

## KCDB REPORT AS ON 12 APRIL 2006

### Information registered in the KCDB

#### 1. Appendix B

Appendix B of the database now covers 671 key and supplementary comparisons conducted under the auspices of the CIPM or of RMOs. There include 537 key comparisons and 134 supplementary comparisons. On average, one new key comparison has been registered each week over the last year.

About 45 % of the registered key comparisons have results published in the KCDB Appendix B. This percentage may increase slightly in the coming years as the output of some of the key comparisons that were decided when the CIPM MRA came into force in 1999/2000 are not yet reported and approved. It will then, probably, stabilize at a level of order 50 % to 60 % when the first round of key comparisons is ended for all metrology areas.

A number of key comparison results are regularly updated. These mainly concern the ongoing BIPM key comparisons in electricity (Josephson standards at 10 V) and on radionuclide activity conducted within the framework of the International System of Reference (SIR). These updates correspond to new bilateral comparisons that are regularly carried out between the BIPM and some National Metrology Institutes. In addition, new data concerning the computation of Coordinated Universal Time, UTC (key comparison CCTF-K2001.UTC), are published every month. We have also registered a new BIPM key comparison, BIPM.QM-K1 (ozone at ambient level), as a follow-up of Pilot Study CCQM-P28.

The results of 35 RMO key comparisons (14 conducted by APMP and 21 by EUROMET) are linked to those of the corresponding Consultative Committee (CC) key comparisons; the full sets of degrees of equivalence are published in the KCDB. The same type of linkage has also been carried out for 16 CC key comparisons, among which 11 are key comparisons of radionuclide activity conducted under the auspices of Section II of the CCRI, and linked to the corresponding ongoing BIPM SIR key comparisons. The five others are bilateral key comparisons subsequent to full-scale CC key comparisons; their results are added on the appropriate graphs of equivalence.

The measurand defined for one given key comparison may often take several nominal values and the parameters involved (temperature, frequency, etc.) may also be varied, with the consequence that one key comparison result generally comprises several matrices and graphs of equivalence; for example, a set of 43 matrices and 43 graphs for key comparison CCT-K1 published on 21 March 2006. It follows that the KCDB Appendix B currently displays about 680 graphs showing equivalence between standards or capabilities of institutes participating in the CIPM MRA.

The entry of results in the KCDB Appendix B is an intensive and continuous effort. When a new approved report is received at the KCDB Office, it is placed on the queue for publication. On average, six new reports are placed on the queue, leading to delays of publication that may reach several weeks. This is a new phenomenon, arising from the growing amount of data, especially updates of ongoing comparisons. Another fact is that the EXCEL files of results, including the numbers and the graphs, are less and less provided, especially in the case of linkage between key comparisons. This leads the KCDB Office to compose them by hand-typing from the Final Reports. Unfortunately, it is generally understood that posting the approved Final Report on the Appendix B suffices for the publication. It is, however, not true, as the role of the Appendix B is also to display degrees of equivalence in numerical and graphical form, useful for the CMCs review. The KCDB Office wishes to alert the JCRB to this growing problem.

## 2. Appendix C

Appendix C contained exactly 18 043 Calibration and Measurement Capabilities (CMCs) on 11 April 2006, covering all fields of metrology. Following the decision of the JCRB at its 14th meeting, held in Minsk in May 2005, 723 CMCs (79 from APMP, zero from COOMET, five from EUROMET, 94 from SADC MET, and 545 from SIM – see details in the KCDB Report to the 15<sup>th</sup> JCRB meeting) that were not covered by an approved Quality System were deleted from the KCDB in July 2005. The 94 CMCs from SADC MET (60 in photometry and radiometry, and 34 in electricity and magnetism) were re-entered into the KCDB Appendix C on 10 October 2005, soon after an appropriate Quality System was approved. At that time, it displayed a total of 17 183 CMCs, so 860 newly approved CMCs have been published over the last six months. (None of the other CMCs deleted in July 2005 have been re-entered).

Compared to the early 2000's, the Appendix C now grows much more slowly; sets of new CMCs are small, for example:

- CMCs covering Cycle VI in Chemistry include 277 CMCs from APMP, 63 CMCs from EUROMET and 41 CMCs from COOMET, which sounds very short compared to the potential chemical capabilities developed in institutes participating in the CIPM MRA. In fact, the Appendix C currently displays only 3500 CMCs in the field of chemistry, still much less than what could be expected for future.
- Some institutes from smaller countries have declared their first sets of CMCs in fields traditionally largely covered: for instance, Bulgaria, Greece, Latvia, Serbia and Montenegro, and Romania in electricity and magnetism; and Cuba in ionizing radiation.

In addition to publication of newly approved data, we undertake a daily update to respond to small corrections (mainly editorial, including change of laboratory names), minor changes (increase of uncertainty values, reduction of the measurement ranges, etc.), and deletion of some CMCs (services that are no longer offered to clients).

### **A new page in the KCDB website**

A new page entitled "KCDB Newsletter – KCDB Statistics" is now available from the KCDB Home page at [http://kcdb.bipm.org/kcdb\\_statistics.asp](http://kcdb.bipm.org/kcdb_statistics.asp). It gives access to the successive issues of the KCDB Newsletter and to some statistics corresponding to FAQ answers.

- The KCDB Newsletter is issued twice a year, in June and in December, to communicate on matters relevant to the CIPM MRA, the JCRB, and any other news concerning the content of the KCDB. It is sent by e-mail to about one thousand addresses. The latest issue has now an absolute URL address, following a request from the Boeing Corporation.
- The second part of the page displays real-time information on the number of key and supplementary comparisons registered in the Appendix B, and on the number of CMCs published by country and by metrology area in Appendix C (under the form of a printable .pdf file). Graphs illustrating the participation in key and supplementary comparisons are also available: these statistics are based on all comparisons (finished, in progress, or planned) recorded in Appendix B, and laboratories non-participating in the CIPM MRA are not shown. They will be updated every 6 months.

### **Visits to the KCDB website and future plans**

The number of monthly external connections to the KCDB website was of order 11 100 over the last four months, against 8 600 visits in March 2005.

The total number of visits per month to Appendix B has remained stable since April 2005 at about 2 300 visits. As already noticed, the Appendix B is basically made "by the NMIs for the NMIs", and we think that we have now attracted this public.

The number of visits to Appendix C has been increasing since the beginning of the KCDB. We observe, however, that the visitors generally download .pdf files and consult the page of news, but do not use the search engines that are proposed. The Appendix C search engines are based on the Classification of services drawn up for each metrology area, and they may be too difficult to use for a wide public who is not fully acquainted to the vocabulary and categorization of metrology.

In order to increase the visibility of the BIPM web applications, a group composed of three BIPM staff, the Webmaster, the IT Manager and the KCDB Coordinator, has studied the advantages of implementing a semantic search facility, able to interpret a text-based inquiry, on the main BIPM website and on the KCDB website. Several such search engines, all commercially available, were compared, and the BIPM has now purchased such a software. This is now being implemented on the prototype Appendix C, and it appears that the direct access to information is greatly facilitated. It makes it possible to find all CMCs containing a given word, and then refine via options proposed in a dynamic way (RMOs, NMIs, Chemical category, fields of physics, etc.); for instance, find a CMC based on a given CRM. We hope this new search facility will be launched publicly by next October.