International Committee for Weights and Measures (CIPM)

Session I of the 115th meeting
(17-19 March 2026)

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MEMBERS OF THE INTERNATIONAL COMMITTEE FOR WEIGHTS AND MEASURES

as of 17 March 2026

President

W. Louw, South Africa.

Secretary

T. Usuda, Japan.

Members

V.G. Achanta, India.

V. Coleman, Australia.

D. del Campo Maldonado, Spain.

C. Denz, Germany.

N. Dimarcq, France.

H.A. Frøystein, Norway.

J.-T. Janssen, United Kingdom.

H. Laiz, Argentina.

G. Macdonald, Canada.

J. Olthoff, United States of America. *CIPM Vice-President*.

S.-R. Park, Republic of Korea.

J. Qu, China.

M.L. Rastello, Italy.

P. Richard, Switzerland. *CIPM Vice-President*.

G. Rietveld, the Netherlands.

G.P. Ripper, Brazil.

BIPM Director

A. Koo

1. Opening of the session, quorum and President's remarks

The International Committee for Weights and Measures (CIPM) held Session I of its 115th meeting on Tuesday 17 March to Thursday 19 March 2026 at the BIPM headquarters.

Participants:

V.G. Achanta, V. Coleman, D. del Campo Maldonado, C. Denz, N. Dimarcq, H.A. Frøystein, J.-T. Janssen, H. Laiz, W. Louw, G. Macdonald, A. Koo (Director of the BIPM), J. Olthoff, S.-R. Park, J. Qu, M.L. Rastello, P. Richard, G. Rietveld, G. Ripper and T. Usuda.

Also attending the meeting were:

C. Fellag Ariouet (Personal Assistant to the Director and Head of the Executive and Meetings Office), C. Planche (Web and Translation) and R. Sitton (Publications).

The following were in attendance for parts of the meeting:

R. Brown (President of the CCU), A. Cypionka (Director of the International Liaison and Communication Department), V. Gressier (Director of the Ionizing Radiation Department and Executive Secretary of the CCRI), R. Guliyeva (International Liaison and Communication Department), C. Kessler (Ionizing Radiation Department), C. Kuanbayev (International Liaison and Communication Department), S. Maniguet (Chemistry and International Liaison and Communication Departments), G. Martos (Chemistry Department), G. Panfilo (Time Department), C. Paredes (International Liaison and Communication Department), C. Robertson (Chemistry Department), A. Rohrer (Legal Adviser), M. Stock (Director of the Physical Metrology Department), P. Tavella (Director of the Time Department and Executive Secretary of the CCTF), R. Wielgosz (Director of the Chemistry Department).

With eighteen members participating in the meeting, the quorum was satisfied according to Article 12 of the Regulations annexed to the Metre Convention.

The President welcomed the participants. He commented that having a three-day meeting will allow more time for in-depth discussions.

2. Approval of the agenda and the report of Session III of the 114th meeting

The Secretary said that two additions have been made to the agenda. C. Denz will give a report on the Forum on Metrology and Digitalization (FORUM-MD) and J. Qu will give a presentation on the CIPM Task Group on Quantum for Metrology (CIPM-TG-QfM) in §11. The President suggested that D. del Campo Maldonado should give the CIPM an update on the CIPM Sectorial Task Group on Climate and Environment (CIPM-STG-CENV) in §11. The CIPM agreed that a discussion on the subject of Emeritus Directors would take place before the close of the meeting. The agenda was approved with these changes.

The Secretary recalled that the minutes of Session III of the 114th meeting of the CIPM had been circulated and there had been no significant comments. He noted that a tribute to

Dr Barry Inglis had been added to the report as an annex and he thanked NMIA (Australia) for their contribution. The CIPM accepted the minutes as a true record.

Decision CIPM/115-1 (2026)
The CIPM accepted the minutes of Session III of the 114th meeting of the CIPM as a true record.

The Secretary recalled that two decisions had been adopted by correspondence. The first (Decision CIPM/115-2 (2026)) is included in §6 on the BIPM Pension Fund Advisory Board. The second (Decision CIPM/115-5 (2026)) is concerned with continuous Coordinated Universal Time (UTC) and is included in §12 under the report from the Consultative Committee for Time and Frequency (CCTF).

3. Secretary's report

The Secretary said that the Bureau had met on-line on 18 February 2026 to discuss the information and orientation session for the 28th meeting of the General Conference on Weights and Measures (CGPM) for Member States, which had been held on 4 March, and the agenda for the March CIPM meeting. The Bureau held an in-person meeting on 16 March 2026 to finalize the CIPM meeting agenda and draft decisions; feedback from the CGPM on-line briefing session; the BIPM Work Programme 2028-2031; and future CIPM meetings. Other topics discussed at the second Bureau meeting included participation in regional metrology organization (RMO) meetings, budget-related issues and the current geopolitical situation.

4. Director's report

Membership

The Director presented an update of BIPM membership as of March 2026 and recalled that Latvia had officially withdrawn as an Associate of the CGPM on 1 November 2025. Latvia did however pay its subscription for 2025 before it withdrew. Iran is at risk of suspension on 1 January 2027 if it is unable to settle its arrears. Iran is however making payments and is attempting to clear its 2023 arrears before starting payments to cover its 2024 contributions before the 1 January 2027 deadline. Four Associates (Ghana, Namibia, Syria and Zambia) are at risk of exclusion on the same date if they do not settle their arrears. Two of these Associates have given a clear indication that they intend to settle their arrears. The other two will receive a *note verbale* during the second quarter of 2026 to warn them of the possibility of exclusion.

Eight Associates have expressed a wish to become Member States. These are Albania, Azerbaijan, Ethiopia, Luxembourg, Panama, Peru, Philippines and Uzbekistan. Of these eight States, Uzbekistan has sent its instrument of accession and a *note verbale* to the French Ministry for Europe and Foreign Affairs, and Luxembourg has sent a *note verbale*. In addition, there are six potential new Associate States, namely Armenia, Bahrain, Guatemala, Malawi, Nigeria and Rwanda. The BIPM has produced a concept note regarding Draft Resolution A for the 28th CGPM (2026) to introduce the processes and documentation required for "Observer"

status. In addition, a Capacity Building and Knowledge Transfer (CBKT) e-learning course "Introduction to the BIPM" has been developed, primarily for potential Observer States.

Cybersecurity

The Director gave an update on cybersecurity at the BIPM and noted that regular phishing tests are being carried out. Failed phishing tests are mainly among newly-arrived complementary staff. Any person that fails a phishing test is required to undertake mandatory training and anecdotal evidence suggests that such people do not fail the test a second time. Multifactor authentication has been introduced on all accounts and complementary staff are now required to use physical authentication using FIDO2 Security Keys, which eliminates the possibility of passing login details on to others.

Overlap of digitalization work in committees

The Director recalled that a concern had been raised at Session III of the 114th meeting of the CIPM on overlap of work in the various committees, particularly in terms of digitalization activities, where the same stakeholders attend many committees to discuss essentially the same topics. In direct response to this concern, the Quadripartite group, consisting of the BIPM, International Organization of Legal Metrology (OIML), International Laboratory Accreditation Cooperation (ILAC)[1] and International Organization for Standardization (ISO) has agreed to suspend its regular meetings unless there is a specific topic to discuss. The Quadripartite group had been set up to support the Joint Declaration on Metrological Traceability. The principles of this declaration are now well established and discussions at Quadripartite meetings had become focused on digitalization issues that are taking place more effectively in other forums.

The similar concern regarding overlap of work had been raised in the context of the Joint Committee for Guides in Metrology (JCGM), which held its last meeting in January 2026. The eight member organizations (MOs)[2] of the JCGM include Quality Infrastructure (QI) organizations that meet with the BIPM in other committees and contexts. In addition, a member of the JCGM Working Group on the Expression of Uncertainty in Measurement (JCGM-WG1:GUM) is a permanent liaison to the FORUM-MD and a member of JCGM-WG2 is a member of one of the FORUM-MD working groups, representing the International Electrotechnical Commission (IEC).

The Director commented that the representatives and accompanying experts nominated by the MOs of the JCGM to attend its meetings not only represent these organizations, but also their NMIs and, as such, their views may be those of metrologists, rather than the MOs. If this is the case, the JCGM may not be receiving all the feedback it is seeking from the MOs and we may be "talking to ourselves". The same may be true of other committees and ensuring that discussions on topics such as digitalization are being had with the right people from liaison organizations is a governance issue.

[1] On 1 January 2026, Global Accreditation Cooperation Incorporated assumed the roles of the International Accreditation Forum (IAF) and the International Laboratory Accreditation Cooperation (ILAC)

[2] BIPM, Global Accreditation Cooperation Incorporated, International Electrotechnical Commission (IEC), International Federation of Clinical Chemistry and Laboratory Medicine (IFCC), International Organization for Standardization (ISO), International Organization of Legal Metrology (OIML), International Union of Pure and Applied Chemistry (IUPAC), and International Union of Pure and Applied Physics (IUPAP).

The Director added that the BIPM meets with the same QI community in the International Network on Quality Infrastructure (INetQI). The interests within this network have diversified and now include private interests. The BIPM is therefore less engaged with the INetQI and will monitor its involvement. The BIPM will investigate ways to re-engage with the CODATA Digital Representation of Units of Measurement (DRUM) task group, where there is ongoing activity in the area of digitalization. The Director stressed that the major collaborative activities in digitalization are, and should be, in the FORUM-MD.

Recruitment and staff matters

The BIPM digital transformation team has been strengthened with the recruitment of C. Paredes as a Liaison Officer. The team includes S. Maniguet in her capacity as the KCDB Coordinator. At present, the KCDB Coordination role includes a considerable amount of work on the digital transformation. The BIPM is in the process of recruiting a Software Developer to join the team. This team is small and relies heavily on collaborators from among the NMIs to advance its work on digitalization. The BIPM is setting up an internal Digital Discussion Group to consider how the organization can undertake the digital transformation of its own services and the services it offers to NMIs.

The Director noted that the BIPM is in the process of recruiting a Technician for the Organic Chemistry Programme and a Cleaning and Catering Assistant. In addition, two interns are being sought for translation and communications. The Time Department will be looking for Digital Transformation Support for a period of two years.

The Director recalled that the International Service for Remunerations and Pensions (ISRP) has completed a salary benchmark study, which has been submitted for review to the Chair of the CIPM *ad hoc* Working Group on Conditions of Employment (CIPM-WG-EMPLOYMENT). This study was carried out to support the CIPM in fulfilling its obligation under Article 10.1 of the Staff Regulations and Instructions to “review and establish periodically and at least every 5 years the salaries scale and the levels of the staff members’ emoluments”.

The BIPM will carry out a “Talent Management Framework” project in 2026 to align and standardize job descriptions, and clarify roles and grading to optimize the use of its staff resources.

Site news

The apartment in the Petit Pavillon has been refreshed to enable it to accommodate visitors to the BIPM site. CIPM members will have priority for booking the apartment. It will also be made available to quality and technical auditors, CBKT participants, and other visitors and guests.

Health and safety documentation update

The Director said that a management review of the BIPM’s occupational health and safety system was carried out in January 2026. The current documentation was last updated in 2015 and requires a significant amount of work. It will be updated thoroughly in 2026 to reflect current practice and to bring it into alignment with ISO 45001 and ISO 45003.

Metrologia

The Director referred to Decision CIPM/113-29 (2024), concerning the journal *Metrologia*, and noted that as of January 2026 it is fully open access. There are now charges to publish in *Metrologia*, however some support is available through the IOPP for authors from certain countries. The IOPP also offers credits to reviewers towards their next publication. The Consultative Committee (CC) Presidents were encouraged to suggest ideas for special issues and to promote *Metrologia* as the journal of choice for publishing.

The new entity for publishing CIPM MRA comparison reports went live on 1 December 2025. This new entity, CIPM MRA Comparison Reports, follows the same structure as the *Metrologia* Technical Supplement and is hosted on bipm.org at https://www.bipm.org/en/comparison-reports. All reports that were already published in the *Metrologia* Technical Supplement will remain there and there are links from the new site. The citation format follows the practice established in the *Metrologia* Technical Supplement, with "*Metrologia*" being replaced by "*CIPM MRA Comparison reports*". The report number format has been kept consistent with that used in *Metrologia*.

Renewed MOU with UNESCO

M. Milton, the former Director of the BIPM, and Dr Lidia Brito, Assistant Director-General for Natural Sciences at UNESCO, signed a renewed Memorandum of Understanding (MoU) between the two organizations in December 2025. This updates the previous agreement, which dated from 1949. The intent of the renewed MoU is for "greater global awareness and understanding of the role of accurate measurements in modern life" and "to ensure effective dissemination of information on the importance of the quality infrastructure." The Director noted that the BIPM will host an on-line event on "Policy making and AI" to mark World Metrology Day 2026 in collaboration with UNESCO. The theme for World Metrology Day 2026 is "Metrology: Building Trust in Policy Making".

BIPM Finances 2025

The Director presented the BIPM's end of year financial situation for 2025. There was an underspend compared to the budget of 14 723 thousand euros and the revenue of 15 291 thousand euros was significantly higher than expected. This resulted in a surplus of 863 thousand euros. The intention for 2026 is to reduce the surplus to as close to zero as possible.

The Director recalled that the CIPM had approved the budget for 2026 in Decision CIPM/114-19 (2025). A revised budget was presented that includes four additional items that will use 397 thousand euros of the surplus. The revised budget will require a decision by the CIPM. The revised budget consisted of the following extra expenditure: staff expenditure (75 thousand euros), coordination and communication (30 thousand euros), laboratory investment (245 thousand euros) and site investments (47 thousand euros).

2025 Activity Report

A copy of the "*BIPM Headquarters Work Programme (2024 – 2027): Progress report 1 January 2025 – 31 December 2025*" had been made available to the CIPM in advance of the meeting. This report gives information on progress by the BIPM in 2025 against the deliverables in the current work programme. The BIPM is on track to deliver the Work Programme for 2024-2027.

High-level visits since January 2026

The BIPM has received the following visitors:

- H.E. Mr Luca Sabbatucci, Permanent Representative of Italy to the international organizations, on 23 January.
- Ms Palma D'Ambrosio, Vice Ambassador, Permanent Representative of Italy to the international organizations on 25 February.

The following visits are planned:

- H.E. Ms Renata Cvelbar Bek, Ambassador of Slovenia in France on 25 March.
- H.E. Ms Joanna Kempkers, Ambassador of New Zealand in France on 1 April.

The President thanked the Director and invited questions. D. del Campo Maldonado commented on Latvia officially withdrawing as an Associate of the CGPM on 1 November 2025. The National Metrology Centre of Latvia (LNMC) is in talks with the European Association of National Metrology Institutes (EURAMET) to determine how it will engage in the future. In addition, D. del Campo Maldonado recalled that she had participated in the INetQI meeting in December 2025 as the Chair of the European Quality Infrastructure Network. She agreed with the opinion expressed earlier that there are private institutions within INetQI that push their own agendas. She also asked if the Software Developer being recruited by the BIPM will be available to assist the CCs with their digitalization requirements. The Director clarified that the main role of the Software Developer will be to develop and maintain the architecture for a microservices platform that will host the work of the CCs. She acknowledged that there is demand for support from the BIPM regarding Digital Calibration Certificates (DCCs) and other digital technologies, which is an area where future investments may be needed.

S.-R. Park asked about the meeting arrangements for the upcoming meeting of the Consultative Committee for Amount of Substance: Metrology in Chemistry and Biology (CCQM), particularly the availability of offsite meeting facilities. The Director and C. Fellag Ariouet replied that meeting facilities at *France Éducation international* in Sèvres will be available following a period of refurbishment. The BIPM has rented the main amphitheatre for parts of the CCQM meeting.

The CIPM noted that it was being asked to consider and approve a revised budget for the BIPM for 2026. However, the details had not been made available in advance of the meeting and the members will need time to review the proposed revisions. It was suggested that the decision to approve the changes should be deferred until later in the meeting (see the end of this section) and in future, a draft decision regarding any proposed revisions to the budget should be prepared and circulated in advance. The Director replied that the revisions had been discussed with the CIPM Sub-Committee on Finance (FSC) and there will be further discussions during the report by its Chair. However, the point was noted for future reference. The President added that the revisions had been discussed by the Bureau and the intention was for the FSC to present its comments to the CIPM before calling for a decision.

The Director was asked to clarify if the updating of the BIPM health and safety documentation will be carried out in-house or if a specialized contractor will be used. She replied that the Health and Safety Manual will be updated in-house. A specialist contractor will update the "*Document Unique d'Évaluation des Risques Professionnels*", which covers all occupational risks to which employees may be exposed.

The CIPM returned to the discussion on the proposal to revise the budget for a more detailed breakdown of the spending within the four additional items that will use 397 thousand euros of the surplus. The Director said that the proposed additional staff expenditure of 75 thousand euros is for a scientist for one-year to accelerate protein comparison support and to assist with preparations for Work Programme 2028-2031. The extra staff expenditure will also cover the costs of a secondee to support the automatic monitoring of GNSS receiver data inconsistencies and to analyse improvements to the UTCr algorithm. The proposed 30 thousand euro increase in coordination and communication expenditure will cover the development of an e-learning course, based on the Organisation for Economic Co-operation and Development (OECD)-BIPM checklist for public policy. The additional laboratory expenditure of 245 thousand euros will be used to purchase a Magnicon Resistance Bridge to improve resilience and efficiency as a supplement to the home-built current comparator, and to design an automated system for Extended International Reference System (ESIR) measurements. The extra 47 thousand euro site investment will be for the removal of legacy waste.

The President thanked the Director for the additional information and opened the floor to comments. G. Rietveld, speaking as the President of the Consultative Committee for Electricity and Magnetism (CCEM), commented that the purchase of a Magnicon Resistance Bridge will support calibrations in the electricity laboratory by improving traceability to NMIs that do not have quantum standards. The Magnicon Resistance Bridge will allow calibrations to be conducted in an automated way, rather than using the existing manual bridge. He added that the only drawback is that it will still require the use of liquid helium, but there are currently no room-temperature alternatives that are suitable. He added that he supports the investment.

C. Denz commented that the additional expenditure does not include any digitalization activities. She added that the BIPM's digitalization activities are not part of a distinct organizational structure and, as such, may not have the same prominence as the departments when being considered for future investments. The Director recalled that the FORUM-MD meeting on 12-13 March had been informed that the BIPM has recruited a Liaison Officer and is in the process of recruiting a Software Developer to join the digital team. This fulfils some of the current needs but demand for increased services in the digital area is growing. The Director added that if the BIPM chooses to increase digital activities, there may need to be decreased activities in other areas. This will be discussed during §9 on the BIPM Work Programme 2028-2031. The Director added that the BIPM's digitalization activities had been carefully considered during the development of the Work Programme.

G. Macdonald suggested that there is a potential risk associated with planning to make one-year recruitments, by using some of the surplus, and delivering on this commitment within 2026. It may be difficult considering that the revised budget is only available for approval now. For example, the proposal to recruit a scientist for one-year to accelerate protein comparison support. She commented that it may not be possible to hire someone and spend the allocated money before the end of the year. The Director replied that the items chosen for additional spending are one-off investments that do not add long-term resources to the BIPM's budget, for example increasing the size of the digitalization team. In terms of the possible risk of not being able to hire the short-term staff as outlined, considering that it is already March, the BIPM has budgeted to carry out seven to eight months of the work in 2026 and committing a small amount of the 2027 budget to complete the work. The ESIR automation and purchase of the Resistance Bridge come out of the investment line of the BIPM budget. The BIPM Financial Rules (Article 7) have been discussed with the FSC Chair and the internal accounting firm to

confirm that they allow for budget to be carried over when commitments for investments are made in one period, but the delivery is in a subsequent period.

At the start of the second day of the meeting, the Director presented a draft decision on the updated budget and after a discussion, the CIPM approved the following.

Decision CIPM/115-3 (2026)
The CIPM decided that the budget for expenditure in 2026 agreed by the CIPM in October 2025 (Decision CIPM/114-19) should be updated as presented to the CIPM by the BIPM Director.

5. CIPM Sub-Committee on Finance report

P. Richard, Chair of the CIPM Sub-Committee on Finance (FSC), said that although the full FSC had not met since the last meeting of the CIPM in October 2025, he had met regularly with the Director and D. Spelzini, the Head of the BIPM Finance Service, with the last of these update meetings being on 11 March 2026. This meeting included a review of the first draft of the BIPM's financial results for 2025. The budget for 2025 showed a surplus of 863 thousand euros. This surplus was achieved due to good financial management and stability in the personnel budget and despite the additional remuneration for the years 2023 to 2025 (Decision CIPM/114-16) and the salary corrections agreed in October 2025. On-site expenditure was lower than expected in 2025, mainly due to reduced electricity costs.

P. Richard gave more details of the surplus achieved in 2025. Around 37 % of the surplus is derived from interest income on the BIPM's cash reserves. This improved interest income is from a change in the way that the BIPM invests its reserves. He said that the FSC, the Director and the Head of the BIPM Finance Service have been discussing how to better use "other income", including the interest income, in future budgets. These discussions have considered the impact on the dotation and the realization of future work programmes. The aim is to reduce the surplus to as close to zero as possible, without having to use the BIPM's reserves. This information will be an important consideration in preparations for the calculation of the future dotation.

The finalized 2025 accounts for the BIPM will be available at the end of May, following the audit. The audited financial documents will be made available and presented to the CIPM for approval at its meeting in June 2026.

P. Richard expanded on the presentation given by the Director regarding the proposal to revise the budget for 2026. The revision includes an extra 245 thousand euro investment in the BIPM laboratories. He noted that in recent years the BIPM had not been investing enough in the laboratories and other areas whilst accumulating a surplus, a situation which is not appropriate or sustainable. He finished the presentation by recommending that the CIPM approves the revised budget.

The President thanked P. Richard and said that the bureau was uncomfortable with the large surplus. He noted that it is difficult for Member State representatives to understand how the BIPM can have a surplus when they fund its work and have agreed a dotation for a defined work programme. It is also difficult for the BIPM to request an increase in the dotation at meetings of the CGPM when there is a surplus. He reiterated that the unrevised surplus for 2026 is 397 thousand euros, more than a third of which is from the good return on investing the

reserves, which was not the case a few years ago. The BIPM is in a good financial position with reserves of 50 % of the dotation. The President said that the situation regarding the source of the surplus is quite clear and it will be easier to explain to the Member States. He added that the proposed revisions to the budget are concerned mainly with additional investments in the laboratories and site and stressed that these are not recurring expenses and will not be locked into future budgets.

J.-T. Janssen asked if the CIPM should decide on an appropriate level for the surplus. He suggested that it may be prudent to retain a surplus of 1-2 % rather than zero to account for any unforeseen expenses. He also asked if there is a long-term investment plan for the laboratories, particularly for equipment that may have to be renewed, for example on a 10-year cycle. The President replied that the bureau had discussed the current geopolitical situation and agreed that it is good practice to maintain a financial reserve, although this must be done with full transparency. P. Richard added that at the end of 2024, the latest year for which audited accounts are available, the BIPM had a mandatory reserve of 50 % of the dotation of 6.7 million euros and unreserved cash of 4.5 million euros. He commented that for this reason, it is reasonable to have a surplus of zero. The Director commented that the BIPM does have a long-term plan for replacement of critical equipment. The long-term financial plan covering 2028-2031 has itemized all of the equipment that is likely to need replacement during that period. The Director, in response to a question, confirmed that the BIPM had budgeted for the revision of the BIPM health and safety documentation.

The CIPM discussed the level of the surplus and the reserves. Although there were concerns about the current geopolitical situation and the need to retain a financial buffer, there was general agreement that the BIPM should not have a surplus compared to its budget. The President suggested that investments should be made using the surplus that will reduce future operating costs to help offset any potential financial difficulties, for example operating costs that increase at a higher rate than the dotation. The CIPM may revisit the level of reserves at its meeting in June 2026 depending on the global political situation. The last time the CIPM decided to raise the level of the reserves was in 2017 (Decision CIPM/106-24 (2017))

6. BIPM Pension Fund Advisory Board report

H.A. Frøystein, Chair of the BIPM Pension Fund Advisory Board (PFAB), presented the report of its recent activities (CIPM/2026-I-06-a). The report summarized recent adjustments to the salary point and its applicability to pensions by refering to the text of Decisions CIPM/114-18 (2025), CIPM/111-13 (2022), CIPM/114-17 (2025), CIPM/114-18 (2025) and CIPM/111-14 (2022). The report also referenced judgement n°5005 of the Administrative Tribunal of the International Labour Organization (ILOAT).

H.A. Frøystein recalled that during Session III of its 114th meeting held in October 2025, the CIPM had agreed to extend the effects of the ILOAT judgement to all staff, which entailed increasing the salary point by nominally 2 % from 1 December 2025. The CIPM also agreed to consider the issue of applying the same correction to pensions and had mandated the PFAB to examine the affordability of such a correction.

Therefore, the PFAB had commissioned the actuarial company Mercer to update the 2023 actuarial study with revalued data and assumptions and provide additional simulations for an increased value of the pension point that went beyond the standard yearly increase for inflation. The PFAB met on 14 November and 5 December 2025 to examine the updated 2023

actuarial report. The Chair of the PFAB submitted a preliminary report dated 7 January 2026 to the CIPM as a result of these meetings.

On the basis of that report, the CIPM agreed to the following decisions by correspondence.

Decision CIPM/115-2 (2026)
The CIPM:

- welcomed the preliminary report from the Pension Fund Advisory Board (PFAB) of 7 January 2026 that presented the views exchanged during the 19th and 20th meetings of the PFAB held pursuant to Decision CIPM/114 18 (2025);
- noted that in application of Article 17.4 of the Regulations of the Pension and Provident Fund, the adjustment to the pension point applicable on 1 January 2026 is 0.9 per cent, which corresponds to the consumer price index calculated by the International Service for Remunerations and Pensions for certain categories of civil servants serving in international organizations based in France;
- noted that the PFAB would formulate a final recommendation on revising Decision CIPM/111-14 (2022) after having sought and examined further information and data from the actuary.

After having received additional information from the actuary, the PFAB met again on 25 February 2026.

He said that following the actuarial studies' update and the discussions within the PFAB, the PFAB had noted firstly, that the application of Decision CIPM/114-17 (2025) effective in January 2026 increased the gap between the salary point value and the pension point value from 3 % to 5 %. The PFAB therefore questioned whether a 2 % correction to the pension point value should be applied. Secondly, the PFAB noted that there are currently no formal criteria or metrics to measure the long-term sustainability of the pension fund. Thirdly, that the PFAB would benefit from the assistance of an independent, external expert on pension fund administration. Such an expert would provide an opinion on the incidence of the widening gap between salary and pension increases as well as advice on defining the required criteria and metrics.

H.A. Frøystein also explained that the PFAB had considered whether there was a legal requirement to revise Decision CIPM/111-14 (2022). The consequence of this decision was that a 4.5 % increase was applied to pensions in January 2023, instead of 6.5 % which was the default increase applicable. The PFAB considered that according to the actuarial information regarding the long-term financial sustainability of the pension fund that was available to the CIPM at the time it took Decision CIPM/111-14 (2022), the decision not to apply the 6.5 % adjustment was fully warranted. The PFAB concluded that the decision had been taken correctly on valid grounds and there was no objective reason to revise it.

H.A. Frøystein completed his presentation by summarizing the discussions in the *Report from the Chair of the PFAB to the CIPM*, dated 12 March 2026 (document CIPM/2026-I-06-a). He presented the text of a draft decision for consideration by the CIPM.

The President thanked the Chair and opened the floor to questions and comments. The CIPM discussed the role and selection criteria for the independent external expert on pension funds. H.A. Frøystein confirmed that the intention is for the external expert to be a paid professional consultant, rather than a volunteer from within the metrology community. He added that any

expert would be independent of the PFAB and the actuary and would have the experience and expertise to give advice on matters such as best-practice for long-term sustainability of pension funds. There was general agreement that this type of specialist expertise is missing from the PFAB. An external expert would also provide the expertise to address potential governance issues, such as ensuring that there is equal representation from both the employer and employee sides in the PFAB. The person would also need to be available, as required, to give advice. It was proposed that the external expert will act as an external advisor (guest or observer) to the PFAB, rather than a member. Being a member would have an impact on the person's independence.

The Chair of the FSC cautioned against making further payments into the pension fund from the unreserved cash as this would reduce the interest income that was discussed earlier, with a corresponding effect on the BIPM budget for 2026. He also commented that if the CIPM were to put a limit on unreserved cash, funds would not be available for further cash injections. It was also noted that further cash injections into the pension fund should not be ruled out as the current geopolitical situation makes it impossible to be certain about the latest projections for the long-term sustainability of the pension fund.

The CIPM discussed the text of the draft decision and agreed the following:

Decision CIPM/115-4 (2026)
The CIPM welcomed the report from the Pension Fund Advisory Board (PFAB) of 12 March 2026. On the basis of the conclusions and recommendations formulated by the PFAB in that report, the CIPM:

- decided that revising Decision CIPM/111-14 (2022) is not warranted;
- tasked the Chair of the PFAB with finding an independent, external expert on pension fund administration to assist the PFAB in fulfilling its advisory function; it being noted that such an expert would be endorsed in due course by the CIPM.

7. CIPM Sub-Committee on Governance report

P. Richard, Chair of the CIPM Sub-Committee on Governance (SC-G), presented an update on the work of the SC-G regarding the Rules of Procedure (RoP) of the CGPM. He thanked the BIPM staff for their help in ensuring that the Draft RoP of the CGPM, the Note to introduce the RoP of the CGPM, and the Commentary to the RoP of the CGPM were published on 13 January 2026. The Report from the CIPM Sub-Committee on Governance and Draft Resolution F *On the adoption of Rules of Procedure of the General Conference on Weights and Measures Report from the CIPM Sub-Committee on Governance* have also been published on the BIPM website.

The Chair expressed concern that no questions or comments were forthcoming on either the Draft RoP of the CGPM or the Special Procedure regulating the conduct of the 28th meeting of the CGPM at the last information and consultation meeting held with Member State representatives on 4 March 2026. The intention of the meeting had been to inform the Member State representatives that the documents had been available for two months and to start receiving comments as early as possible rather than at the last minute. He urged the CIPM members to ensure that the relevant ministries in their countries are aware that the RoP of the

CGPM documents are available now so that they can send comments or proposals for amendments ready for the next consultation meeting.

The Chair said that he has started to align the text of the RoP of the CIPM with the new terminology used in the RoP of the CGPM. The revised version of the RoP of the CIPM will be submitted to the CIPM in readiness for its meeting in June. He added that the changes are minor.

He concluded by stressing that the RoP of the CGPM do not involve any changes to the Metre Convention, however some Member States may have a different interpretation.

The President thanked P. Richard and invited questions. G. Macdonald asked about the criteria that allow for the adoption of the Special Procedure regulating the conduct of the 28th meeting of the CGPM and why it is necessary to implement a procedure that allows for hybrid participation in the forthcoming CGPM. She recalled that in 2022 there was a world-wide travel ban with associated issues concerning participation, which required a procedure. At present there is geopolitical instability but it is not clear in the document what triggers the exceptional circumstances that would require a special procedure for the next CGPM and in the future. The President said that this issue will be discussed further during the presentation in §10. P. Richard added that one of the drivers for developing the Special Procedure is that the Metre Convention does not include any provision for hybrid or on-line participation in meetings. This is covered in the RoP of the CGPM, but until they are adopted there are no formal rules that allow hybrid or on-line participation. Hence there is a need for an exceptional Special Procedure at the forthcoming meeting. Following the 28th meeting of the CGPM, both hybrid and on-line participation will be allowed as a normal practice. The Director added that post-Covid 19 it has become standard practice for international organizations to improve access to meetings for Member States. For the BIPM this will include Associates and potentially Observers of the CGPM. The special procedure and the provisions in the RoP of the CGPM represent preparations for a different way of operating as the norm. The President concluded by suggesting that further discussions on the Special Procedure should continue in §10.

8. Update on Draft Resolutions C and D

N. Dimarcq, President of the CCTF, thanked the CIPM for endorsing the update to Draft Resolution C "*On the technical actions needed to ensure the continuity of UTC*" for presentation at the 28th meeting of the CGPM. He said that the CIPM had adopted the text of Decision CIPM/115-5 (2026) by correspondence in advance of the meeting.

Decision CIPM/115-5 (2026)
The CIPM endorsed the proposal by the Consultative Committee for Time and Frequency (CCTF) to update Draft Resolution C "On the technical actions needed to ensure the continuity of UTC" for presentation at the 28th meeting of the CGPM. The update fixes 20 May 2027 as the implementation date of the new maximum value for the difference |UT1-UTC|.

He recalled that the objectives of Draft Resolution C are to fix both the maximum value for the difference |UT1−UTC| at 3 600 seconds (1 hour) and the implementation date of continuous UTC. He said that the Draft Resolution had been presented to the Member State representatives at their last meeting to ensure that all the delegations at the 28th meeting of the CGPM have

received the information required to support its adoption. He noted that the maximum value for the difference |UT1−UTC| of 1 hour does not represent a problem for most countries, even for those with critical systems that can only tolerate smaller time differences. For some systems, short-term solutions have been proposed within international organizations. For other systems, it will be sufficient to implement updates over many decades. In addition, most Member State representatives are in favour of an implementation date "as fast as possible" due to the risks associated with a negative leap second. The implementation date has been set as 20 May 2027.

N. Dimarcq summarized the work conducted by the CCTF on continuous UTC that led to Draft Resolution C. The work began with the creation of a CCTF Task Group in 2023, which carried out a broad user consultation exercise as well as educational and communication activities in user forums and international meetings. In response, the CCTF has received a significant amount of supportive feedback and official statements regarding continuous UTC from many interested bodies. He added that there is a strong link between atomic time and the Earth's rotation and the associated synergy between the work of the BIPM, CCTF, CGPM and the International Earth Rotation and Reference Systems Service (IERS) needs to be maintained. The BIPM, CCTF and IERS have met to discuss continuous UTC and the IERS has issued a statement to confirm its support and engagement to take all necessary measures to change its operational provision for, and its announcement of, leap seconds according to the CGPM resolutions. The CCTF will hold a meeting in March 2026 with the IERS and its parent organizations (International Astronomical Union (IAU) and International Union of Geodesy and Geophysics (IUGG)) to ensure the measures required are progressing so that they will be ready for the possible adoption of Draft Resolution C in October 2026.

The user consultation exercise for Draft Resolution C has included discussions on the continuation of the dissemination of |UT1−UTC| (when its value is > 1 s) to users by or via the Internet and Radio stations regulated by the International Telecommunication Union Radiocommunication Sector (ITU-R). GNSS providers are already capable of dealing with this evolution for many decades before an update is required. Appropriate services already exist for the internet. In terms of radio stations, some stations will stop the transmission of |UT1−UTC| when its value is larger than 1 s, or they are working to update their code. ITU-R Working Party 7A (WP-7A) "*Time signals and frequency standard emissions"* is progressing well with updating this code for radio stations and the ITU World Radiocommunication Conferences (WRC) 2023 gave a deadline of 2040 for the update.

P. Tavella presented the outcomes of the ITU-R WP-7A meeting held in Geneva (Switzerland) on 2-6 March 2026. This meeting discussed the code and frequency allocated for the radio stations that transmit UTC, the standard frequency and other information such as |UT1−UTC|. She recalled that the ITU WRC in November 2023 endorsed Resolution 4 of the 27th CGPM (2022) *On the use and future development of UTC,* which recommended, if possible, a new tolerance > 100 s and implementation possibly in 2035, with radio stations having until 2040 to update their code (if needed). Following this decision in 2023, the possibility of a negative leap second was discovered, which represents a significant risk to critical infrastructure. The result was that the proposed implementation date for continuous UTC has been brought forward from 2035 to 20 May 2027.

P. Tavella gave details of the proposed technical updates to the code that some radio stations use to transmit the value of DUT1 = UT1−UTC from −0.9 s to 0.9 s. The fractional part will continue to be transmitted this way, while the integer part will be transmitted via other means. Progress with the technical aspects of this change has been good. Despite the progress made

with the technical features of continuous UTC, potential concerns remain for some Member States.

N. Dimarcq emphasized that feedback from Member States regarding Draft Resolution C would be welcome.. N. Dimarcq and P. Tavella informed the CIPM that they are available to supply educational and explanatory materials regarding Draft Resolution C and to participate in meetings to explain technical, scientific and other issues.

The President invited questions and comments on Draft Resolution C. The Director confirmed that letters should be sent to the BIPM using the address cgpm@bipm.org.

N. Dimarcq gave an update on Draft Resolution D "*On the definition of an international lunar reference time scale and its traceability to UTC*." He recalled that the initial objective had been to recommend a lunar reference time scale and ensure its metrological traceability to UTC. The work on Draft Resolution D began in September 2025 with possibilities for a Lunar reference time scale being presented to the CCTF. The CCTF set up a dedicated Task Group on Moon Timing (CCTF-TGMT), which met with many relevant bodies, including the International Committee on Global Navigation Satellite Systems (ICG) and space agencies, between September and December 2025. The conclusion was that a decision on a single Lunar time scale was not mature or possible at that time. In January 2026 Draft Resolution D was published without a recommendation for a unique time scale, with an unresolved choice between either a timescale at the surface (TL) or centre (TCL) of the moon.

The second Joint ICG-IOAG[3] Multilateral Cislunar Positioning, Navigation and Timing (PNT) Workshop was held in Vienna (Austria) on 10-13 February 2026, with P. Tavella co-chairing the Session on Lunar Reference Time. The workshop provided the BIPM with an opportunity to present Draft Resolution D to the PNT community. No consensus was reached at the workshop, either within the CCTF or between space agencies, on a preferred option for a Lunar reference time, considering both the fundamental and practical aspects. The workshop agreed that if a time scale is to be defined on the Lunar geoid, it is essential that the International Association of Geodesy (IAG) International Astronomical Union (IAU) Joint Working Group (JWG) 1.1.3 (Lunar reference frames) establishes a conventional value for the lunar geoid based on a representative value of the internationally recognized measures of the gravitational potential, and not fixed by the first mission that will land on the Moon. The workshop also discussed the possibility of extending the role of BIPM to the measurement of "UTC−Lunar time" and the coordination of different national Lunar time realizations.

N. Dimarcq presented the updated version of Draft Resolution D, which takes into account the outcomes of the above discussions. The President thanked N. Dimarcq and asked the CIPM if there were any questions or comments. In response to a question, he explained briefly why UTC cannot be used directly as a Lunar timescale. He added that relativistic effects are explained in the CCTF Frequently Asked Questions (FAQ) on lunar time, which will be made publicly available in the near future. D. del Campo Maldonado commented the BIPM has a fundamental role in the definition of the lunar reference time scale and this new responsibility will require changes in the Time Department. She added that these extra responsibilities should be articulated in the BIPM work programme and Draft Resolution D. She noted that they will require additional resources and asked if these are available. N. Dimarcq agreed that the work

[3] Interagency Operations Advisory Group

to develop an international lunar reference time scale and ensuring its traceability to UTC will require significant additional resources and the resolution invites the CIPM to consider the possible role that the BIPM could offer under different conditions. P. Tavella added that the presentation on the Time Department in §14 will detail the optional activities that it can carry out if additional resources are available, for example a joint project with a space agency. The CIPM commented that some of the wording in Draft Resolution D that outlines the role of the BIPM and the CIPM is vague and includes too many conditions; it could be made more specific.

The President thanked N. Dimarcq and P. Tavella and suggested that they should re-examine the wording of Draft Resolution D to take into account the CIPM's comments.

N. Dimarcq and P. Tavella presented a revised version of Draft Resolution D at the start of the second day of the meeting, which responded to some of the above suggestions. There was a brief discussion and the final text can be found at:

https://www.bipm.org/documents/d/guest/cgpm-2026-draft-resolutions.

The CIPM adopted the following decision.

Decision CIPM/115-6 (2026)
The CIPM endorsed the proposal by the Consultative Committee for Time and Frequency (CCTF) to update Draft Resolution D "On the definition of an international lunar reference time scale and its traceability to UTC" for presentation at the 28th meeting of the CGPM. The updates underline the need to use conventional values fixed by international organizations and to consider the role of the BIPM.

9. Draft BIPM Work Programme (2028-2031)

The Director began by noting that the style of the Work Programme has been changed so that there is no explicit reference to departments; instead, it is intended to give a view of the BIPM as a single organization. Each project or deliverable may cross departments and this is an internal matter, rather than a consideration for the Member States. The management of meetings and relationships with Member States and Associates has been explicitly included as a direct service to them. The visibility of "stewardship" activities has been increased to improve the way the BIPM considers and administers its resources and to identify any actions it plans to take. Finally, the BIPM has made a clear distinction between objectives that will be delivered based on the contributions and subscriptions, and those that rely heavily on partnerships with other bodies.

The Director summarized the various partnership models used by the BIPM to support its work programme.

- Secondments from NMIs involve specialist staff from NMIs being temporarily assigned to the BIPM while continuing to receive a salary from their home institutions. The BIPM provides a stipend or subsistence allowance. Secondments range from a 2-3 weeks to one year.
- Stakeholder contributions allow external stakeholders to provide resources to support specific activities. This model has been successfully applied in the JCTLM and is expected to continue and potentially expand into other areas.

- Using external facilities allows the BIPM to make use of specialist resources in external laboratories, particularly in ionizing radiation. At present, no other areas have been identified where this would be appropriate, although the possibility remains open.
- Equipment donations have previously been made to the BIPM, for example the NMR apparatus. A proposed optical clock donation for the Work Programme 2028-2031 would require the BIPM to engage in a significant joint technical project: the BIPM does not have on-site the facilities or the expertise to support the operation of an optical clock.
- Joint technical projects involve in-kind contributions from the BIPM and partners, for example NMIs or other stakeholders. Many of the reference materials developed in the Chemistry Department rely on joint technical projects where development of materials for comparisons is shared between the NMI and the BIPM.

The Director added that none of these models are new; they were highlighted to emphasize that they are successful and in the hope that the BIPM's partners will recognize that such models offer a way to grow the capabilities of their own staff and influence the BIPM Work Programme. These models also provide a means of working together to achieve metrological goals that are important to some Member States or NMIs, without being funded by the dotation.

The Director commented that the development of the work programme every four years provides an opportunity to consider why the BIPM has the suite of activities that it operates. The BIPM's activities are guided by its vision and mission, the text of which was presented. The three main roles of the BIPM outlined in the vision and mission that have a direct impact on its activities are: representation, scientific and technical collaboration, and coordination.

Representation

The BIPM's representation role includes liaising with relevant intergovernmental organizations and other international bodies to develop opportunities for the application of metrology to global challenges. This is seen in areas where the BIPM has technical expertise, for example ionizing radiation, chemistry and time, but extends across other international partners in areas such as Quality Infrastructure (QI) and through the Consultative Committees to other liaison entities. It also covers promotion and education about the importance of metrology, progress in measurement science, and the work of the BIPM. This includes initiatives such as World Metrology Day. Representation also involves the BIPM's wider activities in communicating with people outside the scientific metrology community, for example through the development of educational materials in collaboration with partners such as the United Nations Educational, Scientific and Cultural Organization (UNESCO) and building up a portfolio of impact studies in collaboration with the United Nations Industrial Development Organization (UNIDO) to demonstrate the value of metrology.

Scientific and technical collaboration

The Director said that the BIPM's objective to be a centre for scientific and technical collaboration between Member States is achieved through the provision of capabilities for international measurement comparisons on a shared-cost basis. It conducts this role by coordinating international comparisons of national measurement standards agreed to be of the highest priority. The Director listed the reasons why a particular measurement comparison should be coordinated from one location:

- Artefact-based definitions require the artefact to be held at the place where the comparison is coordinated.
- A single stable reference scale is required acting as a 'pivot'.
- The comparison is a 'one off' within an on-going series to underpin CMCs and development of the reference is expensive.
- Preparation for a new comparison requires consensus building and significant centralized stakeholder engagement as well as technical development.
- Continuous, (almost) real-time calculation and dissemination of the results of the comparison is required.
- Transport of artefacts/materials is difficult/expensive.
- It is cost effective.

These reasons have to be balanced against national priorities; even if it is cost-effective to conduct certain activities centrally, some Member States may choose to invest in maintaining their own scales, or several independent scales, for reasons of national sovereignty and independence. This also avoids the inherent weakness of a single point of failure.

The Director presented the reasons why the BIPM headquarters would be the preferred location for specific scientific capability to support comparisons:

- The long-term prioritization of and investment in a stable pivot point can be guaranteed.
- Access for all Member States can be maintained independent of changing geopolitical sensitivities.
- Shared costs ensure that work is carried out cost-effectively for all stakeholders.
- To maintain scientific credibility of the BIPM's "voice" in other contexts (as coordinator of the CIPM MRA, technical meetings and as a representative of a scientific metrology community).
- To build and maintain expertise at the BIPM to respond to scientific questions as they arise.
- To allow the BIPM to host collaborations between Member States to resolve technical issues.

H. Laiz commented that not all the scientific and technical work at the BIPM focuses on international measurement comparisons. For example, the Kibble balance and qNMR activities related to purity assessment. The Director replied that maintaining comparison capabilities at the BIPM allows it to conduct other activities and provide services at marginal extra cost. For example, providing calibrations. She added that the primary role of the qNMR facility is to support CCQM comparisons.

The Director referred back to the reasons why a particular measurement comparison should be coordinated from one location and presented examples.

Mass

Artefact-based definitions require the artefact to be held at the place where the comparison is coordinated.

The mass sector is transitioning from an artefact-based definition. The Director referred to the question from H. Laiz about the Kibble balance, noting that the preparation for a new regime or a new comparison required consensus building and significant centralized stakeholder engagement and technical development. The BIPM currently organizes kilogram realization

comparisons, which contribute to determining the consensus value. There are a limited number of independent realizations of the new definition, and the BIPM has one of them. The Director added that a recurring discussion at the Consultative Committee for Mass and Related Quantities (CCM) meetings is what phase 3 will look like. It is difficult to determine how many national realizations will be maintained over the long term. The role of the BIPM in the next phase should be considered.

Electricity

A single stable reference scale is required acting as a 'pivot'.

Transport of artefacts/materials is restricted or difficult/expensive.

The Director said that the BIPM has the only transportable Josephson voltage standard (JVS) and quantum Hall resistance (QHR) systems for on-site comparisons, which allow NMIs to demonstrate their capabilities. In addition, it is the only team with the experience to carry out these comparisons at short notice in another laboratory. Referring back to the question from H. Laiz, there are other things that the BIPM can undertake apart from comparisons. For example, calibrations in the electricity laboratory make use of the equipment already in place for comparisons and also contribute to world-wide consistency.

The CCEM quoted the following in its *Strategy 2020-2030* in support of the unique work undertaken at the BIPM "*The CCEM considers providing these comparisons, requiring specialized equipment and special expertise, from one single laboratory [the BIPM] is by far the most efficient and effective way of organizing these comparisons*."

Chemistry - Gas

A single stable reference scale is required acting as a 'pivot'.

Preparation for a new comparison requires consensus building and significant centralized stakeholder engagement as well as technical development.

Gas metrology is a field that has a long tradition of artefact-based scales that are not traceable to the SI. The process of bringing the community together to establish SI traceability is more effective when centrally coordinated. Now, the BIPM maintains unique facilities for on-demand bilateral comparisons of greenhouse and air quality gas standards.

The CCQM Working Group on Gas Analysis (CCQM-GAWG) stated that "*The BIPM laboratories provide an important resource for the coordination of GAWG comparisons, in particular, for greenhouse gases and air quality gases, making use of centralised facilities to analyse and compare reference materials with minimised analytical uncertainties*."

Chemistry - Organics

The comparison is a 'one off' within an on-going series to underpin CMCs and development of the reference is expensive.

The Director recalled that the BIPM maintains the only set of laboratory facilities dedicated to organic/protein/DNA purity key comparison coordination (CCQM-K115, K148, K199 series). The BIPM's programme in organic chemistry is unique in that every comparison has a new reference material. The ongoing comparison series underpins broad-range CMCs. It would be impossible to run a comparison for every possible material that organic chemists want to measure. In

addition, the cost of developing the reference materials for the comparisons is expensive and is unlikely to be borne by any single laboratory.

Quotes from the CCQM Working Group on Protein Analysis (CCQM-PAWG) and the CCQM Working Group on Organic Analysis (CCQM-OAWG) highlight that the BIPM comparisons are an integral part of the CCQM's overall strategy. The BIPM comparison programme is a major factor in the ability of the CCQM to run its Track A comparison series to underpin all the CMCs for NMIs in organic chemistry.

CCQM PAWG "*The BIPM …has a dedicated laboratory facility to support these activities, which are essential for traceable and highly accurate biochemical measurements. The comparisons run by the BIPM are an integral part of the CCQM overall strategy to enable NMIs to demonstrate their measurement capabilities in the area of protein analysis and traceability to the SI.*"

CCQM-OAWG "*State-of-the-art purity assessments are a mainstay for the WG as they underpin capabilities for the provision of SI-traceable calibrator materials. These will continue to be a major focus for the Track A key comparison programme supported by the BIPM*."

Time

Continuous, (almost) real-time calculation and dissemination of the results of the comparison is required.

The BIPM has the unique, central and impartial role for UTC including the circulation of the BIPM travelling GNSS receiver standard to support the quality of UTC and coordinated traceability. Their expertise also allows BIPM scientists in the Time Department contribute to the development of an estimation algorithm to determine the frequency values of the secondary representations of the second, they study the relativistic corrections to define time on the Moon and its measurement versus UTC, as requested by national and international space agencies, and in addition, they have developed a stochastic model to predict UT1-UTC and the probability of a negative leap second.

Ionizing Radiation

A single stable reference scale is required acting as a 'pivot'

Transport of artefacts/materials is restricted or difficult/expensive.

The entire metrology system for dosimetry (including the International Atomic Energy Agency (IAEA) and Secondary Standards Dosimetry Laboratories (SSDL)) and radionuclide measurements relies on the BIPM laboratories, with comparisons conducted bilaterally with the BIPM. Key Comparison Reference Values (KCRVs) are those defined by the BIPM in dosimetry or by the SIR system in radionuclide metrology. Comparisons organized by the CCRI or by RMOs take several years to complete, whereas bilateral comparisons with the BIPM typically take only a few months due to artefact transportability issues.

The Director presented a quote from the CCRI that stated "*The strategy of the CCRI is therefore to increase the range of comparison exercises to cover emerging requirements, and to reduce the number of long-term large-scale exercises through optimizing use of resources at NMIs/DIs and the BIPM in order to avoid difficulties associated with shipping hazardous materials or sensitive equipment*."

The Director paused the presentation and invited questions and comments. G. Macdonald, speaking as the President of the Consultative Committee for Mass and Related Quantities (CCM), commented that there is no support for the "related quantities" in terms of comparisons at the BIPM. She commented that for accountability of the CCM and its Working Groups the focus is on the kilogram definition, which is essential, but the related quantities are overlooked. She added that the BIPM is proposing support for the CCQM comparison programme via secondees, but this is not the case for other CCs. G. Macdonald asked if there is a compelling reason for this, for example is this because the tasks selected from the CCQM for support cannot be conducted elsewhere because the capability does not exist in the Member States. She suggested that feedback should be sought from the Member States regarding focus areas for the work programme, rather than relying on the members of the CCs. The Director replied that the CCQM has ten working Groups and the BIPM is only supporting three of them; this represents a small fraction of the total activities of the chemistry and biology sector. S.-R. Park added that there are an enormous number of measurements that are of interest in chemistry and biology, so the CCQM has to be efficient in terms of collaboration between NMIs and the BIPM Chemistry Department. The CCQM singled out purity assessment as a focus area. The Director added that obtaining feedback from the Member States is important and that she is investigating new avenues to obtain feedback, which will allow the BIPM to make well-informed decisions for the long term, rather than just repeating what it has always been done. The Work Programme 2028-2031 will be circulated for consultation, although most of the feedback is expected to come from NMIs. J.-T. Janssen said that it is the responsibility of the CIPM to determine the right balance of activities within the BIPM laboratories. He did not expect the Member State representatives to give feedback on this subject at the 28th CGPM as it is not one of their priorities.

G. Macdonald suggested that when activities are being considered for the work programme, their impact should be measured. For example, how many Member States will benefit and will it have broad enough uptake to justify use of the resources involved.

The Director resumed the presentation and said that because the BIPM develops expertise for running comparisons, this expertise can be used for other things at marginal cost, such as offering services to its Member States. These services include capacity building and knowledge transfer, calibrations, training, domain-specific digital tools and methods, and the development of guidance documents. In the areas where the BIPM has technical expertise, it is more effective in stakeholder engagement on behalf of the NMIs than it would be without that expertise.

The Director referred back to the list of reasons why a particular measurement comparison should be coordinated from one location and noted that there may be compelling reasons why it is no longer necessary to have a central location. This should be taken into account when recognizing that the BIPM work programme needs to evolve. Examples include when definitions change from being artefact-based and if affordable and stable transportable artefacts become available.

The Director commented that the proposed Work Programme 2028-2031 is not expected to undergo significant changes and there are good reasons why the BIPM has its current portfolio of technical capabilities. The strategic plan was circulated in 2025 and feedback and approval was received. The work programme is directly linked to the contents of the strategic plan.

Coordination

The third objective of the BIPM is to be the coordinator of the world-wide measurement system, ensuring it gives comparable and internationally accepted measurement results. This role is primarily focussed on carrying out activities on behalf of the metrology community. For example, it coordinates activities between the NMIs of Member States and the RMOs, including the provision of technical services to support the CIPM MRA and the infrastructure for the development and promotion of the SI. In addition, the BIPM provides the necessary Digital Framework to maintain the CIPM MRA and the SI Reference Point. The Director added that the capacity to provide broader digital services is currently limited.

The areas where the BIPM has committed to delivering specific activities related to Coordination in the Work Programme 2028-2031 were presented. The stewardship section was also presented, covering those activities that relate to how the BIPM uses and protects its assets.

The Director explained how the Work Programme 2028-2031 responds to the CIPM Strategy 2030+. The strategy document gave details of high-priority activities that should continue at the BIPM headquarters of the future. These activities were presented along with details of where they can be found in the work programme.

The Director completed the presentation by stating that the Work Programme 2028-2031, as presented, can be delivered if a dotation increase of 1.5 % per annum is adopted at the 28th CGPM. This level of increase would allow for maintenance of the number of staff at the current level and no growth in laboratory capital investments. There would also be increased expectations for partnership models for funding specific activities. The BIPM's unreserved cash will need to be used for development of the KCDB 3.0. The assumptions made for finances over the period 2028-2031 are that additional income, including interest on reserves, will stay at the current level and inflation will remain the same.

The President thanked the Director and opened the floor to comments. It was suggested that a stronger message may be needed in support of the proposed 1.5 % increase in the dotation. This message could highlight the new activities that will be possible in order to give Member State representatives more leverage in arguing for the increase. G. Macdonald cautioned that if the BIPM is going to ask for a 1.5 % increase in the dotation from the Member States, this will be against a background of declining budgets, staff cuts and the closure of activities in many NMIs. The BIPM should therefore be very clear about the unique benefits that Member States will receive if they set aside money for the dotation. One CIPM member commented that there is a danger of linking the increase to particular new activities. If certain Member States do not support these activities, they may argue against the increase. It was also noted that some Member States do not want an expansion in the BIPM work programme; they would prefer to see the workload evolve and to be refreshed, but for it to remain the same size with associated improvements in efficiency. The CIPM suggested that the Member States should be made aware of the consequences, and what activities will be lost, if a 0 % increase in the dotation is adopted.

The President recalled that in preparation for previous meetings of the CGPM, the Member State representatives had been presented with a message on projected inflation in Europe as support for the dotation request. The projection for 2028 is for inflation of 2 % and the BIPM is only seeking a 1.5 % increase. This increase of below inflation will still allow the BIPM to deliver the Work Programme 2028-2031. He noted that this type of message has been effective in the past. C. Denz warned that many NMIs are not currently receiving any compensation for inflation and

are having to cut staff levels and budgets, so saying that the dotation request is below inflation may not be a convincing argument in its favour.

The Director presented the first draft of the budget for 2028-2031. This budget includes a projected 11 % increase in staff costs, which assumes that salary inflation will be 2.8 % per annum instead of 3.8 % in the current period. The coordination and communication budget is expected to increase by 5 % and laboratory operating expenses will remain static. Laboratory investments are budgeted to rise by 11 % and site investments by 20 %. This is due to annual spending in these areas being behind expected depreciation expenditure. Overall, the budget anticipates a 10 % increase in total expenses (63 992 thousand euros) in 2028-2031 compared to 2024-2027 and a 5.55.5 % increase in income (allowing for a 1.5 % increase per annum in the dotation and other income remaining steady). This budget will allow the BIPM to deliver the Work Programme 2028-2031, assuming that the refresh of the KCDB will be financed using 500 thousand euros from the unreserved cash. A breakdown of the budget by delivery team was presented.

C. Denz commented that the budget breakdown by delivery team does not include a direct mention of digital activities; these are included in the work of the BIPM departments. She added that having the digital transformation included as a separate new activity would allow the proposed development of the KCDB 3.0 to be taken out of the International Liaison and Communication budget and to recognize its importance to the CCs and NMIs. The Director replied that the budget breakdown is only intended for the CIPM and added that development of the KCDB 3.0 will progress differently to previous refreshes due to the emergence of "smarter" ways to develop new digital services. These new ways of working may result in a reduction in the development costs. The budget includes a provision to replace the ^{60}Co source, regardless of the option chosen; the options will be discussed in §14.

The Director presented the activities that would not be possible if a 1 % increase in the dotation were to be adopted at the 28th meeting of the CGPM. She added that the BIPM may have to reconsider some of the activities in the Work Programme 2028-2031 if there is consistent feedback for growth and new activities in areas such as digital transformation and Lunar time. The BIPM is currently maintaining a coordination role in the digital transformation rather than an active technical role. The deliverables for Lunar time in the work programme are concerned with feasibility, rather than implementation.

The President thanked the Director and asked if there were any comments. H. Laiz suggested that the BIPM has more than a coordination role in digitalization, it has the responsibility to provide the SI Reference Point (SIRP), which is a service. The Director replied that the BIPM is committed to maintaining the SIRP, however most of the work on developing the SIRP is conducted by an expert group of people from the NMIs and contractors. The BIPM is responsible for the ongoing provision of the SIRP and its development. The role of the new software developer will be to maintain the platform to provide the service and contribute to its evolution. The BIPM's coordination role does not include the provision of significant new digital services.

The CIPM asked if the BIPM is on target to deliver the activities for the last two years (2026 and 2027) of the Work Programme 2024-2027. This information is important with regard to how it feeds into the start of the following work programme and an update may be required at the next session of the CIPM in June. The President reminded the CIPM that they have a responsibility to comment on, and to agree, the Work Programme. The work programme is only circulated to the Member States after it has been adopted by the CIPM and they consider it to be the best possible programme for the metrology community. He asked the Director for the final deadline for

comments from the CIPM. The Director replied that comments should be received from the CIPM by 27 March. A revised work programme will then be sent to the NMIs for comment with a deadline of early May. Feedback from the CIPM should not just be on the content of the work programme; it should include details of activities that may have to be discontinued if the dotation request of 1.5 % is unsuccessful. The latter is important information for the discussions with Member States. The Director said that she will visit the larger contributors to the dotation in order to present the Work Programme 2028-2031 and the rationale behind the activities, in support of the dotation request.

The Director said that CIPM approval will be required after any NMI comments have been incorporated into the Work Programme 2028-2031 and before it is published. This will be before the next session in June and will allow the Director to present a finalized version during visits to the Member States.

10. Preparations for the 28th meeting of the CGPM (2026)

The Director recalled that the Convocation of the 28th meeting of the CGPM, the Special Procedure, Rules of Procedure and Draft Resolutions had been sent to Embassies, NMI Directors and Member State representatives on 13 January 2026. The Call for nominations for the CIPM election was circulated on 26 February 2026 with a deadline of 30 April.

Prof. Françoise Combes, President of the *Académie des sciences* in Paris, has been confirmed as President of the Conference. Two preparation meetings are planned with Prof. Combes, one at the BIPM and one at the *Académie*.

The CGPM webpages will be made more visible on the BIPM website. The webpages gather all the required information on the CGPM and will include embedded links to allow on-line participation.

The first on-line preparation meeting was held on 4 March 2026. The meeting was attended by 110 participants from 56 Member States. The next preparatory meetings are scheduled for 2 June and 9 September. A pre-meeting for Member State representatives will be held at the BIPM headquarters on Monday 12 October.

The Director asked the CIPM members to gather as much information as possible from the Member State representatives regarding their intentions for the BIPM dotation. On the run up to the CGPM, the information of particular importance is the level of dotation increase that they are willing to accept and how they will vote on Draft Resolution V. She commented that any feedback would be useful so that potential problems can be dealt with in advance of the General Conference.

The Director presented the Draft Programme for the 28th CGPM. She highlighted that there will be an extended lunch break on Day 1 (13 October), which will include a poster session. The intention is for the CC reporting to be via posters and a five-minute presentation by each President. The Director and President asked the CIPM for feedback on this suggestion. There were no comments from the CC Presidents, so the poster session will go ahead as planned. The CC Presidents will also be involved in two round-table discussions on 14 October. The themes being considered for these round-table discussions are “new technologies for metrology” and “metrology and digitalization”. She asked the CC Presidents to consider in which round-table they can participate. Two social events are planned. A reception will be held on the evening of 13 October in the Salon Gustav Eiffel on the first floor of the Tour Eiffel.

The Director recalled that the Special Procedure regulating the conduct of the 28th meeting of the CGPM is essentially the same as the previous CGPM. Although it is not explicit about whether on-line participants can vote on the resolutions, the implication is that they can, and it would be difficult, on the basis of the special procedure, to exclude this option. The procedure is clear that on-line participants cannot vote in the elections. On-line participants did vote for resolutions at the 27th meeting of the CGPM (2022). However, it was difficult for those monitoring the on-line platform to be confident that the person(s) claiming to speak on behalf of a Member State were indeed those who had been credentialled to attend the meeting. If there is no change to the Special Procedure, a secure method of managing the voting should be adopted. Since the Special Procedure has already been published and Member States have been invited to respond, a clear mandate will be needed from Member States to change it and not before 31 May due to a deadline set in the Convocation.

The Director said that if on-line participants are allowed to vote for resolutions, it is recommended that a secure electronic platform is adopted for all participants to use, both on-line and in the room. If voting is only allowed in the room, a secure electronic platform is still a good option as it is quick, represents a low risk of errors, is transparent and cheap. The traditional approach of raised hands, rollcall and paper ballots is still available if there are concerns of confusion over the procedure. The BIPM has investigated various options for on-line voting and the costs and details of these options were presented.

The President thanked the Director for the presentation and invited comments. V. Coleman said that information should be made available on how any selected electronic voting system would work and be accredited, as these are the type of questions that will be asked by the Member States. P. Richard reminded the CIPM that Draft Resolution F *On the adoption of Rules of Procedure of the CGPM* introduces the possibility to vote on-line at future meetings. He suggested that, to avoid confusion, voting should be carried out in-person at the 28th meeting of the CGPM.

The CIPM noted that it is becoming more-and-more difficult to obtain funding to attend in-person meetings. If Member States are offered the option of on-line voting at General Conferences, they may be less inclined to send delegations and this will have an effect on the way the meetings are conducted. The CIPM members commented that in-person voting allows delegates to get a “feel” for how the voting is proceeding and it may have an influence on their decisions. This is not the case with on-line voting, where the process is anonymous. P. Richard added to this comment by suggesting that it would be more difficult for delegates to vote against Draft Resolution V on the dotation if they are in the room, rather than if they are on-line. The Director added that on-line voting is not fully anonymous; the results of the voting will be displayed after each vote.

The President suggested that voting on the dotation could be restricted to in-person only and recalled that the Special Procedure does not explicitly exclude on-line voting. The Director said that if the CIPM decides to restrict voting to in-person only, the Special Procedure will need to be changed.

P. Richard asked if the two round-table discussions on Day 2 of the upcoming CGPM meeting could be dropped or shortened if extra discussions are needed on the BIPM dotation. The Director agreed that these items could be dropped if extra time is needed. However, she noted that the closed session for the Working Group on the BIPM dotation will be held on the

afternoon of 13 October and this session can be extended for as long as required. If this is the case, it may not have an impact on Day 2.

11. Reports from the FORUM-MD, Sectorial Task Groups and Joint Committees

Joint Committee for Guides in Metrology (JCGM)

The Director recalled that the JCGM had met on 23 January 2026. The representatives of the eight member organizations appointed A. Koo as the Chair to replace M. Milton following his retirement.

The member organizations reported on downloads, purchases, references to GUM documents and the VIM to gain an understanding of the level of adoption and impact of the work of the JCGM. The exercise was considered to have been useful, however to assess trends, the same statistics will be required over a period of several years.

The JCGM reflected on the "Measurement Uncertainty" webinar held on 2 July 2025. The feedback from the webinar was that one of the working groups thought that the different perspectives on the proposed definition of measurement uncertainty were not fully represented. As a result, work remains in terms of helping the community to understand the reasons for the proposal.

The Director said that JCGM Working Group on the Expression of Uncertainty in Measurement (JCGM-WG1:GUM) has an interest in artificial intelligence and its connection with measurement uncertainty. A workshop was held during its November 2025 meeting, which featured four NMI expert presentations and a round-table discussion. The focus was to help WG1 to better understand the way it could contribute to the topic.

P. Blattner (International Commission on Illumination, CIE), gave a presentation at the JCGM meeting on the activities of the roundtable of the signatories of the Joint Statement of Intent on the digital transformation in the international scientific and quality infrastructure (JSI). Some members of both JCGM working groups will attend a technical exchange/workshop on the topic of "Making FAIR vocabularies" on 30–31 March in Geneva (Switzerland).

The JCGM has set up an *ad hoc* group to review its charter.

The Director said that one of the most important outputs of the meeting was that the JCGM Working Group on the International Vocabulary of Metrology (JCGM-WG2:VIM) has completed the Voting Draft of the Fourth Edition (VIM4 Voting Draft). This edition is focused on introducing new entries pertaining to nominal properties. Despite considerable discussion, a new definition of measurement uncertainty has not been widely agreed, so the long-standing definition has been retained. The VIM4 has been sent to the member organizations of the JCGM to vote on approval and the BIPM is soliciting comments from NMIs to inform its vote. The BIPM is primarily seeking editorial comments and any major objections to approval of the draft. Other technical comments will be kept aside for a possible future edition of the VIM.

Joint Committee for Traceability in Laboratory Medicine (JCTLM)

R. Wielgosz, Executive Secretary of the JCTLM, recalled that the JCTLM Members' and Stakeholders' Meeting and workshop on "Result harmonization in medical laboratories: accomplishments and challenges", held on 1-2 December 2025 attracted 150 participants and generated 13 052 euros in registration fee income after costs. This money is used for the upkeep of the JCTLM database. The report of the meeting has been published in *Clinical Chemistry*[4].

He said that the vision of the JCTLM is for all *in vitro* diagnostic (IVD) manufacturers, regulators and laboratory medicine professionals world-wide to use this database when claiming accuracy of diagnostic results. The JCTLM database has around 1 000 entries, with 100 new entries being submitted for review annually.

R. Wielgosz commented that the database can be searched using a web-based interface, which has recently been upgraded. Application Programming Interfaces (APIs) are also available that can be used by other systems to query the database. The JCTLM has responded to the large language model revolution by working with a developer to make a "flat" version of the database that can be referenced by Google and other search engines. As a result, the JCTLM database is now searchable by ChatGPT. The next step is to investigate the use of AI to support the peer-review process.

The JCTLM database currently uses an Excel and SharePoint-based system for submissions and reviews, with support from the BIPM e-learning platform. A more efficient web-based platform for submission and reviewing is under development. This on-line submission and review platform will cost 80 000 euros, which is being funded by donations from seven NMIs, four corporate members of the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC), the International Council for Standardization in Haematology (ICSH) and funds from the last stakeholder meeting. Initial tests have been completed and beta-testing will start soon. A JCTLM Task Group on Database Development has been created to support the work and a visiting scientist from LACOMET (Costa Rica) will lead the testing for four months. The target date is for the new database platform to be launched by January 2027.

R. Wielgosz recalled that the JCTLM is investigating ways to diversify the funding for its activities and to offset future investment costs. Its annual expenditure includes operating costs (BIPM staff costs) of 120 thousand euros and JCTLM database maintenance of around 10 thousand euros. The database has a useful lifetime of ten years and development costs are 210 thousand euros. JCTLM income is derived from the BIPM annual staff budget of 70 thousand euros, an annual donation from the IFCC of 50 thousand euros and the BIPM Chemistry Department budget of 10 thousand euros.

The JCTLM is investigating a membership model whereby some of its costs are offset by subscription fees from its members. The JCTLM has 83 member organizations that are split between National and Regional Members, and Stakeholder Members. The latter includes some *in vitro* diagnostic manufacturers. Discussions between the JCTLM and its members have indicated that there are members that would be prepared to provide financial support. The proposed membership model is a vehicle for organizations to support the BIPM and allows either full or associate membership. Full members will receive a reduction for the biennial

[4] "Result harmonization in medical laboratories: accomplishments and challenges" *Clinical Chemistry and Laboratory Medicine (CCLM)*. https://doi.org/10.1515/cclm-2026-0323

meeting. For corporate members, the membership fee depends on annual turnover; the greater the turnover, the bigger the fee. The model is based on the structure used by the IFCC. Details of the proposed JCTLM tiered membership proposal were presented.

The money generated through the proposal would be used for JCTLM database maintenance costs, development costs, and secretariat operating costs above the levels covered by the BIPM and IFCC. In the event that funds cannot be used for these needs, for example if JCTLM activities ceased, it would be proposed that remaining unused funds would be allocated to laboratory medicine related activities in the BIPM Work Programme.

R. Wielgosz said that the proposal had been discussed at the JCTLM meeting in December 2025 and a questionnaire was sent to members in January 2026. The next steps are to modify the JCTLM Declaration in 2026 and to renegotiate the financial support from the IFCC during 2027-2029. The aim is to implement the tiered membership model on 1 January 2027. He presented the initial findings of the questionnaire; the majority of responders remain open to the idea of joining as a subscription paying member.

R. Wielgosz informed the CIPM that a JCTLM Workshop on "Reference materials and reference measurement systems" will be held at the Nicolaus Copernicus University in Toruń (Poland) on 27-28 May 2026. A JCTLM Stakeholders' Meeting will be held in 2027 on the subject of "Globally aligned strategies for metrology in laboratory medicine".

The President thanked R. Wielgosz and asked if there were any questions. V. Coleman asked if there are any published metrics for who uses the JCTLM database. R. Wielgosz replied that the upgrade of the database will include Google referencing and new data will become available. He added that data is available from a few years ago, when there were around 1 000 visits per month from those making nominations through to database users. J.-T. Janssen asked if the searchability of the JCTLM database by large language models is being monitored to check the quality and that it is operating satisfactorily. R. Wielgosz said that testing in the development phase shows that the results are accurate but not always reproducible. J.-T. Janssen added that the reputation of the JCTLM database could be affected if ChatGPT were to generate erroneous data. R. Wielgosz said that searches by large language models such as ChatGPT could be checked against results from the internal search engine of the database.

Forum on Metrology and Digitalization (FORUM-MD)

C. Denz, Chair of the FORUM-MD, reported on the 3rd Plenary Meeting of the FORUM-MD, which was held at the BIPM headquarters on 17 March 2026. She began by giving a summary of the growing importance of digitalization over the last few years, including digitalization in trade, and data security. The introduction included details of transforming the SI for a digital world and how digitalization opens the door to new metrological services.

C. Denz recalled that Resolution 2 of the 27th meeting of the CGPM (2022) encouraged the CIPM to "ensure that the Metre Convention naturally extends its role as the globally accepted anchor of trust for metrology into the digital era." This role included the adoption of FAIR (Findable, Accessible, Interoperable, and Reusable) principles in digital metrological data, machine-actionable functions of the SI, and enabling the use of digital calibration certificates (DCCs).

She referenced Draft Resolution E "*On the further digital transformation of the global metrology system*", noting that it encourages the CIPM to: extend the SI Reference Point into a

comprehensive and authoritative digital framework that allows machine-actionable conversion between the SI and other systems of units; foster harmonization to ensure conceptual consistency and interoperability across the overall digital metrological framework; and facilitate the advancement of digital metrology for AI and complex systems.

C. Denz showed an overview of the mission and objectives of the FORUM-MD and the Terms of Reference (ToR) of its Working Group on Strategy (FORUM-MD-WG-S). She gave details of how the five different ToR are being fulfilled. The structure and governance of the five Task Groups, three Working Groups and the Discussion Group were presented.

The activities of the FORUM-MD since the last session of the CIPM were presented. The meeting of NMI Directors and State Representatives on 16-17 October 2025 included presentations on horizontal groups, digitalization and AI, and quantum technologies. A webinar on FAIR data was held on 12 February 2026, with 150 participants and a workshop on "AI in a metrological context" was held on 11 March 2026. The FORUM-MD Task Group on Building Safe and Trustworthy AI (FORUM-MD-TG-AI) has drafted a document that analyses AI regulations world-wide; the FORUM-MD will review the document before it is published as a white paper. An additional document "State of DCC and DRMC[5] 2025" has been produced by the Task Group on Harmonizing DCC and DRMC (FORUM-MD-TG-H-DCC/DRMC). This Task Group also organized the 6th International DCC Conference on 24-26 February 2026.

C. Denz gave an overview of the FORUM-MD meeting held at the BIPM headquarters on 9-13 March 2026. This meeting included a workshop on "AI in a metrology context: AI for metrology and metrology for AI." The aim of the workshop was to investigate how AI can be used to improve classical metrology. In parallel, the workshop examined how metrology can be used to assess AI.

The FORUM-MD meeting agreed a number of decisions, including the adoption of modified membership criteria from the document CIPM-D-01 "*Rules of procedure for the Consultative Committees (CCs) created by the CIPM, CC working groups and CC workshops*." The criteria that were customized into workable practices for the FORUM-MD are: members should be recognized internationally as expert in the field and participate actively in FORUM-MD, and members should demonstrate competences by a record of international activities in the field. In addition, the horizontal nature of the FORUM was recognized through more inclusive participation, observers being welcome, and via the invitation of experts. Recent changes in the Chairs of the FORUM-MD's Working and Task Groups were presented.

C. Denz completed the presentation by informing the CIPM that three NMIs have applied to become members of the FORUM-MD: INMETRO (Brazil), KRISS (Republic of Korea), and DFM (Denmark). The FORUM supports the applications.

The President thanked C. Denz and noted the three applications for membership for a decision later in the meeting.

[5] Digital reference material certificate

CIPM Task Group on Quantum for Metrology (CIPM-TG-QfM)

J. Qu, Chair of the CIPM-TG-QfM, presented a summary of its first meeting, which had been held on 9 March to discuss the group's work plan. The members are J. Qu, J.-T. Janssen, G. Rietveld, G. Macdonald, V. Coleman and V.G. Achanta. J. Olthoff and D. del Campo Maldonado were unable to attend the meeting. The theme of the meeting was to discuss the work plan of the Task Group.

The meeting agreed the comments on the CIPM-TG-QfM made at the last session of the CIPM. It will now officially start work to become the CIPM's focal point on quantum for metrology. The initial group of the CIPM-TG-QfM will have limited membership and will meet on-line every three months to ensure progress. The CIPM-TG-QfM will not replace the CCs' work, but will work with them on overarching, cross-cutting topics. It will identify which IOs have programmes that are dependent on quantum standards and traceability, and will formulate a clear Action Plan on how to achieve its tasks and who to engage in its work.

J. Qu said that the priority task for the initial group will be to formulate a report on developments in quantum technologies and cross-sectoral requirements. A first draft will be ready before the March 2027 meeting of the CIPM. The scope of the report will be clearly defined to focus on the implications of the new SI, the state of the art of quantum metrology and how the CIPM can be involved.

J. Qu commented that the role of the Task Group and the Initial Group was discussed. The Task Group is a non-permanent "CIPM Task Group in Quantum for Metrology". The Initial Group is part of the Task Group, whose role is to set up an action plan describing how to achieve tasks of the Task Group. The scope of the Task Group is to focus on the realization of the SI.

A brainstorming session at the meeting agreed to develop guidelines on validation of quantum standards; this is a core role of the Task Group. It will look into what is currently happening in different CCs in terms of whether there are quantum standards outside the NMIs. It will also investigate what quantum means to the CIPM MRA and how it can adapt and the requirements of industries, as they will also require more details to assure their quantum standards are realized correctly. The initial group will consult with CCs to see if they should develop specific guidelines, with the task group focusing on generic guidelines.

The initial group of the CIPM-TG-QfM will identify stakeholder international organizations by leveraging existing networks and conducting a rapid search of current quantum-related projects and policies within various organizations to find out if there are any activities these organizations undertake that can link to the Task Group's work.

J. Qu said that the next meeting of the initial group of the CIPM-TG-QfM will be on-line on 1 June 2026.

The President thanked J. Qu and invited questions. C. Denz commented that quantum standards are not part of quantum for metrology as they are more of a concern for industry. She asked if the focus is the SI or industry and standards. J. Qu replied that the focus is on how to use quantum technology to realize the SI units.

CIPM Sectorial Task Group on Climate and Environment (CIPM-STG-CENV)

D. del Campo Maldonado, Chair of the CIPM-STG-CENV, said that it had held an on-line meeting in January 2026 to discuss the next stakeholders meeting in 2027. The proposal is for the stakeholder's meeting to have a modified focus on industry or sustainability.

D. del Campo Maldonado recalled that the planned on-line webinar at the 30th UN Climate Change Conference (COP30) in Brazil in November 2025 was cancelled. It is hoped that it will be possible to hold a webinar during COP31 in late 2026 in Türkiye. D. del Campo Maldonado noted that she is the current Chair of the European Metrology Network (EMN) for Climate and Ocean Observation and is in contact with relevant colleagues in TÜBITAK UME (Türkiye) to ensure that the webinar goes ahead.

12. Reports from the CIPM Consultative Committees

Consultative Committee for Time and Frequency (CCTF)

N. Dimarcq, President of the CCTF, said that it has been working towards the finalization of the updated CCTF Strategy 2025-2035 and the CCTF Roadmap towards the redefinition of the second. The documents have been finalized and validated by the CCTF Working Group on Strategic Planning (CCTF-WGSP) and were presented to the CIPM ready for publication on the CCTF webpages in March 2026.

He presented an overview of the updated CCTF Strategy 2025-2035 and noted that it is aligned with the strategy of the BIPM Time Department. The Strategy emphasizes the importance of educational and communication aspects for all "hot topics" both within and outside the CCTF, and the need for secondees to make progress on all topics. The CIPM took note of the updated CCTF Strategy 2025-2035.

N. Dimarcq continued by presenting the updated CCTF Roadmap towards the redefinition of the second. He recalled that the first version of the roadmap was produced in 2016 and that a first update was conducted in 2021. The contents of the roadmap that was updated in 2025 were displayed. He noted that the target date for a decision on the redefinition is maintained as "in 2030" if a consensus on the preferred option for the species for the new definition of the second is reached and if the mandatory criteria outlined in the roadmap are fulfilled.

N. Dimarcq presented the short-term work plan for the CCTF Task Force on Updating the Roadmap for the redefinition of second (CCTF-TFU). Its activities are focused on choosing the preferred option and species for the new definition of the second. To move forward, some fundamental and practical questions are addressed in periodic meetings of the co-chairs of the CCTF-TFU, with the objective to provide answers by the end of the year at the latest. He commented that the diagram showing the current status of the fulfilment of the mandatory criteria for the redefinition of second will be updated. He added that optical frequency standards are now contributing to the calculation of TAI but for this criterion on the roadmap, the level of fulfilment is not yet sufficient. However, the situation is improving.

The President thanked N. Dimarcq and opened the floor to questions. R. Brown asked about the primary and secondary methods for the realization of the new definition of the second; primarily if the CCTF is happy with what a primary method is in the context of option two, or is it a subject that needs further discussion. N. Dimarcq replied that it is one of the topics the

CCTF is currently addressing. There is currently a primary realization with caesium and secondary realizations with species from a list of species providing secondary representations of the second that is presented to the CIPM. For option one, it would be the same as the present situation, but for option two, it is necessary to define how the new definition will be realized either with the whole ensemble of species operating together, or with only one species of the ensemble, or with a species that is not in the ensemble. The CCTF has some preliminary answers so it is not considered to be a blocking point, however clarification is required. Discussions have already taken place with the Consultative Committee for Units (CCU) about the understanding of secondary realizations of a unit and the associated need for calibration against a primary standard.

N. Dimarcq presented the final wording of Draft Resolution D "*On the definition of an international lunar reference time scale and its traceability to UTC*". The CIPM had a brief discussion and some minor editorial changes were agreed.

Consultative Committee for Ionizing Radiation (CCRI)

J.-T. Janssen, President of the CCRI, said that the CCRI and all three of its sections had met during 2025 and several workshops had taken place. The 30th meeting of the CCRI was held at the BIPM headquarters on 7 November 2025.

CCRI Section I: X- and gamma rays, charged particles (CCRI(I)) met at Minamisoma City, Fukushima Prefecture (Japan) on 17-18 September. The delegates were given a unique opportunity to tour the Fukushima Power Plant and to see the dismantling and clean up of the site. The CCRI(I) meeting looked into the key comparison framework based on bilateral comparisons between the NMIs/DIs and the BIPM and agreed that the brachytherapy comparison, BIPM.(RI)-K8 will continue in its current form. The meeting decided that there was no strong requirement for the BIPM to develop a primary standard for high-energy electrons. However, there is a high priority to maintain the ^{60}Co source at the BIPM.

J.-T. Janssen said that the CCRI Section I: Brachytherapy Standards Working Group (CCRI-BSWG(I)) and CCRI Section I: Key Comparisons Working Group (CCRI-KCWG(I)) will be relaunched with extended ToRs. Section I will create a new task group on proton dosimetry to develop a protocol for a trial comparison in this field. A Working Group will be set up to exchange data on emerging treatment modalities, including MR-linacs, UHDR systems and light-ion accelerators. An additional Task Group will be established to develop guidance for traceability and uncertainty estimation on Monte Carlo radiation transport systems used in dosimetry standards.

CCRI(I) has received membership applications from the Office of Atoms for Peace (OAP, Thailand) and the Federal Authority for Nuclear Regulation (FANR, United Arab Emirates). Both applications were unanimously approved by the CCRI(I).

J.-T. Janssen recalled that CCRI Section II: Measurement of radionuclides (CCRI(II)) had held its meeting at the BIPM headquarters on 3-5 November 2025. A new Chair and Vice-Chair were appointed. A new CCRI(II) Task Group on the developments of RMO-SIRTIs was created, working in collaboration with International Committee for Radionuclide Metrology (ICRM) Working Groups. In addition, the comparison of algorithms for digital data treatment is being discussed within the ICRM RMT WG and will return to the CCRI(II) when it is ready to run the comparison, piloted by the BIPM.

The CCRI Section III: Neutron measurements (CCRI(III)) meeting at the IAEA Headquarters, Vienna (Austria) on 9-11 July discussed emission rate comparisons of one radionuclide neutron source type using the manganese bath to validate a laboratory's capability for all radionuclide source types. It also discussed future comparisons for derived quantities, for example, doses that are not listed in the current service categories. These should be conducted as RMO supplementary comparisons.

In terms of membership, J.-T. Janssen noted that calibrating neutron devices with traceability from a calibrated transfer instrument is not sufficient evidence to join CCRI(III). Guest presentations were made by STUK (Finland), PSI (Switzerland), KACST (Saudi Arabia), and FANR (UAE). All three laboratories are advanced in neutron metrology, but do not yet meet CCRI(III) requirements. They were encouraged to continue progress and to attend the next meeting as guests.

The meeting also saw the creation of a Task Group on neutron metrology for Boron Neutron Capture Therapy (BNCT) to address the increasing demand for accurate neutron measurements in BNCT. A Task Group for high-energy neutron comparisons was established to organize and define parameters for such a comparison (neutron energies above 20 MeV), including the determination of whether it will be key, supplementary or a pilot study.

J.-T. Janssen presented the main outcomes of the CCRI Task Groups and Working Groups.

The Task Group on Radioactive Sources and Alternative Technologies had a goal to provide a metrology-specific perspective on the topic of alternatives to radio-isotope reference fields. It concluded that radioactive sources remain the best option. A report has been published and the Task Group closed.

The Radiotherapy Standards and Quantitative Imaging Working Group had positive outcomes from the first Alpha-therapy workshop with recommendations published. The second Alpha-therapy workshop in May 2026 will be held at the BIPM headquarters. Guidance on Traceability and Establishment of Secondary Standards Laboratories will be published as an IAEA report in 2027.

The CCRI(II) Task Group on Mass Spectrometry (CCRI(II)-MS-TG) conducted a survey and held a workshop at the NPL (UK) in May 2025, with three papers being published as a result. Recommendations for traceable methods, standards and reference materials will be developed.

The CCRI Task Group on Digital Transformation (CCRI-DT-TG) has fulfilled its mandate to liaise with the FORUM-MD, support the digital transformation of KCDB service categories and to serve as a platform for information exchange through webinars. The proposal is to convert the Task Group into a Working Group to serve as a coordinating body within the CCRI to encourage digital transformation across all sections. It will follow-up developments and implementation of BIPM digital services for the CCRI's metrological activities.

The CCRI RMO Working Group on IR CMCs (CCRI-RMOWG) made several new documents available on the BIPM website. It also sent a communication to the JCRB to suggest a revision of the JCRB review process to allow multiple revision rounds, for example RMO reviews, to improve CMC evaluations.

The CCRI Communication Working Group (CCRI-COMWG) has been active over the last two years. J.-T. Janssen presented a summary of its activities, which included 12 webinars with a total of 1 700 attendees and seven workshops with 1 050 attendees, 380 of which were on-site.

He reported that the CCRI is updating its “Strategy 2030+” document, which was last reviewed in 2023. This fourth version incorporates the outcomes of the series of webinars and workshops organized in 2025 to build a vision for the future of ionizing radiation metrology.

J.-T. Janssen presented recent changes to the structure of the CCRI and its Sections. In addition to the proposition of the transformation of the CCRI-DT-TG into a Working Group, a new CCRI working group on nuclear data is proposed, with the aim of supporting nuclear data creation and dissemination for the 3 sections. He completed the presentation by recalling the current membership criteria for the CCRI. Institutes that are members of all at least two CCRI Sections can be members of the CCRI, with the Sections deciding the membership. Institutes that are a member of one CCRI Section can become an official observer of the CCRI. Any Member State, which is not represented by an official observer can apply to attend the CCRI meeting as an observer (document CIPM-D-01 Clause 4.5). Currently the CCRI has thirteen members, ten official observers and four Liaison organizations.

The CCRI received applications from three potential new members, as members of the three sections: SMU (Slovakia), BARC (India) and ENEA (Italy). Four potential new observers have applied to become members of CCRI(I): FANR (United Arab Emirates), SSM (Sweden), STUK (Finland) and OAP (Thailand).

The President thanked J.-T. Janssen and the CIPM discussed the creation of two new Working Groups, the new membership proposals, along with the earlier proposals by the FORUM-MD. The CIPM endorsed the proposals and the following decisions were adopted.

Decision CIPM/115-7 (2026)
The CIPM approved the establishment of the following Working Groups of the Consultative Committee for Ionizing Radiation (CCRI):

- Digital Transformation
- Nuclear Data

Decision CIPM/115-8 (2026)
The CIPM accepted the following changes to the membership and observership of the Consultative Committees and Forums:
CCRI

- SMU (Slovakia), BARC (India), ENEA (Italy) as members
- FANR (United Arab Emirates), SSM (Sweden), STUK (Finland), OAP (Thailand) as observers

FORUM-MD

- INMETRO (Brazil), DFM (Denmark), KRISS (Republic of Korea) as members.

The CIPM had a brief discussion on the unique nature of the three CCRI Sections. It was noted that the Sections follow the same rules that apply to the Working Groups of the other CIPM Consultative Committees.

13. Review and revision of CIPM-D-01

The Director presented a document outlining the proposed changes to document CIPM-D-01 "*Rules of procedure for the Consultative Committees (CCs) created by the CIPM, CC working groups and CC workshops*" to accommodate the needs of the Forums and Sectorial Task Groups. The document is attached as Annex 1. The Director presented a second document "*Rules of Procedure for the CIPM Consultative Committees (CCs), Forums and Sectoral Task Groups (STGs), and their working groups and workshops*", which showed the suggested changes to CIPM-D-01 using track changes.

The CIPM had a comprehensive discussion on the proposed changes. The main points were:

There is existing confusion and overlap between participation categories. The distinction between the categories is often unclear and the application of terminology is inconsistent and applied subjectively. The CIPM recommended that the term "permanent observer" should be changed to "official observer". These can be considered as regular meeting participants who are included automatically in invitations.

The CIPM agreed that there needs to be clarity regarding the definition of the terms temporary observers, one-meeting observers and non-permanent observers. These are participants that attend occasionally, usually by request. It was noted that the term "Member State Observer" adds to this is confusion. The CIPM considered the issue and the use of "guest", "temporary observer" or "meeting observer" were discussed as options to cover this need.

An associated issue is the use of the term "guests". These are participants that are invited by CC Presidents for specific purposes, for example expertise that is not available within the group. The CIPM agreed that it is necessary to clarify the differences between guests and observers, including their rights, roles and eligibility.

The CIPM agreed that the granting of observer status should be controlled in order to manage participation in the CCs, Forums and STGs. However, it was suggested that any decision should consider the administrative burden, especially when taking into account the large number of meetings and committees. A possible alternative is to delegate some authority to CC Presidents, within defined rules.

There is significant confusion due to overuse of the word "group", for example Groups, Working Groups and Task Groups, with inconsistent naming across documents. The CIPM considered defining the terms clearly at the start of the document. It also considered using a generic term such as "sub-groups" where appropriate. It may be appropriate to link this terminology to concepts such as "subsidiary entities", which are referred to in the Rules of Procedure of the CIPM (Rule 11) and were used in the preparation of the By-Laws.

The CIPM discussed the lack of clarity on the distinction between CCs, Forums and Sectorial Task Groups (STGs). The Forums and STGs lack clearly defined objectives in CIPM-D-01. There is a need to develop definitions and objectives for each entity and to clarify their purpose and scope. The outcome of the discussions was that Forums tend to be broader, long-term, platform-like structures, whereas STGs are more focused, temporary and are driven by specific issues. One of the criteria for membership of a CC is to *have demonstrated competence by a record of participation in international comparisons organized either by the Consultative Committee, the BIPM or a regional metrology organization.* This is not the case for Forums and STGs, which have an advisory and reporting role.

The CIPM recalled that it had previously agreed to retain the role of Presidents for the CCs and Chairs for the Forums and STGs in order to retain a clear difference between these entities.

The discussions indicated that there needs to be more emphasis in the revised CIPM-D-01 document on defining the objectives and responsibilities for each of the entities, which should be applied consistently. There also needs to be clear criteria for when to create each type of group and the distinction between what constitutes a CC, Forum and STG. There was agreement that defining the objectives for any proposed Forum or STG is a crucial step before its inauguration.

The CIPM discussed the potential definition and scope of the STGs. It was greed that they should have a focused and flexible structure to deal with specific cross-cutting or emerging challenges. The core membership should have CIPM oversight and the Chair appointed by the CIPM. The STGs have an explicit requirement to liaise with CCs, RMOs and international organizations. The STGs should avoid developing into large, forum-like structures. The STGs may have defined timelines or endpoints, but no consensus has yet been reached on how to formalize timelines in CIPM-D-01; this will require further discussions. The timeline should incorporate mechanisms for closing or converting STGs. The CIPM noted that the definition of what constitutes an STG should remain broad enough to accommodate future STGs.

The CIPM noted that the CCs, Forum and STGs apply criteria and processes inconsistently. There was support for harmonizing criteria, for example how to apply membership and observer status and for harmonizing processes, such as who is responsible for making decisions and how decisions are made. It was suggested that a one-page guidance document could be drafted to provide clear guidance for consistent application. The CIPM reiterated that this guidance will need clearly-defined criteria for membership of the Forums and STGs, which are different to the CCs. C. Denz noted that the requirements to be involved in the FORUM-MD may be very specific, with specific digitalization expertise not necessarily being available in the NMI community.

The CIPM expressed concerns over the membership approval process. Formal approval by the CIPM of membership applications to the CCs is often regarded as simply being a formality with applications being “rubber-stamped”. It was noted that the original purpose of CIPM approval was to prevent conflicts, for example the possibility of approving multiple NMIs and DIs from the same country. It was suggested that scrutiny of membership applications should be conducted earlier in the process rather than at final approval. Membership applications can be delayed by the process of waiting for CIPM approval after having been endorsed by a CC.

The President recalled that the current rules in CIPM-D-01 are outdated and not fully aligned with the needs of the new structures, particularly in relation to Forums and STGs. In addition, the existing rules are applied inconsistently or subjectively. There was agreement among the CIPM members that this revision is only a first step and that a deeper review will be needed later. There is a need to harmonize both the criteria and processes in the RoP of the CCs, Forums and STGs.

The CIPM will continue to consider the best practice for managing participation in CCs, Forums and STGs. It discussed whether observers must formally request attendance via the BIPM Director or if a simpler system could be implemented. There was no overall consensus with some members in favour of strict control and others preferring simplification. The policy for inviting official observers and guests will require clarification to ensure that it is applied consistently. This clarification should include clear guidance on the invitation of guests, whether

observers should apply to a CC President or Forum/STG Chair or the Director, and who is ultimately responsible for approving attendance of observers and guests. This issue is linked to the earlier discussions on clarifying the differences between guests and observers.

The CIPM was asked to consider the inclusion of clause 3.14 in the revised version of CIPM-D-01 to ensure that the eligibility of CC members is kept under review. A review process could be used to assess whether participating laboratories continue to operate relevant activities at a high enough level to contribute meaningfully in the activities of a CC. It was noted that this activity is usually conducted with the CCs through reports by the members. There is however a need to ensure that the policy is applied consistently across all CCs. It was noted that §3.14 may need to be simplified to acknowledge that CCs will require a stricter qualification review due to participation in key comparisons. Forums and STGs do not have equivalent technical requirements, so identical review mechanisms are unnecessary. The phrase “formal review” could be replaced with a revised process such as the Forums/STGs reviewing eligibility of members/observers periodically, for example every 4 years. The Forums would then report or propose changes to the CIPM, with the emphasis being changed to CIPM oversight rather than direct review. There is a requirement for an explicit clause allowing removal of members/observers if criteria are no longer met. A decision is needed on whether the authority for removal is with the CIPM or CC Presidents.

The CIPM commented on §5 *Operation of the CIPM Groups* in the revised CIPM-D-01 document presented by the Director, particularly that the clause relating to the organization of CIPM Group Meetings may be overly “rigid”. The CIPM concluded that more flexible language should be considered, for example “normally meet at BIPM” instead of “The CIPM Groups meet at the BIPM site in Sèvres.” This would avoid constraints that limit operational flexibility for forums and STGs. It also recognizes that requirements for CCs may not apply to other groups.

The revised CIPM-D-01 requires clarification in §6 *CIPM Group Working Groups and Task Groups* on the approval requirements for Working Groups, especially within CCs. Some of the wording implies CIPM approval is required, while earlier discussions suggested otherwise. It was proposed that tightening up the terminology to distinguish between Working Groups and Task Groups could help with this inconsistency.

J.-T. Janssen referred back to the earlier discussions on the CCRI Sections and noted that there is no reference to them in §6.1 of the revised CIPM-D-01. The CIPM agreed that this is an important oversight and proposed that they be included. The issue will be discussed further with the CC Presidents.

The CIPM reached a consensus that a full review of CIPM-D-01 is an ongoing task. The current review should focus on completing a basic updated version of the document rather than a comprehensive review. This shall be followed by assigning CC Presidents and Forum/STG Chairs to review unclear areas, harmonize practices, and to propose improvements for a future revision at the next session in June 2026. The President suggested that the next draft of the document should aim to establish usable rules for Forums and STGs, with future refinements being based on practical experience.

The President thanked the Director and the CIPM for their feedback and suggested that the next draft of the revised CIPM-D-01 document could be discussed in a dedicated session with the CC Presidents at the start of the on-line meeting of the CIPM in June.

14. Reports from the BIPM departments

Physical Metrology

M. Stock, Director of the department, presented its Programme of Work for 2028-2031, focusing on stopped or reduced activities, as well as ongoing, new and partnership activities in electricity and mass.

Reduced activities - Electricity

In electricity these are focused on the calculable capacitor, which is currently on hold. The project started many years ago and there has been little progress in recent years due to a staff shortage and other projects being prioritized. Despite its reduced priority, the capacitor is completely mounted with good alignment of the electrode bars. The importance of calculable capacitors has diminished in the revised SI, with priority being placed on quantized Hall resistance instead. The department collaborated with colleagues from the LNE (France) during 2024-2025 to conduct finite element modelling to determine the tolerances required to achieve a capacitance uncertainty of 1×10^{-8}. This project will be presented as a joint paper by the BIPM and LNE at the upcoming CPEM conference but no further work is planned.

Ongoing activities - Electricity

Ongoing activities in electricity include the two on-site comparisons of electrical quantum standards to demonstrate NMIs' capabilities at the highest level to support their CMCs. These are BIPM.EM-K10, an on-site comparison of dc and ac voltages (≤ 1.2 kHz) from Josephson voltage standards (JVSs), and BIPM.EM-K12, an on-site comparison of quantum Hall resistance (QHR) standards and resistance scaling. There are also three bilateral comparisons using conventional electrical BIPM transfer standards for NMIs that do not have quantum standards and as a first step before an on-site comparison. These are BIPM.EM-K11 (voltage at 1.018 V and 10 V), BIPM.EM-K13 (resistance at 1 Ω and 10 kΩ), and BIPM.EM-K14 (capacitance at 10 pF and 100 pF, at 1592 Hz and/or 1000 Hz).

The BIPM.EM-K12 on-site comparison was carried out at the PTB (Germany) and CEM (Spain) in 2025 and at CMI (Czechia) in March 2026. A questionnaire on interest in this comparison was circulated in 2023, with 14 NMIs expressing an interest through to 2030.

M. Stock said that development of a graphene-based QHR standard is ongoing with the long-term goal (2028-2031) of replacing the gallium arsenide (GaAs) QHR standard with graphene to simplify QHR implementation during on-site comparisons and to reduce their cost. In 2023, two devices were provided to the BIPM by the PTB (Germany) to study long-term stability of the charge carrier density. In 2025-2026 the department participated in the CCEM Task Group on Graphene QHR standards (CCEM-TG-Graphene) to develop guidelines with the aim of formally accepting graphene as primary standard.

The BIPM.EM-K10 on-site comparison has been available at ac voltages up to kilohertz since July 2025. A comparison with the PTB in 2025 found agreement within several parts in 10^8. This confirms the operation of JVS at ac at uncertainties well below 10^{-7}, compared to that of conventional thermal voltage converters of about 10^{-6}. A second comparison was successfully

carried out with CENAM (Mexico) in 2025. Two more BIPM.EM-K10 comparisons will be conducted with INRIM (Italy) and NIM (China) in 2026.

M. Stock recalled that the electricity laboratory continues to offer calibrations that provide traceability to NMIs without primary standards, based on the same equipment used for comparisons. This contributes to world-wide uniform measurements in electricity. In 2023, the department received 97 requests for calibrations, its largest number ever. The trend is towards more calibration requests due to new Member States, which in most cases have limited capabilities.

New activities - Electricity

New activities in electricity include development of ac QHR as a primary standard for ac impedance. The present traceability chain from dc QHR to the farad requires many intermediate steps with several standards and measurement systems. Use of ac QHR allows a significantly shorter and simpler traceability chain. More research is needed on frequency dependence of ac QHR. The new system will result in less time-consuming measurements and a smaller uncertainty for capacitance measurements. The project will not require major investments as it will use the same cryostat or cryocooler as for dc QHR. Specially shielded ac QHR samples will be needed and some have already been obtained from the PTB. The system will also use a dedicated home-built quadrature bridge.

Knowledge transfer activities in electricity will be strengthened. The BIPM's on-site comparisons of electrical quantum standards, delivered in the framework of the on-site comparisons of Josephson voltage standards and quantum Hall resistance standards, have an aspect of knowledge transfer because the BIPM staff work intensively with the NMI staff during two-three week periods; the NMIs benefit from this exchange of best practice. The department will also organize a workshop on practical aspects of the operation of electrical quantum standards and related instrumentation, together with experts from the CCEM. The presentations will be made available via the BIPM e-learning platform.

Partnership opportunities – Electricity

M. Stock reported that a partnership opportunity is being investigated to extend the AC-JVS comparison to higher frequencies > 1 kHz. The present technique for ac voltage, based on programmable Josephson voltage standards (PJVSs), delivering stepwise approximated sinewaves, is limited to about 1 kHz. The BIPM is just starting comparisons of PJVSs and there has been demand for comparisons in this frequency range for many years. Signals at higher frequencies (>100 kHz) can be synthesized with a Josephson Arbitrary Waveform Synthesizer (JAWS), which produces a pure sinewave. At present, JAWS systems are not widely available. It is anticipated that there will be future interest for comparisons in this frequency range. The department plans to carry out a study on the interest in and the technical feasibility of on-site comparisons of JAWS systems, in collaboration with NMIs that are experienced in this technique.

Reduced activities – Mass

M. Stock recalled that the BIPM has stopped the fabrication of new platinum iridium (Pt-Ir) mass prototypes. The final prototypes (Nos. 114 and 115) were manufactured for NIM (China) in 2022. The cost of Pt-Ir alloy from Johnson-Matthey has increased to about 80 thousand euros

for 1 kg in 2024, including the manufacturing charge. The BIPM decided in 2025 to stop providing prototypes, acknowledging that the importance of Pt-Ir prototypes has decreased as a consequence of the new definition of the kilogram. Forty-five countries have received at least one Pt-Ir prototype, with some having received up to eight, since 1889.

Ongoing activities – Mass

M. Stock commented that the major ongoing activity in mass is the organization of the CCM.M-K8 comparisons for the realization of the kilogram with Kibble balances and the XRCD method. The comparison has been carried out three times since the redefinition of the kilogram to provide input for calculation of the CCM Consensus Values. It will be repeated at least once more during 2027-2028. There is a preference within the Kibble balance community to continue the comparisons with a periodicity to be determined. This will also provide motivation to continue maintaining and running the Kibble balances.

He said that maintenance and improvement of the BIPM Kibble balance is ongoing as an international reference facility, maintained on a shared-cost basis, and to support a uniform kilogram realization and dissemination. It is currently unclear how many national Kibble balances will be maintained around the world in the long term. The BIPM Kibble balance has an uncertainty target $< 4 \times 10^{-8}$ at 1 kg. The BIPM participated in the third CCM.M-K8 comparison with a $u_r = 3.6 \times 10^{-8}$.

The BIPM is developing a compact Kibble balance, which is easier to use and maintain, and which is based on the experience gained with the established Kibble balance. It will share instrumentation with the established Kibble balance, including the laser, PJVS and digital voltmeters (DVMs). The magnet was obtained in 2024 through a technical collaboration project with Tsinghua University (China). It will implement a common weighing and moving mechanism according to the “Kibble-Robinson theory”, which will simplify alignment for masses at 1 kg and less. It is hoped that it will achieve a lower uncertainty than the established Kibble balance due to the improved ease of alignment.

Mass calibrations remain an important ongoing activity. On average six Pt-Ir prototypes and twelve stainless steel standards are calibrated annually. Calibrations can include determinations of volume/density and centre-of-mass if requested. Mass calibration and comparison services have been provided to 91 % of Member States.

New activities – Mass

M. Stock said that knowledge transfer activities in mass will intensify. The department is planning to organize on-line technical exchanges on themes relevant to Kibble balance design and operation in collaboration with the Kibble balance community. It will also provide advice to new or existing Kibble balance projects, as requested, either on-line or during visits to the BIPM headquarters.

Partnership opportunities – Mass

There is a partnership opportunity to help the BIPM determine the gravitational acceleration in the Kibble balance laboratory. For the Kibble balance it is necessary to know the absolute value of gravitational acceleration within 10 ppb. The BIPM does not own an absolute gravimeter, which would cost about 500 thousand euros and would be used rarely. In the past, the BIPM has collaborated with NMIs, who brought their instruments to the BIPM headquarters to

determine the value. It is hoped that this model can be used again for determinations with a periodicity of approximately every five years.

The President thanked M. Stock and invited questions. He was asked if would be possible to restart the fabrication of Pt-Ir prototypes in the future if there was a requirement to do so. M. Stock replied that it would be possible and the entire process has been documented. C. Denz acknowledged the numerous collaborations with the PTB and noted the importance of knowledge transfer for the proposed new activities, for example comparisons using graphene-based QHR standards. P. Richard stressed the importance of continuing the work to improve and develop the BIPM Kibble balance. He asked which Member States will benefit from the work on the compact Kibble balance and if it is an activity for the majority of them. M. Stock replied that the whole mass community will benefit from having an operational Kibble balance at the BIPM. The existing apparatus is complicated to use and that was part of the inspiration to build a smaller, less-complex version, which in the long term, may replace the established balance. The knowledge and experience gained from developing the new apparatus will be shared with the Member States. In addition, the whole mass community will benefit by knowing that the BIPM will continue to participate in future comparisons. He added that it is an open question as to how many of the seven currently operating Kibble balances will exist in 10-20 years, and discussions are under way on this topic. D. del Campo Maldonado commented that it is important to emphasize that the BIPM Kibble balance gives access to a primary realization of the kilogram that is independent and available to all Member States. M. Stock added that the department envisages using the compact system for knowledge transfer activities, possibly by inviting people to come to the BIPM headquarters to work on it, which is difficult with the existing system because of its complexity.

Time

P. Tavella, Director of the department, presented its Programme of Work for 2028-2031, focusing on ongoing, new and reduced activities, partnership opportunities, and activities that may be at risk and the options. Stakeholder engagement was also presented.

Ongoing activities

P. Tavella said that the realization of Coordinated Universal Time (UTC), Rapid UTC (UTCr), Terrestrial Time (TT) and the key comparison CCTF-K001.UTC will continue. There are currently 94 laboratories from 71 countries that participate in UTC and UTCr, although not all laboratories contribute every month. Most Member States participate and 14 Associates; an additional six Associates have expressed an interest.

New activities

P. Tavella noted that there is a need in the Work Programme 2028-2031 for *Circular T* to address the increasing needs of NMIs. This will underpin the efforts of NMIs and RMOs to identify and deal with the requirements of their users for traceable and resilient time synchronization in an equitable and efficient way. The department has seen increasing interest in UTC particularly during the UTC Summer School. Contributing to UTC requires high-quality clock and time transfer measures. Some countries need a millisecond dissemination service as a Network Time Protocol (NTP). In such cases they do not need caesium clocks, but a commercial low-accuracy atomic clock. They can receive this type of traceability to UTC through another country

generating UTC(*k*) or they could form a new category of "observer" sending data to the BIPM and being evaluated versus UTC, without contributing to UTC and without requesting the BIPM to check the data quality. The best solutions will be explored with RMOs and NMIs in the CCTF Working Groups.

The availability, accuracy and reliability of UTC, UTCr, TT and CCTF-K001.UTC will undergo continuous improvements. This will be achieved via new types of clocks and primary frequency standards (PFS) as well as through higher resolution in computation. Novel techniques in time and frequency links will be adopted.

There will be increasing automation and improvement of digital data processes to provide a wider range of services to support NMIs, the CCL and the CCTF in their roles. Digitalization of time and frequency activities will continue using a Python library with open-source software.

Reduced activities

P. Tavella commented that there are few activities in the department that can be reduced. It conducted a survey in 2025 among UTC laboratories and general users asking which of the UTC products they actually use. The idea was to identify products and services that are not regularly used and which could be interrupted. The result is that the Time Department will reduce the number of products based on manual activities. There will be an exercise to automate the tasks that are either manual or which require manual checking as much as possible.

Partnership opportunities

P. Tavella said that the evolution of BIPM timing products to support NMIs' contributions to the space-based projects of national or international space agencies will require the establishment of joint projects to support this activity. The BIPM may have a new role in coordinating Lunar time. The department will explore possible joint projects with space agencies through a student or secondee at the BIPM.

The extended use of optical frequency standards (OFS) in time scales will require support from the NMIs in the use of OFS in national time scales and UTC by defining data exchange formats and protocols, as well as adapting data treatment algorithms. A commercial portable optical frequency standard has been offered to the BIPM that could become the "international travelling standard" to start a new key comparison. It would be used to visit different laboratories to compare with their OFSs and to set up a "continuous" and "international" comparison campaign by transporting the portable OFS to the different laboratories, particularly where no fibre network exists. It could have the added benefit of contributing to UTC each month. The Time Department will explore a pilot project and then a new key comparison with the involvement of the donating company and NMIs by sharing the cost through expert staff, secondees, equipped laboratories, logistical and financial support.

The Time Department will continue to develop capacity building and knowledge transfer initiatives in time and frequency to support (inter)national timekeeping. This will allow improvements in UTC and national time scales UTC(*k*) by allowing UTC laboratories to validate the data contributing to UTC, providing software tools and exchanging best practice. The CCTF CBKT plan is based on using shared resources. CBKT initiatives in the Time Department will be via e-learning courses delivered with interactive software, summer schools and seminars, as well as on-line technical exchanges. An overview of recent UTC summer schools was presented.

Activities at risk and the options

P. Tavella said that in the event that joint projects, secondees or students/PhDs/Post Docs are not supported due to budget constraints, all projects that require a secondee will either not be started or will be carried out in a reduced form. Planned new developments to the scientific algorithms, for example new clocks and new time transfers, and those in the support of the NMIs' network will be limited. In addition, activities requiring joint projects will not be activated. Finally, the CBKT activities, summer schools and technical exchanges will be at risk.

P. Tavella gave a brief summary of the possible risks associated with the current geopolitical situation to the provision of UTC.

Stakeholder engagement

The Time Department will reinforce its liaisons with:

- IOs representing timing users, for example the International Telecommunication Union Radiocommunication Sector (ITU-R), International Telecommunication Union Telecommunication Standardization Sector (ITU-T), Institute of Electrical and Electronics Engineers (IEEE) and International Committee on Global Navigation Satellite Systems (ICG). Draft Resolution C of the 28th meeting of the CGPM *On the technical actions needed to ensure the continuity of UTC* will be endorsed at the ITU World Radio Conference 2027 and in the associated standardization process.
- IOs related to time keeping and time and frequency metrological standards, for example International Association of Geodesy (IAG), International GNSS Service (IGS) and International Earth Rotation and Reference Systems Service (IERS).
- Scientific bodies, for example the SKA Observatory (SKAO) and space agencies to ensure UTC is recognized as the consistent and useful time reference, or suitable time scales traceable to UTC are identified.
- Organizations of industries and their forums to maintain and extend the connections with industrial users to understand and fulfil their needs.

These reinforced liaisons will encourage the implementation and adoption of Draft Resolution C (2026).

The President thanked P. Tavella and invited questions. She was asked to clarify the situation regarding proposed new projects. A number of new projects were presented but it appeared that they can only go ahead if adequate resources are available, for example the donation and operation of a commercial portable optical frequency standard. It was suggested that if it is likely that a new activity will not start, it would be prudent to not mention it as a new project. P. Tavella said that the donated optical frequency standard could be used in a novel way. The initial idea to host it at the BIPM in a suitable laboratory was abandoned because it would be too expensive to set up a laboratory and to have a dedicated team working on the apparatus. The new proposal is not to keep it at the BIPM, but to organize a new comparison whereby it would be continuously transported around the world. A portable standard is one of the methods used to compare optical standard, so the BIPM considers that a key comparison, run by the BIPM could be useful, because it will be truly international. The BIPM would be responsible for organizing the transport of the clock around the world.

Chemistry

R. Wielgosz, Director of the department, presented details of its Work Programme for 2028-2031. The presentation focused on activities that can be reduced, are continuing and new activities. It also covered partnership opportunities, activities that are at risk and the options. Stakeholder engagement was outlined.

He began by giving an overview of participation in the Chemistry Department's programme. A total of 49 out of the 64 Member States, six Associates and three IOs participate in its activities. Thirty-two of the Member States have sent visiting scientists to the BIPM Chemistry Department since its creation, with close to 100 visiting scientists from the NMIs having been hosted, with a growing number externally funded. This support allows the department to conduct a comprehensive programme of work and provide output and impact that is important to the measurement community.

Reduced activities

The department's large-scale multilateral gas standard CCQM key comparison coordination activity is being replaced with on-going BIPM comparisons that require reduced resource requirements. The CCQM-K82.2023 key comparison (CH_4 in air) is the last large-scale multilateral gas standard key comparison coordinated by the BIPM and was completed in 2025. The BIPM.QM-K2 key comparison (CO_2 in air) provides an example of the bilateral key comparisons now coordinated by the BIPM.

Ongoing activities

The BIPM.QM-K1 (surface ozone standards) comparison continues, with the implementation of a new ozone cross section value world-wide being completed last year. The department's key comparisons on CO_2 and methane continue: BIPM.QM-K2 (CO_2 in air/N_2), BIPM.QM-K3,K4 (CO_2 isotopes), BIPM.QM-K5, K7 (CO_2/CH_4 scale standards and GHG-DB), and BIPM.QM-K6 (NO_2 in N_2 standards) will also continue. The facilities for these comparisons were developed with the support of NMIs, for example with NIST (USA) and RISE (Sweden) for the CO_2 and air, and the University of Colorado/National Oceanic and Atmospheric Administration (NOAA) and the VSL (Netherlands) for the database for scale standards. These facilities provide NMIs with on-demand comparisons against fully validated and stable references at the BIPM.

R. Wielgosz said that the department's work as a "centre of excellence for purity measurement" for small and large organics will continue, coordinating comparisons for pure standards and pure solutions that are the basis of metrological traceability for chemical and biochemical measurement. These pure materials are at the top of the calibration hierarchy chain providing traceability for reference methods and matrix materials. The BIPM's role as a centre of excellence is supported by NMIs around the world, who send visiting scientists, both to add to the programme and to learn from it. He presented the CCQM Working Group on Organic Analysis (CCQM-OAWG) comparison model for small organic purity and the CCQM Working Group on Protein Analysis (CCQM-PAWG) comparison model for protein purity. The CCQM key comparisons coordinated by the BIPM are for primary small organic CRMs (CCQM-K148 series), primary small organic calibrator solution (CCQM-K78 series) and primary protein CRMs (CCQM-K115 series).

Another major ongoing commitment by the Chemistry Department is its role in providing the secretariat for the Joint Committee for Traceability in Laboratory Medicine (JCTLM) database for

in vitro diagnostic standards. The department has a database coordination and maintenance function, as well as organizing the yearly review cycle.

The department will maintain its CBKT programmes, which are derived from its laboratory technical work. Upcoming on-line technical CBKT initiatives for chemical and biochemical standards are in the areas of gas standards, small organic standards and large molecule standards. The department also organizes summer schools, for example the qNMR summer school held on 24-28 June 2024. The department has received offers of sponsorship from instrument manufacturers, standard manufacturers and the pharmaceutical industry to sponsor these schools.

R. Wielgosz said that there is a trend to move away from artefact-based standards for certain chemicals to digital-based standards. Comparisons will be needed to support the introduction of these chemical digital standards. The Work Programme 2028-2031 includes digital standard comparisons for qNMR. In order to apply these new standards, which are being introduced, for example by the United States Pharmacopeia (USP) and pharmaceutical companies, it is necessary to have validated data based on real measurement data and reference materials provided by NMIs, and the BIPM's comparisons will continue to support that evolution. This work will include supporting new products from NMIs, which will be used as validated data to support new models in the future. (See the presentation on *Digital standards in chemical metrology* below for more details).

New activities

R. Wielgosz recalled that the BIPM's ongoing comparison of ozone standards is the oldest comparison it operates, with over 20 years of consistent measurement data. The system works perfectly, which has initiated discussions on the model and frequency of comparisons to be applied for such stable standards. Modelling of the global network of ozone standards through a "digital twin", is a newly proposed work item, that will allow the efficiency of the comparison model to be checked and optimized. New tools for modelling a digital network and predicting how standards will change within a network is expected to allow the BIPM to transition to a more efficient comparison model with fewer optimized comparisons.

The department will investigate the application of AI to support JCTLM processes. The possibility of using large language models (LLMs) to search and enter relevant information will be included in this study. The JCTLM process relies on comparing data and publications against well-defined requirements and ISO standards; the hope is that AI could be used to streamline this task. It would also reduce time spent on data entry by submitters and review by experts.

The Chemistry Department will increase the scope of comparisons to support biotechnology and bioengineering and the CCQM Working Group on Nucleic Acids (CCQM-NAWG) (CCQM-K199 Series). This will involve DNA/RNA primary reference calibrator comparisons that will use the same methodology and existing instrumentation that is currently used for proteins. The development of digital polymerase chain reaction (d-PCR) technology over recent years has enabled new calibration hierarchies with high-concentration DNA/RNA pure materials to be developed with such materials now being produced by NMIs and requiring interlaboratory comparisons. (See the presentation below on *Metrology support for health and biotechnology* for more details).

Traceability for isotope delta measurements will be carried out through improved international standards for CO_2 isotopes. The BIPM currently provides CO_2 isotope gas standards for NMIs.

There are currently multiple $\delta^{18}O$ scales and the carbonate oxygen scale system for CO_2 is not optimal. Linking $\delta^{18}O$ to the Vienna Standard Mean Ocean Water - Standard Light Antarctic Precipitation (VSMOW-SLAP) scale would be made possible with a new facility. These new gas standards would provide the lowest uncertainty realization of scales for NMIs. This is an additional project that will start if support is available.

Partnership opportunities

R. Wielgosz said that 13 out of the of 14 activities that the Chemistry Department will run in the Work Programme 2028-2031 have opportunities for NMI visiting scientists. A further six activities have opportunities for joint technical projects with NMIs. At least three activities foresee stakeholder contributions: the JCTLM, a gas standards CBKT initiative and a qNMR Summer School.

Activities at risk and the options

R. Wielgosz outlined three risks to delivery of the Work Programme 2028-2031 and the possible mitigation options.

The department has a high reliance on visiting scientist input. Annual calls to NMIs for visiting scientists is very successful. At present there is high uptake among the NMIs to provide visiting scientists and the BIPM is benefiting from increasing financial support from the seconding institutes. In 2026 there have been eleven visiting scientists from nine NMIs. Seven of these scientists were funded entirely by the NMIs.

The department has a reliance on joint technical projects (JTPs). The possibility of these JTPs ending or being reduced can be offset by promoting the “win-win” value proposition for NMIs. There is a high uptake of proposals for JTPs and many will continue from the Work Programme 2024-2027. A list of the JTPs under way in 2026 was presented.

The possibility of large capital equipment either breaking down or becoming obsolete presents a risk. This threat is mitigated by having a robust purchase and replacement strategy. This strategy includes replacement of the NMR apparatus in 2026. The risk is also mitigated by having fit-for-purpose maintenance contracts.

Stakeholder engagement

R. Wielgosz finished his presentation by listing the stakeholders with which the department is engaged under the headings of IOs with measurement and related programmes, direct engagement and indirect engagement. He handed over to C. Robertson from the Chemistry Department to present further details on digital standards in chemical metrology.

Digital standards in chemical metrology

C. Robertson’s presentation outlined the rationale, development and future direction of digital standards in chemical metrology, with a focus on reducing reliance on physical Certified Reference Materials (CRMs) and enabling more efficient, scalable measurement systems.

A driver for this area of digitalization is the pressure facing NMIs, based on the increasing complexity of systems and the number of analytes for novel CRMs that require expensive and time-consuming development. There is also growing demand for faster validation of these broad

and complex systems as well as requirements for new methods and services in validation, certification and uncertainty evaluation of digital applications.

Digital standards represent a cost effective and disruptive technology to support potential new NMI services by reducing the need for physical CRMs and new validations for every analysis.

The BIPM has led the work to address these needs in collaboration with NMIs, notably the NMIJ (Japan). This work has focused on reducing the number of required physical CRMs, for example through the development of the "Octad" of CRMs[6] and the application of quantitative NMR (qNMR) in comparison studies since 2023. These developments build on earlier infrastructure investments in NMR capabilities.

The transition towards digital standards involves generating digital reference materials (DRMs) from experimental spectral data derived from a single physical CRM. These DRMs can be distributed and reused across laboratories, maintaining traceability and validation while significantly reducing material dependency. This represents an intermediate step toward full digitalization.

A more advanced stage involves *in-silico* generation of quantum mechanical derived reference materials (QMRMs) to create these digital reference materials without requiring a physical artefact. Advances in computational power enable this approach, offering improved transparency, auditability and SI traceability. However, such methods require validation through CCQM comparison studies to ensure fitness for purpose.

The benefits of digital standards include faster certification for CRM providers through standardized metadata; reduced material dependency and flexibility for the pharmaceutical industry; more transparent auditability for regulators; and improved reproducibility, Inventory ease, and reduced costs for laboratories.

These advantages are particularly relevant for the pharmaceutical industry, which is actively pursuing digital laboratory transformation, as well as for regulators seeking robust and auditable data frameworks.

Future NMI services for the Digital Standard Infrastructure (DRMs and QMRMs[7]) will include validated digital assets, validated measurement workflows, metrology documentation and infrastructure outputs (for example spectral libraries).

The impact of digital standards in chemical metrology will be enhanced through BIPM and CCQM coordination of well-defined comparisons to underpin new methods derived from the BIPM's CRM Octad activities. The BIPM will provide support to NMIs for service provision in digital standards through qNMR summer schools, forums and Task Group workshops. Finally, the BIPM will organize liaison activities between NMIs and stakeholders, for example Pharmacopoeias and the pharmaceutical sector by harmonizing strategies and developing networks through participation in activities such as panels, conferences and expert groups.

The President thanked C. Robertson and opened the floor to comments. C. Denz stressed that the work on digital standards in chemical metrology should be coordinated with the

[6] A universal suite of eight higher order SI-traceable primary standards, the Octad, for the purity assignment of essentially any organic compound using qNMR in any solvent.
[7] Quantum mechanical derived reference materials: a validated *in-silico* model used as a reference material.

FORUM-MD. R. Wielgosz confirmed that the CCQM Task Group on Data Digitalization (CCQM-TG-DD) fed directly into the activities of the FORUM-MD.

Metrology support for health and biotechnology

G. Martos from the BIPM Chemistry Department said that modern healthcare increasingly depends on accurate, reliable and comparable measurements, which form the basis of clinical diagnoses, therapeutic decisions and the development of new medical products. Metrology plays a central role in ensuring this process.

The *in vitro* diagnostics (IVD) industry requires internationally equivalent calibrators; without these, innovative diagnostic and therapeutic products cannot be effectively benchmarked or validated. Metrology supports the translation of technological advances into clinical practice by enabling consistent and trustworthy measurement results, ultimately improving patient outcomes and supporting safe and effective therapies, including drugs and gene-based treatments. The metrology sector achieves this via reference methods and materials that are supported by CCQM comparisons.

The BIPM coordinates the CCQM-K115 purity of peptide and protein primary calibrators key comparison series for the CCQM. Prioritization of which proteins and peptides to measure is guided by clinical needs in collaboration with organizations such as the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC). Current activities include studies on parathyroid hormone, cyclosporin A and monoclonal antibodies.

G. Martos gave examples to highlight the impact of metrology. In Type 1 diabetes research, accurate measurement of C-peptide enables differentiation between endogenous and administered insulin, supporting evaluation of emerging therapies such as stem cell treatments. In nucleic acid analysis, major advances driven by technologies such as digital PCR have enabled a shift from arbitrary units to SI-traceable measurements. New PCR technologies can be calibrated with materials characterized by “orthogonal” approaches such as mass spectrometry and qNMR to ensure measurement accuracy.

The rapid evolution of bioengineering, particularly in DNA, RNA and protein engineering, presents new challenges and opportunities. Advances in protein structure prediction and AI-driven design now enable the creation of novel, programmable proteins with specific functions. In parallel, biofoundries are developing into high-throughput automated facilities that convert genes, proteins and metabolic pathways into desirable biological systems and this can now be achieved at scale. These innovations require robust metrological support, including standards and reference materials to certify the identity, purity and structure in these novel systems.

The NMIs play a critical role by developing reference materials, calibration methods and SI-traceable measurements for biomolecules and bioengineered products. These efforts support a wide range of stakeholders and contribute to improved diagnostic accuracy, harmonized laboratory results, reduced healthcare costs and enhanced biosecurity and outbreak response capabilities. The comparisons within the CCQM-PAWG and CCQM-NAWG coordinated by the BIPM will demonstrate the equivalence of new standards from NMIs.

The President thanked G. Martos and opened the floor to comments and questions. S.-R. Park commented that this is an important area that is developing quickly and also at NMIs. He suggested that the CIPM should not overlook the role that can be played by the NMIs, especially

the larger NMIs, which may have the capacity to provide assistance to the BIPM. R. Wielgosz was asked to expand on the presentation on digital standards in chemical metrology particularly that the work presented would only be feasible if the quantum chemistry models are available, but these models are not available for large molecules. There will therefore be some limitations and the work will require computational facilities at the BIPM headquarters to advance this activity. R. Wielgosz replied that studies carried out so far had been limited to small organics and the BIPM is not going to develop the models and therefore additional computational facilities at BIPM will not be necessary. The models are being developed by private companies, acdaemia and potentially NMIs. The BIPM will continue to provide the comparisons, because there will always be a requirement for a link back to the artefact material to validate the system. The central role of the BIPM is its ability to provide validated data and reference materials. That remains a significant benefit to the BIPM and the NMI community. The BIPM has the technology and know-how of value assignment and running comparisons and this is a win-win scenario for the community and the BIPM.

Ionizing Radiation

V. Gressier, Director of the department, presented the department's plans for the Work Programme 2028-2031. The presentation focused on activities that can be reduced, are ongoing and new activities. It also covered partnership opportunities, activities that are at risk and the options. Stakeholder engagement was also outlined. The presentation included a report by C. Kessler on *Assessment of Options for Replacing the Co-60 Radiotherapy Source at the BIPM*.

Reduced activities

The department has stopped the development of high-energy electron standards at the DOSEO facility, Saclay (France) due to its low priority among the CCRI community. The Asia Pacific Metrology Programme (APMP) has started a comparison to cover the needs in the short term.

The number of SIR Transfer Instrument (SIRTI) measurement campaigns for NMIs will be reduced. However, this will be supplemented by RMO SIRTI measurements.

Ongoing activities

V. Gressier said that the twelve existing comparison services and the eight calibration types in dosimetry will continue. These involve around 100 comparisons and 100 calibrations as per the Work Plan. The CCRI(I) meeting looked into the key comparison framework based on bilateral comparisons between the NMIs/DIs and the BIPM and agreed that the brachytherapy comparison, BIPM.(RI)-K8 should continue in its current form. The department will continue to upgrade, expand and assure long-term sustainability of the services through research and development projects.

The Ionizing Radiation Department provides knowledge transfer and capacity building mainly through webinars and workshops in association with the CCRI; this activity will continue.

He noted that the department has a special relationship with the International Atomic Energy Agency (IAEA) and participates in several of its committees and consultant meetings. The BIPM also provides traceability services to the IAEA and as a consequence to the SSDL network.

New activities

V. Gressier said that the department is planning two new dosimetry services that have been requested by the CCRI(I) community. These are a new x-ray beam quality for diagnostics, probably at 80 keV, and a new low dose rate I-125 brachytherapy service.

Work will start to assure the traceability of the RMO SIRTIs delivered through links to the BIPM SIRTI during international exercises.

The department will extend the number of radionuclides covered by the International Reference System (SIR), SIR Transfer Instrument (SIRTI) and Extension of SIR (ESIR). The extension with the SIR is due to the significantly enhanced sensitivity of the SIR2.0 device, using an Ultra Low-noise Current Amplifier (ULCA) and back-to-back connection between the two chambers. The SIR2.0 will also be able to perform measurements with gaseous radionuclide samples. The SIRTI will undergo dedicated metrological studies and validated cross-calibration with the SIR system for specific short-lived new radionuclides. The ESIR will start to cover beta emitters with impurities and then alpha emitters.

High-quality nuclear data measurements and evaluations will start during the next work programme in coordination with the newly created CCRI nuclear data Working Group.

Development of digital electronics in ionizing radiation metrology will include systems for both the SIRTI and ESIR. A digital data acquisition system will be established for the 4πβ–γ liquid scintillation measuring system at the BIPM. In addition, a BIPM centralized service to compare and validate data analysis methods for digital measurement data is in development and will be made available to the community. Digitalization of ionizing radiation services will focus on automated systems for the production of comparison reports and calibration certificates, and automated measurement processes for one radionuclide service.

The department's new capacity building and knowledge transfer activities will centre on a summer school on radionuclide metrology, which will focus on both primary and secondary standards to strengthen the community and enable new institutes to develop these activities in their own countries.

Partnership opportunities

V. Gressier said that the Ionizing Radiation Department's partnership with the IAEA includes use of its Cs-137 facility for comparisons and calibrations at the radiation protection level. Supplementary CCRI comparisons for radionuclide metrology, co-piloted by the BIPM and the IAEA using reference materials provided by the IAEA are under discussion. The BIPM will work on better coordination between the IAEA in its nuclear data evaluation and measurement programme and the CCRI (through its nuclear data WG). The BIPM and IAEA also collaborate to develop joint events and training activities.

The department has partnered with APMP and the Inter-American Metrology System (SIM) to develop RMO SIRTIs. This may be extended to EURAMET.

Activities at risk and the options

V. Gressier highlighted two risks to delivery of the Work Programme 2028-2031 and the possible mitigation options. Partnerships that have a low likelihood of proceeding should be kept under review, for example the planned RMO SIRTI for EURAMET is not confirmed. In addition, there

are certain critical projects that have high associated costs. In these cases, alternative options should be explored. An example of a high-cost project is replacement of the Co-60 radiotherapy source at the BIPM. The options for the Co-60 source are outlined in the specific presentations at the end of this section.

Stakeholder engagement

The department is supporting engagement of CCRI activities with RCNP (Japan) and iThemba LABS (South Africa), which are facilities that produce high energy neutrons. It will also support CCRI engagement with proton- and hadron-therapy facilities. These relationships are required for the long-term development and sustainability of both high-energy neutron comparisons (up to 400 MeV) and dosimetry comparisons in proton-/hadron-therapy fields.

Assessment of options for replacing the Co-60 radiotherapy source at the BIPM

C. Kessler emphasized the continued importance of Co-60 as a fundamental reference in both radiation metrology and radiotherapy. While Co-60 teletherapy units have largely been replaced in clinical practice by modern technologies such as linear accelerators (producing high-energy X-ray and electron beams) and emerging technologies including proton, ion and neutron therapies, cobalt-60 remains essential for comparison and calibration purposes.

A key requirement in radiotherapy is the accurate calibration of radiation beams prior to patient treatment, specifically in terms of absorbed dose to water. This is achieved using ionization chambers, which must be calibrated in reference dosimetry laboratories. Ideally, calibration is performed in a beam of the same quality as that used clinically; however, due to the limited availability of such facilities, this is often not feasible. Only a small number of NMIs possess linear accelerators, and even fewer can provide traceability for advanced beam techniques.

To address this limitation, a standardized approach is used in which ionization chambers are calibrated in a reference beam quality, denoted Q_o, which is Co-60. The chamber is then used to calibrate a clinical radiation beam of quality (Q), using a “conversion quality” factor (k_{Q,Q_o}) as defined in internationally recognized protocols, such as those developed by the IAEA.

Co-60 is preferred as the reference radiation beam in radiation metrology due to several practical and metrological advantages. It provides excellent long-term stability, reducing recalibration frequency and uncertainty budgets. Installation and operating costs are significantly lower when compared to linear accelerators (LINAC), with a long lifetime of up to 20 years. Furthermore, Co-60 has a high metrological robustness because it is the only radiation beam considered identical among different NMIs; this facilitates international comparisons with reduced uncertainty. Finally it provides a reliable reference quality: international protocols and codes of practice that are used in clinics are based on Co-60.

The presentation highlighted the role of the BIPM in maintaining and disseminating Co-60-based standards. Activities include conducting international comparisons to validate primary standards, calibrating secondary standards to ensure traceability, and providing reference irradiations for different purposes, such as dosimetry audits and dose assessments for industrial applications. These services support both NMIs and the IAEA, which in turn serves a global network of secondary dosimetry laboratories and hospitals. Over the past 15 years, extensive participation in comparisons and calibrations has demonstrated the central role of these services in the global traceability chain.

The BIPM has maintained three reference Co-60 beams over the years to ensure continuity of the services, with overlapping periods to assure the long-term stability of the Key Comparison Reference Value.

The BIPM determinations of the quantities of interest, like air kerma and absorbed dose to water, are the key comparison reference values, which are used to validate national primary standards. Bilateral comparisons run by the BIPM are employed to assess equivalence between NMIs more efficiently than large multilateral comparisons.

The final part of the discussion addressed the future of Co-60 capabilities at the BIPM. The current source is expected to reach end-of-life by 2032 due to regulatory and technical constraints, requiring a decision on replacement or alternative arrangements. Three main options were evaluated.

The first involves replacing the Co-60 source at the BIPM headquarters and continuing to use the LINAC at DOSEO. This would ensure continuity of expertise, infrastructure and service quality. It would have relatively low long-term operational costs despite the high initial investment for the Co-60.

The second option is to use the Co-60 source and LINAC at the DOSEO Facility (CEA). This option has risks associated with dependence on the French regulatory framework and national investment priorities over the next 20 years for both Co-60 and LINAC facilities. There is also a potential risk of increased access costs over time. Other negative factors associated with option two are issues for specific nationalities to access the facility; administrative complexity, including contracts, responsibilities, and scheduling of available time slots; and the risk of reduced service quality, with measurement uncertainties that will be potentially more difficult to maintain at the same level.

The third option involves relocating activities to an international partner facility, such as the IAEA, which may offer cost-sharing opportunities but presents the following challenges. It is an off-site facility located far from the BIPM with associated difficulties for quality assurance and maintenance. There would be administrative complexities, including HR issues, limited responsiveness and lack of continuity in staff. Option three would involve potential disruption of services during the transfer of activities from the BIPM to the IAEA. Finally, there would be the loss of 0.5 FTE within the department (a BIPM staff member will have to work permanently at the IAEA site, while working part of their time for the IAEA), requiring internal reorganization and consequently, a reduced research and development capacity.

A fourth option would involve using Co-60 at the BIPM and a LINAC at the IAEA.

V. Gressier commented that his preference is for Option 1 in the medium term, with the possibility of moving towards Option 4 in the future when the situation becomes more favourable or relevant, for example, following staff changes.

A key consideration is that moving Co-60 capabilities off-site would represent a significant operational shift, reversing the current balance in which most calibrations and comparisons are performed at the BIPM headquarters. This could reduce direct control over core services and impact measurement uncertainty and responsiveness.

The overall conclusion is that the decision should not be driven solely by cost considerations. Strategic factors, including maintaining the lowest achievable measurement uncertainties, preserving institutional expertise, ensuring operational flexibility and sustaining the BIPM's leadership role in international metrology are equally critical.

The President thanked V. Gressier and C. Kessler. He asked the CIPM if there were any comments or questions. There was support from the CIPM for maintaining a Co-60 source at the BIPM headquarters, particularly from India, Australia and the African region. It was noted that geopolitical issues may affect the supply of Co-60 in the future as the sources come from one country. J.-T. Janssen commented that the CCRI consensus is for Option 1 in the medium term, with an eventual move to Option 4. This will allow the department to further develop its relationship with the IAEA.

International Liaison and Communication (ILC)

A. Cypionka, Director of the department, presented its planned activities for the Work Programme 2028-2031.

Ongoing activities

The department's membership activities will continue to focus on discussions with those countries that either want to proceed from being an Associate to becoming a Member State, or those that are interested in becoming an Associate for the first time. The ILC Department is also engaged with Member States and Associates that are at risk of suspension or exclusion due to non-payment of contributions or subscriptions. The ILC Department engages in bilateral discussions with any country that faces possible suspension or exclusion to find solutions to ensure that, in the best case, they pay and remain in the organization.

The department will continue to organize NMI Directors' workshops and will maintain the relationship between the BIPM and the RMOs. The latter includes a commitment to report on BIPM activities in RMO General Assemblies and to provide a platform for the RMOs to collaborate and create synergies. This activity has started, with an initiative to connect the various RMO Secretariats.

Liaison with other International Organizations will continue. The BIPM's main partners are quality infrastructure (QI) organizations, for example the International Organization of Legal Metrology (OIML), International Organization for Standardization (ISO), and the new joint International Accreditation Forum (IAF) and International Laboratory Accreditation Cooperation (ILAC) organization[8]. The department also liaises with broader international bodies including the United Nations Educational, Scientific and Cultural Organization (UNESCO), United Nations Industrial Development Organization (UNIDO), United Nations Economic Commission for Europe (UNECE), United Nations Framework Convention on Climate Change (UNFCCC), Organisation for Economic Co-operation and Development (OECD) and the World Trade Organization (WTO). The BIPM participates with these IOs via meetings and reporting, where it promotes quality infrastructure and metrology to these organizations. The ILC Department will continue to pursue activities, such as joint events, studies and publications that will highlight the role of metrology in different areas of application.

A. Cypionka reminded the CIPM that the ILC Department supports the entire CIPM MRA system by providing the secretariat for the Joint Committee of the Regional Metrology Organizations and the BIPM (JCRB). The JCRB Secretary and the KCDB team carry out a considerable amount

[8] Now known as the Global Accreditation Cooperation Incorporated (Global ACI)

of work throughout the year, not only in dealing with requests from users and stakeholders, but also maintaining the KCDB as the central database for the CIPM MRA.

The department's communication and publication priorities will be to continue to maintain the website, including the addition of articles and videos. This content will be made available to share with NMIs and RMOs, particularly those that do not have communications staff. The department will continue to collaborate with RMOs and IOs to promote metrology and with the OIML and RMOs on World Metrology Day. The BIPM and OIML will meet in June 2026 to discuss ways to improve the delivery of the World Metrology Day campaign. The communications team will maintain its publication of reports and documents, including translation and assigning DOIs to improve their findability.

A. Cypionka said the capacity building and knowledge transfer (CBKT) programme will continue its activities to support CIPM MRA users through on-line, in-person and e-learning courses. Additional courses will continue to be added to the e-learning platform. The CBKT team will also conduct capacity building initiatives for digital services at the BIPM as requested by the FORUM-MD. Capacity building activities for the scientific departments include workshops, summer schools and e-learning courses. The department is investigating how to streamline the activities around the CBKT framework to make the programme even more efficient and to further improve the way in which the resources are used. There is a proposal to present the CBKT initiatives of all BIPM departments as one through an "all-of-BIPM" framework. A needs assessment and evaluation of the activities will be carried out so that the CBKT initiatives are on an equal basis for all.

Two CBKT initiatives that have been particularly successful are the interdisciplinary summer schools, for example the Varenna summer school, and the TÜBITAK UME Laboratory Placement Programme. Further summer schools with other physical societies are being considered and the Laboratory Placement Programme is a concept that can be transferred to other NMIs.

A. Cypionka said that digitalization activities are making good progress. Work has started to build the SI Reference Point, the broader SI framework with the necessary architecture and the web interface. The team is collaborating with partners in the FORUM-MD to ensure that digital services are promoted and aligned with their needs. The BIPM recently conducted a second needs assessment with the NMIs to provide a platform for digital services; this will be developed with the necessary infrastructure for the CCs and the NMIs to work together. For example, as new activities progress towards expanding the ontologies that are available in the SI Digital Framework, an important point from Draft Resolution E is to enable the conversion between the SI and other vocabularies to support large sensor networks, or the work that NMIs conduct on large sensor networks, through the BIPM's services. The BIPM provides the logical platform to align this work and to provide a technical infrastructure, which can be hosted in an impartial way that is accessible for everybody.

The BIPM has a small team working on digitalization, so it will not be possible to provide all the services that are requested, for example by the FORUM-MD at the BIPM headquarters. The BIPM relies on the NMIs for assistance in this area, which is an approach similar to the CCs, where not all the work is done in at the BIPM headquarters, but via a joint work plan. The BIPM will require particular support from the NMIs in the area of digital transformation and for the development of the KCDB 3.0.

New activities

A. Cypionka said that membership activities will include a new task to work with potential "observers" assuming that Draft Resolution A *On universal adherence to the Metre Convention* is adopted at the 28th meeting of the CGPM.

The BIPM may have a future role in supporting some of the administrative tasks within the RMOs through the provision of a web-platform for certain tasks. The ILC Department is also monitoring the current geopolitical situation and how it may affect the ability of certain countries to participate in RMO activities.

The department has a particular aim to intensify its work with UNESCO. The BIPM signed an updated MoU with UNESCO in December 2025. Work has started on a four-year work plan with UNESCO and it is envisaged that the BIPM will collaborate on activities for capacity building, especially developing tools for educators. The BIPM intends to expand activities around World Metrology Day in collaboration with UNESCO. The proposal is to organize joint events with UNESCO in different regions around the world on a rotating basis.

A. Cypionka recalled the presentation on the Work Programme 2028-2031, noting that a major update or redesign of the KCDB is planned to make it fully machine-actionable. This project will require extensive consultation with users and database experts and will start as soon as possible.

The Work Programme 2028-2031 includes a plan to update the BIPM website. The website currently combines a classical outward-facing information site, interlinked with the BIPM document management system. There are sound technical reasons to separate these two parts in the future. The funding for the update has been included in the budget plan for the next work programme, although it may not be possible to undertake this step during 2028-2031. However, plans remain in place to update the outward-facing part if there is insufficient budget to technically separate the documents and create a document repository or document management system. The full update would be deferred until 2032-2035.

The department will need to develop capacity building assistance for observers, but it will not be possible to fund this from the BIPM's resources. The BIPM is seeking collaboration partners such as IOs that already work with these countries and NMIs that have specific programmes for technical assistance.

Stakeholder engagement

The ILC Department has significant engagement with the BIPM's stakeholders, with most of its projects involving RMOs and liaison organizations. The department will strengthen its cooperation with UNESCO and UNIDO during the Work Programme 2028-2031 and also with the other signatories of the Joint Statement of Intent on the digital transformation in the international scientific and quality infrastructure (JSI).

Reduced activities

A. Cypionka highlighted the ILC activities and services that are scalable and could be reduced in scope or stopped depending on the available resources and the level of commitment from project partners. These activities could include a reduction in preparation of communication materials; a reduced number of training and e-learning courses; fewer promotion and awareness events held with other IOs; and fewer studies published with other IOs.

Activities at risk and the options

A. Cypionka presented the risks that could affect delivery of the Work Programme and options to mitigate the effects. She commented that ILC is different to other departments, in the sense that its programme relies on external partners for many of its projects. Working with IOs and the RMOs requires flexibility. The department remains engaged with these organizations, and then looks for the right opportunity to work with them.

Risks and mitigation options include the fact that support for observers will fully depend on external funding; it will be necessary to collaborate with IOs and NMIs that are already supporting these countries. Development of the KCDB, the BIPM website and document repository will depend on technological developments, for example the applicability of AI. The budget is difficult to estimate and a full “needs assessment” of users and outside consultation on possible technical solutions will be required. The developments may have to be implemented in stages if it is too expensive. The Development of new digital services, APIs and ontologies will depend on expertise from NMIs. The BIPM will provide the platform to support or host these services and coordination to enable the best possible synergy. The RMO landscape might change: If support to RMO secretariats (new or existing) or individual Member States is needed, the BIPM should prioritize these activities to maintain the stability of the CIPM MRA.

The President thanked A. Cypionka and invited questions. C. Denz congratulated A. Cypionka on the diversity and significant number of tasks handled by the ILC Department and the efficient way in which the work is carried out. C. Denz suggested that the BIPM’s digitalization activities should be given greater prominence and added that although the digitalization team is small, there are digitalization activities being undertaken in other BIPM departments, so the BIPM’s overall activities in this area are significant. V. Coleman commented on the plans for the KCDB 3.0 and noted that the new version may address some of the technical issues reported at the meeting of the JCRB. She also suggested that the Member States could leverage some of their permanent delegations to UNESCO to help provide greater support, for example for joint educational programmes.

CBKT report to the CIPM

C. Kuanbayev said that the CBKT programme has delivered 81 projects through both on-line and in-person formats, involving approximately 5 600 participants. These activities have been achieved through collaboration with NMIs, RMOs and other international organizations.

He highlighted the successful concept of the “Summer School” in collaboration with the Physical Societies and the proposal to transfer the concept. The Summer Schools have been running in collaboration with partners such as the Italian Physical Society. The last three editions of the Varenna Summer Schools each attracted around 60 participants. The initiative is dedicated to young metrologists with strong scientific potential. The programme addresses current challenges and opportunities in measurement science and involves high-level scientists. Each Summer School provides valuable networking and professional development opportunities and includes short-term project placements at NMIs for a limited number of participants. Following each school, selected participants conducted research at METAS (Switzerland). Summer schools are a strong and proven concept and ready to be further expanded.

The CBKT initiative for joint technical projects with NMIs is a strong and proven concept and ready to be further expanded. The BIPM has demonstrated consistent success over the past nine years with the TÜBİTAK UME project placements and there continues to be high demand,

with approximately 80 application for ten slots in each cycle. This proven concept has strong potential for implementation across different regions; future iterations could be organized on a rotational, regional basis among NMIs to increase accessibility and impact. These joint technical projects support young metrologists at all experience levels in research activities by providing placements in NMI laboratories to conduct research projects. They include lectures on international aspects of metrology, delivered by the BIPM and RMOs and support (in-kind or financial) for participation and mentorship from partner NMIs.

C. Kuanbayev presented plans to extend CBKT collaboration with UNESCO. Many NMIs already collaborate with educational organizations (elementary schools, universities) and support metrology education. However, efforts remain fragmented, with no coordinated international approach coming from the UNESCO programme. Some NMIs have expressed the need for shared educational resources. The BIPM, in collaboration with UNESCO, proposes the development of a common framework for metrology education through a modular curricula from elementary to higher education, involving both NMI experts and education specialists.

The plan would be to create educational materials (interactive learning kits, instructional guides, curricula, etc.) to support students and educators in understanding measurement principles. It would lead to delivery of tailored CBKT programmes (for teachers and young professionals), co-developed with UNESCO. The BIPM would also organize joint outreach events with UNESCO to raise global awareness.

He highlighted initiatives to extend CBKT collaboration with RMOs, OECD, UNIDO and other bodies. These initiatives would contribute to the implementation of Draft Resolution A *On universal adherence to the Metre Convention*. The target groups of UNIDO and the BIPM significantly overlap. Many of the UN Least Developed Countries (LDCs) do not participate in BIPM activities and a number of potential observers are already engaged in the RMOs. Tailored joint initiatives, developed in collaboration with RMOs, UNIDO and other partners, could enhance engagement and participation. The proposed initiatives could also include the development of e-learning courses from project materials. Current activities in the area of e-learning resources related to QI are exploring the publication of an on-line module based on the OECD QI for regulation report. Collaborations with potential partners, including UNIDO, are being explored and formalized. Current activities include the development of case studies on how metrology supports the UN SDGs.

Digitalization Work Programme 2028-2031

C. Paredes presented the BIPM's digitalization Work Programme 2028-2031, which is aligned with Draft Resolution E *On the further digital transformation of the global metrology system* to be submitted to the 28th CGPM.

A central theme in the Work Programme 2028-2031 regarding digitalization is the further development and consolidation of the SI Digital Framework, which extends the role of the Metre Convention into the digital world. It will ensure that measurements are machine-readable and machine-actionable, and will support digital metrological traceability. The SI Digital Framework has a layered structure, with core data services defined by CIPM and implemented by the BIPM with support from the NMIs.

The deliverables in the work programme that will be linked to the SI Digital Framework start with maintaining, updating and developing the necessary ontologies. These ontologies are at the core of the SI Reference Point and denote the formal representations of knowledge for the

machines to apply metrological concepts and to organize the information. The ontologies are delivered by the SI Digital Framework with a coordinated and modular services architecture that allows machine-actionability and application of FAIR (Findable, Accessible, Interoperable, and Reusable) principles to all reference data held by the BIPM, while ensuring integrity of the data.

C. Paredes said that one of the major benefits of making the data FAIR is that it will allow machines to operate without human supervision on that information. An SI Digital Framework will provide an authoritative system to perform conversion between different units of measurement and also between the representation systems of different units. This will ensure interoperability across unit systems and representations.

A survey on digitalization in metrology found that many of the Member States and Associates do not fully understand the benefits of digital services under development at the BIPM. CBKT initiatives will be developed to support users of the BIPM digital services. The BIPM will also find better ways to engage with the metrology community regarding digital developments.

The BIPM will continue to carry out surveys among the NMIs to determine their current needs and advances in digitalization. The BIPM will adapt its services to fit their requirements and provide them with the tools to access digital services. It will also provide a focal point to access other NMI's services, which are important in the wider framework of the SI Digital Framework. The work programme includes a proposal to hold webinars and conferences in collaboration with the FORUM-MD, the JSI Round Table and RMOs. The interoperability of the SI Digital Framework will be improved through additional promotion and liaison with external organizations.

C. Paredes completed his presentation by noting that the Work Programme 2028-2031 includes the development of a fully machined-actionable version of the key comparison database (KCDB). The KCDB holds information on calibration and measurement capabilities (CMCs) and key and supplementary comparisons. The CMCs have been made machine-readable through APIs and data models, but their machine-actionability will be pursued. The KCDB part regarding comparisons is not yet machine-readable; the BIPM is investigating how to remedy this situation, possibly through the implementation of ontologies and by integrating persistent identifiers (PIDs) from both internal SI sources and external systems.

Executive and Meetings Office

C. Fellag Ariouet, Head of the Service, presented the Meetings Office team, which provides comprehensive support for the organization of meetings and institutional activities. The team oversees complex operational processes, including the development of on-line forms that support Quality Management System (QMS) surveys. The team also manages travel and event logistics, catering services, visa support documentation for international delegates and visitor coordination. The Meetings Office contributes to the BIPM's technical administration through the preparation and registration of calibration certificates. This core team is supported by catering, cleaning, and supplementary reception staff, ensuring smooth day-to-day operations across the BIPM site.

One of the main tasks of the Executive Office is the collection of contributions and subscriptions from Member States and Associates, alongside providing the necessary administrative support to allow these payments.

Meeting activity has expanded significantly in recent years. Following the COVID-19 pandemic, the BIPM has successfully transitioned to a hybrid meeting model, combining on-site and on-line participation. This approach has increased accessibility and overall engagement. The number of meetings hosted by the BIPM continues to grow year-on-year and in 2025 it hosted 191 meetings with 10 956 participants (7 587 on-line and 3 369 in-person).

To support this growing trend, several infrastructure upgrades are planned. These include replacing the ageing outdoor "tent facility", modernizing meeting rooms with improved audiovisual systems and introducing flexible, reconfigurable furniture. These investments aim to accommodate different meeting formats, including parallel sessions and hybrid events, while improving overall efficiency and participant experience.

C. Fellag Ariouet said that the Executive Office actively develops strategic partnerships with national and local institutions. Collaborations with organizations such as the *Académie des Sciences* and the *Manufacture de Sèvres* have supported high-profile events, including the BIPM anniversary celebrations. Strong ties with local authorities, particularly the City of Sèvres, provide access to additional facilities and community engagement opportunities, such as hosting public events and participating in initiatives like the *Urban Trail de Sèvres* on 12 April 2026.

A widely distributed institutional leaflet, with 12,000 copies being printed, has been designed for easy translation and reuse by international partners, enhancing global dissemination. The BIPM has further strengthened public engagement through participation in European Heritage Days, attracting nearly 2 900 visitors since 2020, as well as hosting school visits to promote awareness of metrology among younger audiences.

Finally, scientific communication and historical research continue to contribute to the institution's visibility. Academic work, including conferences, publications and collaborative projects, have highlighted both well-known figures and lesser-known contributors to the history of metrology, while fostering partnerships with publishers and international scholarly communities. The book *Le bureau international des poids et measures: 150 ans de mesures pour le monde*, authored by C. Fellag Ariouet and published by Gallimard, sold out of its initial print run of 150 copies following its distribution to bookshops in France.

The President thanked C. Fellag Ariouet and asked for comments. J. Olthoff commented that the significant increase in meeting attendance both on-line and on-site is impressive. However, if this upward trend continues it may indicate where extra resources will need to be applied. C. Fellag Ariouet agreed that there is a trend towards growth in on-site attendance and added the caveat that 2025 was an exceptional year due to the extra people that attended events for the 150th anniversary.

15. Any other business

The Secretary presented a "Note for recommendation to Emeritus Director". He recalled the history of previous nominations as Emeritus Director, their role and guidance covering their attendance at meetings (Decision CIPM/103-32). The President noted that the title of Emeritus Director can only be bestowed on those that complete a full term. Following a discussion, the CIPM agreed that the title of Emeritus Director should be bestowed on Dr Martin Milton.

Decision CIPM/115-9 (2026)
The CIPM bestowed the status of Emeritus Director on Dr Martin Milton.

The President confirmed that Emeritus Directors are bound by the rules of the *Regulations, Rules and Instructions applicable to staff members of the BIPM*.

The Director recalled that full transparency was required for the CIPM's decision to give one of the vases produced for the 150th anniversary of the BIPM to Dr Martin Milton on his retirement. Therefore, for auditing purposes, and to allow the BIPM to track its assets, the following decision was presented for adoption by the CIPM. The CIPM agreed unanimously.

Decision CIPM/115-10 (2026)
The CIPM decided to give one of the vases produced for the 150th anniversary of the BIPM to Dr Martin Milton on his retirement in recognition of his service to the organization.

The Director presented a proposal for having special ties and scarves designed and produced for CIPM members, following a request from the President. The intention is for these to be ready for the 28th meeting of the CGPM in October 2026. The CIPM discussed the proposal.

The CIPM had a comprehensive discussion on the scheduling and organization of a meeting of the outgoing and incoming members of the CIPM following the 28th meeting of the CGPM. It was agreed in principle that a meeting would be held on the Friday following the General Conference. This arrangement is intended to ensure continuity, facilitate initial coordination, and address practical and legal considerations associated with the transition between the outgoing and incoming committees. However, it was also agreed that the detailed structure and purpose of this meeting would be further examined at the June meeting, with input from the BIPM Legal Adviser. The following decision was agreed.

Decision CIPM/115-11 (2026)
The CIPM decided that the existing CIPM and newly elected members will meet on the Friday following the 28th meeting of the CGPM.

16. Closure of the meeting

The President thanked the CIPM members for their contributions and said that he looked forward to seeing them on-line in June and then at the CGPM. He closed the meeting.

Annex 1

D01 Refresh

Changes to accommodate Forums and STGs

Created three sections, one for each type of group

- **Objectives, Responsibilities, Activities and Participation of the CCs**
- **Responsibilities, Activities and Participation of the Forums**
- **Responsibilities, Activities and Participation of the STGs**

No change in all other sections except generalized the language to apply to CIPM 'Groups'

Notes on section related to Forums

- It follows the pattern for CCs, modifications made as appropriate
- Responsibilities of forums: taken from ToR for the FORUM-MD
- Activities of the forums: removed reference to technical activities, e.g. comparisons, uncertainty calculations
- Participation in the forums:
  - We added 'and bodies' to allow for participation of such entities as the JCGM WG1 who would like to obtain a liaison status.

    Organizations and bodies that are not offered liaison status within the context of the Forum will be known as "organizations in cooperation".
  - There is only one class of observer status, obtained on application to the Director and notified to the CIPM.
  - There is no description of the number of delegates and accompanying delegates given in the definitions of members, observers or liaisons. Rather the 'delegates and experts' section has the following which is more flexible that the equivalent section for CCs:

    Members, Observers, Liaisons and Organizations in Cooperation may send one delegate. In addition, the convocation will state the number of experts that may accompany each delegate, as determined by the Forum chair(s) and the BIPM Director.

Notes on section related to STGs

Everything has been left completely flexible

Responsibilities

The terms of reference for a STG will be determined by the CIPM identifying the specific task assigned to the STG and an indicative timeline for completion.

Activities

Activities in support of achieving the task of the STG will be planned by the STG but may include

stakeholder meetings,
foresighting and horizon scanning surveys
reporting.

Participation

Governance and participation models for each STG will be determined by the STG and published in the BIPM website.

Notes on changes to the section related to CCs

- References to the number of delegates and accompanying experts have been removed from the definitions of members, observers, liaisons. The number of delegates and accompanying experts is now only found in the 'delegates and experts' section but is unchanged.
- The two types of observer have been distinguished as 'Permanent Observers' (decided by the CIPM) and 'Member State Observers' (on application to the Director for each meeting).
- The process for application to become a member of the CC is clearly laid out (email to Director, consult with President, may be requested to make presentation to the CC, recommendation to CIPM for decision). No such description is given for Observers but the same process seems to be common practice.
- Discussion needs to be had on the intent of two classes of observer for CCs.

Notes on generalization of language

- It turned out to be not too difficult, mostly achieved by simple substitution of the following:

Before	After
CC	CIPM Group
CC President	President/Chair(s)
CC Executive Secretary	Executive Secretary

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