REPORT OF 9th JCRB MEETING, 3-4 OCTOBER 2002

1. OPENING AND WELCOME BY THE CHAIRMAN

The JCRB Chairman welcomed all those present. The Draft Agenda was approved, with the addition of Agenda Item 13.5, *Proposed Working Group on Uncertainty Analysis,* as requested by Dr Semerjian. [The Final Agenda is given in Appendix 1 incorporating all modifications, and providing references for all working documents.]

2. MATTERS ARISING FROM THE REPORT OF THE 8TH MEETING HELD AT NML-CSIR, SOUTH AFRICA

The Chairman referred to Document JCRB-9/2. He then invited the JCRB Executive Secretary to review outstanding matters. The following specific Actions were discussed:

Action 6: HECTEF's status – Dr Seta informed the meeting that this is awaiting finalisation within Japan.

Action 8: As an extension of this, the Chairman informed the Committee that he had been asked whether senior BIPM staff would be available to attend specific RMO technical meetings.

ACTION 1: In order to ensure appropriate BIPM representation, RMO Representatives are to send a yearly calendar of RMO activities to the JCRB Exec Secretary, highlighting meetings at which attendance by senior BIPM staff is requested.

Action 10: Dr Schwitz noted that EUROMET Guidance Document No. 3 now explicitly states that EUROMET-initiated comparisons are to be notified to the Executive Secretary of the relevant CC.

Action 11: The Exec Secretary noted that the flowcharts for registering RMO key and supplementary comparisons were forwarded to JCRB members for comment and are now available on the "Meeting Documents" *and* "Working Documents" sections of the JCRB website, i.e., accessible by RMO TC/WG[1] members also.

Action 12: Dr Sacconi informed the Committee that the discussion paper on "designated institutes" has not been finalised. It is pending on-going discussion about the appropriate terminology for different types of institutes that may be "designated" in the MRA.

Discussion on Action 14 was postponed until Agenda Item 6; discussion on Actions 32 and 38 was postponed until Agenda Item 10; discussion on Actions 39 and 41 was postponed until Agenda Item 13.1.

3. REPORT BY THE CHAIRMAN ON PROGRESS SINCE THE 8TH MEETING

The Chairman commented that most actions from the 8th meeting have been carried out.

He raised the issue of calibrations undertaken by the BIPM for Member States. He noted that responses from the Questionnaire sent to Directors in late 2001 indicated that there is overall high appreciation of this BIPM activity, but that the question was raised whether this is a responsibility that could be taken up by the RMOs. He requested RMO representatives to the JCRB to inform him of their views informally during the course of the meeting. Dr Schwitz inquired about traceability of calibrations provided by the BIPM in the context of the CIPM MRA, i.e., what conditions should the BIPM fulfil in this regard. The Chairman responded that the BIPM is putting in place a Quality System to support its calibration services in order to address this issue.

4. REPORT ON THE PRESENT STATUS OF THE KCDB

The Chairman referred to Document JCRB-9/4, provided by the KCDB Coordinator, Dr Claudine Thomas. He then invited Dr Thomas into the meeting, to present her report.

Dr Thomas noted that the overall statistics of data available in the KCDB are provided in the report. She drew the Committee's attention to the following specific issues:

[1] All references to TCs in this document refer to Technical Committees or Working Groups, whichever terminology is appropriate for a particular RMO.

1. Non-uniform changes to service categories among RMOs

ACTION 2: RMO-JCRB Representatives are to request that RMO TC/WG Chairs contact the KCDB Coordinator when changes are necessary to service categories so that this can be done in a coordinated way across all RMOs.

ACTION 3: The JCRB recommends that RMO TC/WG Chairs meet regularly at least once per year, including scheduling a meeting in association with CC meetings.

Dr Semerjian pointed out that the CMC review process seems to be much more efficient when it is undertaken at a joint meeting at which all the relevant RMO representatives come together, as is the case within the CCQM and CCL. He suggested that this approach be encouraged within all CCs.

ACTION 4: The JCRB recommends the formation of separate *Working Groups on CMCs* within each CC[2] with the main objective of facilitating the review of CMCs. All RMOs are to be represented within these Working Groups, even if they are not members of the CC - the Chairs of the relevant RMO Technical Committees/Working Groups are to have automatic membership on these Working Groups.

Dr Semerjian drafted the Terms of Reference for these Working Groups – these are provided in Document JCRB-9/8(4-rev)[3].

2. Only CMCs of designated institutes can be published in the KCDB.

Dr Valdés sought clarification of the difference between designated NMIs and designated institutes. The Chairman responded that the MRA states that, within each country, there is one signatory institute which signs on behalf of all designated institutes responsible for maintaining national standards in the country. Only CMCs from institutes listed in Appendix A can be published in Appendix C. It is up to each country to decide which institutes are to be designated. Other institutes can participate in CIPM key comparisons but their results will not be published in the KCDB. Any institute that meets the membership requirements of an RMO can participate in RMO comparisons.

Dr Sacconi commented that problems arise with institutes that only contribute one or two CMCs in a very narrow range of areas.

3. Publication of supplementary comparisons

Dr Thomas informed the Committee of the discussion underway regarding the usefulness of publishing supplementary comparison results in the KCDB. She highlighted in particular the comment provided in Document JCRB-9/4 by Dr Quinn, that:

"The MRA makes no statement regarding what must be published in the KCDB as regards a supplementary comparison, so we are free to choose."

5. CHEMISTRY CMCs

The Chairman drew the Committee's attention to the two documents JCRB-9/5[1] and [2].[4]

6. REPORTS BY RMO REPRESENTATIVES TO THE JCRB (including the status of CMC reviews)

The Exec Secretary tabled Document JCRB-9/6, in which the current status of CMC reviews is provided. She noted the current outstanding issues regarding overdue reviews and approvals and requested RMO-JCRB representatives to provide her with an update on these actions during the course of the meeting.

6.1 APMP: Dr Imai

Dr Imai tabled Document JCRB-9/6(1), summarising the main points. He informed the Committee that the position of APMP Executive Secretary has been transferred from Dr Katuo Seta to Dr Takashi Usuda.

On behalf of the Committee, the Chairman thanked Dr Seta for his efforts with regard to the JCRB and welcomed Dr Usuda.

---

[2] Note: Following the 9th JCRB Meeting, the CIPM in 2002 resolved that the formation of these Working Groups and their meeting at the time of a Consultative Committee are to be encouraged but that they are not to be *Consultative Committee* Working Groups.

[3] The Terms of Reference drafted by Dr Semerjian have been revised since the 9th JCRB meeting to reflect the decisions of the CIPM, consequently the current document is JCRB-9/8(4-**rev**).

[4] Note that Document JCRB-9/5(3) was provided subsequent to the 9th JCRB Meeting.

Dr Usuda noted that the report requested for the CMCs APMP.EM.1.2001 was provided as part of Document JCRB-9/8(1b).

ACTION 5: APMP is to provide an updated RMO report to the Executive Secretary.

6.2 COOMET: Dr Belotserkovskiy

Dr Belotserkovskiy referred to Document JCRB-9/6(2). He directed the Committee's attention to the new COOMET structure, provided in Appendix 2 of the report. This re-organisation was mainly aimed at simplifying tasks in relation to the MRA.

6.3 EUROMET: Dr Hetherington

Dr Hetherington tabled Document JCRB-9/6(3), summarising the main points. He then requested Drs Schwitz and Sacconi to report on Sections 4, 5, and 6 (On-going Inter-regional review of EUROMET CMCs; On-going reviews of Other RMOs' CMCs by EUROMET; Status of Quality Systems and Review Process).

Dr Schwitz noted that problems had arisen among all RMOs with CMCs in thermometry and that some assistance should be given to help these TCs/WGs resolve the issues. He suggested setting up minimum requirements of what should be provided when a set of CMCs are submitted for inter-regional review – i.e., some assessment of how well the 9 criteria have been met. (See Action 11.)

Dr Semerjian commented that RMOs reviewing CMCs are working on the assumption that the submitting institutes are designated – he inquired how valid this assumption is. The Chairman responded that the assumption is nearly always valid. Dr Semerjian also mentioned that apparently in some areas similar CMCs were submitted from two institutes in the same country. The Chairman informed him that these cases are known and that this issue is being monitored on an on-going basis.

Dr Semerjian reiterated Dr Schwitz's recommendation that the situation with regard to the CMCs in thermometry needs to be addressed in a centrally coordinated way, adding that there are also problems in the area of photometry and radiometry, especially given the situation that an institute that has capabilities that others do not seems to be penalised for this. The Chairman agreed that this becomes a significant problem when there is no resolution within the technical community. It is hoped that this will be better addressed by the establishment of the Working Groups on CMCs. The process may be assisted if the appropriate JCRB RMO representative also attends these meetings and there is a clear requirement placed on the Working Groups that a resolution must be reached at these meetings.

Prof Kühne noted that, with respect to the thermometry CMCs, most people will be meeting in Chicago in October, so this may be an appropriate occasion to schedule a meeting to resolve outstanding issues. Dr Schwitz informed the Committee that such a meeting is being set up. The Chairman added that both he and Dr Semerjian will be attending this meeting.

The Chairman then referred to the first dot point on page 5 of the EUROMET Report:

- "…Does the MRA allow an NMI or Designated Institute to have CMCs approved and published without its own "corresponding" national standards, e.g. is it sufficient that standards or instruments used to deliver the service be calibrated against the national standards of another participating NMI?"

responding that an NMI does **not** need to hold primary standards, but can hold standards that are traceability to another NMI through calibrations and use these to provide CMCs and to take part in comparisons. The NMI has to maintain those standards and participate, normally, in RMO comparisons.

The Chairman informed the Committee that discussion is taking place with ILAC to clarify that, if an NMI is accredited on the basis of standards traceable to another NMI, then the uncertainties given for the services it provides have to be compatible with the uncertainties obtained from its' traceability. Dr Benyon agreed that ILAC is particularly concerned with the situation where traceability referring to top-level services means that the uncertainties that an NMI provides for accreditation purposes are better than those for their CMCs. (See also the discussion under Agenda Item 13.3.)

Regarding the second dot point on page 5 of the EUROMET Report:

- "Before CMCs are submitted to other RMOs for review, the originating RMO does its own review. Moreover, the intra-RMO review is done on every single entry, while the inter-RMO review is done on a selective basis. How do we act when an intra-RMO report is not available?"

the Chairman stated that the intra-regional RMO report **must** be available with the submission of CMCs for inter-regional review.

Dr Semerjian asked EUROMET how the QS forum approves an NMI's Quality System. Dr Sacconi responded that the oral presentations provided are itemised to explain how each country has built up its system, to indicate specific problems identified and their solutions. There is a precise format for presentations, details of which are available through the *Initiation* website (which will shortly be moved to the EUROMET site). The presentations are made available before each meeting. After the presentations, experts are asked whether all items have been sufficiently addressed, whether they have confidence in the Quality System, and whether the Quality System provides appropriate support for the corresponding CMCs. The opportunity is taken during QS Fora to visit the hosting laboratory to review the application of the Quality System. Thus, it is a formal review and at the end unanimous approval is required. There have been cases where approval has not been granted and more information has been requested.

It is anticipated that there will be periodic major re-presentations/reviews, but the timing of these has not been fixed (it is likely to be 4-6 years). Dr Sacconi noted that there have been complaints that EUROMET's transparency in this area is not necessarily reflected in other regions. The EUROMET approach has helped identify and resolve problems. Dr Benyon added that the QS Forum has also provided the opportunity for other RMOs to make presentations. It has been particular useful in clarifying the relationship between the implementation of a Quality System and the associated CMCs.

Dr Valdés inquired how the QS Forum handles NMIs that are accredited, whether these are simply accepted or whether they also undergo review? Dr Sacconi responded that the same process applies to all participants, independent of the route they have chosen to address Clause 7.3.

6.4 SADCMET: Dr Hengstberger

Dr Hengstberger tabled Document JCRB-9/6(4), summarising the main points. He noted that, in addition to the SADCMET TC-1 Working Groups identified in the Report, there are two new Working Groups
1: WG-QS – to address quality systems issues. The approach will be similar to EUROMET's in having a peer review of the Quality Systems of member NMIs. He noted that the only SADCMET NMI that has undergone peer review of its Quality System to date is NML-CSIR, South Africa. This was undertaken two years ago and included experts from SIM, APMP and EUROMET.
2: WG-DB – to work on the regional database, with assistance from NIST/SIM.

Dr Hengstberger stated that there is a need for a West African regional metrology organisation, and that SADCMET is encouraging Nigeria (which is applying for SADCMET membership) to take the lead here. The ECOWAS (Economic Community of West African States) trading bloc could form the basis for this new RMO.

Dr Schwitz asked for Dr Hengstberger's views on how the north African region should be covered. Dr Hengstberger agreed with the Chairman that political problems have made this difficult and that, due to this, MENAMET had ceased. He informed the Committee that Egypt would like to start an RMO in North Africa, but he was not aware if any progress has been made.

6.5 SIM: Dr Semerjian

Dr Semerjian tabled Document JCRB-9/6(5), summarising the main points.

ACTION 6: SIM is to provide an updated RMO report to the Executive Secretary.

Dr Semerjian noted that Dr Willie May of NIST has provided a report on the work of the CCQM Working Group on CMCs. (NOTE: This is now available to RMO-JCRB representatives as Document JCRB-9/5[3]). He also informed the Committee that SIM has just formed a Task Force on Quality Systems, which he will be chairing. The details are to be discussed at the forthcoming SIM General Assembly.

7. THE JCRB WEBSITE

7.1 Accessing documents

The Exec Secretary informed the Committee that some RMO TC/WG members do not appear to be aware of the existence of the RMO TC/WG section of the JCRB Website. She requested the Committee to provide feedback on improving its usefulness as well as that of the Technical Reviewers' Logbooks and automated-reminder features for CMC reviews.

ACTION 7: RMO-JCRB Representatives to ensure that RMO TC/WG Chairs are informed about the TC/WG section of the JCRB website and to provide feedback on improvements to this and to the new features provided to facilitate the CMC review process.

With respect to Action 32 from the 8th JCRB Meeting Report, Dr Hetherington sought the Committee's views on how information regarding NMIs' approaches to implementing Clause 7.3 of the MRA should be provided on the BIPM website.

ACTION 8: JCRB members to provide views to Dr Hetherington on how information regarding NMIs' approaches to Clause 7.3 should be made available on the BIPM website.

Dr Hengstberger commented that the enhancements to the CMC review process instituted since the 8th JCRB meeting have been useful in the context of a small RMO and that he would appreciate more reminders from the Exec Secretary.

ACTION 9: Exec Secretary to provide more reminders regarding CMC review deadlines as appropriate.

8. INTER-REGIONAL REVIEW OF CMCs

8.1 Acceptable evidence for CMCs during transitional mode of MRA

The Exec Secretary opened the discussion about the status of EUROMET's review of the Thai NMI's Electricity and Magnetism CMCs by tabling Issue #6 from Document JCRB-9/8(1c), Actions arising from the Meeting of RMO TC/WG Chairs in Electricity and Magnetism held at the BIPM in September 2002.

Prof Kühne noted that there are two issues of concern for EUROMET regarding the NIMT CMC submission:
(1) whether sufficient comparisons had been undertaken when the accreditation was given, i.e., is there enough comparison evidence to justify the claimed uncertainties?; and
(2) the fact that, after accreditation, the NMI recently participated in a key comparison in which the quoted uncertainties obtained were a factor of two larger than those given in the "accredited" CMCs. Therefore, the published uncertainties from the results of the key comparison in the KCDB will not match those given for the CMCs. This mismatch may be due to a misunderstanding but needs to be resolved.

Dr Schwitz added that, in this specific case, the timing of events had led to incompatible uncertainties. As well, the APMP intra-regional review report had not been provided with the CMCs.

Mr Jones stated that it is not clear why the case of Thailand is special. Within Europe, there are countries that rely on accreditation and have not necessarily participated in key comparisons – eg.., Hungary, Czech Republic and Slovenia. What APMP seeks is clarification of what is required of Thailand to satisfy the EUROMET reviewers. He noted that, as a DKD accredited laboratory, NIMT's results would normally have been accepted in Europe but because of the MRA they are not accepted.

The Chairman noted that there is a specific issue to be resolved with respect to the Thai laboratory, but that there are other more general issues arising out of this that need to be addressed. One of the reasons for creating the CIPM MRA was that ILAC needs worldwide recognition of calibration certificates, so links between the CIPM and ILAC MRAs and compatibility between the MRAs is necessary. Dr Benyon added that more links are needed between the two MRAs so that accreditors have a consistent understanding of what is meant when they accredit an NMI's capabilities.

Prof Kühne stated that the accreditation of NMIs' quality systems does not replace the need to participate in key comparisons.

Mr Jones inquired whether NIMT's CMCs will be accepted if their uncertainty claims are satisfied. Dr Schwitz responded that what is required is evidence from comparisons.

ACTION 10: The JCRB strongly urges the EUROMET and APMP representatives to the JCRB to work together to resolve the issues relating to Thailand's E&M CMCs.

Dr Semerjian inquired whether this was only a transition period issue due to the fact that, in this case, the only basis for the claimed uncertainties is through traceability to another NMI? The Chairman responded that the

issue is how well the NMI has performed in internal comparisons compared with the uncertainties given in its accreditation. The Chairman added that uncertainties in key comparisons and CMCs must be compatible.

Dr Semerjian pointed out that this case illustrates the fact that accreditation does not answer all questions about the capabilities of an NMI. Dr Seta agreed, adding that, in his view, there was some lack of transparency in this specific situation with respect to the evidence provided by NIMT.

Dr Sacconi suggested that this case highlights a weak point in the MRA in that it allows participation not only by "real" NMIs but also by accredited laboratories at the next level. Dr Hengstberger responded that these laboratories are also "real" NMIs, since they have the legal status of providing national measurement standards for their country. Therefore, they are not the same as, for example, accredited commercial laboratories.

The Exec Secretary then tabled Issue #7 from Document JCRB-9/8(1c) in which the EM TC/WG RMO Chairs have noted for the information/advice of the JCRB that, due to various constraints, NMIs would opt to undertake regional *bilateral* comparisons to meet the requirements of the CIPM MRA. The Chairman stated that there is no problem with this, since a properly conducted regional bilateral comparison following the guidelines has the same status as a key comparison.

8.1A Clarification of Criteria given in Document JCRB-8/13(1b)

Mr Jones sought clarification of the Criteria given in Document JCRB-8/13(1b). He highlighted Item 3 – how will a new NMI satisfy these requirements? The burden of this is currently on the TC/WG Chairs – can the JCRB provide some guidance?

The Chairman stated that it is not possible to quantify the criteria. Dr Semerjian agreed that it is difficult to be more proscriptive. The criteria are to be used to judge the acceptability of another laboratory's CMC claims as a reminder or check list only. They are also a reminder that the judgement should not be based on a single issue, and that indeed more emphasis may be required on some items when evaluating a laboratory with which the expert is less familiar.

Mr Jones pointed out that, for a new NMI there can be conflict in what one RMO considers adequate evidence compared with another RMO. Dr Semerjian responded that part of the knowledge of a laboratory is obtained through the exchange of artefacts, knowledge of the staff, etc, but specific points that must be taken into account are difficult to define *a priori*. As an example, in the case of NIMT, Thailand, if NMIJ had stated that they have a lot of experience with the laboratory this could be considered very helpful, but it is a subjective judgement.

Mr Jones concluded that perhaps the important point is that, when delays occur in reviews due to matters of interpretation of how well the criteria have been addressed, there needs to be some clear method of resolution and that the TC/WG Chairs are not left to resolve this in isolation. Dr Schwitz responded that it is very seldom that the judgement relies on one person alone and that the TC/WG Chairs are usually very experienced. What would be helpful to the TC/WG Chairs in other RMOs when trying to make this judgement is if the report provided when the CMCs are submitted for inter-regional review addresses how well the criteria have been addressed, explaining why points are not addressed and when they will be.

Dr Semerjian noted that the Working Group concept may help address some of these issues. Even if they are not addressed directly in the report, at least clarification can be sought at these meetings.

Mr Jones asked whether such a report is currently provided when CMCs are submitted for inter-regional review. The Chairman responded that it is implicit that the MRA's requirements should be addressed when CMCs are submitted for inter-regional review. Perhaps a checklist should be included. Mr Jones noted the amount of additional work this would require and suggested that the meetings of TC/WG Chairs could be asked to decide how best to share the information. He sought agreement that the key message is that there is still significant flexibility in the interpretation of the criteria. Dr Schwitz pointed out that all that is required is a summary of the review that has already been undertaken, and that this would serve to underpin the work already done.

ACTION 11: RMOs must provide a one or two page summary of the intra-regional review report, providing an evaluation of how well the 9 criteria in Document JCRB-8/13(1b) have been addressed *with each submission* of CMCs for inter-regional review.

8.2 Process for review of "single-line" CMCs

The Exec Secretary tabled Issue #2 from Document JCRB-9/8(1c), the question of the review procedure for "single-line" CMCs or small modifications to published CMCs. The Chairman stated that in these cases the CMCs would still need to under go the whole process. However he added that the proposed meetings of RMO TC/WG experts should be an effective way of handling this.

8.3 Statement regarding IAEA CMCs

The Chairman stated that, during the transition period, it is acceptable to have the IAEA CMCs in the database pending the finalisation of the Quality System. He then proposed that the requested deadline to establish the Agency's Quality System be accepted. The Committee agreed.

Prof Wallard suggested that, since the Agency is not part of an RMO, perhaps one of the RMOs could include them in their "QS Forum" process. (IRMM goes through the EUROMET process.) The Chairman agreed, adding that it would clearly be simplest for IAEA to undergo the EUROMET process but inquired whether there were any different views. Dr Hengstberger expressed his support for this approach.

ACTION 12: The Chairman will write to IAEA encouraging it, once it has established its Quality System, to consider having it evaluated through one of the RMO QS processes. The letter will inform the Agency that EUROMET is willing for it to participate in its QS Forum process. In the meantime the JCRB approves the requested deadline by which the Agency will have established its Quality System.

8.4 CC[5] Working Groups on CMCs

Dr Semerjian tabled the draft Terms of Reference for the proposed *Working Groups on CMCs* for comment.

NEW ACTION 13: JCRB Committee members are to review the Draft Terms of Reference for the Working Groups on CMCs (Document JCRB-9/8[4-rev]) and provide final comments to the Exec Secretary by *25 November 2002*.

9. KEY COMPARISONS

The Chairman highlighted the change in the flow chart regarding the procedures for undertaking a key comparison (Document JCRB-9/9). The modification has been made to the fourth box from the top in the right-hand column. This previously stated that results of key comparisons were to be submitted to Consultative Committees. It now states that they are to be submitted to the CC Working Groups on Key Comparisons (or equivalent). The flowchart will be posted on the KCDB website.

9.1 Registration of new key comparisons

The Exec Secretary tabled the template (Document JCRB-9/9[1]) for registration of CIPM and RMO key, supplementary and bilateral comparisons. This is proposed to be used by Consultative Committees to register such comparisons.

ACTION 14: RMO-JCRB Representatives are to send the template for registration of CIPM and RMO key, supplementary and bilateral comparisons to their RMO TC/WG Chairs for information.

9.2 Impact of key comparison results on CMC claims

The Chairman raised the issue of the chain of responsibility in terms of monitoring when the results of key comparisons impact upon published CMC claims. [This was also included as Issue #1 in Document JCRB-9/8(1c).] He recommended that the hierarchy of responsibility is: the NMI whose CMC claims are affected, the RMO to which that NMI belongs, and then other RMOs.

Dr Hetherington stated that EUROMET agreed that this is primarily the responsibility of the relevant NMI. Dr Semerjian noted that it would form part of the responsibilities of the new Working Groups on CMCs to point out these discrepancies. However, he agreed that it is the responsibility of the NMI to take the appropriate action. Dr Benyon pointed out that, for NMIs with a Quality System in place, this on-going monitoring is part of the System. Dr Sacconi commented that one of the regional outputs of the QS Forum is whether each NMI has a written procedure for continuous re-alignment of results of key comparisons and TC/WG evaluations of CMC claims.

[5] See Footnote 2.

The Chairman stated that the brief report of this discussion in the Meeting Report should be used to inform RMO TC/WG experts of the JCRB view on this issue.

ACTION 15: RMO-JCRB Representatives are to refer RMO TC/WG experts to the discussion under Agenda Item 9.2 in the Report of the 9th JCRB Meeting regarding the responsibility for taking action when key comparisons results impact upon published CMC claims.

Dr Korostin raised the issue that information about key comparisons is currently spread among a number of documents and suggested that a single document be created that brought together all the relevant information. The Chairman clarified that this referred to extracts from the MRA, guidelines for key comparisons, the form for registering key comparisons, etc.

Dr Benyon pointed out that it is potentially dangerous to have extracts from other documents put together into a new document, due to the possibility of changes to the original documents. He suggested that the relevant references could instead be collated in one document to tell users where to obtain information. The Chairman agreed and added that JCRB members should encourage RMO TC/WG experts to read the documents that are available.

ACTION 16: The JCRB Exec Secretary is to create a new document which collates references to all other procedural documents regarding key, supplementary and bilateral comparisons and other relevant information to facilitate access to existing guidelines by RMO TC/WG experts.

ACTION 17: RMO representatives to the JCRB are to encourage RMO TC/WG experts to refer to the existing guidelines on comparison procedures, etc.

10. INTER-REGIONAL HARMONIZATION OF QUALITY SYSTEM REVIEWS

10.1 Updated report of *ad-hoc* working group

Dr Hetherington presented the revised Report of the Ad-hoc Working Group for comment [Document JCRB-9/10(1)]. The amendments proposed by the Committee were incorporated and a new version is now available – Document JCRB-9/10(1_rev).

Dr Benyon referred to the second bullet point on page 5 and inquired why signatories to the ILAC MRA need to provide assessors' details. Dr Hetherington inquired in turn whether there was any reason not to provide these details. The Chairman added that, if the NMI customer is willing to have these names divulged – an issue that should be addressed before the process of accreditation begins – then there seems to be no reason why the accreditation body should refuse to provide these details. It provides more confidence for the NMI that the assessment has been done appropriately, so NMIs should be encouraged to provide these details.

Dr Semerjian asked whether this is a problem for accreditation bodies. Dr Benyon responded that there is a variation in approaches to this among accreditation bodies. Dr Schwitz then asked whether there is an ILAC policy on transparency of experts, noting that the CIPM MRA states that reviewers names be available. Dr Benyon responded that the information is provided in the reports of the assessments and in the evaluation of the review of each accreditation body, but this is not public so the use made of it depends on the laboratory. There is an ILAC policy that each accreditation body must have a system of providing details of the qualifications of the experts.

Dr Semerjian stated that there should be a comparable transparency. Prof Kühne added that the objective is to improve confidence. The Chairman proposed that this be addressed by the Joint BIPM/ILAC Working Group.

ACTION 18: The Joint BIPM/ILAC Working Group (see Action 22) is to address the issue of consistency between the CIPM and ILAC MRAs regarding the provision of details of NMI assessors.

The Chairman noted that this document is not yet ready to be presented to the CIPM.

ACTION 19: The Document JCRB-9/10(1_rev) is to be taken back by the JCRB-RMO representatives for discussion within the RMOs. Comments are to be brought to the next JCRB meeting so that the document can be finalised as a JCRB document at that time.

11. NOTIFICATION OF DESIGNATED INSTITUTES

Dr Semerjian sought clarification on the formal process for designating an institute. The Chairman responded that the Signatory institute in the MRA for a particular country is responsible for informing the Director of the BIPM officially which institutes from that country are to be designated and therefore to be included in Appendix A of the MRA. Dr Valdés inquired whether every institute that wishes to participate in the MRA is obliged to address this through their recognised institute. The Chairman agreed that he can only accept this information from the signatory institute.

The Chairman informed the Committee that discussions are under way within the CCQM regarding the status of CRM providers and the decision is that sub-contracting is not acceptable. Dr Semerjian added that there did not seem to be any point in having a sub-contracted institute. However he expressed his concern that in the Laboratory Medicine area there are commercial companies that make money by providing standards for cholesterol tests, etc, and these would like to increase their credibility by being able to claim that they are designated institutes.

The Chairman concluded the discussion by re-stating that the authority to designate institutes rests with the government or official body within the country and that this is a purely internal matter for each country.

12. REVIEW OF MRA DUE FOR 2003: END OF TRANSITION PERIOD OF MRA – INTERPRETATION OF MRA TEXT

The Chairman opened the discussion regarding Document JCRB-8/13(1), "Interpretation of Paragraph 11.3 of the CIPM MRA concerning the end of the transition period". He informed the Committee that this had been tabled at the Directors' Meeting in April and that there had been objections raised to Clauses J and H from the NIST and PTB.

Prof Kühne clarified his understanding that the objection from PTB was that it *appeared* as if NMIs using approach Clause 7.3(b) should have different requirements placed on them, and that in fact the requirements should be the same no matter which approach was adopted.

It was agreed that all references to Clause 7.3 would remove any distinctions between (a) or (b). The document was re-drafted and has become **Document JCRB-8/13(1_rev).**

The Chairman then opened the discussion on Document JCRB-9/12, "End of transition period of CIPM MRA – review of published CMCs". The following changes were agreed and the Document revised accordingly:

- To remove the implication that there is a difference between the applicability of the 9 criteria before and after the end of the transition period.
- To Highlight Criteria 1 and 8, stating that
  - CMCs not supported by a Quality System after the end of the transition period will need to be withdrawn unless an extension is sought and granted; and that
  - as part of its on-going processes, the new WG on CMCs is expected to review the results of each key comparison and make a report on the implications with regard to the CMCs of the NMIs.
- Also to consider the fact that some CMCs currently published are supported by "provisional" evidence and that this will need to be addressed after the end of the transition period. It was agreed that, if stronger evidence does not become available, the CMCs remain in the KCDB until such evidence is available. However, if relevant key/supplementary comparisons are undertaken that support particular CMCs and countries choose not to participate, then the "provisional" evidence supporting their CMCs is no longer valid and the CMCs must be withdrawn. It is the responsibility of the RMOs to ensure that NMIs participate in the appropriate key/supplementary comparisons.

Dr Seta inquired about the relationship between Appendices B and C, suggesting that information should be provided about which key comparison covers which CMCs. The Chairman responded that this is difficult in view of the large number of key comparisons. Dr Semerjian noted that the CCQM recommends that each key comparison has a statement at the end identifying the areas that the comparison covers.

ACTION 20: The Consultative Committees are to be asked to formally consider providing information about the coverage of key comparison results, e.g., in relation to which CMCs are supported by the results, etc.

13. OTHER BUSINESS

13.1 Publicity

The Executive Secretary tabled Document JCRB-9/13(1a), in which approaches in terms of promoting participation in the Metre Convention and the CIPM MRA are considered in the context of the level of awareness of countries regarding metrology and related activities. She referred to Document JCRB-9/13(1b), a letter from the BIPM Director to NMI Directors of States that are not yet members of the Metre Treaty or Associates of the CGPM. She also made reference to the new Joint Committee on coordination of assistance to Developing Countries in Metrology, Accreditation and Standardization (JCDCMAS), for which the draft Terms of Reference and reports from the first two meetings are provided for the information of the JCRB as Documents JCRB-13(2a), (2b) and (2c).

The Chairman then outlined the background to the drafting of the Letter, and requested Committee members to review this and provide feedback to him.

Dr Semerjian suggested that it would be helpful to articulate existing metrology programs for these countries and perhaps provide a summary of references to existing documents (e.g., the KPMG report, impact studies and other documents such as those that the NIST has produced). He added that the efforts of Dr Thomas at the PittCon meeting and the BIPM presence there was a good means of developing grassroots awareness. He suggested that two-three major exhibitions/conferences should be targeted per year for this type of exposure, and that perhaps local people could be trained to provide demonstrations of the KCDB rather than Dr Thomas/BIPM staff having to undertake these activities each time.

Dr Hengstberger added that it was important to target industry representatives since they are in a position to drive participation by governments. He added that this type of approach is being undertaken by some of the RMOs and that the activities of the JCDCMAS will be helpful in this connection. He noted that many of the less developed countries are in fact aware of the benefits of participating in international activities of this type.

Prof Wallard then summarised the work to date of the JCDCMAS and highlighted the specific actions arising from the 1st meeting in Stockholm on September 28. The Exec Secretary informed the Committee that comments on the JCDCMAS's draft Terms of Reference were due by Friday 4 October.

ACTION 21: JCRB-RMO Representatives to review the draft Terms of Reference of the JCDCMAS and provide comments to the JCRB Exec Secretary.

13.3 BIPM-ILAC MoU and related issues

Documents JCRB-9/13(3a) and (3ai) were tabled, in which criteria for NMI assessors/reviewers were proposed and APMP's comments to these were provided. Dr Benyon informed the Committee that ILAC Document 11 (1998) provides a similar list of criteria. After further discussion, it was agreed that there was no necessity for the JCRB document and it was **withdrawn**. Any further discussion on this issue will be taken up within the new Joint BIPM/ILAC Working Group (see Action 22).

(Note that Documents JCRB-13(3b) and (3c) were included for the information of the Committee and are lists of NMI assessors provided by the CENAM Director-General.)

The Chairman then invited Prof Wallard to present to the Committee the paper he delivered to the ILAC General Assembly on September 26 2002 (Document JCRB-9/13[3e]). Prof Wallard's presentation highlighted the two proposals he had made to ILAC [which were also given separately in Document JCRB-9/13(3d)]:

1. "For a particular quantity, an accredited laboratory will not have uncertainties smaller than those of the NMI from which it claims traceability. This would require assessors to ask specific questions about traceability and use the BIPM database to identify the CMC from the NMI concerned. In addition common service terminology would be necessary.
2. In the case that an NMI is accredited and takes traceability from another NMI, often from within the same Regional Metrology Organisation, then it should not have CMCs smaller than those that can be justified by the comparisons linking it to the other NMI. This again requires accrediting bodies and assessors to identify traceability links and the associated uncertainties."

Dr Benyon suggested that actions could be initiated by the JCRB to obtain convergence on the question of CMCs vs BMCs. He added that this would be a practical way of addressing Proposal (1), where problems are occurring because certificates are being accepted with uncertainties that are lower than those from the NMI's

CMCs. Although the NMIs are not responsible for the use that customers make of results, there is an obligation to explain traceability to accredited laboratories so that they know to look for such discrepancies.

The Chairman stated that it is understood that NMIs can have better capabilities than those in their CMCs, but this is outside the realm of the MRA. The question is what is the status of such certificates with respect to those of other NMIs. The second question is can an NMI claim uncertainties smaller than those obtained through a key comparison.

Dr Schwitz agreed that, if an NMI provides a special service, e.g, providing services to another NMI to enable it to then provide CMCs, this should be open and transparent but should not be considered the same as an ordinary CMC. The Chairman added that if an NMI uses this means to justify CMCs, it has to fit into the CIPM MRA procedures.

Prof Kühne stated that there is the risk of losing equivalence between primary standards. If uncertainties are smaller than degrees of equivalence, the relationship to the SI could be lost.

Dr Benyon noted that what is needed is a practical and unambiguous route to support traceability that can be used at the accreditation level, i.e., there is the need to distinguish between certificates that are consistent with CMCs and those that are not. Prof Kühne suggested that NMIs could issue two types of certificates: one backed up by CMC claims could be used for traceability purposes in the ILAC scheme; the other, based on the uncertainties from an NMI's primary standards, could be used only in special cases. Dr Benyon agreed that this would help assessors. However, the second type of certificate does not exclude support of traceability.

The Chairman asked to what extent the NMIs present issue certificates to other NMIs that are very different from their CMCs. Dr Semerjian responded that NIST has a declaration of equivalence with NMi, the Netherlands, that precedes the CIPM MRA. The uncertainties in this have to be at a higher level than for NIST's normal reference materials. In addition, in the case of certain laboratories that act as the primary laboratory for the military, etc, NIST may provide calibrations with better uncertainties because the measurements have been undertaken differently, e.g., with more repeats, over a longer period of time, or using additional independent techniques to improve the measurement uncertainty, etc. He suggested that if an NMI issues a calibration report with uncertainties that are not reflecting their CMCs, the NMI should explain the additional measures taken to achieve these different uncertainties. The Chairman asked whether these should still be compatible with the results of key comparisons. Dr Semerjian responded that this is debatable. At NIST, key comparison measurements are undertaken like other measurements, not at the "research project" level. However, this may not be true in other NMIs. The definition of the CMC is that it is meant to reflect "normal" procedure. However, a customer may make a special request.

Dr Benyon noted that the confidence in CMCs comes from the fact that there is a review process, and that most of the services that accredited laboratories need will come from CMCs. However, accredited laboratories need to know which certificates are covered by CMCs and which are not, and if not, whether they are covered by a key comparison. The Chairman asked the Committee whether it is the metrological community that should provide the answer or whether this should be addressed at the NMI-level. Prof Kühne responded that this is an issue that should be resolved by the metrology community.

Prof Kühne pointed out that the low frequency of repetition of key comparisons means that some NMI's calibration capabilities may significantly improve before this is reflected in a new key comparison.

Dr Schwitz noted that the issue is the next level of services that are "ordinarily available" but are provided between NMIs. Ing Mussio pointed out that when a special calibration is requested by a small NMI of a larger NMI this forms part of the review report accompanying the submitted CMCs. Dr Benyon responded that the problem is not when the certificate goes to another NMI, since it is within the community and understands the context, but when the certificate goes to, say, a commercial company outside the region. This can become a technical barrier when the calibration is not justified by CMCs. Dr Semerjian reiterated that, since this case is outside the framework of the MRA, an NMI claiming less uncertainty should be required to provide at least an uncertainty analysis that discusses why the uncertainty of this particular measurement is less than that in the CMC.

Prof Kühne proposed that the RMO TC/WG in the region in which the calibration laboratory operates could discuss the situation with the other RMO TC/WG in the region where the traceability originates.

Dr Benyon pointed out that, in the case where the uncertainties claimed for a service are not consistent with the CMCs and the uncertainties are being used to support an accreditation, then additional information **would be needed** to support the smaller uncertainties. This would ensure that the certificate provider knows that there is a cost to them in claiming the smaller uncertainty. He repeated that accreditors are not questioning the services provided between NMIs. However, if this is a service between NMIs used in the context of accreditation then such information would also be required. He then proposed that an *ad hoc* joint working group be created to draft the appropriate words to be inserted into the CIPM-ILAC MoU.

Dr Hengstberger supported the idea of setting up a joint Working Group to resolve this. (See Action 22.)

Dr Semerjian stated that the main issue is to distinguish between certificates consistent within the MRA framework and those that are not. He suggested that a simple statement could be included on the certificate stating that the uncertainties are smaller than those in the KCDB for the following reasons. This would inform the accreditor that this is a different situation and they can then decide how to deal with it.

Dr Hetherington agreed with the Chairman that firstly the size of the problem should be determined. Ing Mussio supported the suggestion of determining how many certificates this affects. He added that if there are only a few, they can be treated as exceptions.

The Chairman concluded that, with respect to the issue of smaller uncertainties from special calibrations, NMIs are clearly free to do this at any time but have to make it clear whether their certificates are supported in the MRA. It is the NMI's prerogative to provide special services to commercial companies, etc.

ACTION 22: A Joint BIPM-ILAC Working Group will be established to resolve the issues raised concerning coherence between the CIPM and ILAC MRAs. Prof Wallard is to to take the lead in this, and each RMO is requested to nominate one representative to provide the metrology representation. Prof Wallard is to determine a suitable venue for the initial meeting at which the issues will be identified. The outcomes are to be brought back to the next JCRB meeting.

13.4 Brief Report from ILAC

Dr Benyon tabled two ILAC documents which became Documents JCRB-9/13(4a) and (4b). He noted that if coherent traceability to the SI is needed by users then the appropriate links need to be made between the CIPM and ILAC MRAs. With reference to Document JCRB-9/13(4b), Dr Benyon highlighted the suggestion that NMIs be encouraged to participate in "calibration"-level comparisons to reinforce the direct link between key comparisons and "industrial" comparisons. The Chairman responded that this does take place already in certain areas, e.g., IRMM's activities, but that more of such activities would be an enormous load on NMIs. Dr Benyon responded that NMIs be encouraged only to consider undertaking this activity.

The Chairman noted that there should not be the perception that only capabilities in the MRA have credibility. Dr Benyon agreed, adding that it is a matter of how confidence is transmitted to the end-user for capabilities that are not in the MRA.

Dr Valdés commented that this is a question of who assures traceability. Dr Semerjian informed the Committee that NIST has decided that it is not its job to decide who assures traceability, but this is left up to the regulatory body or customer to decide. NMIs can only assure the presence of national standards that can provide traceability. The Chairman agreed, noting that traceability of laboratory medicine provided a good example, where the EU Directive has obliged industry to determine how they will assure traceability.

13.5 Proposed Working Group on Uncertainty Analysis

The Chairman invited Dr Semerjian to raise his proposal. Dr Semerjian noted that uncertainty analyses are being undertaken by different CCs in different ways, with many of the same issues coming up. He suggested that there is a need for an advisory group to the JCRB on uncertainty issues, to provide guidance to the CCs and harmonise these efforts. He noted that there had been a recent meeting on this subject at NPL, and that another is planned at PTB in December. It is not clear who is invited to these meetings and how they are coordinated. He suggested that the Advisory Group include statisticians *and* metrologists who have a good understanding of statistical issues. He noted that the Chairman has set up a small group to help in this regard but that the membership needs to be broader with more open selection from the RMOs, etc. The Chairman informed the Committee that the membership of the informal advisory group to which Dr Semerjian referred had been based on representatives of the Joint Committee on Guides in Metrology. He accepted the criticism that it does not include a professional

statistician. However, he considered that this is not task of the JCRB, but he will look again at the composition of the existing group and may formalise it, rather than creating a new one.

ACTION 23: The Director of BIPM is to re-consider the composition of the informal advisory group on uncertainty analysis with a view to formalising and broadening the membership.

Dr Hengstberger stated that the existing group does not have enough profile to respond to the needs of the CCs. Dr Semerjian added that the group should respond to the JCRB's needs, since the JCRB is the meeting point for the concerns of the CCs. The Chairman responded that it is not the JCRB that handles the concerns of the CCs but the CIPM. Dr Semerjian inquired which body resolves issues such as the stalled review of CMCs in thermometry. The Chairman responded that, again, this is the task of the CIPM.

Dr Semerjian raised the case where appropriate expertise does not exist within an RMO to evaluate a CMC. He asked for confirmation that, in such cases, the CMC evaluation is referred to another RMO. The Chairman agreed. Dr Semerjian then informed the Committee that, based on this understanding, SIM had asked another RMO to evaluate some CMCs, but that the other RMO had sent the CMCs back saying that SIM has to take responsibility for them. The Chairman responded that this is not correct and that the correct process is already taking place in the case of CMCs from SADCMET that are being *intra*-regionally reviewed by APMP. Dr Schwitz commented that this is not the same situation in that SADCMET had asked to outsource its CMCs to APMP, with the consequence that APMP is excluded from participating in the inter-regional review. In the case raised by Dr Semerjian, there is only one RMO that can undertake both the intra and inter-regional review. The Chairman responded that in such a case the CMCs can only undergo one review but this should be considered an exception.

ACTION 24: Dr Semerjian is to re-submit SIM's CMCs to the relevant external RMO in the special case where only one external NMI from this RMO is in a position to review them. He is to inform the external RMO of the JCRB guidelines that, in this special case, only one review is undertaken of these CMCs.

14. DATE AND PLACE OF NEXT MEETING

The Chairman invited the Chairman of APMP to inform the Committee of the dates and venue for the 10th JCRB Meeting. Dr Imai stated that the 10th JCRB meeting is to be held on 3-4 March (Monday-Tuesday) in Tsukuba, Japan. In addition to the JCRB Meeting, there will be a one-day seminar on Wednesday 5th March, with the morning sessions targeted at the NMI-level with presentations on the global MRA, etc, and the afternoons sessions open for all AIST members, with presentations on subjects such as reference materials and biomeasurement.

15. CLOSE OF MEETING

The Chairman then closed the meeting and thanked all participants for their contributions.