

**Report of the sixth meeting of the JCRB
held on 8-9 March 2001 at the NIST, Gaithersburg**

Participants:

T.J. Quinn	BIPM (chairman)
R. Kaarls	CIPM (secretary)
H. Imai	APMP
K. Seta	APMP
B. Inglis	APMP
Shi Changyan	APMP
Sze Wey Chua	APMP
P. Kneppo	COOMET
A. Astashenkov	COOMET
A.I. Pokhodun	COOMET
L. Issaev	COOMET
W. Schwitz	EUROMET
A. Wallard	EUROMET
L. Erard	EUROMET
T.M. Plantenga	EUROMET
H. Ugur	MENAMET
F. Hengstberger	SADCMET
L. F. Urresta	SIM
H. Nava-Jaimes	SIM
I. Castelazo	SIM
H. Semerjian	SIM
J. Lusztyk	SIM
L. Contier de Freitas	SIM
R. DaCosta	SIM
C. Thomas	BIPM
S. Carpenter	NIST

A list of the participants with their affiliation and addresses is added as Appendix 1 to this Report.

1. Opening and welcome by the Chairman

The chairman, Dr T. Quinn (subsequently referred to here as TJQ) opened the meeting welcoming the representatives of the RMOs as well as Dr Claudine Thomas (BIPM).

The draft agenda was approved with the addition of an agenda item 15 "Other business". Under this item the following topics were placed:

- a common text to be printed on calibration certificates issued by NMIs, declaring that the certificate is issued under the provisions of the CIPM MRA;
- supplementary and bilateral comparisons;
- a list of NMI-expert assessors on behalf of ILAC for NMI assessments;
- publicity for the BIPM key comparison database;
- dates and places of next meetings of the JCRB.

2. Matters arising from the report of the fifth meeting of the JCRB held at the BIPM, Sèvres on 11-13 October 2000.

The Report of the fifth meeting of the JCRB was approved. The agreed actions have been carried out or come back under the different points of the agenda for this meeting.

3. Report by the Chairman on progress since the 5th meeting.

The chairman reported on the following issues:

- At the end of 2001 the chairman of the JCRB will write his annual report to the CIPM; a copy will be sent to all JCRB members.
- The implementation of the CIPM MRA proceeds well; much work has been carried out by the NMIs, the RMOs and the BIPM.
- It is now clear that the technical staff acting on behalf of the RMOs involved in the implementation of the MRA should really be “top-people” with sufficient authority and available time; a great deal depends on their efficiency and hard work.
- Co-ordination between RMOs is essential; it is also necessary to maintain frequent links between the RMO technical contact persons and the CC-Key comparison working groups; with its new facilities, the BIPM welcomes such meeting to take place there.
- After having received the CMC claims of the NMIs from their respective RMOs, T.J. Quinn sends the CMC claims to the other RMOs for review; he explained that thereafter it is not clear to him or to RMO representatives which RMO is examining which CMC and what action is being taken; he says that feedback is very desirable in order to be able to follow the process.
- Length and Electricity is now on the web; Claudine Thomas spent much time on the lay-out and harmonization of the CMCs.
- It is TJQ’s intention to create a confidential section on the BIPM web page for RMO representatives to the JCRB.

4. Reports by RMO representatives to the JCRB.

APMP

- APMP has established a special committee for assistance to developing economies in the APMP area.
- The next General Assembly of APMP will be held on 7-8 November 2001 at Tsukuba, Japan.
- See also Doc. JCRB-6/04 and Doc. JCRB-6/10.

COOMET

- Only 5 COOMET member-countries have signed the CIPM MRA; the rest of COOMET members have not yet signed.
- Some of the COOMET members are also member of EUROMET and have sent their CMCs via EUROMET.
- The process in COOMET is not very fast; time schedules of meetings have been sent out.
- See also Doc.JCRB-6/01.

EUROMET

- The next meeting of the EUROMET Committee will be on 15-16 May 2001 at Bern, Switzerland.
- The EUROMET web page has now been transferred to Switzerland.
- The process of reviewing CMCs goes very smoothly, but it is a very heavy burden; several thousands of entries have now been reviewed; with exception of ionizing radiation everything is on time.
- EUROMET intends to discuss how to maintain confidence over time in the claimed CMCs.
- More publicity about the availability of the BIPM database is now desirable.
- There are still some questions with respect to the review routes chosen by those Nomi’s that are members of more than one RMO; (Note that this is now clear on the BIPM KCDB following an enquiry from TJQ to each NMI).
- In the case that there is only one NMI with a unique capability in a certain region, then that region should approach another RMO to review the capabilities of that NMI.
- More feedback of the inter-regional review process, as a result of comments given, is desirable (cf Chairman’s comments on the same issue above).
- It is not completely clear what should be understood under “fully reliable”; it is sometimes difficult to achieve a common view by all the experts involved in the review process.
- It is not clear how the entries in the database have to be chosen and sub-divided; differences are seen between the different NMIs and the RMOs.
- Dr Plantenga gave a presentation on the quality system review in EUROMET; the QS-Forum, as part of the EUROMET INTMET Working Group, acts as a platform on how quality systems are and can be implemented by the different NMIs (QS forum is not an assessment team); the results are laid down in the minutes of the meetings of the QS-Forum; on the basis of the results, further detailed discussions may take place if required by participants. Dr Plantenga also refers to the INITIATION leaflet. See also Doc. JCRB-6/05.
- See also Doc. JCRB-6/02.

MENAMET

- Four MENAMET countries are participating in the CIPM MRA, namely Turkey, France, South Africa and the United States. They all send their CMCs in via other RMOs.

SADCMET

- SADCMET has now 14 member countries and 3 new associate members (Uganda, Kenya and Egypt).
- The next plenary meeting of SADCMET will be held on 25 April 2001 in Lesotho.
- Quality system evaluation will be done via accreditation.
- NML South Africa has been visited by an international peer review team.
- See also Doc.JCRB-6/08.

SIM

- In several fields a further harmonization of the classification of services is needed.
- Quality systems are not yet considered by SIM; it is expected that the quality systems will be reviewed in one or two years.
- See also Doc. JCRB-6/03.

4a. Approval of CMCs for entry in Appendix C.

The following CMCs were approved by the JCRB:

- Gas mixtures: APMP: 3 countries; COOMET: 1 country; EUROMET: 10 countries; SIM: 1 country.
- Photometry and radiometry: APMP: 5 countries, EUROMET 14 countries; SADCMET 1 country; SIM: 5 countries; Note: approval of SADCMET and SIM countries is under the condition that the review process is finalized in accordance with the rules. Several APMP CMCs have been questioned and are still under consideration.
- Acoustics, ultrasound and vibration: APMP: 3 countries; EUROMET: 12 countries; SADCMET: 1 country; SIM: 5 countries; approval of SIM entries is under the condition that the review process is finalized in accordance with the rules.

In general, it is remarked that the CCs should make some statement on “how far the light does shine” for their various key comparisons. It has to be made clear by the CCs how far the CMCs are covered by the results of the key comparisons. TJQ will inform the CCs on this issue.

5. Appendix C: guidelines for preparing Excel spreadsheets.

Dr Thomas introduces the Document 6/06: BIPM Instructions for drawing up CMC Excel files.

Dr Erard suggests that a more systematic layout of document 6/06, making clear what is a requirement and what is guidance or recommended, will be useful. Dr Thomas replies that taking into account the complexity of the Appendix C it is very difficult to do this as there is often no clear distinction.

The Document 6/06 is accepted and will be available in the BIPM website.

6. Inter-regional review of CMCs, experience gained in applying the JCRB rules.

Differences exist between the RMOs in the way they apply the rules for reviewing CMCs; some are more strict than others. A better co-ordination between the RMOs and the Key Comparison Working Groups of the CCs is desirable. In addition, within the RMOs, the vertical flow of information from the JCRB representative to the technical experts may require some further attention.

The feedback from the RMOs to the BIPM and by the BIPM to the RMOs has to be improved in order to keep the review process under satisfactory control. The rules of procedure should be followed as much as is possible.

It was agreed that TJQ will set up on the BIPM website a confidential interactive box for indicating the status of and steps and dates in the review process of the CMCs.

See further Doc. JCRB-6/04 and Doc. JCRB-6/07.

(Note that the BIPM website interactive box for CMC review is now almost ready for trial and will be available soon).

7. Format for chemistry CMCs.

Dr Thomas gives a short explanation on the lay-out and the search engine for the Appendix C for chemistry. The search engine makes it possible not only to consider tabular forms of the CMCs but also more verbal

forms. She also points to differences in the way the different CMCs are presented; this leads to difficulties in the comparability of CMCs. Further harmonization is needed.

Where needed, explanatory notes will be added so that the user can understand what is meant by the different relations for measurement uncertainty, as well with respect to a correct understanding of the measurement uncertainty in relation to the claimed measurement range. There is not always a one to one relationship.

In the field of chemistry there are often several names in use for the same analyte. In order to solve this problem an extra column will be added with the unique CAS numbers for each analyte; this will greatly improve the efficiency of the search engine.

Dr Gary Mallard of NIST Chemical Databases Section has experience in database nomenclature and will support Dr Thomas with this issue.

The problems with the chemistry CMCs and the Appendix C will also be discussed with the CCQM Working Group chairmen on Saturday 10 March 2001 and in the CCQM during its meeting on 4-6 April 2001. (Note that as a result of a meeting that took place just after the CCQM a new format for the search engine was agreed that will be much more flexible and adaptable to the whole of chemistry)

8. Criteria related to Certified Reference Materials for entry in Appendix C.

Dr Kaarls identified some problems likely to arise with respect to CRMs to be mentioned in Appendix C as a means of disseminating traceability. The following principles have to be taken into account:

- Appendix C is not a catalog of all CRMs which can be delivered by an NMI;
- CRMs referred to are to be seen as the nature of service the NMI is delivering to its customers based on its own technical capabilities and competences;
- The characterisation (stability, homogeneity, etc.), validation and the assignment of values have to be done on the basis of the measurement capabilities and expertise that each CMC provider can itself offer;
- Traceability to the SI (or another internationally agreed reference) has to be demonstrated in a clear and transparent way;
- The NMI or designated institute has to take full responsibility and liability for the CRMs referred to;
- Sub-contracting should only be possible on a very limited scale and under very strict conditions and supervised by the institute concerned;
- NMIs or the designated institutes have to participate in studies and key and supplementary comparisons;
- NMIs and the designated institutes have to fulfil all other criteria of the CIPM MRA, for example with respect to quality assurance.

The current situation in the field of measurements and traceability in chemistry is that many CRMs are not produced, analysed and certified by the NMIs or designated institutes. For example in Europe many CRMs produced under the BCR are analysed and certified in organizations other than the NMIs. Moreover, several NMIs deliver CRMs which have not been analysed and certified by themselves. This is in particular the case in fields like health and food. The EU and the WHO are establishing their own networks of "primary reference laboratories".

It is extremely important that as soon as possible the NMIs appoint other key laboratories in their countries as designated institutes taking responsibilities for certain areas of metrology in chemistry, like health and food.

A first draft document on criteria for CRMs will be discussed on Saturday 10 March 2001 in a meeting of the CCQM WG chairmen.

A revised draft will then be discussed at the meeting of the CCQM on 4-6 April 2001.

The JCRB will then receive a report and final draft for consideration and approval at its meeting on 8-9 October 2001.

9. Procedure for updating or re-evaluation of CMCs already in Appendix C.

A first discussion on this point indicates the following:

- a periodic enquiry/review of the validity of the claims is needed, for example every 3 or 4 years;
- results of key comparisons give indications on the validity; these however are only momentary snapshots which are repeated relatively infrequently;

- the NMIs in the first place are responsible for the validity of the claims and the updating of the CMCs and secondly the RMOs have a responsibility for review, for example on the basis of the reported internal NMI review.

A more detailed procedure for updating will be drafted by the BIPM and will be discussed at the next meeting of the JCRB.

10. Procedure if more than one institute in the same country offers CMCs for the same quantity.

It is concluded that only one NMI or designated institute may claim a particular measurement capability; so, only one institute shall have national responsibility for a certain quantity and measurement range.

11. RMO responsibility for NMIs that are not yet connected to an RMO.

NMIs not connected to an RMO or an NMI that has no suitable peers in its own region have to be served by the existing RMOs.

In principle, a non-connected NMI has to agree with one of the existing RMOs that that RMO will take care of the interests of the NMI concerned and in particular carry out the intra-regional review of its CMCs. The NMI has to join in activities and comparisons organised by that RMO. Once an RMO has been chosen, all of the CMCs of that NMI must pass through this RMO. For example, South Africa is well served by APMP.

NMIs having difficulties should contact TJQ who will then assist in finding an acceptable solution.

12. Timetable for future submissions for Appendix C.

CMCs of the following fields may be expected for October 2001 meeting of the JCRB:

- mass, force, pressure, density, hardness, volume, torque and some of chemistry.
- CMCs of the following fields may be expected for the Spring 2002 meeting of the JCRB: temperature, flow, rest of length, rest of photometry and radiometry and more of chemistry.

With respect to “viscosity” it is remarked that the ad-hoc CIPM Working Group, chaired by Dr Kaarls, will first have a meeting later this year in order to discuss the situation with respect to traceability. This meeting was originally scheduled for the autumn of 2000, but had to be postponed because some data retrieval at NIST and primary measurements at NRLM had not yet finished.

As soon as the results of this ad hoc working group are available Rkaarls will report back to the JCRB.

13. The content of and responsibility for RMO databases.

If an RMO wishes to set up a parallel database to the BIPM key comparison database (KCDB) containing equivalents of Appendices B and C, the JCRB emphasized that there are two constraints that must be accepted:

1. The part of an RMO database that is common with the BIPM database must be rigorously identical to the BIPM key comparison database.
2. If an RMO database also contains information about non-signatories of the MRA (non-Metre Convention members/non-CGPM Associates) then there should be a very clear distinction between the part of the RMO database that is common with the BIPM database, established under the procedures of the MRA and recognized by all the participants, and the local part which is not part of the MRA. The JCRB emphasized the importance of users not being misled.

Dr Semerjian and Dr Carpenter explained their need for a SIM database. It will contain information related to the many non-Member/non-Associate countries of the Americas. Although for these countries the MRA does not apply, SIM is making sure that the same procedures will be applied. NIST needs a database containing all the results of comparisons in which NIST is involved. This database will be used by the FAA and other agencies for decisions on international recognitions. TJQ said that NIST and the BIPM will consult together to set up an appropriate mechanism that meets the NIST requirements and points 1 and 2 laid out above.

Note from TJQ: Since the JCRB, taking account of the importance and size of the data in Appendix C, I now suggest that we call the database: **The BIPM key comparison and calibration database** with the acronym (as before) **KCDB**. I propose that from 1 June we make the change..

14. Guidelines for the publication of the results of key comparisons.

TJQ informed the JCRB that he, together with Dr Wielgosz of the BIPM, has written a document on "Guidance for the publication of the results of key comparisons" (see Doc. JCRB-6/13). This as a result of discussions that took place in the scope of the CCQM. The document will be discussed during the forthcoming meeting of the CCQM.

15. Other business.

- Text on Calibration Certificates

EUROMET proposes a text to be printed on the calibration certificates issued by the NMIs under the rules of the CIPM MRA. See Doc. 6/11.

The proposal is welcomed and after some discussion it is agreed that the common text should be in accordance with the relevant text of Art. 22 of the MRA.

The draft text (modified by TJQ after the meeting and now subject to approval by the JCRB) reads as:

This certificate has been issued under the provisions of the MRA drawn up by the CIPM. All participating institutes recognize the validity of each other's calibration and measurement certificates for the quantities and ranges specified in Appendix C of the MRA (for details see <http://www.bipm.org>).

- List of expert assessors on behalf of ILAC;

ILAC has asked the CIPM during the tri-partite meeting with the OIML, ILAC and the CIPM/BIPM in February last to establish a list of NMI expert assessors with an international experience in assessment or peer evaluation. ILAC would make use of such a list when they are looking for acceptable expert assessors when carrying out an assessment of an NMI or an assessment of an ILAC member country, including a view on the capabilities and competence of the NMI of that ILAC member country (this in the case when the NMI concerned is not already recognized under the CIPM MRA).

The JCRB welcomes the initiative of ILAC for further co-operation.

However, the JCRB would like to have more details on the conditions under which these NMI experts will work and about the exact aims of and tasks in the ILAC assessment team.

TJQ will ask ILAC for further information and will report back at the next meeting of the JCRB in October 2001.

- Supplementary and bilateral comparisons;

RMO supplementary comparisons have to follow the same rules as key comparisons for their results to be published in Appendix B after a review of the CC concerned.

Bilateral comparisons can go in Appendix B as well. The BIPM will draft some guidance on this issue.

- Publicity

The BIPM will produce some promotional text and an A4 flyer/leaflet on the CIPM MRA and the BIPM KCDB.

More attention to publicity will be given, for example together with ILAC and the NCSL.

- Dates and place next meetings of the JCRB.

After some discussion, it is agreed that in principle the March meeting of the JCRB should take place in various regions around the world. The October meeting of the JCRB will always be held at the BIPM.

The following meetings have been agreed:

- 8-9 October 2001 at the BIPM,
- 5-6 March 2002 at the NML South Africa in Pretoria,
- October 2002 at the BIPM,
- March 2003 at the NMIJ in Tsukuba?

Closure of the meeting.

TJQ closes the meeting and expresses his thanks to our hosts of this meeting, NIST, for all the arrangements that have helped this meeting to be a successful one.

Note: Please note that the passwords given to you all at the JCRB are meant to allow access to the website by all those who have a need to view it. I expect you to make them available to others in the RMOs and NMIs closely related to the work (TJQ).

Appendices

Annex 1 List of participants with their affiliation and co-ordinates

Annex 2 List of documents presented at the 6th meeting of the JCRB

Annex 2

Doc. JCRB-6/01	COOMET Report
JCRB-6/02	Report by EUROMET representatives to the 6th JCRB
JCRB-6/03	SIM Report for the 6th meeting of the JCRB
JCRB-6/04	APMP Recommendation for the share of CMC Review
JCRB-6/05	Review Criteria and Procedures for EUROMET CMCs
JCRB-6/06	BIPM Instructions for drawing up CMC Excel files
JCRB-6/07	Inter-regional review of CMCs, experience gained in applying the JCRB rules (EUROMET)
JCRB-6/08	Report to the 6th JCRB, 8-9 March 2001 by SADC MET
JCRB-6/09	Time table for submission of CMCs to the JCRB for entry into Appendix C for the years 2001 – 2002
JCRB-6/10	Present situation for CMCs review in APMP
JCRB-6/11	Statement on NMI certificates covered by the MRA (EUROMET proposals)
JCRB-6/12	Report on the sixth meeting of the JCRB on 8-9 March 2001 at NIST, Gaithersburg Md., USA
JCRB-6/13	Guidelines for the publication of the results of Key Comparisons.