REPORT ON THE FOURTEENTH MEETING OF THE JCRB

Held on 12 May 2005, in Minsk, Belarus

Note: Links to documents that have been approved for distribution to TC/WG Chairs are referred to the "Meeting document" section at http://www.bipm.org/cc/JCRB/MeetingDocuments/MeetingDocuments.jsp?cc=JCRB

Links to other documents still under discussion are referred to the "Working document" section at http://www.bipm.org/cc/JCRB/Restricted/WorkingDocuments.jsp

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0. Attendees

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Dr. William Anderson	SIM
Dr. Vladimir I Belotserkovskiy	COOMET
Prof. Matey Bily	COOMET
Dr. Stephen Carpenter	SIM
Dr. Ismael Castelazo	BIPM
Mr. Luc Erard	EUROMET
Dr. Pedro Espina	BIPM
Dr. Chang Hsu	APMP
Dr. Keith Jones	APMP
Dr. Robert Kaarls	CIPM
Dr. Sergey Korostin	COOMET
Prof. Dr Michael Kühne	EUROMET
Dr. Mukayi Musarurwa	SADCMET
Prof. Luis Mussio	SIM
Dr. Anatoly Pokhodun	COOMET
Dr. Attilio Sacconi	EUROMET
Dr. Claudine Thomas	BIPM
Dr. Takashi Usuda	APMP
Prof. Andrew Wallard	BIPM (Chairman)
Dr. Nikolai Zhagora	COOMET

A complete list of delegates, with their affiliations and contact data, as well as the names of observers, is given in **Document JCRB-14/01**

1. Opening and welcome by the Chairman

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The Chairman welcomed the attendees and invited them to introduce themselves. He then asked for comments and approval of the meeting Agenda, which is included in the table of contents for this report, as well as in **Document JCRB-14/00**. The Chairman suggested discussing document JCRB-14/11 at the end of agenda item 5. The Executive Secretary informed attendees that a late submission by APMP, Document JCRB-14/07c, had been received and will be discussed in point 7. Dr. Kühne requested not to accept discussion papers later than two weeks before the meeting. Prof. Wallard concurred and indicated that for the next meeting he will stress the importance of submitting all documents early enough so that they can be analysed by attendees. The agenda was then approved.

2. Matters arising from the report of the 13th meeting held at the BIPM

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The Chairman asked for comments on the 13th JCRB meeting Report and reviewed **Document JCRB-14/02**, "Matters arising from the 13th Meeting". Action items that required further discussion had been already included in the agenda for this meeting. The 13th meeting Report was approved.

3. Report by the Chairman on progress since the 13th meeting

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The Chairman reported that since the last JCRB meeting Costa Rica and Estonia have joined the CIPM MRA as Associates of the CGPM. With these signatures all 17 Associates have now joined the CIPM MRA. The Chairman has written to a number of members not yet signatories of the CIPM MRA, explaining the benefits of their participation and inviting them to sign the Arrangement. The BIPM has received inquiries from other states which are considering joining but have not made a decision yet. Progress on these inquiries will be reported as they develop.

CARICOM (the economic block of Caribbean nations) formally applied for Associate of the CGPM as an economic group. The CIPM had a favourable view on this request and progress is being made. However, this would be a new form of participation and some issues are still being clarified before the application is formally accepted.

Prof. Wallard informed the JCRB that the BIPM quality system was presented at the QS Workshop held at the BIPM on 30 September 2004. The meeting was attended by QS representatives from all RMOs participating in the JCRB.

The Chairman also commented that this would be the last meeting as Executive Secretary of the JCRB for Dr. Ismael Castelazo, who returns to his post in CENAM at the end of this month. Dr. Pedro Espina, from NIST, who has been working at the BIPM since the beginning of April, will become at that time the new Executive Secretary. Prof. Wallard extended a warm welcome to Dr. Espina and his appreciation to Dr. Castelazo for his collaboration during this period.

4. Report on the present status of the KCDB

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Dr. Claudine Thomas tabled **Document JCRB-14/04**. Her report includes statistics on the contents of Appendices B and C plus a list of users from industry and accreditation organisations that have visited the KCDB. Prof. Luis Mussio asked if it would be possible to maintain a record of changes to Appendix C available on line. Dr. Thomas responded that the website was not designed for that purpose but that it showed instead the state of the database in real-time. Other JCRB members commented that it would

be useful to have a note in the KCDB website explaining that this was the case. It was agreed that a note would be inserted explaining that the CMCs posted in Appendix C may change at any time and that details on the history of particular CMCs should be requested to the issuing NMI.

Action 14/1 The KCDB office to add a note to its website indicating that only the latest version of the CMCs is shown and that further details on the history of a CMC should be requested from the issuing NMI.

5. Reports by RMO representatives to the JCRB

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5.1. APMP

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Dr. Usuda tabled documents **JCRB-14/05(1)** and **JCRB-14/05(1a)**. He presented an update on APMP's membership and explained the review process for quality systems, in particular for the case when an NMI decides to become accredited. Dr. Usuda indicated that APMP submitted a set of Excel files as requested with the list of CMCs to be temporarily deleted from Appendix C until the quality system is approved.

The Chairman asked if there were comments on the list of CMCs to be deleted. No comments were voiced at this time. Prof. Wallard also asked if the RMOs were making on-site peer review reports available for the inter-regional review. The general feeling was that they would be made available if requested. Dr. Castelazo commented that several CMC submissions have already been accompanied by the reports of on-site peer reviews. These files are posted in the JCRB web page and are available to all reviewers.

5.2. COOMET

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Dr. Belotserkovskiy tabled documents **JCRB-14/05(2)** and **JCRB-14/05(2a)**. He explained that COOMET has always submitted CMCs that were supported by a quality system and, consequently, COOMET would not request deleting any CMCs from Appendix C. He also expressed COOMET's satisfaction with the new interactive CMC-review website developed by the BIPM and requested the participation of the JCRB Executive Secretary in the COOMET technical meetings. The Chairman asked for a clarification of this point and Prof. Bily explained that the request was that the Executive Secretary would provide information on request.

Dr. Belotserkovskiy informed the JCRB that COOMET is developing a CMC database with searching capabilities that serve the needs of its member

NMIs better than the functions currently available in the KCDB. He commented that they are downloading the information from the KCDB but that this is made difficult by the fact that the website only provides a PDF version of the lists of CMCs and requested if a different format such as XML could be used. Prof. Wallard expressed his concern that alternative databases can not guarantee to be accurate copies of the KCDB because this changes continuously. He pointed out that the BIPM is already exploring the possibility of implementing a Google-type search capability. Drs. Jones and Sacconi indicated that they agreed with the need to expand the CMC search capability for local RMO needs. Prof. Bily indicated that COOMET will send a letter to the BIPM with a concrete request so that the Chairman could respond accordingly.

In his report, Dr. Belotserkovskiy, stressed the need to provide the RMOs with better guidance on statistical techniques to assess the results of key comparisons. He suggested the adoption of a general scheme like the one proposed by Maurice Cox in *Metrologia* 39 (2002) pp. 589-595. Prof. Wallard responded that the JCRB has left technical decisions such as this to each consultative committee because their needs are different. This opinion was supported by all attendees.

The Chairman pointed out that, according to the COOMET report, the issue of excluding CMCs from Appendix C would be discussed at the meeting of the Joint COOMET Committee for Measurement Standards, to be held the following day. He asked the other JCRB members for their opinion on this timeline which seemed to be a request for an extension. Prof. Bily explained that the report had not been properly worded and that COOMET had already approved the quality systems supporting the CMCs currently in Appendix C. The discussions and peer reviews they have planned for next month are part of an on-going review program which may result in the modification of some CMCs but that at the present time they are declaring full compliance with the MRA requirements. The Chairman then asked COOMET to submit an addendum to their report that would unambiguously clarify this issue.

5.3. EUROMET

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Mr. Erard tabled documents **JCRB-14/05(3)** and **JCRB-14/05(3a)** and made a presentation on the CMC-review process in EUROMET. Dr. Sacconi presented the procedures used in EUROMET to review the quality systems implemented in their member NMIs.

Dr. Kaarls asked for a clarification to the statement that some NMIs have been accredited with a flexible scope because he understood that EA considers this possibility only for testing laboratories. Mr. Erard pointed out that COFRAC has indeed accredited LNE's calibration capabilities with a flexible scope.

5.4. SADCMET

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Dr. Musarurwa tabled **Document JCRB-14/05(4)**. South Africa is still the only SADCMET member that has CMCs published in Appendix C and for this reason they continue participating on the APMP intra RMO review. NML has received on-site peer review teams in many areas and is also accredited by SANAS. Based on these reviews SADCMET recommended temporarily deleting some NML CMCs.

Dr. Musarurwa also informed the JCRB about SADCMET's plans to expand its membership to the rest of Africa with a sub-regional organisation.

5.5. SIM

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Prof. Mussio tabled **Document JCRB-13/05(5b-e)**. He summarized the current membership status in SIM and its activities since the last JCRB meeting. Dr. Anderson informed the JCRB about SIM's review of the quality system implementations in NMIs that participate in the CIPM MRA. It was reported that INMS/NRC temporarily modified its position from accreditation to self-declaration of its quality system.

5.6. Schedule for regular reviews of Quality Systems

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The Chairman asked the JCRB members how often the quality systems should be reviewed in order to maintain confidence in them. EUROMET and SADCMET reported that they do yearly reviews. For example, EUROMET asks for an annual report statement from each of its member NMIs in which they assert that their quality system is still valid. EUROMET formal re-reviews take place every 5 years. In APMP they have considered periods of four to five years. It was agreed that the minimum frequency for review of the quality systems should be every five years.

Dr. Kaarls inquired if there should also be a specified period for regular review of CMCs. It was agreed that a review of the validity of the published CMCs should be conducted at least once every 5 years. The question of the period of validity of the results of a Key Comparison was left up to the individual Consultative Committees to decide. Prof. Mussio proposed that the CMCs that have been temporarily deleted for lack of an approved quality system may be reinstated without a new inter-regional review unless the respective CC considers that that area needs to be reassessed. The proposal was accepted.

NOTE: Document JCRB-14/11 on BMC and CMC was discussed at this point.

Prof. Wallard tabled document **JCRB-14/11**. He commented that the BIPM and ILAC have discussed the definitions of the terms "Calibration and

Measurement Capabilities" (CMC), used in the CIPM MRA, and "Best Measurement Capabilities" (BMC), used in the accreditation community. It was emphasized that using the term CMC implied that the laboratories can do better than formally declared and that this generates confidence. ILAC has agreed to gradually promote the use of CMC instead of BMC. However, it is very important to agree on the definition of this term before it is proposed for use in a wider community. The paper stresses that the service must be ordinarily available to customers and proposes to include the uncertainty contributions presented in document JCRB-8/9.

Dr. Kühne commented that in his opinion the definition was too long and proposed the following alternative version:

"CMCs are the peer reviewed best measurements capabilities of an NMI to provide traceability to the SI within the framework of the CIPM-MRA"

In the following discussion attendees considered whether the recommendation of including the uncertainty of the device under test contained in document JCRB-8/9 should be deleted. As no agreement was reached, the Chairman asked RMO representatives to send comments to Dr. Kühne within three weeks.

Action 14/2 RMO representatives to send comments on document JCRB-14/11 to Dr. Kühne by 3 June 2005.

6. Status of CMC reviews

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6.1. Revised Rules of procedure for CMC entry into Appendix C

Dr. Castelazo tabled **Document JCRB-14/06(1)** "JCRB Rules of Procedure for CMC entry into Appendix C". This document had been discussed at the 13th JCRB meeting and the members requested it to be circulated among their respective TC/WG chairs. The version presented at this meeting reflects the comments received as well as those voiced during the 13th meeting. The document was approved.

Action 14/3 The Executive Secretary to post Document JCRB-14/06(1) in the open section of the JCRB website, replacing the current Document JCRB-7/1

6.2. Revised Criteria for acceptance of data for Appendix C

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Dr. Castelazo tabled Documents **JCRB-14/06(2a)** and **JCRB-14/06(2b)** which are two proposed versions for the "Criteria for acceptance of data for Appendix C". The main difference between these two documents is

that for version (2a) the availability of comparison results to support a CMC is only desirable whereas for version (2b) it is a requirement.

Dr. Kühne indicated that EUROMET agrees with version (2a). Dr. Jones suggested that all CMCs should be supported at least indirectly by some form of comparison. Dr. Kaarls commented that that approach might not be possible in all areas. Dr Usuda pointed out that CMCs not supported by some comparison data might need to be peer reviewed on-site.

Dr. Kühne suggested changing the phrase "peer-assessment" in point four of the document for "peer-review". Mr. Erard suggested adding wording in the last paragraph to indicate that traceability of the national standards is to be established "to the SI".

Prof. Mussio commented that the wording in the last paragraph might not be applicable to the chemistry field. Drs. Wallard and Kaarls indicated that they will reflect on the right wording and will include it in the minutes.

Action 14/4 Dr. Kaarls to add a phrase to the last paragraph of document JCRB-14/06(2a) indicating how to assure traceability in the chemical field

Prof. Mussio commented that small laboratories would be hurt by version (2b) because they sometimes claim services for which no comparisons have been organised. LATU was not allowed to claim their capability to calibrate micrometers because it was not considered to be of high enough level. Prof. Wallard responded that the MRA was intended to recognise NMI's capabilities at any level and that no one should be denied their right to submit their services.

It was recommended that each consultative committee should determine its own policies concerning the need to support specific CMCs with comparison results and to accept document **JCRB-14/06(2a)** as the general JCRB criteria.

Action 14/5 After completion of Action 14/4, the Executive Secretary to post Document JCRB-14/06(2a) in the open section of the JCRB website, replacing the current document JCRB-8/13(1b)

6.3. Flowchart for subsequent bilateral comparisons

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Dr. Castelazo tabled Document **JCRB-14/06(3)**. He explained that this document had also been presented for discussion at the 13th meeting and was distributed for comments to the RMO TC/WG chairs. Comments received since October 2004 were incorporated in this document.

Dr. Korostin commented that the document did not give specific guidance for the acceptance of linking laboratories in subsequent comparisons. Dr. Castelazo replied that the document had been intentionally left general enough to be applicable to all cases. More specific guidance should be requested from the respective consultative committee. The document was approved.

Action 14/6 The Executive Secretary to post Document JCRB-14/06(3) in the open section of the JCRB website

6.4. Review of CMCs in the field of materials properties

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Dr. Kaarls tabled documents **JCRB-14/06(4a)**, **JCRB-14/06(4b)** and **JCRB-14/06(4c)**. He indicated that these documents were provided only for information purposes to illustrate a case where an NMI requests the review of a unique CMC. He asked attendees for opinions on how to perform these reviews.

A discussion ensued on whether there was a point when certain services went beyond the responsibility of the NMIs and should not be accepted. Dr. Jones suggested the possibility of asking experts in potentially designated laboratories. Prof. Wallard commented that a possible method would be to consider first if the claim is pertinent for the CIPM MRA. If the CC working group thinks so then an effort should be made to find appropriate reviewers. Otherwise, the claim should not be accepted.

Dr. Kaarls replies that the CCQM Working Group on Surface Analysis has considered the CMCs, but it wishes to ask the opinion of experts from NIST and EMPA in this field of porosity.

6.5. Reports from CC Working Groups on CMCs

Reports from CC working groups on CMCs were submitted to the JCRB from the areas of electricity and magnetism [**JCRB-14/06(5a)**]; ionizing radiation [**JCRB-14/06(5b)**]; chemistry [**JCRB-14/06(5c)**]; acoustics, ultrasound and vibrations [**JCRB-14/06(5d)**]; photometry and radiometry [**JCRB-14/06(5e)**]; thermometry [**JCRB-14/06(5f)**] as well as mass and related quantities [**JCRB-14/06(5g)**]. All consultative committees, except units, have now established working groups and CMCs.

Dr. Korostin suggested that these working groups should be encouraged to provide guidance on the relationship between comparison results and CMC claims (how far the light shines) for all types of comparisons, including supplementary. The Chairman agreed and he indicated that they are already doing it but that it is also a job for the RMOs. Prof. Mussio commented that sometimes it is not easy to provide guidance *a priori* but that it is necessary to look at a particular CMC claim in order to judge if a

comparison result supports it. Prof. Wallard and Mr. Erard agreed that the process varies among the different areas.

7. Report from the Working Group to develop recommended criteria for the selection of peer-reviewers for NMIs

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Drs. Kühne and Jones tabled documents **JCRB-14/07** and **JCRB-14/07b**. They reported that some communication problems had prevented them from finalising the proposal. However they agreed that document **JCRB-14/07b** represented the latest version. The Chairman asked RMOs to send their comments on this version within four weeks.

Action 14/7 RMO representatives to send comments on Document JCRB-14/07b to Dr. Kühne by 9 June 2005.

Dr. Jones tabled document **JCRB-14/07c** which includes proposals from APMP to modify document JCRB-10/8(1c), "Guidelines for the monitoring and reporting of the operation of quality systems by RMOs" and on the design and conduct of a peer review.

Concerning the proposed text in chapter 2.2 Dr. Kaarls remarked that the accreditors have to follow the decisions of the RMO and CC CMC reviews with respect to the approval of quantity, measurand, measurement range and measurement uncertainty and not the other way round. Dr. Jones agreed to adapt the text in 2.2 in the sense that BMCs approved by an accreditation body must be consistent with the uncertainties approved by the RMO/CC review.

Regarding the fore mentioned proposal by Dr Jones, Dr. Kühne expressed his opinion that the JCRB should refrain from approving additional requirements. This level of detail should be left to the RMO as it is done in EUROMET. Dr. Jones commented that they are seeing a gap in the peer review reports from different NMIs. In view of these comments, Prof. Wallard suggested that APMP may want to modify its proposal using less prescriptive language and send it for review.

Action 14/8 APMP to modify document JCRB-14/07c according to the discussion at the meeting and send it for comments to the JCRB

8. Additional CIPM MRA documents

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8.1. CIPM MRA: Resolving inconsistencies

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Prof. Wallard tabled document **JCRB-14/08(1)** and indicated that it has been approved by the CIPM. In view of this clarification Dr. Sacconi requested that a disclaimer be inserted in the text indicating that it is a CIPM document and not a JCRB one. He also asked to add the word usually to the phrase "coordinating laboratory" at the end of the first bullet.

Dr. Korostin asked if the clarification in point four included the results of supplementary comparisons. Prof. Wallard responded that the reports from supplementary comparisons are already being published in the KCDB.

8.2. NMIs and other designated institutes

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Prof. Wallard tabled **Document JCRB-13/08(2)**. He pointed out paragraph 2.7 and stressed the importance of being clear when making a designation as to the area to be covered by the designated institute as well as the date from which the designation takes effect.

Dr. Kühne remarked that one of the examples in the annex is not accurate because DGKL in Germany is not designated. Prof. Wallard asked all to send him comments on this annex if anybody found any corrections that should be made.

Dr. Carpenter asked if the document should also request for a designation term. Prof. Wallard agreed and indicated that it will be added to the document. Dr. Espina commented that a designation received from Hong King included the acceptance from the designated laboratory. The Chairman commented that it would also be desirable to have this confirmation and that he will write to the NMI Directors to clarify this issue.

8.3. Subcontracting of measurements under the CIPM MRA

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Dr. Kaarls tabled **Document JCRB-14/08(3)**. This document reflects the requirements of ISO/IEC 17025 and ISO Guide 34 which states the subcontracting and collaboration requirements. This document is also presented for information as it has been approved by the CIPM.

8.4. Guidelines for the acceptance of CRMs in Appendix C of the CIPM MRA

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Dr. Kaarls tabled **Document JCRB-14/08(4)**. Dr Wallard indicated that there had been questions on whether this document applies to all types of reference materials. The answer is that it applies only to the reference materials related to the CCQM.

Dr. Kühne reported that some technical contacts in EUROMET have indicated that they might not be able to complete their stability studies before the end of 2006. Dr. Kaarls replied that this was surprising because all reference materials which are quoted in the appendix C of the CIPM MRA as the means of disseminating traceability to the customers need to be and always have produced based on a stability and homogeneity analysis and that all the technical contacts with whom he has had an opportunity to comment this issue, in particular in the CCQM and its working groups, have been aware of this requirement for a long time. No one has ever expressed a different opinion. Drs. Sacconi and Kühne requested confirmation on the formal notification of this requirement. Prof. Wallard replied that while it has not been noted in the minutes the document has been circulating for several years and that all technical contacts were aware of its contents. He suggested that the EUROMET representatives report specific concerns by the next meeting when appropriate action can be taken if necessary.

8.5. Information on the involvement of NMIs and other designated institutes of Associate States and Economies

The Chairman informed the JCRB that the CIPM has approved guidance on this issue that will be made available in the near future. He indicated the EU Joint Research Centre has given authority to the IRMM to designate other expert institutes. Also, the World Meteorological Organisation has expressed its wish to join the CIPM MRA.

8.6. CIPM MRA Quality Procedures

Dr. Castelazo tabled document **JCRB-14/08(6)**. He commented that these procedures reflect current CMC review practices and are a summary of the documents posted in the open section of the JCRB web page. Some of the references need to be changed in order to point to the documents approved in this meeting. The document was approved.

Action 14/9 The Executive Secretary to update the references in document JCRB-14/08(6) and post it in the open section of the JCRB web page

9. Proposals for the CIPM MRA logo

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Prof. Wallard showed the approved logo and asked the RMOs to encourage its use among their member NMIs

10. Progress on JCDCMAS

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The Chairman informed the JCRB that the background document has been approved and that a presentation to be used by all JCDCMAS members is under development. OIML is serving a one-year term as Executive Secretary. A list of possible venues where the JCDCMAS message can be presented is being compiled from suggestions by members.

11. BIPM/ILAC Report on joint initiatives

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The Chairman indicated that the BIPM relation with ILAC is very good and that they have been responsive to the concerns expressed by the metrology community. Annual meetings between the two organisations continue to be held at the BIPM.

12. Progress on JCTLM

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Dr. Kaarls referred attendees to his presentation at the workshop held the previous day.

13. Progress on JCGM

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The Chairman informed attendees that the work on VIM is proceeding slowly and that the goal of publishing it in 2005 might be difficult to achieve. Two GUM supplements on Monte Carlo simulations and multi-variable uncertainties are being developed and they will be available in the BIPM website.

14. Other JCRB business

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Prof. Wallard commented that a panel of peers has reviewed the quality system of IAEA. Responding to questions from the JCRB members the Chairman indicated that he will ask for permission to circulate the peer-review report.

Note: After the meeting it was confirmed that the report may be circulated and it has been posted in the JCRB website as document JCRB-14/05(6).

The committee reaffirmed that the end of the transition period for the implementation of quality systems supporting the CMCs in Amount of Substance (i.e., Metrology in Chemistry) is December 31, 2005. This deadline applies for the implementation of both the ISO 17025 and ISO Guide 34 standards.

14.1. Topics for the next JCRB

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15. Date and place of next meeting

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The 15th meeting of the JCRB will take place at the BIPM on 28 September 2005. A workshop on a topic to be defined (probably setting priorities for research in NMIs) will be held on the 29th and a meeting of NMI Directors will take place on 30th.

Dr. Jones offered to hold in New Zealand the JCRB meeting in the spring of 2006. The Chairman thanked him and commented that at this point the offer will be simply noted in the minutes because the final decision will be made at the 15th meeting in September.

16. Close of meeting

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The Chairman closed the meeting and thanked our hosts from BelGIM for their warm hospitality and excellent organisation.

17. Summary of action items

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