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KCDB REPORT TO THE 20th JCRB MEETING

This report gives the highlights of the work at the KCDB Office over the one-year period May 2007 - May 2008.

1. The CMC database

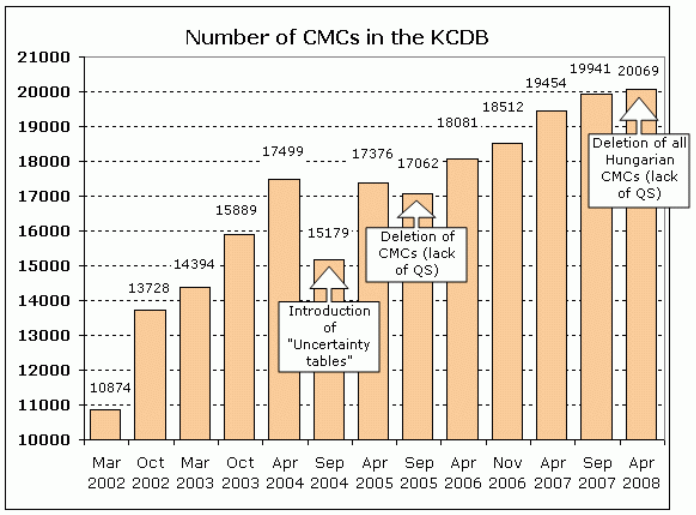
1.1. Content of the CMC database

On 17 April 2008, 20069 CMCs were published in the KCDB:

- 12 736 in General Physics,
- 3 353 in Ionizing Radiation, and
- 3 980 in Chemistry.

This is an additional 600 CMCs compared to the time of the 18th JCRB meeting, one year ago, but not many more than at the time of the 19th JCRB meeting. Indeed, over the last six months period, 12 newly approved sets of CMCs were published (see Section 1.3 below), among which the set identified as “EUROMET.EM.4.2007” (285 new CMCs and hundreds of revised CMCs from EURAMET in Electricity and Magnetism), but 364 CMCs from Hungary were deleted on 28 March 2008 due to lack of approved Quality Systems (see Section 1.2 below).

Details on the number of CMCs currently published in the KCDB, per country and per metrology area, are available in real-time from the Statistics page of the KCDB.



Number of CMCs registered in the KCDB: evolution over the last six years

The page entitled “Get Published CMCs” in the access-restricted JCRB website makes available at any time the EXCEL files of CMCs as they are currently imported into the database.
According to Document JCRB-8/10_rev “Procedure for modifying CMCs already in Appendix C”, dated November 2004, and available from the open-access JCRB website, any modification to published CMCs should be made only in these EXCEL files, and should be brought according to a colour code and rules explained in this document. Following this procedure clarifies the exchange of files within RMOs and between RMOs, and also contributes to simplify the work of the KCDB Office.

1.2. CMCs and Quality Systems

The situation regarding deletion and re-instatement of CMCs linked to approval of appropriate Quality Systems is available on page 5 of the same Statistics page of the KCDB and given in Annex I of this report.

On 17 April 2008, 725 CMCs were still greyed-out from the KCDB due to lack of approved Quality Systems (QS). Note that the term "greyed-out" means that those CMCs that are not covered by an approved QS are not imported in the KCDB, and thus are not available on the public web, but remain in the "Get Published CMCs" EXCEL files where they are highlighted with a grey background. When a Quality System is approved, the corresponding CMCs that were greyed-out are re-imported into the KCDB and appear in the "Get Published CMCs" EXCEL files with the usual white background. They are thereafter not differentiated from the other published CMCs of the file.

The main actions related to Quality Systems that took place over the year covered by this report are as follows:

- On 28 May 2007, a total of 55 CMCs from COOMET (in Acoustics, Ultrasound and Vibration from Ukraine, and in Electricity and Magnetism and Chemistry – Organic solutions – from Russia) were re-instated into the KCDB.
- All CMCs from LATU (Uruguay), namely 45 in Mass and Related Quantities and 3 in Thermometry, were greyed-out on 10 August 2007, and re-instated into the KCDB on 30 March 2008.
- A number of CMCs from NRC (Canada), namely 52 in Chemistry – Biological fluids and Sediments) – were re-instated on 6 November 2008. Those CMCs previously greyed-out in Length – Laser radiations – were replaced by 10 newly approved CMCs on 25 March 2008 (set "SIM.L.4.2007").
- Four CMCs from NPLI (India) in Electricity and Magnetism were also re-instated on 23 November 2007.
- All CMCs from MKEH (Hungary), namely 364 CMCs covering all fields of metrology, were greyed-out on 28 March 2008.

Annex 1 shows that:

- Very few greyed-out CMCs from APMP, though deleted in July 2005, have been re-instated into the KCDB.
- COOMET is only concerned with greyed-out CMCs from Cuba (Mass and Related Quantities and Ionizing radiation).
- The situation is clear for EURAMET, the main problem concerning the Hungarian CMCs that were recently deleted.
- The process is completed for SADCMET.
- Most of the problems were resolved for SIM countries, except a number of CMCs from Mexico (mainly Electricity and Magnetism), Argentina (Ionizing radiation), and Canada (Photometry and Radiometry, and Chemsitry).

It may be the case that some of those CMCs that were greyed-out in July 2005, following the decision of the 15th JCRB meeting, will never be re-published as they are out of date and no longer correspond to any services actually delivered by the laboratory. It may therefore be necessary to clear up their status and figure out if they should definitively be deleted from the KCDB.

1.3. New CMCs publication (since 18th JCRB meeting) – see also "CMCs News"

Over the last one-year period, the following sets of CMCs were published in the KCDB:

- 11 May 2007: EUROMET.PR.4.2006 (DE, TR, and GB).
- 21 May 2007: EUROMET.L.5.2007 (CH, DE, DK, FI, IT, PL, and SK).
- 1 June 2007: SIM.TF.2.2007 (US).
- 5 June 2007: APMP.PR.4.2007 (KR).
- 9 June 2007: EUROMET.TF.3.2006 (ES, FI, and TR).
- 15 June 2007: SADCMET.QM.5.2007 (ZA), and SIM.M.7.2007 (CA).

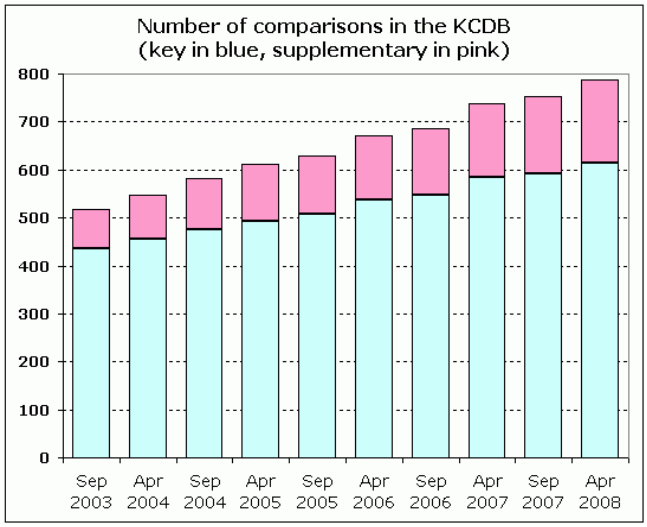
- 22 June 2007: SIM.QM.8.2007 (BR, MX, and US), COOMET.QM.11.2007 (BY, RU, and UA), and EUROMET.PR.5.2007 (FI).
- 12 July 2007: APMP.T.2.2007 and APMP.T.3.2007 (AU, TW, HK, ID, JP, KR, MY, SG, and TH), and COOMET.T.4.2007 (RU).
- 26 July 2007: EUROMET.QM.13.2007 (DK, DE, EU, FR, IT, PL, SE, SK, NL, and GB).
- 8 August 2007: SIM.L.3.2007 (CA).
- 14 August 2007: SIM.T.4.2007 (AR, BR, CA, CL, MX, and US).
- 31 August 2007: APMP.QM.10.2007 (AU, CN, and JP).
- 30 November 2007: SIM.RI.7.2007 (AR).
- 14 December 2007: APMP.TF.4.2007 (SG).
- 4 January 2008: EUROMET.AUV.7.2007 (DE, GB, IT, PL, PT).
- 7 January 2008: COOMET.QM.12.2007 (BY, RU).
- 9 January 2008: COOMET.AUV.4.2007 (UA).
- 4 February 2008: EUROMET.QM.14.2007 (GB, NL).
- 8 February 2008: EUROMET.PR.6.2007 (DE).
- 13 February 2008: COOMET.PR.4.2007 (RU).
- 15 February 2008: APMP.TF.3.2005 (NZ).
- 18 February 2008: APMP.QM.11.2007 (CN, JP).
- 25 March 2008: SIM.L.4.2007 (CA).
- 31 March 2008: EUROMET.EM.4.2007 (BE, CH, CZ, DE, DK, ES, FR, GB, IT, LT, NL, NO, PL, PT, RS).

In addition, the KCDB Office dealt with numerous corrections: editorial changes, deletion of services that are no more available, and changes of laboratory names and acronyms (for instance “SPRING Singapore” was changed for “A*STAR” on 11 January 2008).

2. Key and supplementary comparisons database

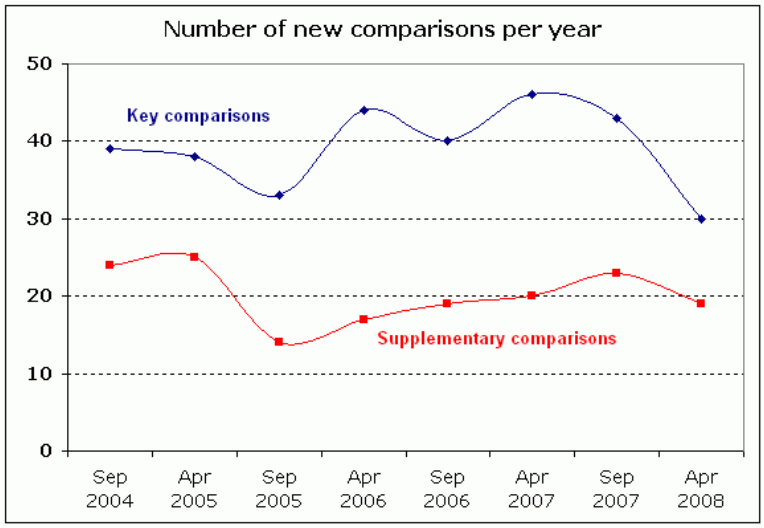
2.1. Content of the database

On 17 April 2008, the database covered 614 key comparisons (79 from the BIPM, 307 from the CCs, 77 from APMP, 21 from COOMET, 99 from EURAMET, 1 from SADCMET, and 30 from SIM) and 173 supplementary comparisons.



Number of key comparisons (in blue) and of supplementary comparisons (in pink) registered in the KCDB: evolution over the last four years and a half

One observes, however, that fewer new key comparisons were registered over the last year. This can be partly explained by the fact that information on a number of new key comparisons decided by the CCQM Working Groups at their meetings in October 2007 has not yet reached the KCDB Office. Following last CCQM meeting, held in March 2008, action should soon be taken to correct for this lack.



Number of new comparisons registered in the KCDB over the one-year period ending at the date indicated on the x-axis: evolution over the last four years

Updated graphs illustrating the participation in key and supplementary comparisons were made available from the Statistics page of the KCDB on 3 December 2007.

2.2. Key and supplementary comparisons registered over the last one-year period

- 9 May 2007: EUROMET.QM-S3, and SIM.EM-K3.
- 21 May 2007: CCEM-K3.1.
- 19 June 2007: SIM.T-S1.
- 20 June 2007: SADCMET.L-S1, and SADCMET.L-S2.
- 22 June 2007: SIM.M.FF-S4.
- 17 August 2007: APMP.L-K11, SIM.M.P-S1, and EUROMET.M.P-S4.
- 20 August 2007: APMP.M.D-K4.
- 30 August 2007: APMP.EM.RF-K19.CL.
- 13 September 2007: EUROMET.L-S17, SIM.L-K1.2007, APMP.L-K4, APMP.L-K6.
- 14 September 2007: APMP.L-K8.
- 19 September 2007: COOMET.EM-S2.
- 27 September 2007: APMP.T-K7.
- 16 October 2007: SIM.EM.BIPM-K10.b.
- 31 October 2007: SIM.RI(I)-K3.
- 19 November 2007: EUROMET.M.M-K4.1.
- 21 November 2007: EURAMET.PR-K1.a.1 (first European comparison registered under the new acronym “EURAMET”).
- 22 November 2007: CCRI(II)-S6.Co-57 and EURAMET.EM-S29.
- 23 November 2007: APMP.L-K11.1.
- 30 November 2007: EUROMET.T-S2.
- 18 December 2007: COOMET.QM-K1.a and COOMET.QM-K23.b.
- 19 December 2007: CCQM-K64.
- 8 January 2008: CCAUV.U-K1.1.
- 11 january 2008: COOMET.M.M-K5.
- 23 January 2008: BIPM.RI(II)-K4.Tc-99m.
- 31 January 2008: APMP.PR-S3.a, APMP.PR-S3.b, and APMP.PR-S3.c.

- 14 February 2008: APMP.QM-S2.
- 20 February 2008: CCRI(I)-S2.
- 26 February 2008: EURAMET.PR-K2.b.1.
- 5 March 2008: EURAMET.PR-K6.1.
- 14 March 2008: EURAMET.PR-K3.a.1.
- 25 March 2008: APMP.EM-K8 and APMP.EM-K10.
- 31 March 2008: APMP.PR-K1.a.1.
- 4 April 2008: EURAMET.M.P-K7 and EURAMET.M.P-S5.
- 8 April 2008: CCM.T-K1.1 and CCM.T-K1.2.
- 14 April 2008: APMP.PR-S1.1 and APMP.PR-S1.2.

Note that identifiers including a date such as “2007” are reserved to the special case of the CCL-RMO key comparisons decided by the CCL, and that identifiers including “.1”, “.2” indicate subsequent bilateral key comparisons to an existing key comparison.
Over the last one-year period, only one registered comparison was cancelled (for technical reasons): EUROMET.EM-S22 (deleted from the KCDB on 29 January 2008).

2.3. Published results of key and supplementary comparisons

On 17 April 2008, among the 614 key comparisons that were registered:

- 88 corresponded to exercises prior to the implementation of the CIPM MRA, and will never have results published in the KCDB (they were “Approved for provisional equivalence”,
- 73 of the 79 on-going BIPM key comparisons had results published in the KCDB, which are regularly extended when new data becomes available (most of them serves also as “master” key comparisons to which other CC and RMO key comparisons are linked (see the example of 10 V Josephson standards: six comparisons linked together), and
- another 216 CC and RMO key comparisons had their final reports approved and posted in the KCDB website, and corresponding tables of numbers and graphs entered in the database.

All together, the KCDB currently displayed a total of more than 1 000 graphs of equivalence.

The results of 73 RMO key comparisons (against 57 one year ago) - 25 conducted by APMP, 6 by COOMET, 39 by EUROMET, and 3 by SIM - are published in the KCDB - see “Comparisons News” for the list of the most recent publications.
Linkage has also been carried out for 13 bilateral key comparisons subsequent to full-scale CC key comparisons; their results are added on the appropriate graphs of equivalence. The most complete graph of equivalence available from the KCDB displays 66 degrees of equivalence, obtained from four different RMO key comparisons linked to CCM.M-K1 (1 kg stainless steel mass standards).

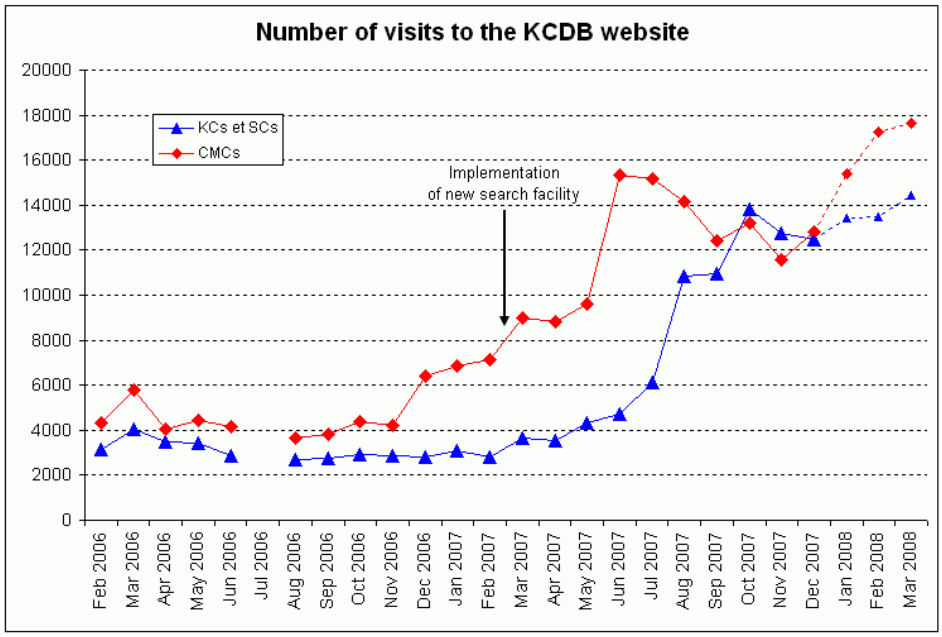
The final reports of 53 among the 173 supplementary comparisons registered in the KCDB are also posted in the KCDB.
Note that final reports of key and supplementary comparisons posted in the KCDB are also generally published in the series of *Metrologia Technical Supplements*.

3. The KCDB system

3.1. Design of the KCDB system

No further modification was brought to the design of the KCDB system after the launch of the new free-text search engine on 6 March 2007, except the introduction of the acronym “EURAMET” on 9 August 2007 (database and programming) in such a way that all search engines of the KCDB operate equally if the user enters "EUROMET" or "EURAMET".
A new release of the search engine software is currently under implementation on the BIPM and KCDB prototype websites. It should bring novel features and make it possible to extend the scope of the search.

3.2. Visits to the KCDB website



Number of visits to the KCDB website: evolution over the last two years

The total number of visits of monthly external connections to the KCDB website has increased from 10 300 to 27 200 between August 2006 and August 2007 (the word “visit” is taken as a connection including at least three hits). Details on the number of visits are given for the two main parts of the website (key and supplementary comparisons and CMCs) in the Figure shown above, giving evidence of the impact of the new search facility implemented in March 2007.

The numbers displayed for the three first months of 2008 are only estimation. We observed a huge increase of the requests entered in the free-text search over that period (up to hundreds of thousands over one month), especially the same requests repeated every 10 or 30 seconds over hours and days exploring all possible answers. We identified that these automatic searches were carried out by “robots”, which scrutinized the KCDB site. These are not malicious attacks as it does not alter the content of the database or the way the information is displayed on the web. On the contrary, they index the content of the KCDB site and provide links to our site from famous search engines available on the Internet. No action was thus taken for the time being, except doubling the front server to be able to handle all requests. It remains difficult to know the number or “real” visits, which is the reason why the curves are shown with dashed lines on the above Figure.
We are currently implementing a new tool for analyzing the log-on files and hope to get more robust estimation in near future.
It should also be pointed out that the “bump” observed in June and July 2007 on the red curve is probably also due to the same phenomenon.

One can, however, conclude that more and more users navigate on the KCDB website, and we receive regular feedback from National Metrology Institutes. We think that they constitute a part of the audience, but that our site attracts also other communities such as regulators, accreditors, and commercial and industrial companies.

3.3 Publicity

The KCDB website was demonstrated in the exhibition hall of the NCSLI Conference (Saint Paul, Minnesota, United States)[1] on 1st August 2007.

Issue 7 and Issue 8 of the KCDB Newsletter were launched on 8 June 2007 and 11 December 2007.

A plenary session on the 10th anniversary of the CIPM MRA is scheduled at the International Congress of Metrology to be held in Paris from 22 to 25 June 2009. The KCDB Coordinator is a member of the Organizing Committee of this congress, now known as "Paris'2009".

Follow-up of Action 17/1 from the 17th JCRB meeting
"Future KCDB reports to the JCRB are to include the information on CMC statistics (per RMO) thus avoiding the inclusion of this information in the RMO reports to the JCRB.9".

Status as on 14 April 2008
APMP: 3875 CMCs
COOMET: 1527 CMCs
EUROMET: 9872 CMCs
SADCMET: 336 CMCs
SIM : 4220 CMCs
IAEA : 13 CMCs
IRMM : 226 CMCs
All details by metrology area and by country are available by clicking here.

[1] The BIPM is grateful to NRC for hosting the KCDB demonstration on their stand.

Annex 1: Distribution of CMCs deleted from the KCDB due to lack of approved Quality Systems

	M	PR	EM	T	RI	L	AUV	QM	TF	Total
APMP										
AU			10 - 1 = 9							9
CN			21							21
IN			15 - 4 = 11							11
KR		33								33
										Total APMP: 74
COOMET										
CU	12				51					63
UA							6 - 6 = 0			0
RU			44 - 44 = 0					5* - 5 = 0		0
										Total COOMET: 63
EUROMET										
GR	4 + 3 - 3 = 4						8			12
FR		~~1~~								0
HU	50	57	85	11	104	19	6	27	5	364
										Total EUROMET: 376
SADCMET										
ZA		60 - 60 = 0	34 - 34 = 0							0
										Total SADCMET: 0
SIM										
MX	6	17 - 15 = 2	66 - 9 = 57							65
CL	33 - 33 = 0			4 - 4 = 0						0
BR	3									3
AR					104 - 33 = 71					71
UY	4+45-45 = 4			3 - 3 = 0						4
CA		30	~~245 - 236~~ = 9	14 - 5 = 9	16 - 11 = 5	~~4~~		107 - 82 = 25		69
										Total SIM: 212

Total: 725 CMCs deleted

black: deleted in July 2005, following decision of the 15th JCRB
red: deleted between September 2005 and September 2006
orange: deleted in November 2006
green: reinstated after QS approval **blue: LATU (UY), CMCs deleted in August 2007, re-instated on 30 March 2008**
* It corresponds to one multi-component CMC including five different analytes

~~X~~	definitively suppressed or replaced by new claims
	Countries for which the process is ended
	CMCs of Hungary deleted on 28 March 2008

Status as on 30 March 2008