIs which was now complete. She mentioned that any changes could be introduced by the NMIs/DIs themselves by contacting ROR. She recommended IOP publishing be contacted for the introduction of RORs for affiliations. She then presented the work of mapping of service categories to quantities for the metrology areas. The work was ongoing and was at different levels of completion in each metrology area. She discussed the challenges faced by each metrology area and the proposed solutions. A special mention was made for the field of Mass which had their first comparison where the results were submitted using the DCC format and a potential "magic black box" would be used for calculating results. She concluded by acknowledging the work of John Bartholomew and NCSLI on developing a taxonomy for service categories. Dr Milton wrapped up by saying that he was reluctant to change the data in the KCDB based on a request from individual CCs or RMOs but preferred a holistic approach that would require approval by the JCRB.

Mr Kuanbayev presented the plan for FAIR principles to the KCDB that included proposed potential changes which are due for discussion. He discussed updates to the CCAUV CMCs in the KCDB, that accommodated 4-digit service categories. The KCDB Office promised to continue offering support to CCAUV on their proposed changes, especially in vibration. He mentioned the harmonization of CMCs in CCPR, resulting in 260 published CMCs with editorial modifications. He added that CCPR was requesting a drop-down menu in the KCDB for consistency, and this may be adopted by the other CCs for harmony.

He mentioned that CMC digital identifier query was available in quick search but not in the advanced search but that was being worked on. He reminded the JCRB that the API for CMCs to extract KCDB information was available from the SI Reference Point. This API was improved to extend queries to the record of CMCs that are no longer published and was now being beta-tested. He then took the JCRB through the proposal of adding metadata for key and supplementary comparisons, accessible to TC chairs or working group chairs, including the date of measurement and an outcome column indicating success or failure for NMIs, restricted to chairs. He highlighted the need for further discussion on these points.

Dr Milton discussed the digital revolution's complexities and the need for a comprehensive data management approach. He highlighted the challenges of updating the KCDB and creating a truly digital version. He mentioned ongoing work in the working group on the SI and the CIPM Forum-MD, expressing a preference for a holistic approach over piecemeal changes. The conversation ended with Dr Milton inviting further questions and promising to revisit the topic in the next meeting of the JCRB and providing an update on the progress.

Ms Amen raised a query if ROR digital identifiers were only used for NMIs/DIs identity or were also used for other institutions such as ILAC and other research organizations. Dr Miles and Milton clarified that anyone could use them but at times it would not suit all organizations. Referencing systems like Wikidata were also available for use. The use of RORs was mainly by communities publishing comparison results. It was suggested that other identifiers could be used for calibration

labs. Other unique identifiers were also used by special communities such as in chemical metrology.

10.CBKT and Young Metrologists' 2050+ Vision

10.1 Capacity Building and Knowledge Transfer Programmes

Mr Kuanbayev presented the report on capacity building and knowledge transfer programmes coordinated by the BIPM. He reminded the JCRB that the programmes were aimed at increasing the effectiveness of member states and associates in the global measurement system. He then presented the components of the programmes and the four mechanisms for delivery of the programmes. Mr Kuanbayev then shared the statistics of the programmes which included 61 CBKT initiatives to 4109 participants.

He then mentioned the outcomes of the RMO Secretariat Forum in September 2023, which was used to launch the RMO toolbox to guide on the workings of the global measurement system. He reported that the BIPM and RMO CBKT Officers met to cement their collaboration and exchange ideas on the growth of the e-learning platform, and the organization of future training sessions and laboratory placements. The next meeting would be held in December 2024. He mentioned that the latest planned activities were the setup of a knowledge transfer hub for comparisons in the e-learning platform and the technical exchange on orientation of RMO TC/WG Chairs in December 2024. These two programmes were aimed at supporting knowledge transfer to comparison pilots arising from the statistics he shared and for better engagement of RMO TC/WG Chairs in CMCs review.

Mr Kuanbayev also discussed the joint project between the BIPM and OIML on National Metrology systems which led to a joint publication of guidance brochures and establishment of a joint e-learning course. In addition, he mentioned that the BIPM also had its own publications, the CIPM MRA brochures. He pointed out that both sets of brochures were available on the BIPM website.

Mr Zviagin enquired about the next RMO Secretariat Forum and he was informed that it occurs every 4 years so the next one would be held in 2027. He also asked how RMOs would contribute to the knowledge hub. Mr Kuanbayev responded that the programme was based on collaboration with RMOs since the BIPM does not have expertise in all metrology areas and that he expected RMOs to provide experts to share their experiences and knowledge in comparison piloting.

10.2 Young Metrologists' 2050+ Vision

Mr Kuanbayev started by thanking the RMOs for their support for the Young Metrologists' 2050+ Vision initiative, the RMO coordinators and representatives, the metrologists who participated by submitting their feedback and Mr Kangyuong Sung, a BIPM secondee from South Korea.

He highlighted the importance of a long-term vision for an international measurement system as mandated by the 27th General Conference for Weights and Measures, involving wider consultation among young metrologists guided by the question of where they think metrology would be in the year 2050. This would complement the CIPM Strategy 2030+ with visionary ideas for future opportunities and challenges from young metrologists looking further into the future and was not meant to overlap with the CIPM's strategy.

He then presented the outcome of the foresighting exercise with the guiding question and the broad questionnaire covering the selected themes. The project involved five steps from preparation to delivery, with RMO coordinators organizing the process, including disseminating

information and analyzing responses. He reported that a workshop was held with 380 young metrologists joining from the six RMOs. He added that a consolidation meeting was held in July 2024 which processed over 170 responses from young metrologists. The top 5 respondents were given the opportunity to explain their responses and the best was selected anonymously. He added that the responses were analyzed to formulate a global vision, which was reviewed and finalized into a report. He concluded by highlighting the various topics for action towards the achievement of the young metrologists' vision especially active engagement at the strategy formulation and decision-making level. Dr Milton informed the JCRB that he would submit the report to the CIPM in the subsequent week.

11. Update on 2023 BIPM QMS review

Dr Milton introduced Mr Jose Angel Moreno, the current BIPM Quality Coordinator, which is a rotational role amongst BIPM staff. Mr Moreno presented the 2023 BIPM Quality Management System review report prepared jointly with Dr Vincent Gressier, the BIPM QMS Representative. The report touched on the overall BIPM QMS status, the outcome of 2023 internal audits, customer feedback, risk management and BIPM services statistics. He informed the JCRB that the risk register is now based on ISO 31000 for improvement in line with international best practice. He mentioned that QMS documents were in the process of being updated and the KCDB customer satisfaction survey tool was under modification in addition to the introduction of the new UTC online customer satisfaction tool. Mr Angel concluded by sharing the 2024 QMS plans.

Ms Amen sought clarification on the internal and external audit programmes. Mr Angel clarified that it was based on a 5-year cycle where a general audit is conducted and every 4 years there was an external peer review by the RMOs with an annual audit for one hot topic of interest. Mr Zviagin asked about the criteria and number of people used to in seeking feedback from customers. Mr Kuanbayev responded that last 20 comparison pilots and the last 20 CMCs submitters are selected to provide feedback. Mr Angel added that the update on the KCDB survey tool will focus on the service and not the technical details of the KCDB.

12. Any Other Business

12.1 Indication of validity of CMCs in the KCDB after subsequent comparisons

Mr Altan presented EURAMET's proposal to have a record of CMC re-validations in the KCDB after new comparison results become available. He emphasized the importance of comparisons in maintaining the validity of CMC declarations, highlighting a deficiency in the current system where the dates of reconfirmations of existing CMCs through comparison results were not visible to users. He proposed recording confirmations of existing CMCs through subsequent comparisons in the KCDB, making the process visible to users. The JCRB discussed the outdated approval dates for some of the CMCs in the KCDB, with Mr Altan suggesting a solution to update the approval dates. Concerns were raised about the workload involved in reviewing these dates and the potential confusion between approval and confirmation dates. The JCRB agreed to evaluate the process thoroughly to address potential issues. The Chair contributed to the discussion and allowed further contributions from all the RMOs and the CIPM representative to the JCRB. The Chair concluded by summarizing the need for a detailed proposal from EURAMET to be circulated before the next meeting for the JCRB's review and decision.

This matter led to an action as indicated in the outcomes section of this report.

12.2 Reviewed DI nomination form

Dr Milton introduced the reviewed DI nomination form which now includes sections for capturing the digital identity of DIs.

This matter led to an action as indicated in the outcomes section of this report.

12.3 The 2025 BIPM QMS Review

Dr Milton reminded the JCRB that the BIPM QMS review relies on input from RMOs on a rotational sequence every five years. He reported that EURAMET had conducted the peer review three times, SIM twice and APMP once. He invited RMOs interested in carrying out the peer review of the BIPM QMS in 2025 to an initial engagement via email.

12.4 Comparison reports

Dr Janet Miles emphasized the importance of unique digital identifiers such as ORCiDs for authors and DOIs for comparison protocols. She also recommended the need for harmonizing comparison reports and suggested that the JCRB recommend that the Consultative Committees harmonize comparison reports. She mentioned that currently, comparison reports are published in the technical supplements of Metrologia, which was not the same service as papers published in Metrologia and that negatively affected the “impact factor” of the journal. She proposed a new series of comparison reports to be published on the BIPM website, with digital identifiers for each report. This would be equivalent to the technical supplement. To facilitate the process, she asked the JCRB to recommend a harmonized name for comparison reports to be forwarded to the CIPM for approval and for the BIPM to register DOIs for comparison protocols. She also mentioned some of the proposals were available in the written report to the JCRB. Dr Milton informed the JCRB that he would be making a proposal to the CIPM on how to set up a new series of comparison reports starting in 2025 and would give an update in the next meeting of the JCRB.

Ms Amen cautioned against using the acronyms of NMIs/DIs in the harmonized titles of comparison reports due to occasional changes in the names. Dr Milton confirmed that it would be avoided.

12.5 25 years of the CIPM MRA

Dr Milton presented the evolution of the 25th anniversary of the CIPM MRA and its role in gaining leverage for metrology through international standards. Among the key latest achievements were the launch of the CBKT programme, the KCDB 2.0 digital platform and the acceptance of GULFMET as the newest RMO. He finalized by mentioning that the CIPM MRA was now recognized worldwide by international organizations dealing with standards and regulations.

12.6 CMCs from flow for accredited laboratories

Dr Del Campo discussed issues raised by the EURAMET TC Chair from Flow regarding manufacturers’ accredited laboratories from some countries providing flow measurement uncertainties smaller than the uncertainties from NMIs with published CMCs. She added that the scenario was possible since they had the capability to develop special facilities that NMIs could not. She mentioned that accreditation bodies following the ILAC P10 did not explicitly require comparisons on such capabilities and suggested that countries should demonstrate their CMCs (representative CMCs) in that field and that the accreditation bodies of the respective countries should be informed about this. She suggested that the JCRB informs ILAC about the issue. Dr Chunhui Li contributed to the discussion by sharing the APMP experience noting that other than

the comparison challenge there was also metrological traceability challenge in the example of flow highlighted by Dr del Campo. Dr Milton also highlighted the challenges faced by accredited laboratories and NMIs due to differing criteria set by various accreditation bodies in different countries and suggested that someone should write down the problem specifics and possibly collaborate with others to address it. Dr Del Campo promised to take up the matter.

12.7 ARAMET statement

Dr Noha read out a statement from ARAMET. She mentioned that ARAMET operates under EDMO/Arab League and had formed TCs covering all metrology areas and operates in ways that mirror CIPM MRA processes. She reported that ARAMET would officially apply before the next JCRB meeting to be recognized as an RMO.

13. Next meeting and meeting closure

13.1 The 49th meeting of the JCRB

The President of COOMET was invited to share his proposal of hosting the 49th meeting of the JCRB. He made his remarks and requested the JCRB to support the proposal that the 49th meeting of the JCRB be held in Tashkent, Uzbekistan. A short video was played to showcase the experiences awaiting the delegates. The proposal was supported by the JCRB. Dr Milton reminded the JCRB that the March meeting would be skipped but RMOs would still be expected to submit their interim reports. Mr Ahmed informed the JCRB that the reporting templates would be reviewed to make them more user friendly.

In accordance with Resolution JCRB/48-2(2024), it was agreed that the 49th meeting of the JCRB will be held in September 2025 in Tashkent, Uzbekistan.

13.2 Reading of the Outcomes of the meeting

The Chair, Dr Milton read through the list of the outcomes of the meeting to wind up the meeting. The draft texts of the Resolutions, Recommendations, and Actions were circulated by the JCRB Executive Secretary in the subsequent days with the options for RMOs to comment within two weeks. All RMOs' feedback supported the drafted texts:

Action JCRB/48-1

The JCRB noted the request from EURAMET to provide open-access to information about the confirmation of CMCs including the technical evidence used and the dates of confirmation in the KCDB. The JCRB requested EURAMET to develop a detailed proposal including an outline timetable for implementation for consideration at the 49th JCRB.

Action JCRB/48-2

The JCRB Executive Secretary was requested to send a list of comparisons older than 5 years to the CCs and RMOs that are overseeing them. The JCRB requests the CCs and RMOs to review the status of each of their comparisons in this category and to report to the 49th meeting of the JCRB on the cause of the delays and the actions they will take to address the delays.

Action JCRB/48-3

The JCRB noted two forms developed by the JCRB Executive Secretary. The JCRB requests RMOs:

- to encourage CMC Writers to make use of the CMC checklist before submitting CMC claims for Intra-Regional review.

- to use the revised form for the nomination of Designated Institutes.

Resolution JCRB/48-1

The JCRB approved the inclusion of a note at the end of section 5.2 of document CIPM MRA-G-13 addressing the automatic 3-week extension when RMO TC/WG Chairs do not declare interest on the KCDB web platform and/or relinquish their right to review a CMC.

Resolution JCRB/48-2

The JCRB welcomed the invitation from the COOMET region to hold the 49th meeting in week 39 (beginning 22nd September) of 2025 in Tashkent, Uzbekistan.

The Chairman, Dr Milton took the opportunity to thank all delegates for their attendance and contributions to the meeting.

He then closed the 48th meeting of the JCRB at 13:10h (UTC+2).