

Bureau International des Poids et Mesures

Consultative Committee for Ionizing Radiation (CCRI)

Report of the 26th meeting
(29-30 June 2017)
to the International Committee for Weights and Measures



Comité international des poids et mesures

**LIST OF MEMBERS OF THE
CONSULTATIVE COMMITTEE FOR IONIZING RADIATION
as of 29 JUNE 2017**

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W. Louw, member of the International Committee for Weights and Measures

Executive Secretary

Mr José María Los Arcos, International Bureau of Weights and Measures [BIPM], Sèvres

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Federal Agency on Technical Regulating and Metrology [Rosstandart], Moscow

Korea Research Institute of Standards and Science [KRISS], Daejeon

National Institute of Metrology [NIM], Beijing

National Institute of Standards and Technology [NIST], Gaithersburg

National Metrology Institute of Japan, AIST [NMIJ/AIST], Tsukuba

National Physical Laboratory [NPL], Teddington

Physikalisch-Technische Bundesanstalt [PTB], Braunschweig

Official observers

Bundesamt für Eich- und Vermessungswesen [BEV], Vienna

Central Office of Measures/Główny Urząd Miar [GUM], Warsaw

Centro Español de Metrología [CEM], Madrid

Czech Metrology Institute [CMI], Brno

Federal Institute of Metrology METAS [METAS], Bern-Wabern

Government Office of the Capital City Budapest [BFKH], Budapest

Instituto Nacional de Metrologia, Qualidade e Tecnologia [INMETRO], Rio de Janeiro

Institutul National de Metrologie [INM], Bucharest

Istituto Nazionale di Ricerca Metrologica [INRIM], Turin

National Measurement Institute, Australia [NMIA], Lindfield

National Metrology Institute of South Africa [NMISA], Pretoria

National Research Council of Canada [NRC], Ottawa

Slovak Institute of Metrology/Slovenský Metrologický Ústav [SMU], Bratislava

Nederlands Meetinstituut Van Swinden Laboratorium [Nmi-VSL], Delft

Liaisons

European Commission - Joint Research Centre [JRC-Geel], Geel

International Atomic Energy Agency [IAEA], Vienna

International Commission on Radiation Units and Measurements [ICRU]

1– 4 INTRODUCTIONS / RAPPORTEUR / REPORT OF PREVIOUS MEETING

The 26th meeting of the Consultative Committee for Ionizing Radiation (CCRI) was held at the BIPM in Sèvres on 29 and 30 June 2017.

The following were present:

U. Ankerhold (PTB), N. Durny (SMU), V. Gressier (LNE-IRSN), S. Judge (NPL), L. Karam (NIST), J. Keightley (NPL), N.E. Khaled (NIS), J. Kim (KRISS), C. Kottler (METAS), L. Le Noir de Carlan (LNE-LNHB), J.M. Los Arcos (CCRI Executive Secretary), W. Louw (CCRI President), G. Machula (BFKH), F.J. Maringer (BEV), M. Milton (Director of the BIPM), M. McEwen (NRC), A. Meghzifene (IAEA), H.G. Menzel (ICRU), R. Minniti (NIST), N. Moiseev (VNIIM), Z. Msimang (NMISA), C. Oliver (ARPANSA), M. Pieksma (VSL), S. Pommé (JRC-Geel), J. Smoldasova (CMI), J. Stenger (PTB), J. Suran (CMI), J. Wu (NIM), J. Zhang (NIM).

Also present: T. Aalbers (Outgoing Chair RMO-WG), D. Burns (BIPM), S. Courte (BIPM), C. Kessler (BIPM), Mr Haoran Liu (from the NIM detailed to the BIPM Ionizing Radiation Department), C. Michotte (BIPM), M. Nonis (BIPM), S. Picard (BIPM, KCDB Coordinator), G. Ratel (BIPM), P. Roger (BIPM), N. Zviagin (Executive Secretary of the JCRB).

The CCRI President Dr Louw opened the meeting by welcoming all participants and thanking them for attending. A round of introductions was initiated by Dr Milton who welcomed the CCRI. All meeting participants introduced themselves by stating their names and institution affiliation. Following the introductions, Dr Ronaldo Minniti from NIST was appointed as the *rapporteur* and the agenda was formally approved.

The numbering of the sections below followed that of the agenda. The presentations given by the several speakers during this meeting are available online on the restricted BIPM website for working documents.

5 REPORT ON THE 25TH MEETING OF THE CCRI

Dr Louw, the CCRI President, reminded everyone that the report of the 25th meeting had been on the BIPM website for some time and hoped that everyone had an opportunity to review it. He encouraged everyone to provide comments during the meeting if there is anything from the report that remained to be addressed.

6 OUTCOMES OF THE 2016 MEETING OF THE CIPM

Dr Milton, the BIPM director, gave a presentation where he acknowledged that during the past few days all of the important points and decisions from the CIPM had been introduced. Dr Milton acknowledged that Dr Louw had stimulated a good discussion during the morning session of 29 June (the joint “CCRI Strategic Plan 2020-2025 and CIPM MRA Review” workshop) about the CIPM MRA review, which included an important set of decisions and initiatives made by the CIPM. In addition, he introduced the decisions taken by the CIPM on membership and observership.

During his presentation, Dr Milton provided an update on the latest news on the possible revision of the SI. He showed a roadmap that was developed by the CCM and CCU covering the period 2013 and 2018, which includes all the actions expected to be reached by November 2018 by the General Conference. All data that will contribute to the redefinition of constants is due by the end of June 2017 for publication, so considering this, all the actions that were needed to progress towards the redefinition, are now in place. In 2016, the CIPM took several decisions, one of which was the date when the redefinition will be implemented (20 May 2019) to correspond with World Metrology Day. The CIPM has requested the CCs to prepare a document for users, explaining the changes. This is now being done. Dr Milton explained that a resource document was being prepared with the assistance of a group of experts from the NMIs, to be available on the BIPM website, which contains graphics and explanations about the redefinition. This will help facilitate these changes.

Dr Milton summarized some of the issues covered at the 16th meeting of the CCM (May 2017) on the data that will be used in the redefinition of the Planck Constant. The latest data received during the last 6 months were not consistent. He explained the CCM's view on this finding, and that the NMIs could use a consensus value. There is an interim arrangement that will allow the CIPM to move forward with the redefinition in this case. More information is available in the report of the [16th meeting of the CCM](#) on the BIPM website.

7 OUTCOMES OF THE CIPM MRA REVIEW

7.1 Plans for BIPM KCDB 2.0

Dr Louw informed the participants that, during the morning workshop (where some of the people attending the general CCRI meeting had not been present), there had been a discussion on the CIPM MRA review. Among the information presented in the morning workshop had been an update by Dr Picard from the BIPM on development of a new key comparison data base (KCDB). Dr Louw invited Dr Picard to give a formal presentation to the CCRI general meeting, so that all attendees could be informed of the status of this development.

Dr Picard gave an update on the new BIPM KCDB (KCDB 2.0). She explained that there had been a request for a review of the CIPM MRA and a workshop organized to give related recommendations. As a result, the BIPM had issued specifications for the new KCDB based on those recommendations that were in a document (showed in her slide presentation) published in August 2016. The four main topics that were identified for the review of the KCDB based on the recommendations were: better search capabilities within the KCDB; more user-friendly web support including web-based CMC ("Calibration and Measurement Capability") submission and review; and capability for tracking comparisons in real-time.

The CMCs are currently communicated among stakeholders using Microsoft (MS) Excel spreadsheets, available through the JCRB CMC website as well as sent by email, at all stages of the CMC review process. One of the problems with this current setup is that there are several files with potentially different versions of supporting data, which make the process complex. Therefore, to simplify the process, the group had decided to create a more centralized system using a web-based platform to allow the data to remain and be maintained in the same place, allowing different stakeholders to access sequentially the data from this one centralized location. Contrary to what is presently done, this new capability will be used for both intra- and inter-RMO reviews. Access will

be restricted, so people that need access will require a user account. The current practice of submission of CMCs by “batches” of countries will be abandoned to avoid the issue that a delay by one country can impact the review of other CMCs. In the new KCDB, a so-called “risk-based” evaluation will be included, which will allow the application of uncertainty limits to determine if a review is required. In response to a request from the working group, the software will include a mechanism to allow down-selection of CMC reviewers (to avoid multiple reviews of the same CMC) by sending the CMCs for review to selected members only. During comparisons, Pilot laboratories will be requested to update information to allow real-time tracking of such comparisons. This information will be available to management. Dr Picard requested assistance from all CCRI sections to improve the thesaurus. The search facility will also include numerical data, which is included in the database but is not searchable at present. Dr Picard concluded her presentation by informing all attendees that there is a need to decide a time scale to transition from the current KCDB to the new KCDB. In deciding this timeframe, the target date for implementation of November 2018 should be remembered.

Dr Louw thanked Dr Picard and asked if she could provide the timeframe proposed so far. He also asked when the KCDB developers would require input from the CCRI. Dr Picard replied that a suitable service provider is being sought and the programming should start in the September/October timeframe. Comments from the CCRI need to be sent as soon as possible and not later than February 2018. This is the last possible date for the CCRI to provide comments.

Dr Louw recalled that the CCRI section chairs have been asked to review the service categories and that input on the templates should be given by the CCRI. The chairs were urged to provide this information as soon as possible so that it can be passed on to the KCDB software developers in time. This is especially the case if any change to the templates are expected to have a significant impact.

Dr Karam, (NIST and Section II Chair) asked for clarification as to who the feedback should be sent to: Mr Los Arcos (the current CCRI Executive Secretary) or Dr Judge (the incoming CCRI Executive Secretary). Dr Louw replied that if any input is sent during August it should be sent to both Mr Los Arcos and Dr Judge. After August, which is when Dr Judge will become the CCRI Executive Secretary, it should be sent only to him.

7.2 Issues specific to the CCRI

In this section of the agenda, a summary of the discussions on the CIPM MRA review that took place during the morning CCRI and CCRI(I) Joint Workshop, was discussed.

Dr Louw started by summarizing the first point discussed, which was Action item A1A from the CIPM MRA review: the Consultative Committee strategy documents must clearly define the long-term timetable for key comparisons including the repeat cycle. He reported that the CCRI strategy will be refined after this week’s meetings. The RMO TCs should also plan regional key comparisons strategically. As discussed in the workshop, all the Sections have a long-term timetable, as do most of the RMOs (there had been an update during the Workshop held earlier on the APMP’s timetable). The status of the timetables for AFRIMETS and COOMET was outlined. Dr Louw requested the RMO WG chairs to include the reports of the RMOs in the report of this meeting as well as in the section reports with the timetables, and asked if this could be sent during the next two to three weeks to Mr Los Arcos (current CCRI Executive Secretary). Following this summary, Dr Louw opened the floor for questions. No questions were asked.

Dr Louw mentioned that, during the Section meetings, there had been discussion on the number and type of participants in the key comparisons. There had also been significant discussions in the Sections, and in the workshop held on the morning of 29 June, on reviewing the expression and consistency of the CMCs, including a discussion on the EURAMET proposal, “Revised Scheme for the CMCs for Radioactivity, Dosimetry and Neutron Radiation.” Dr Louw will communicate the results of these discussions within the CCRI, and the action items identified to the CIPM in October 2017. He will also inform the CIPM that the schedule for concluding the review of the CMC process is February 2018.

There were discussions on the issue of the result of key comparisons and that it should be interpreted as widely as is reasonably applicable. CCRI Section II is working on a proposal to group comparisons of reference materials by basing it on what had been done for the primary measurements in the Measurement Method Matrix (MMM). There was a discussion on how to apply this even further. The Secretariat will make the relevant documents available from the other Consultative Committees that are doing a lot of work in this respect, such as the CCQM. The goal is to make the entire process more efficient. Dr Louw reported on the extensive discussion that took place during the CCRI(I)-CCRI Joint Workshop on how to address the issue of calibration services and how they are reflected in CMCs. This discussion had focused on whether there should or should not be one CMC entry per calibration service, or if the calibration services should be listed somewhere other than in the CMCs. Based on these discussions, the CCRI will work on this topic over the next few months. As a final item on this topic, Dr Louw reported that, in the next few weeks, an interpretation document for the support of CMCs will be finalized. The document is from the CCRI RMO Working Group on IR CMCs (RMOWG). Dr Louw added that the President of the CIPM has requested that all Consultative Committees need to have an interpretation document for CMCs and that it must be published in an open forum of the website. Dr Louw then invited Dr Karam, Chair of Section(II), to provide a presentation on the interpretation document on CMCs for CCRI.

Dr Karam presented the current draft interpretation document on how to support the CMCs. The interpretation document is only two pages long and is available to all CCRI members in the working area of the BIPM website. The interpretation document includes a quote from the document CIPM MRA-D-04 which says that the CIPM, through the JCRB, requires that CMCs submitted for publication are accompanied by an RMO report indicating that the local Technical Committee/Working Group has approved the range and uncertainty of said CMCs and that each one of them is supported by a fully implemented Quality System.

Dr Karam explained that there are six different ways that the CMCs can be supported and it is important to realize that there is no hierarchy in these six sources of evidence for supporting CMCs. These six sources are:

- Results of key and supplementary comparisons
- Documented results of past CC, RMO or other comparisons (including bilateral)
- Knowledge of technical activities by other NMIs, including publications
- On-site peer-assessment reports
- Active participation in RMO projects
- Other available knowledge and experience

Dr Karam emphasized that any one of the six sources of evidence listed above (included in the interpretation document she presented) are useful for supporting the CMCs. There is no need to have all of them although we probably can all agree that the results from key and supplementary comparisons are the ideal type of evidence because it is through those comparisons exercises that we get the full metrological evidence for each NMI's CMC claims (including uncertainty budgets, measurement ranges, measurement methods and traceability). Dr Karam encouraged the attendees to provide feedback on this interpretation document.

There was a comprehensive discussion on the CMC review process within CCRI Section II. To interpret how a CMC is reviewed, Dr Karam quoted a phrase from guidance document [CIPM MRA-G-02](#), "Guidelines for the monitoring and reporting of the operation of quality systems by RMOs," and explained this quote: "The quality management systems implemented to support the calibration and measurement capabilities of the NMIs and DIs must undergo a full review with a period not longer than five years". However, this five-year term applies to the review of the Quality System and not the CMCs - instead, the CMCs published in the KCDB undergo continual monitoring to ensure their validity. As part of the Quality System reviews, the CMCs are also reviewed. In fact, as the CMCs are the major component of the NMI's quality system, the five-year review for the NMI's quality management system includes a review of the supporting evidence for CMCs. Individual RMOs are responsible for the review of the Quality Management system; for example, SIM operates a Quality System Task Force, which performs the review of the Quality Systems of all NMIs and DIs within SIM.

Dr Karam read a section of the two-page interpretation document where it states that: "*This comprehensive periodic review includes examination of evidence to the continued validity and vitality of published CMCs*". Dr Karam emphasized that all of this is in the context of the five-year review of the Quality System. The quotation goes on to say that, in addition to the five-year review of the Quality System, CMCs published in the KCDB undergo continual monitoring to ensure their validity. The interpretation that the WG is proposing is that this action (the continual monitoring of CMCs) is the responsibility of the originating NMI and DI (based on what is stated immediately following in the CIPM MRA guidance document). This can take place in many ways, especially in ionizing radiation dosimetry and radioactivity, and, especially for DIs, through third party accreditation. In third party accreditation, there is a thorough technical review, though not exactly the same as the Quality Management System review, which is more frequent and done every 18 months to 2 years. In addition, as part of an NMI's Quality Management System, an internal review of laboratories must be carried out every two years. Therefore, the maintenance of a Quality Management System is not an activity that happens only once every five years, but is an ongoing process that is constantly readdressed, reconsidered and evaluated. All NMIs that have published CMCs must provide an annual quality report to the RMO, which covers any issues that may affect the CMCs of the NMI.

Dr Karam quoted from the CIPM MRA guidance document the following phrase: "In order to optimize both intra- and inter RMO review, reviewers are encouraged to take a "risk-based" approach to reviewing CMCs, particularly those measurement claims that are derived from other, more basic or primarily realized, measurement capability claims." Regarding this quote Dr Karam said that this addresses two issues. It allows an NMI or DI the privilege of documenting any calibration and measurement capability that they wish to claim. This is especially important for DIs that work very closely with stakeholders. It also removes the burden to review a considerable number of CMCs from the inter-RMO review. With one exception, all RMOs review CCRI CMCs that are new or modified.

As an example, SIM has had to review a few dozen CMCs in recent years and the work has not been burdensome. Nevertheless, attendees appreciated that there are instances when the task of reviewing CMCs line by line can be tedious for a reviewer; taking a risk-based approach means that this does not have to be done. The description of the traceability of the derived quantities that are being claimed should be documented in the Quality System and, if one so chooses, they can be evaluated, although the intra-RMO review of the CMCs should cover this. Dr Karam ended her presentation by encouraging attendees to review the interpretation document and to send feedback on the document with comments corrections or changes. Dr Louw opened the floor for questions and comments.

Dr Louw said that the interpretation document will be made available on the website for comment. Dr Milton (BIPM Director) said that this was a good starting document. Dr Keightley (NPL) commented that we should address how we define active participation in RMO projects. For example, in the case of the WG, we often state that having results in a draft A report is not sufficient to claim a CMC, but contributing to a draft A report could be interpreted as active participation. Dr Keightley recommended that this issue should be clarified in the interpretation document. Dr Karam said that it is important to remember that all of this supporting documentation for the NMI's claimed measurement capability is only needed for the review process. When the KCDB is queried, this information does not appear on the CMC. So, if the reviewer is satisfied with the laboratory's claim, this is sufficient. The job of the reviewers as metrological experts is to know what is acceptable. What is needed in these types of documents is for the reviewer to be able to see what the details are: the uncertainty budget, the range of measurement, and the technical methods being used. In a draft A report, much of that information is there but it is not publicly available. It is difficult for a reviewer to access this information to make an assessment.

Dr Keightley agreed with Dr Karam's reply and suggested that her response should probably be added to the report for clarity, to avoid misinterpretation in conducting the CMC review. It would be useful to have a top-down CCRI directive on how this should be done. Dr Karam added that this report stipulates that its content is for the benefit of the reviewer. Dr Louw acknowledged that this is a good point and that it should be addressed in the document. He went on to take other questions. Dr Stenger (PTB) commented that he was not clear on what was the function of this interpretation document. It is a draft of a formal statement of the CCRI to the CIPM but it seems incomplete in the sense that it does not cover the extensive discussions that took place in the morning workshop. Instead, it only discusses the complexities of the Quality Management System review process. It addresses the option of the risk based evaluation process but it does not address the issue of whether the structure of the CMCs is appropriate. Dr Karam clarified that there is a separate document for that.

Dr Louw clarified to Dr Stenger that there is a separate document for the structure of the CMCs. As he had mentioned early in the meeting, the CIPM tasked the Consultative Committees to develop an interpretation document that focuses on the use of evidence to support the CMCs to achieve greater harmonization. He also mentioned that, in some instances, the chair of a KCWG makes a list of comparisons that are available for use in the CMCs. For example, when the review of Draft B is completed, the completed draft B reviewed report can be used as evidence for claiming a CMC prior to publication. However, there are several comparisons where the review process has been going on for some time and they are still in an early stage of the review. He asked if there cases in which some of these drafts could be used as evidence to avoid issues with the reports taking so long to be

reviewed. Dr Keightley commented on Dr Louw's question and said that it would be good if the CMC reviewer could contact the KCWG chair and obtain a copy of the Draft report to use in the CMC review process. He cautioned that care must be taken over the extent to which this is used.

Dr Louw suggested that the guidance document could include the suggestion that the reviewer can contact the KCWG chair and ask if the draft is available and if it can be used, or that the KCWG chair could be asked to publish a list of comparisons available for review. Dr Louw asked if there were further questions on Dr Karam's presentation about the interpretation document to support CMCs. There were no further questions.

Dr Louw invited Dr Karam to talk about the separate document on the structure of CMCs. Dr Karam thanked EURAMET for taking the initiative of writing the proposal for optimizing CMCs and initiating the discussion. Dr Karam had prepared a document on a general approach to optimize ionizing radiation CMCs. Every Consultative Committee is different and what may work for one field may not work for another. Therefore, this document is specific to the field of ionizing radiation. SIM and AFRIMETS have provided responses to the EURAMET proposals. Dr Karam pointed out that, in the initial four years of CMC submissions, there had been a large number of CMCs (approximately 3000) submitted in ionizing radiation, but this was more than ten years ago. In the last four years, only 174 new CMCs have been submitted. This does not reflect the number of modified CMCs, but gives a good idea of how the workload of CMCs has levelled off with time.

The responsibility for monitoring CMCs by NMIs and DIs had also been considered; this is a requirement under Quality Management Systems as well as under the CIPM MRA, and it is also best practice for a metrology laboratory. If the focus is on new or modified CMCs, the work is not onerous. However, the work needed to support the validation of the CMCs can be burdensome: comparisons, publications in scientific journals, participation in projects, participation in meetings, etc. This is where the time is taken to demonstrate calibration and measurement capabilities: not so much in reviewing the CMCs in recent years. It seemed to Dr Karam (and to others in the CCRI) that the absolute number of CMCs is not necessarily what needs to be optimized. What needs to be optimized is how to leverage other resources, such as quality management systems, comparisons, and the resources that are already in place or can be implemented easily. As mentioned earlier in the meeting, it is probably difficult to come up with a definitive approach on how to evaluate ionizing radiation CMCs in a short period of time.

Dr Karam asked the attendees to review the document she had presented and to provide feedback. She also suggested that the final document on CMCs will rely heavily on the Quality Management System and its entire infrastructure, including the fact that NMIs and DIs must monitor their own CMCs. The CCRI office bearers will ask the Sections and the RMOs to re-evaluate the classification of services. All fields of ionizing radiation should optimize their comparison plans so that a single comparison might be used as support for a variety of quantities, but this must be reflected in the Quality System. For example, in CCRI Section II, the MMM has been a useful tool to help accomplish this.

An important point from the EURAMET proposal is the use of derived quantities. However, it is important to consider that some of the larger laboratories serve to provide traceability to some of the smaller laboratories; there could be a problem if the larger laboratory no longer publishes a CMC, for a derived quantity, referred to by the smaller laboratory for traceability. Therefore, in deciding what

CMCs are to be published and which should be removed, the impact on stakeholders down the traceability chain including smaller NMIs and DIs must be considered. Dr Karam ended her talk and, together with Dr Louw, invited questions.

Dr Loic Le Noir de Carlan (LNE-CNAM) asked two questions. The first question concerned the grouping of different radionuclides under the same measurement method, when other factors such as the disintegration scheme of the radionuclide and the chemical aspects of the source preparation are important. Dr Karam replied that the MMM normally does not take the chemistry into account (with some exceptions); however, the decay chain, technical capability of the instrumentation, and consideration of production of the source (while not being documented in that matrix) informs the decision on the relative difficulty in measuring a radionuclide by a specific primary method. Dr Karam explained, for those not familiar with the MMM, it is a large table that lists the various radionuclides listed or proposed for CMCs and the main primary measurement methods used in radionuclide metrology. A radionuclide that can be measured by one or more of those primary methods listed is indicated by a colour. For example, if the radionuclide is shown in red, it indicates that it is difficult to standardize using that method so, if a laboratory can carry out that standardization, it is assumed that the laboratory has the capability to standardize other radionuclides (shown in red, yellow and green) listed under that same method. If the radionuclide is shown in yellow, the standardization is less difficult (so its measurement supports other yellow and green-labelled radionuclides but not red-labelled radionuclides), and if the radionuclide is labelled green it is relatively simple (so its measurement can support only other green-labelled entries). Dr Keightley talked about the MMM and explained more of the details of the system.

Dr Loic Le Noir de Carlan's second question concerned the amount of work needed to ensure that existing CMCs were valid. Dr Karam replied that the whole system, including the KCDB, of the CIPM MRA relies on confidence that all stakeholders are being honest. In other words, the system relies on a system of trust, although we need to be able to verify that this is the case. Dr Karam explained that when each NMI reviews its Quality System, it must also review the CMCs because this is the core of the Quality Management System. Essentially, having an accepted Quality Management System means that the NMI is stating that they can carry out the calibrations and measurements claimed in the CMCs. The CMC is considered valid for an NMI because the CMC must be validated as part of the Quality System approval process.

Dr Louw thanked everyone for the feedback on the two documents discussed during this section of the Agenda and reminded everyone that if they would like to add more input it must be within the next two weeks. He summarized two points from the discussions to consider: first, the CMC and the EURAMET proposal (derived quantities-based CMCs) are influenced by how the NMIs address their calibration services in the Quality System; second, the Quality Management System review and how should this be done (taking into account the discussions on CMC review) will probably be discussed in the JCRB.

Dr Milton mentioned that the goal in this effort to review the CMC implementation is to minimize the use of resources. In this respect, passing on tasks from one committee to another would result in more work and use of more resources instead of less. This raises the question of re-review of published CMCs. The re-review of CMCs should be done by experts and with people with the most recently updated information related to those CMCs: the most appropriate organizations may be the RMOs

and the CMC working group. Dr Milton was not sure to what extent this may be covered in the Quality System review and he agreed that this must be checked.

Dr Louw added that CMCs must be monitored continuously by the NMIs through the Quality Management System (QMS) but well-defined criteria are needed and a method implemented to ensure that this is done, i.e., that the CMCs are monitored continuously by the NMIs through their respective QMS. Dr Ankerhold (PTB) commented that, within EURAMET, all CMCs are reviewed, regardless of whether they are new, modified or existing. Dr Ankerhold agreed that this adds to the workload, but EURAMET regards it as best-practice. She agreed with Dr Milton that the RMOs are best placed to review CMCs.

Dr McEwen (NRC and Chair of Section II) commented that clarification is needed on this latest set of discussions: are we referring to the review of CMCs that have been modified or re-reviewing of CMCs that have been published but have not changed? If we are talking about the latter, is there really a need to re-review a CMC that has been published in the past and has never changed? If so, it is not clear what expertise are we offering in re-reviewing a published CMC that has not changed.

Dr Ankerhold continued by explaining the details of how the review process is conducted in EURAMET. Dr Karam explained how the review of the Quality System is conducted within SIM. She said that the Quality Systems of the NMIs in SIM cannot be approved if the existing CMCs are not re-confirmed as being correct. During the RMO review of the Quality System of a particular NMI in SIM, the reviewer must verify that the NMI is carrying out the calibrations and measurements at the levels claimed in the CMC of that NMI, so the laboratory must declare that they are actually performing the capabilities listed in the published CMCs at the levels claimed in the CMCs.

Dr Louw summarized the latest set of discussions and noted the differences between the CMC review process in each RMO. Dr Louw highlighted the positive aspects of the different proposals and suggested that, based on these discussions, the CCRI should look carefully at how CMCs are reviewed and find ways of optimizing the process.

Dr Stenger said that he appreciated the work presented by Dr Karam on the two documents developed in support of the CMC review (one on how to use the evidence sources and the other on how to approach the review of CMCs). He agreed that the number of CMCs to be reviewed has diminished over the years and the rate of increase has stayed relatively constant. From this standpoint, the number of CMCs by themselves is not the main driving force for the proposal to look into updating the CMC review process; it is also about efficiency and effectiveness. Although there are an exceptionally high number of CMCs in physical quantities fields, it is ineffective and inefficient because (as seen in the PTB example) half of the services are not covered by CMCs for various reasons. One reason is that they sometimes do not have partners for comparisons to cover all parameters; another is because the CMC review can be slow or sometimes the radionuclide requested by a customer is not common. In contrast, the MMM is appreciated as a useful tool, which serves as the basis of some of the considerations presented today by EURAMET. Dr Stenger said that he hoped that there would be a change from basing CMCs on individual radionuclides to the measurement methods in the future, because that would be a way of covering *ad hoc* services and allow a comparison to be used for another radionuclide with the same method. Dr Stenger requested if this can be reflected in the document for future consideration.

Dr Karam thanked Dr Stenger for his comments and appreciated that this is a good point. She commented that this is a complex issue and it will depend on each NMI on what they can or cannot do. Some may benefit from following the approach suggested by Dr Stenger but others may benefit by listing the specific radionuclides. She reminded the attendees that the document she presented is not meant to be a proposal on how to revise the EURAMET proposal. This document is rather a proposal for how to approach doing a revision. Dr Louw added that these documents had been developed to facilitate the CCRI's discussion on the topics. In this respect, Dr Louw requested a written summary of the points raised by Dr Stenger and Dr Ankerhold, so that they can be included in the official CCRI reply to the CIPM.

Dr Ankerhold asked about how to proceed with the documents. One document is a global approach and the title should be changed to reflect that, and the second document is a CMC review process, which may need some changes to achieve a consensus. So how can these two items be addressed and how should we proceed?

Dr Louw suggested that PTB should submit the comments to be discussed in writing for inclusion in the documents.

Dr Louw concluded the discussion by summarizing that, in his view, great progress has been made towards improving the effectiveness and efficiency of the CMC processes. The EURAMET proposal opened new opportunities that can be explored. It was clear from the comments that further development of the proposal is needed to address the needs of all NMIs - both large NMIs that can implement "wider scope" CMCs based on primary realizations that cover their services (detailed in the QS) and smaller laboratories that need a more direct relationship between CMCs and services. He invited all parties to work towards a model that allows both views to be implemented within the CCRI.

8 CONSULTATIVE COMMITTEE GOVERNANCE

8.1 Member and Observer Status in CCs

This discussion also addressed items 8.2 (CCRI process for reviewing applications for members and Observers), 8.3 (Process for appointing CC Vice-Presidents) and 8.4 (CCRI Section and Working Group chairs).

Dr Louw opened the discussion by saying that the CCRI procedure on how new members are approved needs to be reviewed and this must of course be in line with the newly-adopted CIPM criteria for membership. He presented the new rules and mentioned that, at the last CIPM meeting, there had been a request to harmonize the rules of membership among Consultative Committees. He explained that the CCRI is one of the CCs that has fewer members, and the focus may be on ensuring proper representation whereas, for some other CCs, the focus may have to be on limiting the number of members. He added that the CCRI procedure needs to ensure that the main contributors are present at meetings. He also discussed issues on current observership rules and issues.

Dr Louw went on to explain that a discussion was needed on the criteria for allowing membership of the CCRI. As proposed to the CIPM in 2916, institutions that are members of all three Sections of the CCRI have already been accepted as members, while those that participate in at least two are

observers. There are also institutions that contribute significantly to the CCRI mission but have members in only one or two Sections. Dr Louw proposed that we consider, as a possibility for being a full member, those institutions that have memberships of both Sections I and II (instead of requiring membership in all three Sections) since there are some labs, for example, that do not have neutron measurement capabilities (Section III) but contribute significantly to the CCRI. Alternatively, an even more open approach could be considered, allowing membership for institutions that play an important role in just one Section. He pointed out that none of the Sections have their own set of rules on membership. Dr Louw invited the attendees to comment and provide input/guidance on how to proceed on this topic.

Dr McEwen (NRC and Chair of Section I) pointed out that the NRC has membership in one Section and observership in two Sections, so under the proposed rule requiring membership of at least two Sections, NRC would not qualify to have full membership. Dr Louw thanked Dr McEwen for this comment and that based on this input, the CCRI should probably allow full membership if an organization is a member of one Section and can demonstrate a substantial contribution to the other Sections.

Dr Keightley (NPL) commented that it would be difficult to define what was meant by “substantial contribution” to another Section and to decide who would assess the contribution. Dr Louw suggested that since each Section decides whether an institution can be a member of the Section, that Section would be best placed to carry out the assessment. Dr Keightley commented that the Sections in the CCRI now have the status of working groups (WG), so it is not clear how such a proposal would work in practice (i.e., on what basis would the Section be able to make a recommendation). Dr Louw said that in this case, the WG would propose to the CCRI that the institute can become a member or an observer, with the rationale summarized in a document or presentation. There are already two institutes that have observer status and have expressed an interest in becoming members of the CCRI.

Dr Louw continued by explaining that an application for membership of a Consultative Committee must be sent to the Director of the BIPM. He will then consult with the CC President; in the case of CCRI, the president would discuss the application with the Section Chairs before advising the Director of the BIPM. The final decision on membership is taken by the CIPM. However, the procedure to be followed within CCRI still had to be defined and documented. For example, would the Section Chairs advise the CC President based on their own knowledge or would they have to consult Section members?

Dr Franz Josef Maringer (BEV) asked if working groups from other Consultative Committees make a distinction between members and observers? Dr Louw responded that other working groups do not normally distinguish between members and observers but there is a distinction at the level of the CCs. Prof. Jian Zhang (NIM) asked if CCs are open to the institutions from Member States and does this mean there can be more than one institute from a country represented on the CC? Dr Milton (BIPM Director) said that there are cases where more than one institution from a single country participates, but this is always subject to approval from the NMI. Dr Louw added that an institute is allowed to send a representative plus up to two additional experts to the CC; this means that within the CCRI an institute can send someone to each of the three Sections. NIM, for example, can therefore define who the experts are that join the delegation.

Dr Zhang asked for clarification on the rules for observership. Dr Milton replied that this topic is being discussed by the CIPM and there will be a formal communication at a later date. Dr Milton added that liaison status is also taken very seriously and is decided by the CIPM.

To conclude this session, Dr Louw reiterated the need for a short procedure setting out how applications for membership of the CCRI will be handled. The procedure will be circulated to the CCRI for comment.

Dr Milton thanked the CCRI and Dr Louw for the professional manner in which the transition to the new CCRI had been carried out.

There were no points raised on the next agenda item (CC Vice-Presidents) or on the appointment of CCRI Section Chairs or Working Group Chairs.

9 OUTCOME OF THE CCRI STRATEGIC PLAN WORKSHOP

See section 15 on CCRI resolutions below.

10 FINALIZATION OF THE CCRI STRATEGIC PLANNING DOCUMENTS (2020-2025)

Dr Louw opened the floor by asking the CCRI if they would endorse the Strategy Working Group as an *ad hoc* working group. The CC President is Chair of this Working Group; RMO technical committee chairs also attend (if a new technical committee chair is appointed by the RMO, the previous chair can continue on the Strategy Working Group in addition). Anyone wishing to join the Strategy Working Group was invited to contact Dr Louw.

The conclusion was that the Strategy Working Group was endorsed as a CCRI *ad hoc* working group.

11 REPORTS FROM CCRI SECTIONS

Dr Louw invited the Chairs of the three CCRI Sections to summarize the output of the Section meetings held during the previous two weeks.

11.1 Section I: x- and gamma rays, charged particles

Dr McEwen (NRC and Chair of Section I) gave a review of the section I meeting held on 27-29 June 2017 (2.5 days). He began by remarking that the key comparison schedule for Section I is clear for the next several years. The workload for BIPM for key comparisons is significant and, in addition, there is a tendency for new comparisons to be added; therefore, it is necessary to review the impact on other BIPM staff activities. In fact, the issue of the potentially overloading the BIPM staff needs to be addressed to see how the use of comparisons can be optimized.

Dr McEwen highlighted that the BIPM had developed a new standard of absorbed dose to water for medium-energy x-rays and a key comparison had taken place with other NMIs that use a different

approach. The new standard has significantly reduced measurement uncertainties for the end-users (the medical physicists).

There has been a request in place for some time for a comparison for therapy-level electron beam dosimetry – this has been approved (BIPM.RI(I)-K9). There also has been a request from the NPL to repeat the CCRI(I)-S2 comparison for high-dose ⁶⁰Co (radiation processing) absorbed dose, using a similar protocol to those used in 1997 and 2007 (but possibly increasing the range to 50 kGy following a request from the radiation processing community). The Section meeting had concluded that this should be a supplementary comparison.

Dr McEwen summarized a discussion on the review of key comparison reports. If no comments are received (as sometimes happens), there is no evidence to show that there has been any review of the reports. The Section had agreed to implement a system that ensured the reports were reviewed by at least two people (similar to the peer review process for scientific journals) and that they would be asked to confirm whether the report had been reviewed (even if the response was ‘no comments’). This will allow better statistics and transparency of the review process. If these actions did not work, alternative approaches would be sought, such as assigning specific reviewers for each report (as is done for journal submissions).

Dr McEwen spoke about one of the major issues for Dosimetry - the adoption by the CCRI of the recommendations from the recent ICRU Report 90 “*Key Data For Ionizing-Radiation Dosimetry: Measurement Standards And Applications*”. Dr McEwen explained that the goal of the ICRU Report 90, which had taken many years to draft, was to review the key data that underpin radiation dosimetry. The changes in the key data will have a significant impact at the primary-standard level of radiation quantities. Dr McEwen explained that, following publication of the ICRU Report 90, an *ad hoc* working group had been formed to investigate how the recommendations from the report would affect current standards. The scope of this working group was to evaluate the implications of the ICRU Report 90, not to verify the data published. Dr McEwen presented a document to CCRI Section I containing a summary of the decisions from the working group and their recommendations. This had been discussed within the Section, and there had been agreement at the technical level that the changes should be adopted. The adoption of these recommendations will start on 1 January 2018, and delegates were to confirm adoption of the changes by the NMIs/DIs. It had been agreed that CCRI(I) would co-ordinate the explaining of the changes to end-users and help overcome any national legal challenges.

Dr McEwen explained that implementation of ICRU Report 90 will require immediate action, and he summarized the issues arising. NMIs will need to review the impact of the new data on their primary standards - the changes expected in the standards can be up to 1 %, depending on the modality and operation of the standard. Some changes will be noticeable by stakeholders, while others are possibly within the measurement uncertainties of calibrations. Perhaps the biggest issue for the CCRI and BIPM is how to update the KCDB: most key comparisons are unaffected because of correlations between standards. However, many CMCs may change (due to modified uncertainties) so the question arises on how can this can be done efficiently.

Dr McEwen summarized the discussions on the review of the 2013-2023 Strategic Plan. Dr McEwen recalled that there had been interesting presentations, including new absorbed dose to water standards, new beam modalities, new treatment modalities and new applications such as using

low-energy electrons for radiation processing and sterilization of surfaces. Dr McEwen commented that there has been a noticeable overlap between CCRI Sections I and II in molecular radiotherapy during the CCRI meeting. In this regard, he commented that there may be a need to be coordination between the reporting of activity and dose, and communication to end users. Dr McEwen remarked that little had been reported on the actions identified for 2020-2023. His opinion was that there may be presentations on nanodosimetry and biological quantities in the future.

Dr McEwen reported on membership status in Section I. NIS (Egypt) has been confirmed as an official observer. DTU (Denmark) presented the scope of its activity, and ASTM International attended as a guest (representing the radiation processing community).

Dr Karam (NIST and Chair of Section II) and Dr Keightley (NPL) both endorsed the idea proposed by Dr McEwen to form a joint *ad hoc* working group on molecular radiotherapy. Dr Keightley endorsed the proposal to firm up the requirements for reviewing the key comparison reports. He further proposed that this should be done at the CCRI level to ensure a high standard of published reports.

11.2 Section II: Measurement of radionuclides

Dr Karam (NIST and Chair of Section II) thanked Dr Keightley for being the *rapporteur* of the Section II meeting.

Short-term actions had been published in a *Metrologia* Special Issue which included the outcome of the recent International Committee for Radionuclide Metrology (ICRM) meeting in Buenos Aires (Argentina) where many NMIs and DIs were present. There was an overview of key data needs and roles. Regarding medical applications, there were discussions on calibrations for theranostics and extending the International Reference System (SIR) to alpha-emitting radionuclides. In addition, there had been discussions on emerging issues that were impacting the field: transferring sources between countries, availability of radionuclides and advances in measurement techniques.

Dr Karam gave an update on comparisons, and presented the completed and on-going comparisons within Section II, as well as the Section's 10-year plan of anticipated comparisons. There were proposals for new comparisons including a proposal for wheat flour from NMIJ. Dr Karam mentioned that there was good discussion on the MMM, which continues to be maintained and adapted to maximize coverage of CMCs. A new primary method, Čerenkov Coincidence Counting, has been added to the Matrix. With the MMM reaching maturity, the 10-year comparison plan will transition to become sector specific (to address customer needs) rather than nuclide specific (to support the MMM). Dr Karam presented a table with this plan. She mentioned that there is an action item on this and white paper will be written (by Dr Karam) on how this should be carried out.

Dr Karam discussed the long term Strategic Plan. He noted that the team from the BIPM provides an excellent with the traveling SIR (SIRTI) for short-lived radionuclides, but the site visits can be time-consuming. She therefore encouraged participating laboratories to measure at least two radionuclides each time the SIRTI is hosted. Consideration for each RMO to develop their own SIRTI was discussed during the Section meeting, which would help increase the coverage to more laboratories, including secondary laboratories.

Dr Karam presented updates to the Key Comparison Reference Values (KCRVs) and pointed out that a KCRV for ^{223}Ra is available for the first time. She also talked about the SIRTI comparison (K4) results for ^{18}F that will be included in the KCRV and the update of the KCRVs for ^{18}F , ^{57}Co , ^{59}Fe , ^{109}Cd , ^{131}I , ^{134}Cs , ^{177}Lu and ^{223}Ra . Dr Karam concluded her summary by listing a total of 18 action items (shown on her presentation slide) that were developed within the Section meeting.

11.3 Section III: Neutron Measurements

Dr Gressier (LNE-IRSN and chair of CCRI Section III) summarized the discussions that took place during the CCRI Section III meeting held on 23-25 June 2017. The Key Comparison Working Group also held a half-day meeting on 20 June 2017. He stated that the number of attendees from NMIs was stable and that the total number of participants was 20. Feedback on the new CCRI arrangements had been positive.

There are two on-going comparisons and three new comparisons scheduled over the next 3 years. Dr Gressier summarized the comparisons, covering the following: CCRI(III)-K9.AmBe.1 (AmBe neutron emission rate), the follow-on CCRI(III)-K9.AmBe.2 (also AmBe neutron emission rate), and CCRI(III)-K8.2018 (thermal neutron fluence). Dr Gressier went on to explain the new key comparisons including the CCRI(III)-K8.2018 comparison which is planned for 2018-2020/2021 and will be piloted by IRSN or NIST, depending on the protocol.

Dr Gressier summarized the discussions on measurements of operational quantities; there are CMC claims for $\text{H}^*(10)$ and/or $\text{Hp}(10)$ from all NMIs engaged in neutron metrology in CCRI(III). Dr Gressier said that no CCRI key or supplementary comparisons for $\text{H}^*(10)$ or $\text{Hp}(10)$ for neutrons had ever been performed. He mentioned the regional comparisons of $\text{H}^*(10)$, EURAMET project No. 608, which ended in 2008 after the transfer instruments failed twice but the APMP.RI(III)-S1 comparison had been completed successfully. He stated that CCRI(III) supplementary comparisons needed be able to check technical procedures and influences on the results such as anisotropy, scatter correction and source spectrum, as well as providing the results needed for compliance with ISO 17025.

Dr Gressier summarized the supplementary comparisons and discussed the work on strategic planning, showing that Section III has completed most of the actions. The presentation will be made available on the BIPM website.

Dr Gressier concluded his presentation by talking about CMCs. With regard to the analysis of the EURAMET CMC proposal, Section III members had transformed their CMCs into the new format, as proposed by EURAMET, and then provided feedback. The general review of CMCs for neutron metrology will be carried out in a fast process as a limited activity within Section III, with the help of a dedicated web platform and support of the BIPM, which will allow a more frequently review than every two years.

11.4 Section General Issues and Membership Applications in Sections

Dr Louw asked the chairs of all three Sections if they could report the status of membership and observer applications.

Dr McEwen (NRC and Chair of CCRI Section I) reported that there are currently no new applications for membership of Section I. There is a recommendation for DTU to become an observer. He mentioned that he would like to recommend ASTM International for liaison status (for the field of radiation processing).

Dr Karam (NIST and Chair of CCRI Section II) reported that there have been no new applications for membership or observer status in Section II. A delegate from CIAE (China) who had attended the Section III meeting had expressed an interest in attending Section II meetings as well, as a guest. Dr Louw pointed out that guest attendance is subject to approval from the official NMI and asked Dr Zhang (NIM) if NIM would agree to let an additional institute from China attend Section II. Dr Zhang replied that since NIM is a member of both Section I and II, no additional delegates from China were necessary. The CIAE will therefore continue to attend only Section III. Dr Louw added that no formal request had been received, and that any formal requests must be sent to the Section Chair.

Dr Gressier (LNE-IRSN and Chair of CCRI Section III) reported that there has been a request from NIS to join Section III. This process is being finalized within Section III.

11.5 CCRI RMO Working Group on IR CMCs (RMOWG)

This discussion covered: 11.5.1 “Report on the JCRB decisions pertaining to CCRI”; 11.5.2 “Reports from the Regional Organizations”; and 11.5.3 “Outcomes from the RMOWG Meeting”.

Dr Karam provided a report on the topics discussed, in her capacity as Acting Chair of RMOWG for the meeting held on 26 June 2017. There were extensive discussions during this meeting so Dr Karam covered the highlights and actions only.

ACTION: RMO Chairs and the KCWG Chairs to develop a list of all comparisons by 31 December 2017. This will cover all comparisons that have not been completed.

Dr Karam reported that a large part of the RMOWG meeting had focused on discussion of the EURAMET proposal for reducing the number of CMCs in ionizing radiation and ancillary documents (including the interpretation document from Section II). In short, EURAMET is proposing to reduce the CMC listing to focus on national primary standards with a link to the disseminated customer quantities made in the quality system. Both SIM and AFRIMETS expressed concern about the implications for the various stakeholders (customers) who may use the CMCs for various purposes (for example, when the stakeholders are looking for calibration services to meet local regulations). The CC presidents had reviewed at the previous meeting who uses the CMCs in practice, and for whom the CMCs were originally intended.

Based on this discussion, the actions decided had been:

ACTION: RMOs to send their version of Optimizing CMCs in Ionizing Radiation Under the Revised CIPM MRA to the CCRI by 1 February 2018.

ACTION: Sections and RMOs to evaluate the services listed at http://kcdb.bipm.org/appendixC/RI/RI_services.pdf and propose corrections and recommend updates to the interim RMOWG Chair as soon as possible.

ACTION: CCRI Sections to develop a list of comparisons still useable for CMC support.

Dr Karam informed the meeting that SIM has volunteered to chair the RMOWG for the next two years, following Dr Louw's call for a volunteer RMO.

DECISION: CCRI endorsed the appointment of SIM to Chair the RMOWG meeting until at least the next CCRI.

Dr Karam concluded her presentation by saying that the next meeting is planned for June 2019 to coincide with the next CCRI meeting. However, the RMOWG is planning to hold another meeting on optimizing CMCs (to be arranged). She opened the floor for questions.

Dr Ankerhold (PTB) asked for clarification on the relationship between the CCRI Strategy WG and the CCRI RMOWG, in particular which of these two groups is tasked with preparing the CCRI proposal for the implementation of the recommendations from the CIPM WG. Dr Louw replied that even though there is overlap between these two groups he believes that this task corresponds to the RMOWG. The Strategy WG is where the 2020-2025 strategy of the CCRI is discussed and it is at a different level.

Dr McEwen (NRC and Chair of Section I) asked if Dr Karam could clarify which comparisons should be included in the 'List of Comparisons' requested in the first action, and whether the list should include planned comparisons. Dr Karam replied that planned comparisons should not be included. The aim of the exercise was to determine which comparisons have not been registered or which have not been completed, to check for comparisons that could be used as evidence to support CMCs but were missing from the KCDB. Dr Milton (BIPM Director) emphasized that the KCDB should remain the central repository for information on all comparisons.

Dr Karam concluded the session by reminding all TC chairs to put forward proposals for CMCs (EURAMET had already submitted a proposal).

12 BIPM PROGRAMME ON IONIZING RADIATION

Mr Los Arcos (CCRI Executive Secretary) summarized the ongoing activities in ionizing radiation at the BIPM. He presented a slide that summarized all the programme activities in Dosimetry and Radioactivity, including the facilities, types of radiation and the primary standards available. He explained the standards that are maintained and the services and comparisons that the BIPM provides: low-energy x-ray standards for radio-diagnostics (10 kV - 50 kV), low-energy x-ray standards for mammography (20 kV - 40 kV) (W/Mo, Mo/Mo), a recently completed standard for medium-energy x-ray standard for radiotherapy (100 kV - 250 kV), a ¹³⁷Cs standard for radioprotection, ⁶⁰Co standards for radiotherapy and radioprotection, brachytherapy transfer standards that are transportable, and a high-energy photon beam standard for radiotherapy. This latter standard had been based on a transportable water calorimeter but, as of March 2017, there was now a contract in place for use of a LINAC at the DOSEO facility at Saclay, so comparisons could be carried out near to the BIPM.

Mr Los Arcos also discussed comparisons and explained that more detail had been given in the section meetings. He discussed the main achievements between 2015 and 2017: a total of 21 comparisons in dosimetry and 18 comparisons in radioactivity were carried out over this period. Amongst these he highlighted the first K9 comparison between the BIPM and PTB for medium energy x-rays. He also highlighted four contributions to the special issue of [Metrologia, 2015, 52\(3\)](#)

on uncertainties in radionuclide metrology. Mr Los Arcos finished his presentation by discussing activities associated with international collaboration and coordination.

Dr Stenger (PTB) asked for more details of the new agreement between BIPM and the DOSEO facility. Mr Los Arcos explained that BIPM has a contract for access to one of the clinical accelerators at the facility, with a certain number of days reserved for the BIPM during the year.

13 COMMENTS ON WRITTEN REPORTS FROM INTERNATIONAL ORGANIZATIONS IN LIAISON WITH CCRI

Dr Louw (CCRI President) invited the liaison organizations present to raise any issues they had.

Dr Meghzifene (IAEA) said that the IAEA appreciates and supports the efforts by the CCRI to streamline and optimize the CMC process in order to make it simpler. The IAEA also appreciates the efforts by EURAMET to review the IAEA's Quality System. With regard to the changes in structure of the CCRI, the IAEA had had concerns that the change might impact the effectiveness of the committee but was reassured during the meeting that this was not the case.

Dr Menzel (ICRU) expressed the ICRU's appreciation of how quickly the CCRI had followed up on the publication of the ICRU Report 90. The preparation of this report had originally been requested by the CCRI many years ago, so the ICRU is pleased to see the topic is coming to completion. He went on to give a summary of what is going on in the ICRU and the reports they are working on. In particular, he mentioned a report, which was nearing completion, on radiation monitoring following releases of radionuclides to the environment (motivated by the Fukushima incident). He also mentioned a collaboration between ICRU and the International Commission on Radiological Protection (ICRP) on the proposed new definitions of the operational quantities, including newly calculated dose conversion coefficients. This will be made available on the ICRP website for public consultation.

Dr Pommé (JRC) mentioned that the JRC had been restructured and that it considered its contributions to the CCRI and the working groups to be very important. Dr Karam (NIST) asked Dr Pommé if he could elaborate on the award he had recently received. Dr Pommé explained that the award was in recognition of the work they had carried out to refute the hypothesis that half-lives depend on the distance between the Earth and the sun (the data analysed had confirmed that the exponential decay curve is valid and there was no evidence of the half-lives varying).

Dr Milton commented that the BIPM wishes to formalize links with liaison organizations by establishing Memoranda of Understanding (MoU), similar to the existing MoU in place between the BIPM and the IAEA.

Dr Louw concluded this section of the meeting by acknowledging that there are no actions that need to be taken in regard to liaison organizations, based on the presentations and discussions held.

14 FUTURE CCRI WORKSHOPS

This topic had been covered in the relevant sections of the agenda.

15 SUMMARY OF ACTIONS AND CCRI RESOLUTIONS

Dr Louw discussed a draft of the main actions and decisions taken during the meeting. These are summarized in the table below, along with actions extracted from the minutes.

Agenda item / reference	Action	Deadline
Comparisons Action 26.1	Section Chairs to review service categories in the context of the KCDB 2.0 and send feedback to steven.judge@bipm.org	February 2018
Action 26.2	Section (I) and (II) Chairs to publish the timetables for comparisons in the Section folders by the end.	July 2017
Action 26.3	Section(III) to develop and publish a long-term timetable for comparisons	2019
Action 26.4	RMO TC Chairs to either publish their timetables or develop timetables on the RMO web pages with a link on the RMO WG folder.	By the end of 2017
Action 26.5	Section and RMO TC Chairs to continuously monitor the timetables for comparisons with the aim of improving synergy.	Ongoing
CMCs Action 26.6	EURAMET to discuss and describe the implications and propose a mechanism of how services addressed in the quality system supported by a core quantity or CMC can be integrated with the CIPM MRA. (Specific questions to be addressed are the mechanisms of how to link between core quantity CMCs and services in the quality system, and how to ensure continuous monitoring and updating of the capabilities and services.)	EURAMET to decide
Action 26.7	Sections to review how CMCs can be made representative, within the current guidelines. For example, range-based rather than specific energy-based CMCs could be considered.	February 2018
Action 26.8	The Secretariat to provide examples from other CCs to the Section and KCWG Chairs.	October 2017
Action 26.9	RMO TC Chairs to prepare input from their RMO on “Optimizing CMCs in IR under the CIPM MRA”	February 2018
Action 26.10	Sections to review the Service Categories and report to the Secretariat.	December 2017
Action 26.11	Sections (including the KCWGs) in collaboration with RMO TC-IR Chairs to continue developing a ‘risk based’ approach to CMC review, to avoid unnecessary duplication of reviews and overly rigorous reviews.	February 2018
Action 26.12	The President, with the Secretariat, to finalize the guidance document and publish on the open part of the CCRI site.	April 2018
Action 26.13	Section, KCWG and RMO TC-IR Chairs to add detail to the document where requests for clarification have been put forward. The proposed content to be sent to the Secretariat for finalization by the President.	May 2018
Action 26.14	CCRI to form a Strategy Working Group with representation from the Sections, WGs and RMO TC-IRs. The SWG is tasked with	Starting October 2017

	advice to the CCRI President for the update of the CCIR Strategy 2020-2025, in time for presentation to the CIPM meeting in 2018 and 26th CGPM (2018).	and ongoing
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16 ANY OTHER BUSINESS

Mr José María Los Arcos was thanked for his work as the Director of the BIPM Ionizing Radiation Section and was presented with a gift. Dr Steven Judge from the NPL will take his place after Mr Los Arcos retires from his position at the end of August of 2017. He thanked everyone and expressed his appreciation for having had this opportunity to contribute to the BIPM and commented that he hopes to continue interaction with colleagues in the years to come.

17 DATE(S) FOR NEXT MEETINGS OF THE CCRI

Dr Louw said that the plan is to have the next meeting in June 2019 and try to combine/optimize the CCRI meeting with two other meetings: The I-Dose meeting (IAEA dosimetry symposium) and the ICRM meeting.

18 CLOSURE OF THE MEETING

Dr Louw thanked everyone for an outstanding meeting.
The meeting was adjourned on Friday 30 June 2017 at 15h00.