

## KCDB REPORT TO THE 26th JCRB MEETING

At the occasion of each JCRB meeting the KCDB Office prepares a report on the status of the KCDB. Each report describes the work of the KCDB Office during the previous six-month period, and the compilation of these reports to the JCRB thus provides a complete record of the evolution of the KCDB.

The previous report (JCRB-25/06) was presented at the 25th meeting of the JCRB, held on 21-22 September 2010 in Sharm al Sheik, Egypt, and reflected the situation as at 01 September 2010. The present report covers the six-month period from 01 September 2010 to 01 March 2011.

### Notes from the KCDB Office to the JCRB members

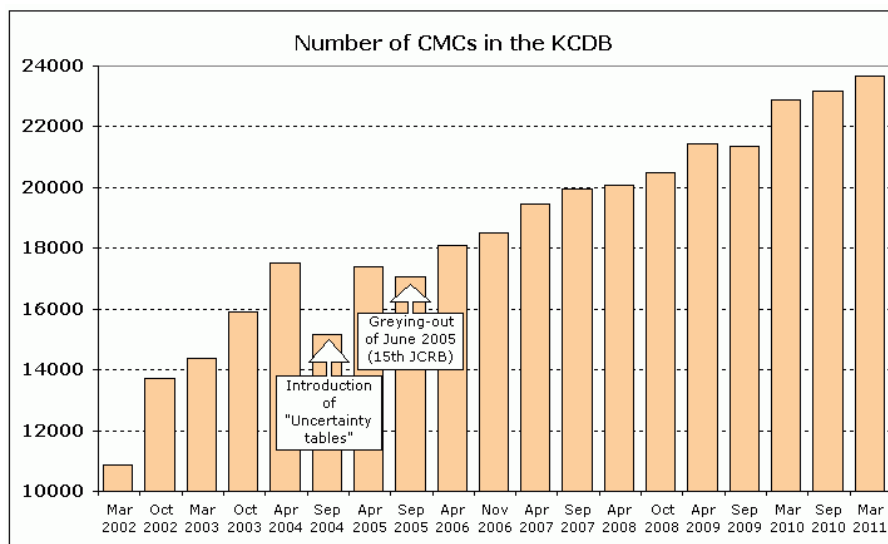
1. Statistics on the content of the KCDB are prepared by the KCDB Office and are available on-line from the [KCDB Statistics page](#). This includes the number of key and supplementary comparisons (updated in real-time), and PDF files showing the participation in key and supplementary comparisons (updated every six months, at the time of each new *KCDB Newsletter* issue) and the number of CMCs by metrology area and by country (updated in real-time).
2. The EXCEL files that are used to generate the PDF files displayed in the KCDB Statistics page are available from the [access-restricted JCRB CMC website](#) (link "[KCDB statistics](#)"). Note that these EXCEL files track all the changes (including greying-out and re-instatement of CMCs) and their dates, and thus allow some recollection of the history of the KCDB. In addition, many numbers that are not shown in the PDF files of statistics are given in the EXCEL files.
3. The KCDB Office provides on demand an additional EXCEL file containing the information of Appendix B of the KCDB, as a snapshot of the content of the database valid at a given date. This makes it possible to carry out statistical analysis using EXCEL functions or customized macro-functions. The file is compiled by the BIPM, using an SQL request named "Angela", and the delivery time is about two working days.
4. The full set of *KCDB Newsletters* is always available on-line from the [KCDB Statistics page](#) (bottom of the page).
5. Since February 2010, a box entitled "Related links" is provided on the left of each KCDB web page. It includes, among others, links to the KCDB Statistics page, to the KCDB FAQs page, and to the open-access CIPM MRA and JCRB documents (located on the main BIPM website).

## 1. The CMC database

### 1.1. Content of the CMC database

As at 01 March 2011, the KCDB included a total of 23 685 CMCs:

- 14 975 in General Physics,
- 3 864 in Ionizing Radiation, and
- 4 846 in Chemistry.



*Number of CMCs registered in the KCDB since March 2002*

Over the period covered by this Report, 22 newly approved sets of CMCs were published (see Section 1.2 below), corresponding to an additional 480 CMCs. There were also some movements related to temporary removal and re-instatement of CMCs (see Section 1.3 below).

Details on the number of CMCs currently published in the KCDB, per country and per metrology area, are openly available in real-time from the [Statistics page of the KCDB](#) (PDF file).

## 1.2. New CMCs publication – see also “[CMCs News](#)”

Since 01 September 2010, the following sets of CMCs have been published in the KCDB:

- 10 September 2010; APMP.M.24.2010 (VN); +6 CMCs.
- 19 September 2010; EURAMET.L.9.2010 (CH, IE, and SI); +6 CMCs.
- 20 September 2010; APMP.L.15.2010 (KR); +23 CMCs.
- 21 September 2010; EURAMET.M.20.2010 (PT); +0 CMC.
- 06 October 2010; EURAMET.M.19.2010 (NL); +0 CMC.
- 15 October 2010; EURAMET.PR.9.2009 (AT, CH, CZ, DE, ES, FR, HU, RO, and RS); +58 CMCs.
- 18 October 2010; APMP.QM.16.2010 (KR Cat 04, JP Cat 04, AU Cat 04, JP Cat 02, JP Cat 03, KR Cat 09, HK Cat 10, JP Cat 10, HK Cat 11, JP Cat 11, and JP Cat 13); +52 CMCs.
- 22 October 2010; APMP.QM.16b.2010 (CN Cat 01, CN Cat 03, CN Cat 04, CN Cat 10, and CN Cat 11); +122 CMCs.
- 03 November 2010; COOMET.M.12.2009 (UA); +1 CMC.
- 03 November 2010; SIM.PR.5.2010 (CA); +0 CMC.
- 04 November 2010; APMP.L.16.2010 (SG); +32 CMCs.
- 19 November 2010; EURAMET.RI.11.2010 (DE); +29 CMCs.
- 21 November 2010; EURAMET.M.18.2010 (GR); +0 CMC.
- 25 November 2010; EURAMET.M.11.2009 (EG); +1 CMC.
- 25 November 2010; SIM.T.6.2010 (UY); +15 CMCs.
- 13 December 2010; SIM.L.6.2010 (BR); +6 CMCs.
- 13 January 2011; AFRIMETS.TF.1.2010 (ZA); +8 CMCs.
- 13 January 2011; AFRIMETS.AUV.2.2010 (ZA); -3 CMCs.
- 31 January 2011; APMP.PR.7.2010 (JP, NZ, SG, and TH); +43 CMCs.
- 31 January 2011; SIM.M.13.2010 (PY); +23 CMCs, **first set of CMCs ever published for Paraguay.**

- 24 February 2011; SIM.M.15.2010 (US, Density of liquid); +1 CMC.
- 01 March 2001: APMP.L.17.2010 (VN); +9 CMCs.

In addition, the KCDB Office has dealt with numerous corrections:

- editorial changes,
- deletion of services that are no longer available (see Section 1.4), and
- changes in laboratory names and acronyms (for Great Britain: NWML becomes NMO and NEL becomes TUVNEL during the period covered by this report).

### 1.3. CMCs: temporary removal and re-instatement

The situation regarding temporary removal (“greying-out”) and re-instatement of CMCs is available on-line from page 5 of the [Statistics page of the KCDB](#) (PDF file).

Since 01 September 2010, the following actions have been taken:

- 30 September 2010; LV (M); reinstatement; +7 CMCs.
- 30 September 2010; LV (EM); reinstatement; +46 CMCs.
- 30 September 2010; LV (L); reinstatement; +6 CMCs.
- 18 October 2010; KZ (M); reinstatement; +6 CMCs.
- 08 December 2010; BR (T); reinstatement; +11 CMCs.
- 21 January 2011; CA (L); greying-out; -11 CMCs.

As at 01 March 2011, 374 CMCs were temporarily removed from the KCDB, compared with 443 as at 01 September 2010 (see table on page 4).

As at 01 March 2011, there remained only a few instances of CMCs that were greyed-out from the KCDB more than five years ago. These are: GR (AUV), 8 CMCs; MX (M, Hardness), 6 CMCs; MX (EM), 37 CMCs; MX (RI, Neutron measurements), 1 CMC; and AR (RI), 71 CMCs. There were all deleted in June 2005 following decision of the 15th JCRB, except GR in AUV and MX in neutron measurements that were deleted in 2006.

This information is kept in the spreadsheet “Dates of CMCs greying-out” of the EXCEL file “CMCsNumber\_2011, available from the [access-restricted JCRB CMC website](#) (link “[KCDB statistics](#)”).

#### Note

The set of CMCs SIM.RI.6.2005 (MX, RI, Radioactivity, 45 CMCs) was posted in the JCRB CMC website in 2005 and was approved by the JCRB three years later, exactly on 25 December 2008. At that time, this set of CMCs was not covered by an approved QS, so these CMCs were not published in the KCDB, but did not enter in the grey zone. The situation is the same today.

At its meeting of 29 April 2010, the CCRI RMO Working Group for Ionizing Radiation CMCs took the following action:

*“Chair of SIM TC-RI (L. Karam) to report on the Mexican QS after the SIM QSTF.”*

The Working Group also asked about the 71 CMCs from Argentina in Radioactivity, which were greyed-out in June 2005 and took another action on this:

*“Chair of SIM TC-RI (L. Karam) to contact SIM TC and QSTF chairs on the procedure to follow with greyed-out CMCs from Argentina.”*

The KCDB Office will thus act as soon as it receives feedback from these two actions.

### 1.4. Definitive deletion of CMCs

The KCDB Office receives very few requests for definitive deletion of CMCs, and the numbers of CMCs involved is always small.

Since 01 September 2011, the following CMCs have been definitively deleted (“pinked-out”) from the KCDB, as they correspond to services that are no longer available:

- 27 September 2010; GR (M); pinked-out (greyed-out in June 2005); -4 CMCs.
- 13 October 2010; CH (RI); pinked-out; -5 CMCs.

	M	PR	EM	T	RI	L	AUV	QM	TF	Total
<b>APMP</b>										
NZ			5							5
										Total APMP: 5
<b>AFRIMETS</b>										
ZA		5								5
										Total AFRIMETS: 5
<b>EURAMET</b>										
BG						1				1
FR	3									3
GR							8			8
LV					143					143
										Total EURAMET: 155
<b>SIM</b>										
MX	51		37		1			7		96
AR					71					71
JM	22									22
CA		9				11				20
										Total SIM: 209
										Total: 374
										CMCs deleted

*Number of CMCs temporary removed ("greyed-out") from the KCDB,  
by country and by metrology area, as at 01 March 2011*

#### 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".

Status as at 01 March 2011

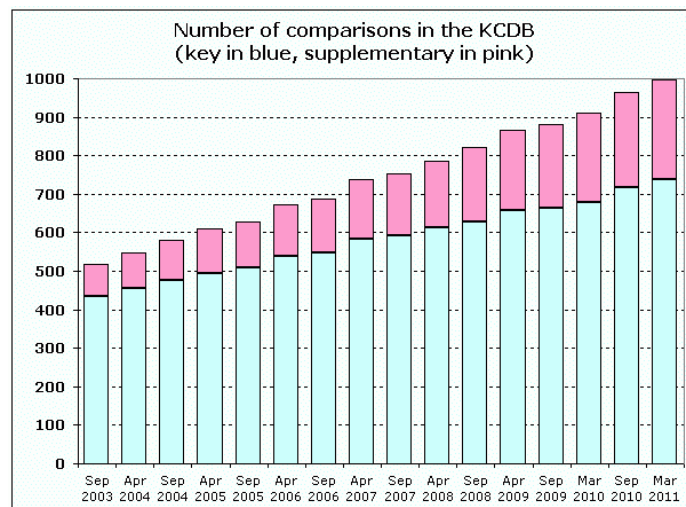
APMP: 4 920 CMCs  
 COOMET: 1 770 CMCs  
 EURAMET: 11 852 CMCs  
 AFRIMETS: 373 CMCs  
 SIM: 4 505 CMCs  
 IAEA: 13 CMCs  
 IRMM: 252 CMCs

## 2. Key and supplementary comparisons database

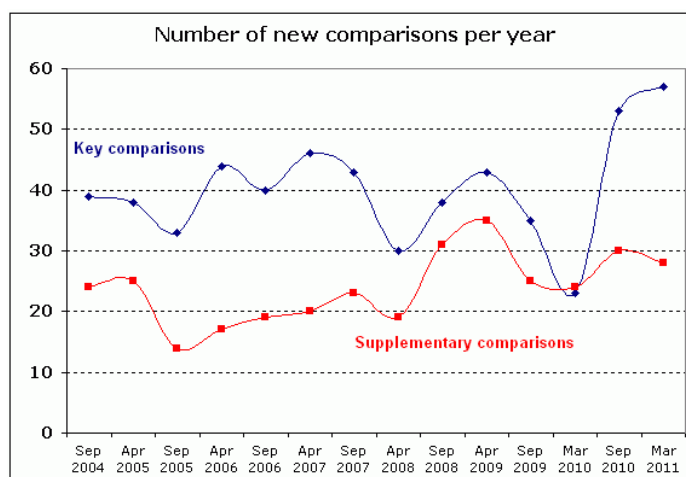
### 2.1. Content of the database

As at 01 March 2011, the database covered 737 key comparisons (84 from the BIPM, 364 from the CCs, 1 from AFRIMETS, 101 from APMP, 28 from COOMET, 117 from EURAMET, and 42 from SIM), and 260 supplementary comparisons.

Graphs showing the evolution since September 2003 of the total number of key comparisons and of supplementary comparisons registered in the KCDB, and the number of new key and supplementary comparisons registered in the KCDB over the one-year period ending at the date indicated on the x-axis are given below.



*Total number of key comparisons and supplementary comparisons registered in the KCDB: evolution since September 2003*



*Number of new comparisons registered in the KCDB over the one-year period ending at the date indicated on the x-axis*

On average, 40 new key comparisons are registered each year in the KCDB, with an increase over the past year due to a catching up of CCQM key comparisons which had not been registered at their planning stages.

Updated graphs (PDF files) illustrating the participation in [key](#) and [supplementary](#) comparisons were made available from the [Statistics page of the KCDB](#) on 23 November 2010.

## 2.2. Key and supplementary comparisons: registration, suppression and modification

Since 01 September 2010, the following actions were taken:

- 10 September; registration of [SIM.QM-K1](#), [CCQM-K17.1](#), [CCQM-K19.1](#), [CCQM-K30.1](#), [CCQM-K55.b](#), [CCQM-K55.c](#), [CCQM-K75](#), [CCQM-K78](#), [CCQM-K79](#), [CCQM-K80](#), [CCQM-K81](#), [CCQM-K85](#), and [CCQM-K86](#).
- 22 September 2010; registration of [AFRIMETS.AUV.V-S2](#).
- 30 September 2010; registration of [CCM.T-K1.3](#), and [SIM.RI\(I\)-S1](#).
- 05 October 2010; registration of [EURAMET.M.P-K4.2010](#).
- 22 October 2010; registration of [APMP.M.M-K2.2](#).
- 07 November 2010; registration of [EURAMET.M.T-S3](#).
- 12 November 2010; registration of [CCM.F-K2.a.1](#).
- 15 November 2010; registration of [EURAMET.T-K3.3](#).
- 23 November 2010; registration of [APMP.M.F-K3.a](#), and [APMP.M.F-K3.b](#).
- 02 December 2010; registration of [EURAMET.EM.RF-S27](#).
- 10 December 2010; registration of [CCAUV.A-K5](#), and [APMP.AUV.V-S1](#).
- 12 January 2011; registration of [EURAMET.L-S20](#).
- 14 January 2011; registration of [CCAUV.U-K4](#), [CCQM-K90](#), [CCQM-K91](#), and [CCQM-K92](#).
- 16 January 2011; registration of [EURAMET.M.P-S9](#).
- 27 January 2011; registration of [CCRI\(III\)-K11](#), [EURAMET.M.M-K4.2](#), [EURAMET.M.M-K2.2](#), and [EURAMET.RI\(I\)-S8](#).
- 14 February 2011; registration of [BIPM.RI\(II\)-K1.Sb-125](#), and [EURAMET.M.P-K1.c](#).
- 15 February 2011; registration of [SIM.M.P-K6.1](#), [SIM.M.P-K1.c](#), [SIM.M.P-K2](#), [SIM.M.P-S5](#), [EURAMET.M.P-S10](#), and [APMP.RI\(I\)-S2](#).
- 21 February 2011; registration of [SIM.M.P-S6](#).

This resulted in an additional 33 key comparisons and 12 supplementary comparisons registered in the KCDB over the six-month period covered by this report.

No suppression of comparisons previously registered, and no modification of existing identifiers occurred during the same time.

## 2.3. Published results of key and supplementary comparisons

As at 01 March 2011, among the 737 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 have been “Approved for provisional equivalence”;
- 74 of the 84 ongoing BIPM key comparisons had results published in the KCDB; these are regularly extended as new data become available (16 new results were published since 01 September 2010); and
- another 336 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 displays a total of 1 580 graphs of equivalence, including more than 60 new graphs of equivalence published over the last six months.

The results of 133 RMO key comparisons (compared with 123 at the time of the 25th JCRB meeting) - 50 conducted by APMP, 15 by COOMET, 53 by EUROMET, and 15 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 33 bilateral key comparisons subsequent to full-scale CC key comparisons; their results are included in the appropriate graphs of equivalence. We now have three examples of families of six key comparisons linked together: [M.M-K1](#) (1 kg stainless steel standards), [AUV.A-K1](#) (LS1P laboratory standard microphones), and [AUV.V-K1](#) (vibration acceleration).

The final reports of 147 of the 260 supplementary comparisons registered in the KCDB were also posted in the KCDB as at 01 March 2011.

All together 64 % of the comparisons registered in the KCDB are ended and have their final reports posted in the KCDB, and also generally published in the [Metrologia Technical Supplement](#).

### 3. Visits to the KCDB website

As reported previously, more than 90 000 visitors opened a total of about 821 000 KCDB web pages over the year 2009: the number of monthly visits varied between 5 600 and 10 100, and the number of pages opened each month between 48 800 and 117 500.

Over the year 2010, some 86 000 visitors have opened a total of more than 1 250 000 KCDB web pages. One observes that the average number of monthly visits remains roughly constant (at the level of about 7 200 visits each month), but that the average number of pages consulted during each visit has increased significantly, as has the average duration of each visit (over the year 2010, the average duration of one visit was equal to 378 seconds!). This indicates that the key communities who visit the KCDB website, National Metrology Institutes, regulators, accreditors, commercial and industrial companies, and others are showing a growing interest in the information displayed.

As observed in 2009, all pages are equally visited, including the News page, the Statistics page, and the Newsletters; and PDF files of comparison reports and of CMC lists are regularly downloaded.

Visitors come from all over the world, and reach the KCDB website from links proposed in other websites (especially NMI websites) for 25 % of them, a percentage comparable to what was observed over year 2009. Internet search engines (Google, Yahoo, etc.) lead about 5 % of our visitors to the KCDB website, the remaining 70 % reach our web page via personal bookmarking, direct URL address typing or using links given in e-mails.

### 4. The KCDB system

The KCDB web system is currently being modified with the help of an outside company. This concerns the KCDB website on CMCs in Chemistry. The aim is to suppress the acronym "QM", which is generally not known of the industrial community, and to replace it by the word "Chemistry". Some functionality will be offered to the users in order to facilitate access to information in this area, especially the BIPM free-text search engine will be inserted in the pages of CMCs in Chemistry. These changes are scheduled to be available on line at the time of next CCQM meeting (April 2011).

### 5. Publicity

[Issue 14](#) of the *KCDB Newsletter* was published on 14 December 2010. Among other topics<sup>1</sup> it included a comprehensive report on BIPM key comparisons.

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<sup>1</sup> The extract of the *KCDB Newsletter* No 14 entitled "Does the KCDB contain CMCs in the field of nanometrology?" is given as an Annex to this report.

Issue 15 is scheduled for June 2011. Since 2011 is the International Year of Chemistry, the KCDB Newsletter No 15 will be a special issue on "Chemistry and the KCDB".

The *KCDB Newsletter* No 14 was successfully sent from the BIPM to 2 500 e-mail addresses around the world. It was posted on the KCDB website and was also advertised (with a web link) in the NCSLI and CFM Bulletins, and in the EURAMET and APMP websites.

## 6. Participation of Associates of the CGPM in CIPM MRA activities

The following table summarizes the participation of NMIs of Associates of the CGPM in CIPM MRA activities as at 01 March 2011.

Associate of the CGPM	Date of becoming an Associate	Date of signature of the CIPM MRA	Total number of published CMCs	Total number of greyed-out CMCs	Date of publication of the first CMC	Number of key comparisons	Number of supplementary comparisons
Albania	10 September 2007	10 October 2007	0	0	-	0	0
Bangladesh	29 March 2010	-	-	-	-	0	2
Belarus	05 May 2003	14 October 2003	152	0	07 April 2004	24	18
Bolivia	04 April 2008	16 May 2008	0	0	-	2	5
CARICOM	10 October 2005	12 October 2005	0	0	-	0	6
Chinese Taipei	26 April 2002	04 June 2002	378	0	21 October 2003	65	30
Costa Rica	29 January 2004	06 October 2004	78	0	26 November 2008	13	7
Cuba	19 December 2000	18 June 2001	63	0	02 May 2005	4	9
Ecuador	20 November 2000	15 April 2001	0	0	-	1	5
Estonia	27 January 2005	23 March 2005	0	0	-	6	4
Georgia	01 January 2008	17 June 2008	0	0	-	0	1
Ghana	17 September 2009	24 February 2010	0	0	-	0	0
Hong Kong (China)	08 April 2000	31 May 2000	311	0	13 December 2000	46	11
Jamaica	15 September 2003	21 July 2004	0	22	24 August 2006	5	3
Latvia	11 January 2001	13 March 2001	59	143	23 March 2005	13	6
Lithuania	12 March 2001	12 April 2001	91	0	11 December 2003	14	10
Macedonia, the FYR of	10 October 2006	14 November 2007	0	0	-	0	1
Malta	11 April 2001	20 June 2001	0	0	-	1	1
Mauritius	05 October 2010	-	-	-	-	2	3
Moldova, Rep. of	01 January 2007	14 November 2007	0	0	-	1	1
Panama	03 August 2003	16 September 2003	26	0	11 September 2006	6	7
Paraguay	06 May 2009	27 October 2009	23	0	31 January 2011	0	5
Peru	28 May 2009	17 November 2009	19	0	03 August 2010	5	11
Philippines	01 June 2002	19 December 2002	0	0	-	10	3
Seychelles	10 September 2010	12 November 2010	0	0	-	1	1
Slovenia	02 June 2003	23 June 2003	254	0	11 May 2004	27	9
Sri Lanka	03 August 2007	14 November 2007	0	0	-	3	1
Tunisia	23 October 2007	14 November 2007	0	0	-	0	0
Ukraine	19 August 2002	14 October 2003	123	0	10 January 2005	27	29
Viet Nam	10 October 2003	16 September 2004	20	0	21 July 2010	19	5
Zambia	10 December 2010	3 February 2011	0	0	-	1	3
Zimbabwe	14 September 2010	14 January 2011	0	0	-	1	4

### *CIPM MRA activity of the NMIs of Associates of the CGPM: important dates, number of published CMCs and participation in key and supplementary comparisons*

\*These numbers take into account all comparisons registered in the KCDB, whatever their statuses are, for which at least one laboratory of the Associate is listed in the participants list.

Note: As the numbers on participation in key and supplementary comparisons change only slowly with time, the corresponding KCDB statistics are updated every six months at the time of preparation of the *KCDB Newsletter* (typically May and December of each year). The numbers given here show the situation as at 23 November 2010. However, as the numbers of CMCs published in the KCDB can vary quickly, they are updated in real-time in all KCDB Statistics files. The numbers of CMCs given here show the situation as at 01 March 2011.

One observes that nearly all of the Associates who participate in the CIPM MRA have at least one of their metrology institutes listed as participant in a key or a supplementary comparison, whereas only 13 of the 30 currently have CMCs published in the KCDB. This reveals how long and difficult the effort is to complete the whole CIPM MRA scheme.



## Annex

### Extract of the *KCDB Newsletter* No 14

#### **Does the KCDB contain CMCs in the field of nanometrology?**

Indeed this is a real question!

As the KCDB Coordinator, responsible for publishing approved CMCs in the KCDB, I can tell you that the KCDB currently contains very few CMCs relevant to nanometrology, perhaps only numbering in the tens out of the 23 500 CMCs currently published. Some of these nanometrology CMCs cover very small length measurements and others cover surface texture.

It is very difficult to find CMCs relevant to nanometrology in the KCDB because the search engines were not designed to handle this subject area. Indeed, CMCs are declared, reviewed and approved as covering specific metrological areas, and the CCs and RMOs have developed specific Working Groups and Technical Committees that follow these areas. In consequence, the KCDB incorporates search engines based on the services listed for each of these metrology areas independently. CMCs in nanometrology may overlap topics such as Length, Chemistry, Force or Electricity and do not fit within the classical scheme of one single metrology area.

Dr Kim Carneiro first brought this problem to my attention: even if hundreds of CMCs in nanometrology were entered into the KCDB, we would not be able to display them all at once! My first idea was to create a new "KCDB metrology area" called "Nanometrology", but this is impractical because the set of CMCs would have to be passed from one existing Technical Committee to another in order to be reviewed. In addition, the EXCEL templates for CMCs in Physics and in Chemistry are different, creating extra technical problems.

Kim Carneiro and I discussed this subject several times over the last few months and we came to the conclusion that each CMC in nanometrology should be submitted according to the usual procedure, but should include a tag in one of the cells of the corresponding EXCEL record. This tag should be a unique and well-identified string of characters, for instance "NANO". Entering "NANO" in the KCDB free-text search engine would then automatically return all CMCs which include the tag.

This will only work if several conditions are fulfilled: a firm decision to go ahead with the change must be taken; CC Working Groups must define where the limit stands in their own field, RMO Technical Committees must be informed of the precise tagging procedure; KCDB users must be informed about the use of the free-text search engine; and last but not least, the KCDB system itself must be adapted. This would involve changes in the KCDB back-office, in the design of the underlying databases, and in the programming of the KCDB website.

This will probably require some more thought, but we have an obligation to provide a solution for our users.

Many thanks to Kim for the helpful discussions,

Claudine Thomas, KCDB Coordinator