

KCDB REPORT TO THE 22th JCRB MEETING

The following report gives the highlights of the work at the KCDB Office since the 21th JCRB meeting held on 24 and 25 September 2008.

1. The CMC database

1.1. Content of the CMC database

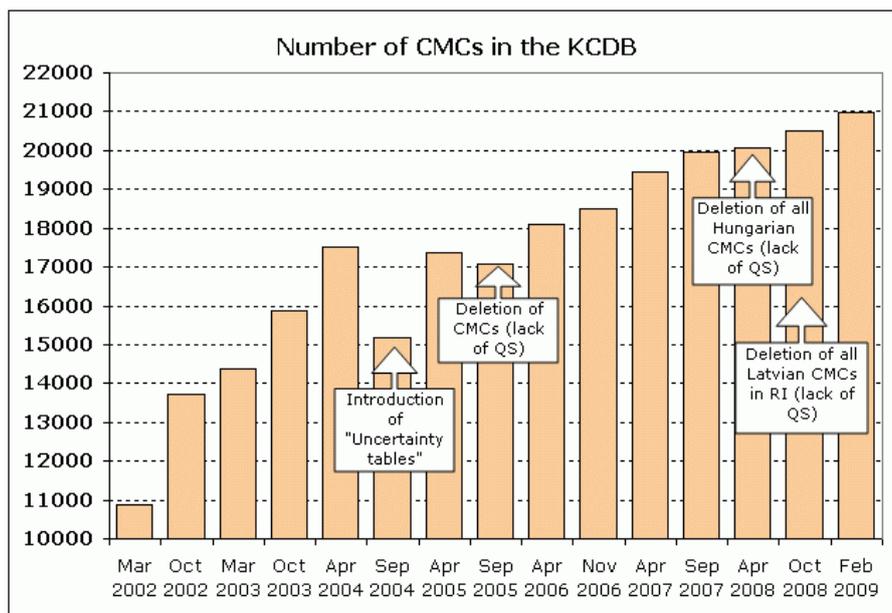
On 12 February 2009, 20 963 CMCs were published in the KCDB:

- 13 133 in General Physics,
- 3 543 in Ionizing Radiation, and
- 4 287 in Chemistry.

This is an additional 500 CMCs compared to the time of the 21th JCRB meeting. Over the last six-month period, 21 newly approved sets of CMCs were published (see Section 1.3 below).

Note that the first CMCs from Costa Rica (24 CMCs in Mass Standards) and the first CMCs from Egypt (2 CMCs in Length) were published on 26 November 2008 and 11 February 2009 respectively.

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](#) (.pdf file).



Number of CMCs registered in the KCDB since March 2002

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](#) (.pdf file).

On 01 October 2008, EURAMET informed that the 143 CMCs declared by Latvia in RI were no more covered by a approved QS: these were immediately greyed-out from the KCDB.

On 21 November 2008, the 33 CMCs declared by Korea in PR that had been greyed-out in July 2005 were definitively suppressed.

On 22 January 2009, the CMCs declared by Canada that were still greyed-out in T, RI, and QM (Cat 10) were also definitively suppressed. There remain 30 greyed-out CMCs declared by Canada, all in PR: they are kept in the "grey area" until further review of their QS.

On 12 February 2009, 737 CMCs were greyed-out from the KCDB.

1.3. New CMCs publication (since 21th JCRB meeting) – see also "[CMCs News](#)"

Over the last six-month period, the following sets of CMCs were published in the KCDB:

- 11 September 2008: APMP.RI.4.2007 (MY); +15 CMCs.
- 12 September 2008: APMP.M.16.2008 (CN); +15 CMCs.
- 18 September 2008: SADCMET.QM.6.2008 (ZA, Cat 04); +6 CMCs.
- 18 September 2008: COOMET.QM.13.2008 (RU, Cat 04); +2 CMCs.
- 19 September 2008: EUROMET.QM.15.2008 (SK, Cat 02; ES, Cat 04; NL, Cat 04; PT, Cat 04; GB, Cat 04; DE, Cat 11, FR, Cat 11); +8 CMCs.
- 23 September 2008: APMP.QM.12.2008 (JP, Cat 03; JP, Cat 04; KR, Cat 03; CN, Cat 01); +45 CMCs.
- 24 September 2008: SIM.QM.9.2008 (US, Cat 01; MX, Cat 03; CL, Cat 05; CL, Cat 06; MX, Cat 08; CA, Cat 10; CL, Cat 11; MX, Cat 11; CA, Cat 13); +33 CMCs.
- 24 October 2008 to 5 November 2008: APMP.EM.6.2008 (ID, MY, JP, NZ, AU, KR, SG, HK); +175 CMCs.
- 25 November 2008: APMP.PR.5.208 (SG); +2 CMCs.
- 26 November 2008: SIM.M.9.2008 (CR¹); +24 CMCs.
- 10 December 2008: APMP.M.17.2008 (SG); no change in number.
- 15 December 2008: APMP.L.5.2008 (TW); +8 CMCs.
- 16 December 2008: APMP.M.19.2008 (TW); +2 CMCs.
- 17 December 2008: COOMET.EM.3.2008 (UA); +14 CMCs.
- 06 January 2009: APMP.AUV.4.2008 (KR); +30 CMCs.
- 06 January 2009: SIM.M.8.2008 (CA); +2 CMCs.
- 16 January 2009: EURAMET.QM.16.2008 (ES, Cat 04; GB, Cat 04; DK, Cat 06; FR, Cat 11; GB, Cat 11); +18 CMCs.
- 20 January 2009: EUROMET.TF.4.2007 (FR); +11 CMCs.
- 21 January 2009: APMP.QM.13.2008 (CN, Cat 01; KR, Cat 01; CN, Cat 02; AU, Cat 04; JP, Cat 04; KR, Cat 04; KR, Cat 10; HK, Cat 11; JP, Cat 11; KR, Cat 11; KR, Cat 13); +195 CMCs.
- 23 January 2009: EUROMET.AUV.8.2008 (AT, DK, ES, RO); +24 CMCs
- 11 February 2009: EUROMET.L.6.2008 (CZ, DE, EG², GB, GR, HR, NO, PT); + 21 CMCs³.

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 ("NMI-VSL" to be changed to "VSL" on 1st March 2009).

¹ First CMCs ever published for Costa Rica.

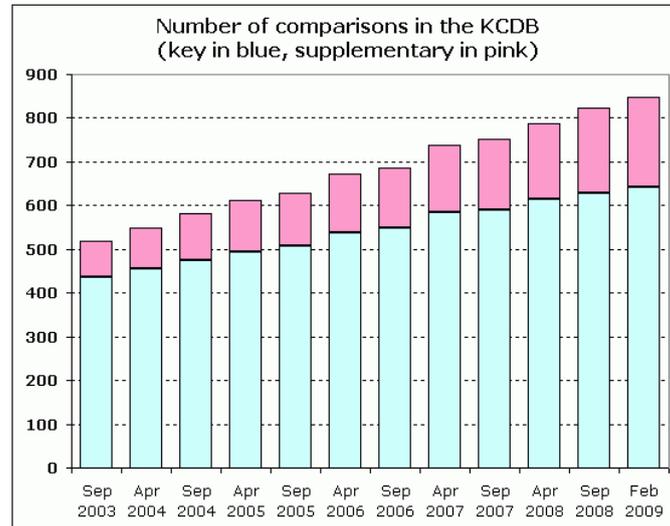
² First CMCs ever published for Egypt (Egypt is a member of AFRIMETS).

³ This gives an additional 650 CMCs. During the same period, 143 CMCs from Latvia (RI, lack of QS) and 2 CMCs from Argentina (Force, services no more provided) were deleted, which gives a total of +505 CMCs.

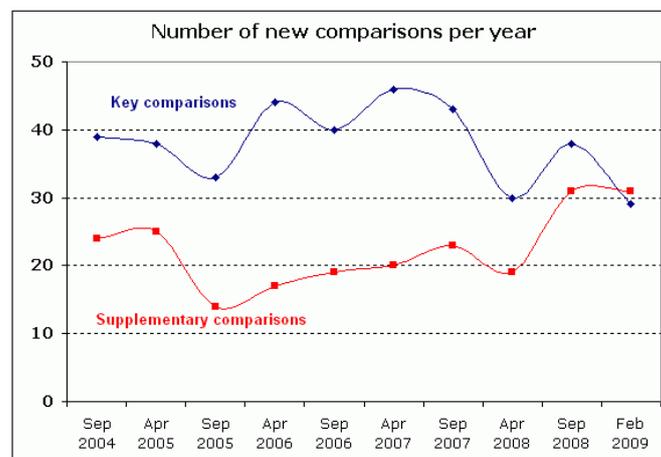
2. Key and supplementary comparisons database

2.1. Content of the database

On 16 February 2009, the database covered 643 key comparisons (79 from the BIPM, 321 from the CCs, 1 from AFRIMETS, 84 from APMP, 28 from COOMET, 101 from EURAMET, and 29 from SIM), and 204 supplementary comparisons.



Number of key comparisons (in blue) and of supplementary comparisons (in pink) 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

One observes that the number of new supplementary comparisons registered over successive one-year periods has been continuously increasing since 2005. This reflects the awareness of RMOs on the interest of declaring their internal exercises and posting the corresponding reports in the KCDB. As far key comparisons are concerned, the general trend is a decrease of new exercises declared to the KCDB Office. For the first time, the two curves have crossed over.

Updated graphs (.pdf files) illustrating the participation in [key](#) and [supplementary](#) comparisons were made available from the [Statistics page of the KCDB](#) on 11 December 2008.

2.2. Key and supplementary comparisons registered since 21th JCRB meeting

- 15 September 2008: [EURAMET.M.P-K1.b.1](#).
- 24 September 2008: [COOMET.M.H-K1](#) and [COOMET.M.H-K2](#).
- 25 September 2008: [EURAMET.AUV.V-K1.2](#).
- 29 September 2008: [CCT-K8](#).
- 30 September 2008: [EURAMET.PR-K6.2](#).
- 22 October 2008: [EURAMET.M.P-S7](#).
- 03 November 2008: [SIM.M.M-S3](#).
- 13 November 2008: [CCM.G-K1](#) (first key comparison in Gravity).
- 17 November 2008: [EURAMET.EM-S30](#).
- 08 December 2008: [CCRI\(II\)-K2.Lu-177](#).
- 10 December 2008: [APMP.M.M-K1.1](#).
- 16 December 2008: [EURAMET.EM-S31](#).
- 08 January 2009: [EURAMET.T-K7.1](#).
- 15 January 2009: [SIM.L-S5](#).
- 16 January 2009: [APMP.T-K3.2](#).
- 19 January 2009: [APMP.PR-S5](#).
- 20 January 2009: [COOMET.M.H-S1](#).
- 29 January 2009: [EURAMET.T-K3.1](#) and [EURAMET.T-S1](#).
- 04 February 2009: [SIM.M.P-K1](#) and [SIM.M.P-K6](#).
- 09 February 2009: [COOMET.PR-S1](#), [COOMET.PR-S2](#), [COOMET.PR-S3](#), and [COOMET.PR-K3.a](#).
- 11 February 2009: [COOMET.AUV.A-K2](#).
- 13 February 2009: [SIM.L-K3.2008](#), and [SIM.L-S6](#).
- 16 February 2009: [APMP.AUV.V-K1.1](#).

Identifiers including “.1”, “.2” generally indicate subsequent bilateral key comparisons to an existing key comparison.

Since the 21th JCRB meeting, EURAMET.L-S20 was deleted from the KCDB on 23 September 2008 because it duplicates [EUROMET.L-S15.a](#). Key comparisons SIM.M.FF-K1, SIM.M.FF-K2, SIM.M.FF-K3, and SIM.M.FF-K6 were also deleted due to lack of calibration facilities for the quantities involved.

Note also that key comparison [SIM.AUV.V-K1](#), conducted from 1997 to 1999 and “Approved for provisional equivalence” as an exercise prior to the implementation of the CIPM MRA, was upgraded to “Approved for equivalence” on 31 January 2009, and linked to key comparison [CCAUV.V-K1](#).

	Number of new comparisons registered in the KCDB between the 20th and the 21st JCRB meetings		Number of new comparisons registered in the KCDB between the 21st and the 22nd JCRB meetings	
	Key comparisons	Supplementary comparisons	Key comparisons	Supplementary comparisons
CC	12	1	3	0
AFRIMETS	0	0	0	0
APMP	5	3	3	1
COOMET	3	6	4	4
EURAMET	1	5	5	3
SIM	0	0	-1	3

Distribution of new comparisons registered in the KCDB over the two last consecutive six-month periods, according to the conducting body

2.3. Published results of key and supplementary comparisons

On 16 February 2009, among the 643 key comparisons that were registered:

- 87 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 (nine new results were published since 11 September 2008), and
- another 254 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 about 1 200 graphs of equivalence, which represents more than 100 new graphs of equivalence published over the last six months (40 new graphs of equivalence were published to cover [CCPR-K6](#) results).

The results of 93 RMO key comparisons (against 86 at the time of the 21th JCRB meeting) - 31 conducted by APMP, 8 by COOMET, 45 by EUROMET, and 9 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 17 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 109 among the 203 supplementary comparisons registered in the KCDB were also posted in the KCDB on 10 February 2009.

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

The implementation of information on Traceability to the SI through the BIPM has been given from the KCDB since 13 February 2009. Links to BIPM calibration and measurement services in [Chemistry](#), [Electricity](#), [Ionizing Radiation](#), and [Mass](#) are provided from the pages "[QM](#)", "[EM](#)", "[RI](#)", and "[M](#)", respectively of the part on CMCs of the KCDB.

The KCDB back-office server was replaced and the whole KCDB web-system reinstalled on 12 and 13 February 2009. This new server, named "kcdbbo", accommodates no other BIPM web applications than the KCDB, which gives a much more comfortable configuration than before. We recall here that the KCDB web site is implemented on two front servers, "kcdb1" and "kcdb2", and that the database contents and web programming are saved every day.

4. Publicity

[Issue 10](#) of the KCDB Newsletter was launched on 17 December 2008.

The plenary session scheduled on Wednesday 24 June 2009 at the International Congress of Metrology to be held in Paris ([Metrology'2009](#)) is entitled "International recognition of measurement certificates". It will provide an opportunity to celebrate the 10th anniversary of the CIPM MRA. Three talks will be presented under the chairmanship of L. Mussio: "Creation of the CIPM MRA: why, how?" by T.J. Quinn; "Presentation of the BIPM key comparison database" by C. Thomas; and "The benefits of the CIPM MRA for industry, regulators, and accreditation bodies" by A.J. Wallard. The KCDB Coordinator is a member of the Organizing Committee and of the Scientific and Technical Committee of this congress.

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 on 12 February 2009

APMP: 4386 CMCs

COOMET: 1606 CMCs

EURAMET: 10104 CMCs

AFRIMETS: 344 CMCs

SIM : 4284 CMCs

IAEA : 13 CMCs

IRMM : 226 CMCs

All details by metrology area and by country are available by clicking [here](#).

Appendix

Remarks and comments from the KCDB Office in answer to “Frequently-Asked-Questions” – FIRST DRAFT⁴

I. What kind of electronic files may I find in the KCDB?

Short answer: only .pdf files.

Detailed answer:

1. The KCDB is a public web site. It thus displays only web pages, including web hyperlinks and links to .pdf files.
2. No EXCEL or Word files are posted in the KCDB.
3. The .pdf files posted in the KCDB are mainly Final Reports of comparisons, Technical Protocols of comparisons, and .pdf files of CMCs.
4. Final Reports of key and supplementary comparisons are posted in the KCDB web site only once they are approved by the appropriate body.
5. Posting Technical Protocols of comparisons mainly applies to AUV and PR comparisons (decision of the CCAUV and the CCPR), but it could be extended to other metrology areas in future.
6. The Contact Person in the Pilot laboratory, or the CC Executive Secretary, or the Chairman of the appropriate Working Group, or any other person having received this responsibility, provides the KCDB Office with approved Final Reports and approved Technical Protocols. These files must be converted under .pdf format before their transfer to the KCDB Office.
7. The .pdf files of CMCs are presented as one per country and per metrology area, or one per country and per Chemical Category. They are built up by the KCDB Office. They include a date, the mention “The BIPM key comparison database”, the mention “Calibration and Measurement Capabilities”, and the KCDB Logo.
8. The KCDB website gives links to other .pdf files of informative nature, for instance: a number of documents related to the CIPM MRA, the Summary Results of key comparisons, the Classification of Services used to draw up CMC files, and statistics on the content of the KCDB.

II. Pilot Studies and the KCDB?

Short answer: irrelevant.

Detailed answer:

1. No work related to Pilot Studies is done by the KCDB Office.
2. Pilot Studies are never registered in the KCDB. Only key and supplementary comparisons are registered in the KCDB, whatever is the conducting body.
3. Pilot Studies in Chemistry are registered in the BIPM web site (click [here](#)).

III. How can I publish the Final Report of a comparison as a *Metrologia Technical Supplement*?

Short answer: send the approved Final Report to the KCDB Office.

Detailed answer:

1. All Technical Supplements to *Metrologia* are available from the main *Metrologia* web site (click [here](#)).
2. The .pdf version of the approved Final Report of a key or supplementary comparison is automatically published as a *Metrologia Technical Supplement* (except if the authors do not wish so) once it is posted in the KCDB. The process of publication is handled with by the KCDB Office (a short abstract in Word format is required).

⁴ This appendix is a first attempt to compile answers on a number of questions relevant to the KCDB, the ultimate goal being to make this information available on-line to the KCDB users.

3. The key or supplementary comparison in question should have first been registered in the KCDB. This means that it corresponds to an exercise that was previously approved by the appropriate body.
4. The *Metrologia Technical Supplement* corresponding to one Final Report is generally on line (from the Technical Supplements web site and from the KCDB) within a few days.
5. A *Metrologia Technical Supplement* provides a formal citeable reference.
6. The Final Report of a Pilot Study may be published as a *Metrologia Technical Supplement*, but this process is not handled with by the KCDB Office.

IV. Where can I find EXCEL files of CMCs?

Short answer: in the JCRB web site.

Detailed answer:

1. There are no EXCEL files of CMCs in the KCDB.
2. Templates of EXCEL files to be used for drawing up CMCs, before the intra- and inter-RMO reviews, are available from the [open-access JCDB web site](#), together with guidelines.
3. EXCEL files of CMCs to be reviewed inside the RMO and across RMOs, are available from the [access-restricted JCRB CMC web site](#) (links “[Complete list of CMCs](#)” or “CMCs by metrology area”, for instance “[AUV](#)”, provided on the left).
4. Once published in the KCDB, EXCEL files of CMCs are available from the [access-restricted JCRB CMC web site](#) (link “[Get Published CMCs](#)”). The EXCEL files of CMCs are presented as one per country and per metrology area, or one per country and per Chemical Category. They are built up by the KCDB Office from the approved CMC files.
5. The EXCEL files of CMCs which are made available from the “Get Published CMCs” part of the access-restricted JCRB CMC web site, are those that are currently imported into the database, and those that must be used for any further modification (see [document CIPM MRA-D-04](#)).
6. The EXCEL files of CMCs which are made available from the “Get Published CMCs” include those CMCs that are greyed-out from the database because of lack of an approved QS, though these greyed-out CMCs are not displayed in the KCDB web site.

V. What is a “KCDB absolute URL address”?

Short answer: an immediate way to get the most up-to-date information on something you are interested in and that evolves with time.

Detailed answer:

1. All URL addresses available from the KCDB are absolute, which means that any kind of information obtained from one of the directed search engines proposed by the KCDB system is returned through a unique web address for ever.
2. This unique web address can be bookmarked or copied/pasted in any kind of document (.pdf files, Word text, e-mail, etc.).
3. Whenever one clicks on one of these bookmarked web addresses, one gets the most up-to-date information corresponding to the items that were initially chosen in the directed search engine.
4. 1st example. The URL address http://kcdb.bipm.org/appendixC/L/EG/L_EG.pdf is the unique address, valid forever, which returns the .pdf file of all CMCs in Length declared by Egypt and published in the KCDB, whatever their numbers, uncertainties, ranges, etc. are.
5. 2nd example. The URL address http://kcdb.bipm.org/appendixC/country_list_search.asp?CountSelected=CA&sservice=M/FF.9.2 is the unique address, valid forever, which returns the web page of all CMCs related to “Volume gas flow rate” declared by Canada and published in the KCDB, whatever their numbers, uncertainties, ranges, etc. are. Note that in these two examples, the way the URL address is built is relatively simple.

6. 3rd example. By clicking [here](#), one would always get the graph of equivalence obtained for the measurement of the mass fraction of aluminium in silicon nitride powder in key comparison CCQM-K58.

VI. How can I find comparisons or CMCs in the KCDB?

Short answer: by using the search engines that are proposed.

Detailed answer:

1. It is impossible to find in the KCDB what is not entered in the KCDB: a comparison that is not registered, or a CMC that has never been approved.
2. The part of the KCDB on “Key and supplementary comparisons” proposes three different search engines: a free-text search engine, especially efficient when one enters words of the vocabulary, for instance “accelerometer” (see **IX**); a direct search by comparison identifier (in part or in full), for instance “cr-51”; and an advanced search, especially efficient for a search by category, for instance “Mass – Viscosity – COOMET”.
3. The part of the KCDB on “Calibration and Measurement Capabilities” proposes two different choices: a free-text search engine, which searches the whole CMCs database independently of the metrology area; and a series of search forms, each designed for one specific metrology area. Each of these search forms provides a direct access to .pdf files of CMCs, and offers an advanced search facility based on the Classification of services drawn up for the chosen metrology area.
4. Note that the advanced search facilities for CMCs can be used from top to bottom (choose first a “Branch”, then a “Service”, then a “Sub-service”), or laterally (direct choice of a “Sub-service” in the complete list provided for the chosen metrology area). For instance, choosing “Diameter standards” as a “Sub-service” in Length, selects automatically the Branch “Dimensional metrology” and the Service “Linear dimensions”.

VII. The acronym or the full name of my NMI has changed: how does it reflect in the KCDB?

Short answer: the old acronym/name disappears for ever from the part “CMCs” of the KCDB.

Detailed answer:

1. The KCDB Office takes into account the new acronym and/or new full name of a National Metrology Institute or a Designated Institute, only when a formal letter stating the new information is made available to the Director of the BIPM.
2. The old acronym and/or the old full name of the laboratory disappear for ever from the part of the KCDB web site on “Calibration and Measurement Capabilities” (.pdf files of CMCs and web pages displaying the CMCs). The text-free search engine implemented on this part of the KCDB web site answers “zero answers” when one types the old acronym and/or old name.
3. The old acronym and/or old name of the laboratory may stay in the EXCEL files of CMCs, but only in the columns that are not imported in the KCDB (“blue” columns, or additional columns for review).
4. The old acronym and/or old full name is kept in the part of the KCDB web site on “Key and supplementary comparisons”, especially in the lists of participants in comparisons, but with a note stating the new acronym and/or new full name, and the date of validity. When new results are approved, and for new comparisons to be registered, one uses the new acronym and/or new full name. The text-free search engine implemented on this part of the KCDB web site normally gives the same answer whatever is the acronym or full name typed in the search box.
5. It follows from item 3 and 4 that the treatment is not the same for CMCs than for comparisons. This is because it is impossible to correct the Final Reports of comparisons that are already posted in the KCDB, and because the CMCs part of the KCDB should always give an up-dated picture of the situation for users who do not belong to the metrology community.

VIII. How can I get statistics on the content of the KCDB?

Short answer: from the KCDB Statistics page.

Detailed answer:

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 (up-dated in real-time), and .pdf files showing the participation in key and supplementary comparisons (up-dated every six months, as the time of a 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 web site](#) (link "[KCDB statistics](#)"). Note that those EXCEL files track the changes 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 those EXCEL files. All this information makes it possible to build any graphs of interest.
3. The text-free search engine, which is implemented on the two parts of the KCDB web site, is very convenient to analyse the content of the databases in terms of numbers, provided one uses the links proposed on the left of the screen to refine the search (see the example below).

IX. Example of the use of the KCDB text-free search engine: how can I make a diagram of the distribution of supplementary comparisons according to their originating RMOs?

Short answer: enter "supplementary" and refine.

Detailed answer:

1. Enter "supplementary" in the box of the search engine implemented on the part "Key and supplementary comparisons" of the KCDB web site.
2. One gets the total number and the full list of supplementary comparisons registered in the KCDB, plus a number of links on the left showing the metrology areas, the statuses, and the conducting organizations, with the appropriate numbers between parenthesis.
3. All links proposed on the left are clickable in two ways: either for selecting one item, or to exclude one item (the little hand tells you where to click either to select or to exclude).
4. Selecting one item, or excluding one or several item(s), refines the search and reduces the number of answers: it works like a funnel. For instance, excluding all CCs and the BIPM from the box "Organizations" gives the statistics according to the metrology area and the status of the ensemble of RMO supplementary comparisons.
5. Clicking again on the link one has just selected, or excluded, allows going one step back.
6. Playing this game quickly leads to the desired distribution, and makes it possible to draw diagrams, such as the ones that are shown below.

