GETTING STARTED

KCDB restricted web portal

KCDB 2.0
v. 2020-10-26
www.bipm.org/kcdb
1 GETTING STARTED

The Key Comparison Database - KCDB – supports the Mutual Recognition Arrangement of the International Committee for Weights and Measures (CIPM MRA), implemented in 1999. It contains data on Calibration and Measurement Capabilities (CMCs) and comparison results of measurements in physics, chemistry and biology. The KCDB is an evidence based database: all data included have been reviewed by international groups of experts and approved for mutual recognition.

The KCDB website www.bipm.org/kcdb gives access to the following open access services:

- Search published CMCs in the KCDB
- Search published comparison reports and results
- Information on statistics and recent news on issues linked to CMCs and comparisons
- A set of guidance documents

The KCDB website also provides a restricted-access platform for users. It gives support for the creation and review of CMCs, as well as tools for the registration of comparisons and submission of comparison reports and associated documents. Statistics on the review process are also available by restricted access.

The restricted access area is available only for persons involved in the review process and its coordination. The restricted area is accessible via a guest username/password communicated by technical committee chairs and other coordinators. Once on the platform, if applicable, a guest may request a personalized user account in which the profiles as a CMC writer/reviewer or comparison pilot may be combined. The writer, reviewer and pilot always represent their institute.

This document gives an overview of the facilities available via the KCDB website.

Contents

1 Getting started ................................................................. 2

2 Home Page ........................................................................ 9

3 Profile ................................................................................ 12
   3.1 Guest ............................................................................ 12
   3.2 TC Chair ...................................................................... 12
   3.3 Writer .......................................................................... 13
   3.4 Reviewer ...................................................................... 13
   3.5 RMO Secretary ........................................................... 13
   3.6 WG CMC Chair ........................................................... 13
   3.7 Pilot .............................................................................. 14
   3.8 KCDB Office and JCRB Executive Secretary (hereafter indicated as the KCDB Office) .............................................. 14

4 Member area and user accounts ........................................... 14
   4.1 Guest account .............................................................. 14
   4.2 Register for a user account ............................................ 15

5 KCDB Platform: all logged-in users ....................................... 17

6 Training platform .................................................................. 17

7 CMC review ........................................................................ 18
   7.1 Intra-RMO review ........................................................ 18
   7.2 JCRB Review ............................................................... 20

8 CMC Format ........................................................................ 22
   8.1.1 CMC ID ...................................................................... 22
   8.1.2 CMC Review status .................................................... 22

9 Writer .................................................................................. 24
   9.1 My CMC Space ............................................................. 25
   9.2 Read a CMC .................................................................. 27
   9.3 Create a New CMC ........................................................ 28
   9.4 Update an already published CMC ................................. 28
   9.5 Duplicate a CMC ........................................................... 29
   9.6 Delete a Draft ................................................................ 29
   9.7 Delete a Published CMC ................................................ 29
   9.8 Withdraw a CMC ........................................................... 29
9.9 Grey out a CMC ................................................................................................. 29
  9.9.1 Grey out a CRM (Chemistry and Biology) ..................................................... 30

9.10 Reinstate a greyed out CMC ............................................................................ 30
  9.10.1 Reinstate a greyed out CRM (Chemistry and Biology) .................................. 31

9.11 Delete a greyed out CMC ................................................................................ 32

9.12 Export and import CMCs .................................................................................. 32
  9.12.1 Export CMCs ................................................................................................ 32
  9.12.2 Import CMCs ................................................................................................ 32

9.13 Institute CMCs ................................................................................................... 33

9.14 Submit a CMC for review .................................................................................. 33
  9.14.1 Writer: Intra-RMO review ............................................................................. 33
  9.14.2 Writer: JCRB review ................................................................................... 34

9.15 Create CMC - Physics ....................................................................................... 35
  9.15.1 Branch (*) .................................................................................................... 35
  9.15.2 Service, Sub-service and Individual service Codes (*) ................................. 35
  9.15.3 Institute service identifier .......................................................................... 35
  9.15.4 Link to Institute service identifier .............................................................. 36
  9.15.5 Quantity (*) ................................................................................................ 36
  9.15.6 Instrument or artifact (*) ............................................................................ 36
  9.15.7 Instrument type or method (*) .................................................................... 36
  9.15.8 International standard ............................................................................... 37
  9.15.9 Unit (*) ....................................................................................................... 37
  9.15.10 Lower limit ............................................................................................... 37
  9.15.11 Upper limit ............................................................................................... 37
  9.15.12 Parameters ............................................................................................... 37
  9.15.13 (Uncertainty) Unit (*) ............................................................................... 38
  9.15.14 (Uncertainty) Lower limit (*) ................................................................. 38
  9.15.15 (Uncertainty) Upper limit (*) ................................................................. 39
  9.15.16 Coverage factor (*) ................................................................................ 39
  9.15.17 % confidence interval (*) ......................................................................... 39
  9.15.18 Absolute or Relative Uncertainty (*) ...................................................... 39
  9.15.19 Edit table ................................................................................................. 39
  9.15.20 Edit an uncertainty equation ................................................................. 40
  9.15.21 Reference standard in calibration ............................................................ 41
  9.15.22 Source of traceability ............................................................................ 41
  9.15.23 Group identifier ...................................................................................... 42
  9.15.24 KCDB support for CMC claim ............................................................... 43
9.16 Create CMC – Ionizing radiation ........................................ 44

9.16.1 Branch (*) .......................................................... 44
9.16.2 Institute service identifier ........................................ 44
9.16.3 Link to Institute service identifier ............................... 44
9.16.4 Quantity (*) ...................................................... 45
9.16.5 Instrument or artifact (*) ........................................ 45
9.16.6 Instrument type or method (*) ................................. 45
9.16.7 International standard ........................................... 46
9.16.8 Medium (*) ....................................................... 46
9.16.9 Nuclide (*) ......................................................... 46
9.16.10 Source (*) ........................................................ 46
9.16.11 Specification of nuclide or source (*) ....................... 46
9.16.12 Unit (*) ............................................................ 46
9.16.13 Lower limit ......................................................... 46
9.16.14 Upper limit ........................................................ 47
9.16.15 Parameters ......................................................... 47
9.16.16 (Uncertainty) Unit (*) ........................................ 47
9.16.17 (Uncertainty) Lower limit (*) ............................... 48
9.16.18 (Uncertainty) Upper limit (*) ............................... 48
9.16.19 Coverage factor (*) ........................................... 48
9.16.20 % confidence interval (*) .................................... 48
9.16.21 Absolute or Relative Uncertainty (*) ...................... 48
9.16.22 Edit table .......................................................... 48
9.16.23 Edit an uncertainty equation .................................. 50
9.16.24 Reference standard in calibration .......................... 50
9.16.25 Source of traceability .......................................... 50
9.16.26 Group identifier .................................................. 52
9.16.27 KCDB support for CMC claim ............................... 52
9.16.28 Other support ..................................................... 52
9.16.29 Comments for publication ..................................... 52
9.16.30 Comments for review .......................................... 52
9.16.31 Uploaded documents ........................................... 53
9.16.32 Supporting evidence for Quality System provided (*) ................................................... 53
9.17 Create CMC – Chemistry and Biology ....................................................... 54

9.17.1 Category (*) ......................................................................................... 54
9.17.2 Sub-category (*) .................................................................................. 54
9.17.3 Institute service identifier ................................................................. 54
9.17.4 Web link to institute service identifier .............................................. 54
9.17.5 Group ................................................................................................... 55
9.17.6 Matrix (*) ............................................................................................ 55
9.17.7 Analyte or component (*) ................................................................. 55
9.17.8 CAS number ...................................................................................... 56
9.17.9 Quantity ............................................................................................. 56
9.17.10 Unit (*) ............................................................................................. 56
9.17.11 Lower limit ....................................................................................... 56
9.17.12 Upper limit ....................................................................................... 56
9.17.13 (Uncertainty) Unit (*) ....................................................................... 56
9.17.14 (Uncertainty) Lower limit (*) ............................................................ 57
9.17.15 (Uncertainty) Upper limit (*) ............................................................ 57
9.17.16 Coverage factor (*) ......................................................................... 58
9.17.17 % confidence interval (*) ................................................................. 58
9.17.18 Absolute or Relative Uncertainty (*) ............................................... 58
9.17.19 Edit table .......................................................................................... 58
9.17.20 Edit an uncertainty equation ............................................................ 59
9.17.21 CRM Value ...................................................................................... 60
9.17.22 Mechanism(s) for service delivery (*) ............................................. 62
9.17.23 Source of traceability ...................................................................... 62
9.17.24 Measurement technique(s) used ..................................................... 63
9.17.25 Group identifier ............................................................................... 63
9.17.26 Uncertainty convention ................................................................. 63
9.17.27 KCDB support for CMC claim ......................................................... 63
9.17.28 Other support ................................................................................. 63
9.17.29 Comments for publication ............................................................... 64
9.17.30 Comments for review ...................................................................... 64
9.17.31 Uploaded documents ....................................................................... 64
9.17.32 Clear description of supporting evidence for this claim ................. 64
9.17.33 Details of calibrants used and assessment of their purity/certification .... 64
9.17.34 Exact nature of service delivered ..................................................... 65
9.17.35 Supporting evidence for Quality System provided (*) ................. 65
9.17.36 Broad claims .................................................................................... 65

10 Reviewer .................................................................................................... 66
11 TC Chair ........................................................................................................... 69

11.1 TC Chair: Intra-RMO review ....................................................................... 70
  11.1.1 Asking for review (“CMC without reviewer”) ........................................... 70
  11.1.2 Ask for review (“CMC without reviewer”) ............................................... 70
  11.1.3 Complete the intra-RMO review (“CMC with reviewer”) ....................... 73
  11.1.4 CMCs from my RMO .............................................................................. 74
  11.1.5 CMCs not needing review ...................................................................... 74

11.2 TC Chair: JCRB Review ........................................................................... 75
  11.2.1 Ask for review (“JCRB space / CMC without reviewer”) ......................... 76
  11.2.2 Complete the review (“JCRB space / CMC with reviewer”) ................... 76

12 Vote and Vote tracking ............................................................................. 78
  12.1 Originating RMO ....................................................................................... 78
  12.2 Voting RMOs ............................................................................................. 78
  12.3 Vote tracking ............................................................................................... 79

13 Pending Actions ......................................................................................... 81

14 JCRB request for review .......................................................................... 82

15 CMC WG Chair ......................................................................................... 82

16 Comparisons ............................................................................................... 85
  16.1 Comparison dashboard ............................................................................. 85
  16.2 Register a comparison .............................................................................. 86
    16.2.1 Comparison conducted by ................................................................. 88
    16.2.2 Approved by ....................................................................................... 88
    16.2.3 Comparison identifier ......................................................................... 88
    16.2.4 Comparison type ............................................................................... 88
    16.2.5 Metrology area ................................................................................... 88
    16.2.6 Comparison sub-field ....................................................................... 88
    16.2.7 Comparison linked to ........................................................................ 88
    16.2.8 Summary description ........................................................................ 88
    16.2.9 Measurand ......................................................................................... 88
    16.2.10 Measurand values .......................................................................... 88
    16.2.11 Parameters ...................................................................................... 88
    16.2.12 Transfer device or sample ................................................................. 89
    16.2.13 Progress status ............................................................................... 89
    16.2.14 Additional contact person ................................................................. 89
    16.2.15 Measurement start year .................................................................... 89
    16.2.16 Measurement end year ..................................................................... 89
16.2.17 Supporting document(s) ................................................................. 89
16.2.18 Supporting link(s) ................................................................. 89
16.2.19 Comments ................................................................. 89
16.2.20 Optional message to the KCDB Office ......................................................... 89
16.2.21 Save and Register ................................................................. 89

16.3 Review and approval of the comparison report ................................................................. 89
16.4 Submit the final report of a comparison ................................................................. 90
16.5 Update of status ................................................................. 91

17 Statistics ................................................................. 92
17.1.1 CMC statistics ................................................................. 92
17.1.2 Comparison statistics ................................................................. 92

18 REFERENCES ................................................................. 94

19 Browser integration ................................................................. 94
19.1 Desktop ................................................................. 94
19.2 Mobile and tablet ................................................................. 94

20 Appendix ................................................................. 95
20.1 Branch codes used for importation ................................................................. 95
20.2 Field size ................................................................. 96
20.2.1 Accessible field size of CMC interactive forms ................................................................. 96
20.2.2 Accessible field size of Comparison interactive forms ................................................................. 97

21 Revision History ................................................................. 98
2 HOME PAGE

The home page gives open access to four main sections:

- **CMC**: Search
- **Comparisons**: Search
- **News**: Search for recent news on issues linked to CMCs and comparisons
- **Statistics**: CMCs and comparisons.

Direct links to the BIPM website BIPM.org and to the list of CIPM MRA Participants are situated at the top of the screen, where it is also possible to reach the restricted user area via Login.

Quick access to documents related to i) the KCDB, ii) the CIPM MRA, and iii) the CLASSIFICATION OF SERVICES (established by the Consultative Committees of the CIPM for each metrology area) are listed at the bottom of the Home page.
Figure 1-a  Upper part of the KCDB home page.
Get access to information on the KCDB, the main documents on the CIPM MRA and Classification of Services as established by the Consultative Committees.

**Figure 1-b**  Lower part of the KCDB home page.

Quick access to the RMO web
3 PROFILE

Restricted access to the user platform is designed for eight different profiles:

- Guest
- TC Chair
- Writer
- Reviewer
- RMO Secretary
- WG CMC Chair
- Pilot
- KCDB Office and JCRB Executive Secretary (hereinafter indicated as the KCDB Office)

3.1 GUEST

A guest has access to the restricted area to view pending actions for CMCs submitted for JCRB review and to consult the CMCs being made available for vote.

The Guest may access the KCDB platform with a generic username and password that can be communicated by the TC Chair.

3.2 TC CHAIR

The TC Chair is an RMO coordinator within a specific scientific field and acts as a gatekeeper. He\(^1\) coordinates the intra RMO review of CMCs and is the contact person for the RMO for the specific metrology area(s) and expertise. He receives the submitted CMCs from the Writers within the RMO. He may choose reviewer(s) for a CMC for the intra-RMO and JCRB reviews and will vote on the approval of CMCs when required.

The TC Chair may approve the creation of user accounts.

The TC Chair is informed via the KCDB platform on the creation and updates of comparisons.

The TC Chair is assigned an account by the KCDB Office. This account is passed on to the successor when the TC-Chair steps down.

A WG CMC Chair role cannot be combined with a TC Chair role for technical reasons – they must be associated to different user accounts.

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\(^1\) “He” is used to refer to a person, regardless of gender.
3.3 **Writer**

The Writer is the author of a CMC with the authority to act as such for his institute. He interacts mainly with his TC-Chair. He may submit new CMCs, modify or delete published CMCs, and grey out (momentarily remove) CMCs.

A Writer account may be requested by a person representing a metrology area and expertise within an institute participating in the CIPM MRA. The TC Chair of the metrology area/Expertise approves the account.

It is possible to act as Writer, Reviewer and Pilot using the same account.

3.4 **Reviewer**

The Reviewer is invited by the TC-Chair of the RMO to review CMCs within his metrology area and expertise. He interacts mainly with his TC-Chair. He may accept a CMC or ask for revision.

A Reviewer account may be requested by a person representing a metrology area and expertise within an institute participating in the CIPM MRA. The TC Chair of the metrology area/Expertise approves the account.

It is possible to act as Writer, Reviewer and Pilot using the same account.

3.5 **RMO Secretary**

The RMO Secretary represents the RMO (the RMO President or any person having a strategic position within the RMO) but who does not write or review CMCs.

The RMO-Secretary is assigned an account by the KCDB Office. This account is passed on to the successor when the RMO Secretary steps down.

The RMO Secretary profile gives access to all TC Chair pages for all metrology areas, in a 'read only' mode for the RMO concerned.

3.6 **WG CMC Chair**

If used, the WG CMC Chair represents the TC Chairs of one metrology area on the JCRB level (for inter-RMO reviews). To avoid reviewing a given CMC by several RMOs he may dispatch and suggest the CMC for review to different RMOs.²

The WG RMO Chair is assigned an account by the KCDB Office. This account is passed on to the successor when the WG RMO Chair steps down.

**A WG CMC Chair role cannot be combined with a TC Chair role for technical reasons – they must be associated to different user accounts.**

² This does not prevent other RMOs from reviewing the CMC if necessary or desired.
3.7 PILOT

A Pilot is the main contact person for a comparison. The Pilot may register a comparison and is invited to update the indicated status at regular intervals. The Pilot interacts mainly with the KCDB Office.

A Pilot account may be requested by a person representing a metrology area and expertise within an institute participating in the CIPM MRA. The TC Chair of the metrology area/Expertise approves the account.

It is possible to act as Writer, Reviewer and Pilot using the same account.

3.8 KCDB OFFICE AND JCRB EXECUTIVE SECRETARY (HEREAFTER INDICATED AS THE KCDB OFFICE)

The KCDB Office is composed of BIPM staff who support the coordination of the database, and the JCRB Executive Secretary, who maintains contact with the RMOs.

4 MEMBER AREA AND USER ACCOUNTS

The member area is restricted to persons directly associated with activities of the CIPM MRA.

4.1 GUEST ACCOUNT

The member area is accessible via a guest account.

The user name is tcguest@bipm

The password is tcontact
4.2 Register for a user account

After having logged in with the Guest account, the user may register for a personalized user account. **Only persons who will write CMCs, review CMCs or pilot a comparison should request a user account.** The profiles as Writer, Reviewer or Pilot for a comparison can be included in the same account.

Information on name, e-mail address, password, RMO\(^3\), country\(^4\), institute and profiles must be given. One or several metrology areas should be indicated, with the associated fields of expertise, to give access to the CMC support. No other areas apart from those directly concerning the user should be indicated. **Once the account has been approved by the TC Chair, any modification of metrology area and/or expertise must be requested from the TC Chair.**

The registered **user account** is personal to the extent that the registered e-mail is the identifier of the account but the registered user always represents the institute.

The submission to request a user account is addressed to the associated TC-Chair within the RMO and the KCDB Office. In general, it is the TC Chair who approves, or rejects, the request.

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\(^3\) For international organizations the RMO involved in the review process should be indicated.

\(^4\) For international organizations, the country is indicated as the organization acronym and name.
Please note that persons who formerly have previously piloted a comparison may already have been assigned a user account. You will notice this when requesting a new account by the massage “This e-mail address already exists. Please enter another valid e-mail address.”. In this case you may recover your account using the action “Forgotten password” and update the account according to your metrology area and expertise.

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5 Information on the user is displayed on the open web when the person acts as comparison pilot. Information on the user is displayed to reviewers and TC Chairs on the restricted web within the CMC review process.
5 **KCDB Platform: All Logged-In Users**

In addition to the open website, all logged-in users have access to

- Pending actions
- Vote tracking
- Statistics on review performance

6 **Training Platform**

A training platform is available at [http://kcdb-cbkt.bipm.org/kcdb/](http://kcdb-cbkt.bipm.org/kcdb/) which is a copy of the most recent KCDB software. The database is not an exact copy of the official KCDB, but allows for the users to test and carry out actions without any consequences on the official site. It can be distinguished from the official site by an additional yellow banner.
Figure 5  Home page for the TRAINING PLATFORM.

It is possible to register for a Writer, Reviewer or Pilot account on the training platform. As no e-mail notifications are generated on the training platform you need to contact your TC Chair or the KCDB Office to get your user account validated.

7  CMC REVIEW

7.1  INTRA-RMO REVIEW

The intra-RMO review has been designed to mirror the JCRB (also known as inter-RMO) review. The CMC may be revised an unlimited number of times. Set date limits are not programmed and are hence, in respect to the software, not fixed.

A CMC is drafted by the Writer and submitted to the TC Chair for intra-RMO review. The TC Chair may accept, or not accept, the CMC, or ask the writer for a revision. The TC Chair may also consult reviewers within the same RMO.

CMCs containing only editorial modifications can be sent directly to the KCDB Office.

Writer, Reviewer and TC Chair may add comments to each CMC during the intra-RMO review process. When the CMC has been accepted by the RMO, it can be submitted for the JCRB review. The TC Chair has the possibility to add additional documents for the submission, such as the mandatory QMS support documentation.

CMCs no longer appear in batches but treated one-by-one. To avoid ‘drip-drip’ effects, the acting TC-Chairs may agree on common dates for submission and review.
Figure 6-a  Flow diagram for intra-RMO review.
7.2 JCRB REVIEW

The JCRB review follows globally the JCRB rules [CIPM MRA D-04]. For example, time limits are fixed for the process. Contrary to the intra-RMO review, the CMC may not be revised an unlimited number of times – it can be revised once.

The CMCs submitted by the TC Chairs for JCRB review are indicated in

i) Pending actions (available to all)

ii) JCRB request to review (available to the TC Chairs)

The TC Chair should first indicate the intention to review, or not to review a CMC. The TC Chair may then indicate the date for review.

The TC Chair may approve the CMC or ask the writer for revision. The TC Chair may also consult reviewers within his own RMO.

The reviewer and TC Chair may add comments to each CMC during the JCRB review process.

If the CMC is approved by all reviewing RMOs, it is automatically transmitted to the KCDB Office for publication and will not be submitted to a vote.

If at least one of the reviewing RMOs asks for a revision, the CMC is made available to the Writer for revision, as soon as all reviewing RMOs have indicated their standpoint, or at latest when the time limit for review has passed. The revised CMC is returned to the TC Chair of the originating RMO who will submit the CMC for vote. Unanimous approval will enable the KCDB Office to publish the CMC.
Figure 6-b  Flow diagram for JCRB (inter-RMO) review.
8 CMC FORMAT

A CMC is composed of a set of information describing the capability or service. The contents depend on the metrology area.

Some of the CMC information is mandatory, other information is optional. Part of the CMC information that is given when it is edited on the platform is intended only for the review, and is not available on the open website.

8.1.1 CMC ID

When available on the open web, a CMC is identified by its institute and internal service code.

In the database, and during the review process, the CMC is identified by the unique identifier that is attributed to all CMCs in the database. It is composed of:

RMO-MetrologyArea-CountryCode-CMCNumber-VersionNumber, where

RMO – Abbreviation of the Regional Metrology Organization
MetrologyArea – Abbreviation of the metrology area
CountryCode – 2-letter ISO country code (such as DE for Germany) or up to 4 letters international organizations (such as IAEA).
CMCNumber – an 8-digit alphanumerical-code where each the value spans from 0 to Z
VersionNumber – the alphanumerical version value from 1 to Z

The CMCNumber is attributed by incrementing the latest number of CMC by +1 when a new CMC is added. The VersionNumber is incremented by +1 when the CMC is updated. If a CMC is deleted, no other CMC will ever carry the same unique identifier.

8.1.2 CMC Review status

During the review process the status of the CMC is indicated in the dashboards available to the Writer, Reviewer and TC Chair.

Draft status of CMC before having been submitted for intra-RMO review
RMO : Submitted the CMC has been submitted for intra-RMO review
RMO : Under review a reviewer has accepted to review, alternatively the TC Chair has reviewed the CMC
RMO : Revision requested the Writer has been requested to revise the CMC and has again access to edit the CMC contents
RMO : Revision completed the CMC has, after revision, been resubmitted to the TC Chair
**Submitted to JCRB**  
the CMC has been submitted by the TC Chair to the JCRB for review.

**JCRB : Under review**  
a reviewer has accepted to review; alternatively at least one of the TC Chairs has reviewed the CMC

**JCRB : Revision requested**  
the Writer has requested to revise the CMC and has regained access to edit the CMC contents

**JCRB : Waiting for VOTE**  
the revised CMC is accessible for voting

**JCRB : Approved**  
all RMOs have approved the CMC

**JCRB : Not approved**  
at least one of the TC Chairs has not approved the revised CMC.
9 **W**riter

The Writer

- represents an institute that takes part in the CIPM MRA
- can create, update, delete, grey out\(^6\), and request for the reinstatement of greyed out, CMCs
- can submit CMCs for review to the TC Chair in his field

The writer has unique access to three different screens via the menu:

- Create CMC
- My CMC space
- Institute CMCs

A structured form is dedicated for the creation of a CM; it contains the sections **Classification of service, Measurand, Parameters, Expanded uncertainty** and **References**. Fields attributed for mandatory information are marked by a **red star (\(^\ast\)).**

When filling in the form, the Writer must first indicate the metrology areas. The information may be saved as a Draft, to be completed at a later date. It is possible to check how the information may appear once published via the function PREVIEW. QUIT allows the CMC to be abandoned without saving. SUBMIT will submit the CMC immediately to the TC Chair for intra-RMO review.

When modifying a CMC that already has been published, the modifications should be described in the internal comments.

‘Tip-tools’ are incorporated as additional guidance.

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\(^6\) Temporarily withdraw.
Figure 8-a Chose the metrology area before drafting the CMC.

9.1 **My CMC SPACE**

The **My CMC space** gives access to a dashboard with the CMCs that have been drafted by the user. At the beginning of KCDB 2.0, this space will be empty, as none of the already published CMCs are associated with a ‘real’ user.

A CMC that has been drafted but not yet submitted to the TC Chair is only available to the Writer, and has the status “Draft”.

The Writer has access to a set of filters, placed to the left of the dashboard.

The condition of the CMC is indicated by a combination of colour-and-letter, where

N - New   M - Modified   G - Greyed out   P – Published

The actions on the CMC can be triggered by
i) using the blue buttons displayed above the dashboard

ii) the actions available in the column listed to the far right of the table. These actions allow to update, duplicate or ask for the reinstatement of a greyed-out CMC.

Figure 8-aa   My CMC space (example for Chemistry and Biology).
9.2 Read a CMC

The Writer may read the CMCs by

i) clicking on the CMC identifier (one-by-one)

or by

ii) clicking on the blue button “COMPARE” (one or several)

or by

iii) exporting the data to an Excel file.
9.3 **CREATE A NEW CMC**

An empty CMC form will appear. When pressing SAVE it will be marked as new, “N”, in the CMC table.

9.4 **UPDATE AN ALREADY PUBLISHED CMC**

A CMC that already has been published can be updated (modified). By clicking in the column far right, the update function can be triggered. The CMC form will open, the update can be made. When saving the updated CMC it will be marked as modified, “M”, in the CMC table.

When updating a CMC, the items that have been updated should be indicated in “Comments for review”.

<table>
<thead>
<tr>
<th>LATEST</th>
<th>MOST RECENT SUBMISSION</th>
<th>STATUS</th>
<th>SUBMITTED TO JCRR</th>
<th>ACTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Published</td>
<td>Published</td>
<td>Update</td>
<td>Duplicate</td>
<td>— e</td>
</tr>
</tbody>
</table>

www.bipm.org/kcdb
9.5 Duplicate a CMC

A published CMC or a Draft CMC can be duplicated, if the contents for a new CMCs if the contents are similar from an editorial point of view. When pressing “Duplicate” on the column far right a new CMC form will appear, containing the data of the original CMC. When pressing save, the CMC will appear as new, “N”, in the CMC table.

9.6 Delete a Draft

A CMC draft can be deleted. The draft CMC will hence no longer be displayed to the user. As soon as it has been submitted, it is no longer possible to delete the unpublished CMC.

9.7 Delete a Published CMC

A CMC may be deleted by the action “Delete”. The CMC will no longer be accessible to the user, nor will it appear via search on the web.

9.8 Withdraw a CMC

When a CMC has been submitted for review, it may happen that the submitting institute wishes to interrupt the review. Such CMC may be withdrawn from the review by the action “WITHDRAW”. The CMC will be displayed in “My CMC space” with the status “Withdrawn”. It is no longer possible to re-submit a displayed withdrawn CMC.

9.9 Grey out a CMC

A CMC may be greyed out by the action “Grey out”. This will remove public access to the CMC until “Greyed out” is removed.

<table>
<thead>
<tr>
<th>CMC State</th>
<th>Identifier</th>
<th>Service Code</th>
<th>Branch</th>
<th>Quantity</th>
<th>Instrument</th>
<th>Institute Service ID</th>
<th>Initially Submitted</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>JM-EM-NR- 0100594-1</td>
<td>AC current, current, and power</td>
<td>AC current up to 100 A sources</td>
<td>AC current source, multifunction calibrator</td>
<td></td>
<td>1N71/01.02.03.05.16.003</td>
<td></td>
</tr>
</tbody>
</table>

*Figure 8-ab* Display of a greyed-out CMC.
9.9.1 Grey out a CRM (Chemistry and Biology)

It may happen that only the CRM part should be greyed out for a valid CMC. In this case, the CMC and CRM should be greyed out, but the CMC part should remain published. To do so, the following actions should be carried out for each CRM to be greyed out:

1) DUPLICATE the CMC A that contains the CRM to be greyed out. The new CMC (copy of A) is here called B.

2) Edit the form of B and delete the CRM data in B (but keep the CMC data).

3) Add a comment in B via "Read and add comments", write that the CRM is greyed out and indicate the CMC ID of A (RMO-QM-COUNTRY-000...). This information will only appear internally, but not to the users on the open web.

4) SAVE the CMC B.

5) SUBMIT the newly duplicated CMC B to the TC Chair.

6) GREYOUT the original CMC A.

As soon as a CMC has been greyed out it is visible in the statistics to logged-in users.

9.10 REINSTATE A GREYED OUT CMC

An already-greyed out CMC may be reinstated by the action available in the column on the far right.

<table>
<thead>
<tr>
<th>INSTRUMENT</th>
<th>INSTITUTE SERVICE ID</th>
<th>INITIALLY SUBMITTED</th>
<th>MOST RECENT SUBMISSION</th>
<th>STATUS</th>
<th>SUBMITTED TO JOB</th>
<th>ACTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC current source subfunction calibrator</td>
<td>INT/10102.02.0510.002</td>
<td></td>
<td></td>
<td>Greyed out</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DC ammeter</td>
<td>INT/10102.02.0510.008</td>
<td></td>
<td></td>
<td>Published</td>
<td></td>
<td>Update Duplicate Reinststate CMC</td>
</tr>
<tr>
<td>Current converter</td>
<td>INT/10102.02.01510.005</td>
<td></td>
<td></td>
<td>Published</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Powermeter</td>
<td>INT/10102.02.01510.006</td>
<td></td>
<td></td>
<td>Published</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 8-ac** The column far right allows to reinstate a greyed out CMC.
When the command “Reinstate the CMC” a draft version will appear in the dashboard.

![Figure 8-ad](image)

**Figure 8-ad** A new version will be created when requesting reinstatement.

It is now possible to modify the contents if necessary. Describe the modifications in the comment tool in the editing area.

![Figure 8-ae](image)

**Figure 8-ae** Edit the new version if necessary.

You may now submit the CMC to the TC Chair for reinstatement. The "all-grey" former version and inclusion in the greyed out statistics will remain until the the reinstated CMC has been published.

9.10.1 **Reinstate a greyed out CRM (Chemistry and Biology)**

Select the greyed out CMC in the writer space and indicate “Submit for reinstatement”. When the reinstatement has been carried out, delete the CMC containing only the CMC part.
9.11 **DELETE A GREYED OUT CMC**

To delete an already greyed out CMC:

Reinstate the CMC by the action available in the column on the far right. Once reinstated, the CMC can be deleted.

9.12 **EXPORT AND IMPORT CMCs**

9.12.1 **Export CMCs**

It is possible to export selected CMCs to an Excel file. The exported data represents all CMC-related information registered in the KCDB for the selected CMCs.

![Export facility when logged in on the web platform.](image)

9.12.2 **Import CMCs**

It is also possible to import CMCs from an Excel file\(^7\). If for any reason the Writer wishes to import the CMCs using an Excel sheet, a template can be downloaded (from the platform) containing the necessary information:

However, the format of the contents is very strict to match with the expected information hosted by the database. It is therefore recommended to use the web form when editing CMCs for the first time. By exporting already edited or published CMCs having similar contents, the exported file may serve as a basis for the importation file having the same format.

\(^7\) Excel 2010 or later version are supported.
It should be noted that to modify CMCs that already have been published, these CMCs must first be exported from the KCDB to an Excel file.

It is not possible to delete or grey out CMCs via an import.

![Import facility and access to an importation template when logged in on the web platform.]

**Figure 8-ag** Import facility and access to an importation template when logged in on the web platform.

### 9.13 INSTITUTE CMCs

Institute CMCs provides almost the same facilities as the My CMCs space, but gives access to a dashboard with all CMCs that have been published by the Writer’s institute within the same expertise of the Writer. Further more, as soon as a CMC has been submitted for review or greyed out, it will be indicated on this page. CMCs that are presently saved as a Draft by a Writer will not appear in the list.

### 9.14 SUBMIT A CMC FOR REVIEW

The Writer submits a mature CMC for intra-RMO review. Once the CMC has been submitted, it is no longer available to the Writer to modify data.


If the TC Chair indicates a request for revision, the Writer will again get access to the CMC to make the requested revision. The Writer may re-submit a revised CMC an unlimited number of times during the intra-RMO review.

The writes may submit using the i) blue SUBMIT button, ii) use the submit function in the column far right of the table, or iii) submit the CMC when the form is open.
9.14.2 Writer: JCRB review

Reviewing TC Chairs may also ask for a revision during the JCRB review. In this case the Writer will again get access to the CMC once the latest deadline for review has passed, to make the requested revision. The Writer may re-submit a revised CMC only once during the JCRB (inter-RMO) review.
9.15 **CREATE CMC - PHYSICS**

![Create CMC Form](image)

Figure 8-b  Classification of Service – Physics.

**9.15.1 Branch (*)**

Choose the Branch. For guidance on the structure, the specific service list established by each consultative committee is available in the bottom of the page.

**9.15.2 Service, Sub-service and Individual service Codes (*)**

This information can either be indicated by the dedicated number, or the explicit category. For guidance on the structure, the specific service list, established by each Consultative Committee, is available at the bottom of the page.

**9.15.3 Institute service identifier**

Each institute may attribute a specific identifier for their service, which is indicated here. It may be completed by a link.
9.15.4 **Link to Institute service identifier**

The specific link to the service (or the institute web page for services, or the web page of the institute, etc.) can be indicated. Please note that it is the responsibility of the originating institute to update the link if it changes.

![Diagram of Measurand and Instrument or artifact](image)

**Figure 8-c**  *Measurand - Physics.*

9.15.5 **Quantity (*)**

Quantity expressions already included in the database are suggested in a menu (type 3 letters first), but it is also possible to indicate a personalized expression when needed.

9.15.6 **Instrument or artifact (*)**

Indicate the instrument or artefact that can be calibrated.

9.15.7 **Instrument type or method (*)**

Indicate the instrument type or method that is applied.
9.15.8 International standard

Indicate if a specific international standard\(^8\) or other recommendations\(^9\) is followed, standards already included in the database are suggested in a menu\(^10\), but it is also possible to indicate a new standard if it is missing from the list.

9.15.9 Unit (*)

The unit is chosen in a fixed drop-down menu. "(dimensionless)" may be chosen for measurands without units, such as ratios or indices and will create an empty space when displayed. The unit “dimension 1” may be chosen when the unit “1” is targeted. Please make sure that the chosen unit is in line with the quantity. If a unit is not available, the Writer is invited to contact the KCDB Office: (bipm.kcdb@bipm.org).

9.15.10 Lower limit

"Lower limit" is the lower limit of the measurand range. If the lower and upper limits are identical, they should be indicated the same in both fields. A point (.) is used as the decimal separator. The symbol “E” represents exponential of 10. For example 10300 may be expressed as 1.03E04; 0.0067 may be expressed as 6.7E-03.

9.15.11 Upper limit

"Upper limit" is the upper limit of the measurand range. If the lower and upper limits are identical, they should be indicated the same in both fields. A point (.) is used as the decimal separator. The symbol “E” represents exponential of 10. For example 10300 may be expressed as 1.03E04; 0.0067 may be expressed as 6.7E-03.

9.15.12 Parameters

As many as five sets of parameter may be indicated, if required, by opening the parameter window. The laboratory conditions, such as temperature or humidity, or specific measurement settings such as applied frequency or voltage, can be indicated.

---

\(^8\) Examples: IAEA, ISO, IEC standards or documents established by Consultative Committees.
\(^9\) Example: References expressed by the Consultative Committees.
\(^10\) Made by autocomplete: if the 3 first letters correspond to already recorded contents, these will be suggested.
### 9.15.13 (Uncertainty) Unit (*\(^a\))

The uncertainty unit is chosen in a fixed drop-down menu. "(dimensionless)" may be chosen for measurands without units, such as ratios or indices and will create an empty space when displayed. The unit "dimension 1" may be chosen when the unit "1" is targeted. Please make sure that the chosen uncertainty unit is in line with the quantity and the indicated measurand unit. If a unit is not available, the Writer is invited to contact the KCDB Office: [bipm.kcdb@bipm.org](mailto:bipm.kcdb@bipm.org).

### 9.15.14 (Uncertainty) Lower limit (*\(^b\))

"Lower limit" represents the lower limit of the expanded uncertainty with a coverage factor of approximately 95 %. If the lower and upper limits are identical, they should be indicated the same in both "Lower limit" and "Upper limit" fields. A point (.) is used as the decimal separator. The symbol “E” represents exponential of 10. For example 10300 may be expressed as 1.03E04; 0.0067 may be expressed as 6.7E-03.
9.15.15  (Uncertainty) Upper limit (*)

“Upper limit” represents the upper limit of the expanded uncertainty with a
coverage factor of approximately 95 %. If the lower and upper limits are
identical, they should be indicated the same in both “Lower limit” and “Upper
limit” fields. A point (.) is used as the decimal separator. The symbol “E”
represents exponential of 10. For example 10300 may be expressed as
1.03E04; 0.0067 may be expressed as 6.7E-03.

9.15.16  Coverage factor (*)

The coverage factor $k$ represents the term for which $k \times u$ has a coverage factor
of 95 %, $u$ representing the standard uncertainty of the measurand value. The
default value is $k = 2$.

9.15.17  % confidence interval (*)

The default value of the coverage factor is 95 %, as stated in the CIPM MRA.

9.15.18  Absolute or Relative Uncertainty (*)

The absolute or relative nature of the stated uncertainty must be selected from
the drop-down menu.

9.15.19  Edit table

When several services are covered by the same instrument or technique, they
may be grouped into one single CMC with an associated uncertainty table.

Applications are for example

   iv) measured AC voltage at different frequencies

   v) mass standards of a set

   vi) a radionuclide measured using different techniques.

This grouping can then be indicated in a common table indicating the
uncertainty for each case. This grouping facilitates, in general, the review of the
CMCs and the overview of the services.

First indicate the unique name of the table under “Uncertainty table name”.

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The table is edited by first indicating the number or rows and columns (headers included). Each field is then completed.

In the table comment field an indication of units (for example “Uncertainties given in μV”) or other essential information can be given.

A table may also be imported from an Excel file. This file must contain only the uncertainty table, and will populate the table including indicating the numbers of rows and columns. Each cell must contain a symbol – indicate empty cells by a hyphen symbol (-).11

![Figure 8-e](image)

**Figure 8-e**  Table for uncertainties - Physics.

### 9.15.20 Edit an uncertainty equation

Uncertainties expressed as an equation are edited in this pop-up. A comment on the equation can be given, where notably the representation of different symbols may be indicated, for example "L representing length".

The format of quantity-based equations was adopted at the Consultative Committee Presidents’ meeting in June 2018 [Report CIPM 2018]. Information on quantity-based equations is given in “Guidance on quantity-based equations”.

---

11 Excel 2010 or later version is supported. If the table data is already listed in an Excel file of a previous version, it must be copy/pasted as “values” (not reproducing the original format).
9.15.21 Reference standard in calibration

The reference standard used for the calibration is indicated here.

9.15.22 Source of traceability

The source of traceability refers to the institute to which measurement traceability is connected.

Figure 8-f  Field for equation - Physics.
9.15.23 Group identifier

The Group identifier is a “tag” that can be attributed to a set of CMCs that are related. The identifier should be unique for the metrology area.
Examples:

i) In electricity and magnetism, amplitude and phase of a measurand are declared as separate CMCs, but are related.

ii) In chemistry and biology, several analytes may be detected simultaneously within the same chemical matrix. These are regarded as separate CMCs, but are related.

iii) In ionizing radiation, several radionuclides may be detected simultaneously within the same matrix. These are regarded as separate CMCs, but are related.

When the CMC is published on the open KCDB website, it will be indicated by a special “link” symbol. Clicking on this symbol will display the related CMCs.

9.15.24 KCDB support for CMC claim

You may add one or more references to comparisons published in the KCDB.

9.15.25 Other support

Indicate one or more support other than comparisons published in the KCDB.

9.15.26 Comments for publication

These comments will be published on the open website.

9.15.27 Comments for review

The contents here are intended for the Writer, TC Chairs and Reviewer during the review process. Indicate possible modifications of the CMC here.

9.15.28 Uploaded documents

Please upload the documents to which you refer (other than KCDB comparisons) to give the reviewing experts access to the documents.

9.15.29 Supporting evidence for Quality System provided (*)

The Writer confirms that a validated Quality System exists before engaging the review procedure. The CMC cannot be submitted without having confirmed this fact.
### 9.16 CREATE CMC – IONIZING RADIATION

![Classification of service—Ionizing radiation](image)

**Figure 8-h** Classification of service – Ionizing radiation.

#### 9.16.1 Branch (*)

Choose the Branch. For guidance on the structure, the specific service list established by each consultative committee is available in the bottom of the page.

#### 9.16.2 Institute service identifier

Each institute may attribute a specific identifier for their service, which is indicated here. It may be completed by a link.

#### 9.16.3 Link to Institute service identifier

The specific link to the service (or the institute web page for services, or the web page of the institute, etc.) can be indicated. Please note that it is the responsibility of the originating institute to update the link if it changes.
9.16.4 **Quantity (*)**

Select the quantity.

9.16.5 **Instrument or artifact (*)**

Indicate the instrument or artefact that can be calibrated.

9.16.6 **Instrument type or method (*)**

Indicate the instrument type or method that is applied.
9.16.7 **International standard**
Indicate if a specific international standard\textsuperscript{12} or other recommendations\textsuperscript{13} is followed, standards already included in the database are suggested in a menu\textsuperscript{14}, but it is also possible to indicate a new standard if it is missing from the list.

9.16.8 **Medium (*)**
Indicate the medium.

9.16.9 **Nuclide (*)**
Indicate the nuclide.

9.16.10 **Source (*)**
Indicate the source.

9.16.11 **Specification of nuclide or source (*)**
If the branch concerns radioactivity, please indicate the nuclide specifications here.

If the branch concerns dosimetry or neutron measurements, please indicate the source specifications here.

9.16.12 **Unit (*)**
The unit is chosen in a fixed drop-down menu. “(dimensionless)” may be chosen for measurands without units, such as ratios or indices and will create an empty space when displayed. The unit “dimension 1” may be chosen when the unit “1” is targeted. Please make sure that the chosen unit is in line with the quantity. If a unit is not available, the Writer is invited to contact the KCDB Office: (bipm.kcdb@bipm.org).

9.16.13 **Lower limit**
“Lower limit” is the lower limit of the measurand range. If the lower and upper limits are identical, they should be indicated the same in both fields. A point (.) is used as the decimal separator. The symbol “E” represents exponential of 10. For example 10300 may be expressed as 1.03E04; 0.0067 may be expressed as 6.7E-03.

\textsuperscript{12} Examples: IAEA, ISO, IEC standards or documents established by Consultative Committees.
\textsuperscript{13} Example: References expressed by the Consultative Committees.
\textsuperscript{14} Made by autocomplete: if the 3 first letters correspond to already recorded contents, these will be suggested.
9.16.14  Upper limit

“Upper limit” is the upper limit of the measurand range. If the lower and upper limits are identical, they should be indicated the same in both fields. A point (.) is used as the decimal separator. The symbol “E” represents exponential of 10. For example 10300 may be expressed as 1.03E04; 0.0067 may be expressed as 6.7E-03.

9.16.15  Parameters

As many as five sets of parameter may be indicated, if required, by opening the parameter window. The laboratory conditions, such as temperature or humidity, or specific measurement settings such as applied frequency or voltage, can be indicated.

![Expanded uncertainty](image)

**Figure 8-j**  Expanded uncertainty - Ionizing radiation.

9.16.16  (Uncertainty) Unit (*)

The uncertainty unit is chosen in a fixed drop-down menu. “(dimensionless)” may be chosen for measurands without units, such as ratios or indices and will create an empty space when displayed. The unit “dimension 1” may be chosen when the unit “1” is targeted. Please make sure that the chosen uncertainty unit is in line with the quantity and the indicated measurand unit.
If a unit is not available, the Writer is invited to contact the KCDB Office: (bipm.kcdb@bipm.org).

9.16.17 (Uncertainty) Lower limit (*)

“Lower limit” represents the lower limit of the expanded uncertainty with a coverage factor of approximately 95%. If the lower and upper limits are identical, they should be indicated the same in both “Lower limit” and “Upper limit” fields. A point (.) is used as the decimal separator. The symbol “E” represents exponential of 10. For example 10300 may be expressed as 1.03E04; 0.0067 may be expressed as 6.7E-03.

9.16.18 (Uncertainty) Upper limit (*)

“Upper limit” represents the upper limit of the expanded uncertainty with a coverage factor of approximately 95%. If the lower and upper limits are identical, they should be indicated the same in both “Lower limit” and “Upper limit” fields. A point (.) is used as the decimal separator. The symbol “E” represents exponential of 10. For example 10300 may be expressed as 1.03E04; 0.0067 may be expressed as 6.7E-03.

9.16.19 Coverage factor (*)

The coverage factor $k$ represents the term for which $k \times u$ has a coverage factor of 95%, $u$ representing the standard uncertainty of the measurand value. The default value is $k = 2$.

9.16.20 % confidence interval (*)

The default value of the coverage factor is 95%, as stated in the CIPM MRA.

9.16.21 Absolute or Relative Uncertainty (*)

The absolute or relative nature of the stated uncertainty must be selected from the drop-down menu.

9.16.22 Edit table

When several services are covered by the same instrument or technique, they may be grouped into one single CMC with an associated uncertainty table.

Applications are for example

i) measured AC voltage at different frequencies
ii) mass standards of a set

iii) a radionuclide measured using different techniques.

This grouping can then be indicated in a common table indicating the uncertainty for each case. This grouping facilitates, in general, the review of the CMCs and the overview of the services.

First indicate the unique name of the table under “Uncertainty table name”.

The table is edited by first indicating the number of rows and columns (headers included). Each field is then completed.

In the table comment field an indication of units (for example “Uncertainties given in Bq”) or other essential information can be given.

A table may also be imported from an Excel file. This file must contain only the uncertainty table, and will populate the table including indicating the numbers of rows and columns. Each cell must contain a symbol – indicate empty cells by a hyphen symbol (-).15

---

Figure 8-k Table for uncertainties - Ionizing radiation.

---

15 Excel 2010 or later version is supported. If the table data is already listed in an Excel file of a previous version, it must be copy/pasted as “values” (not reproducing the original format).
9.16.23  Edit an uncertainty equation

Uncertainties expressed as an equation are edited in this pop-up. A comment on the equation can be given, where notably the representation of different symbols may be indicated, for example “D representing the absorbed dose”.

The format of quantity based equations was adopted at the Consultative Committee Presidents’ meeting in June 2018 [Report CIPM 2018]. Information on quantity-based equations is given in “Guidance on quantity-based equations”.

9.16.24  Reference standard in calibration

The reference standard used for the calibration is indicated here.

9.16.25  Source of traceability

The source of traceability refers to the institute to which measurement traceability is connected.

Figure 8-l  Field for equation - Ionizing radiation.
### References

<table>
<thead>
<tr>
<th>Reference standard used in calibration</th>
<th>Source of traceability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group identifier</th>
<th>KCDB support for EMC claim</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other support</th>
<th>Comments from reviewer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

![Figure 8-m]

**References - Ionizing radiation.**

The contents here are intended for the Writer, TC Chairs and Reviewer during the review process. Please indicate possible modifications of the CMC here.

The contents here will be published on the KCDB web for open access.
9.16.26  Group identifier

The Group identifier is a “tag” that can be attributed to a set of CMCs that are related. The identifier should be unique for the metrology area.

Examples:

i) In electricity and magnetism, amplitude and phase of a measurand are declared as separate CMCs, but are related.

ii) In chemistry and biology, several analytes may be detected simultaneously within the same chemical matrix. These are regarded as separate CMCs, but are related.

iii) In ionizing radiation, several radionuclides may be detected simultaneously within the same matrix. These are regarded as separate CMCs, but are related.

When the CMC is published on the open KCDB website, it will be indicated by a special “link” symbol. Clicking on this symbol will display the related CMCs.

9.16.27  KCDB support for CMC claim

You may add one or more references to comparisons published in the KCDB.

9.16.28  Other support

Indicate one or more support other than comparisons published in the KCDB.

9.16.29  Comments for publication

These comments will be published on the open website.

9.16.30  Comments for review

The contents here are intended for the Writer, TC Chairs and Reviewer during the review process. Indicate possible modifications of the CMC here.
9.16.31 Uploaded documents

Please upload the documents to which you refer (other than KCDB comparisons) to give access to the documents by the reviewing experts.

9.16.32 Supporting evidence for Quality System provided (*)

The Writer confirms that there exists a validated Quality System before engaging the review procedure. The CMC cannot be submitted without having confirmed this information.
9.17 CREATE CMC – CHEMISTRY AND BIOLOGY

**Figure 8-n** Classification of service – Chemistry and Biology.

9.17.1 Category (*)
Choose the category. For guidance on the structure, the specific service list established by each Consultative Committee is available at the bottom of the page.

9.17.2 Sub-category (*)
Choose the sub-category. For guidance on the structure, the specific service list established by each Consultative Committee is available at the bottom of the page.

9.17.3 Institute service identifier
Each institute may attribute a specific identifier for their service which is indicated here. It may be completed by a link.

9.17.4 Web link to institute service identifier
The specific link to the service (or the institute webpage for services, or the webpage of the institute...) can be indicated. Please note that it is the responsibility of the originating institute to update the link if it changes.
9.17.5 Group

Choose one or more groups that are relevant to the contents of the CMC.

![Figure 8-o](Image)

**Figure 8-o** Measurand and CMC value - Chemistry and Biology

When modifying a CMC, if the CMC group is indicated as "Not attributed" (except those for the Electrochemical Analysis and Gas Analysis group), please update the relevant group(s).

9.17.6 Matrix (*)

Matrix expressions already included in the database are suggested in a pull-down menu (type 3 letters first), but it is also possible to indicate an unlisted expression if needed.

9.17.7 Analyte or component (*)

Analyte or component expressions already included in the database are suggested in a menu (type 3 letters first), but it is also possible to indicate an unlisted expression if needed.
9.17.8 CAS number\textsuperscript{16}

By typing 3 characters, already registered CAS numbers will be suggested. Indicating the CAS number is optional.\textsuperscript{17}

9.17.9 Quantity

Quantity expressions already included in the database are suggested in a menu (type 3 letters first), but it is also possible to indicate an unlisted expression if needed.

9.17.10 Unit (*)

The unit is chosen in a fixed drop-down menu. "(dimensionless)" may be chosen for measurands without units, such as ratios or indices and will create an empty space when displayed. The unit “dimension 1” may be chosen when the unit “1” is targeted. Please make sure that the chosen unit is in line with the quantity. If a unit is not available, the Writer is invited to contact the KCDB Office: (bipm.kcdb@bipm.org).

9.17.11 Lower limit

“Lower limit” is the lower limit of the measurand range. If the lower and upper limits are identical, they should be indicated the same in both fields. A point (.) is used as the decimal separator. The symbol “E” represents exponential of 10. For example 10300 may be expressed as 1.03E04; 0.0067 may be expressed as 6.7E-03.

9.17.12 Upper limit

“Upper limit” is the upper limit of the measurand range. If the lower and upper limits are identical, they should be indicated the same in both fields. A point (.) is used as the decimal separator. The symbol “E” represents exponential of 10. For example 10300 may be expressed as 1.03E04; 0.0067 may be expressed as 6.7E-03.

9.17.13 (Uncertainty) Unit (*)

The uncertainty unit is chosen in a fixed drop-down menu. "(dimensionless)" may be chosen for measurands without units, such as ratios or indices and will create an empty space when displayed. The unit “dimension 1” may be chosen when the unit “1” is targeted. Please make sure that the chosen uncertainty unit is in line with the quantity and the indicated measurand unit. If a unit is not available, the Writer is invited to contact the KCDB Office: (bipm.kcdb@bipm.org).

\textsuperscript{16} Chemical Abstracts Service

\textsuperscript{17} For technical reasons, not all analytes can be attributed a CAS number in the database. To add new CAS numbers, please contact the KCDB Office: bipm.kcdb@bipm.org.
If a unit is not available, the writer is invited to contact the KCDB Office: bipm.kcdb@bipm.org.

9.17.14 (Uncertainty) Lower limit (*)

“Lower limit” represents the lower limit of the expanded uncertainty with a coverage factor of approximately 95%. If the lower and upper limits are identical, they should be indicated the same in both “Lower limit” and “Upper limit” fields. A point (.) is used as the decimal separator. The symbol “E” represents exponential of 10. For example 10300 may be expressed as 1.03E04; 0.0067 may be expressed as 6.7E-03.

9.17.15 (Uncertainty) Upper limit (*)

“Upper limit” represents the upper limit of the expanded uncertainty with a coverage factor of approximately 95%. If the lower and upper limits are identical, they should be indicated the same in both “Lower limit” and “Upper limit” fields. A point (.) is used as the decimal separator. The symbol “E” represents exponential of 10. For example 10300 may be expressed as 1.03E04; 0.0067 may be expressed as 6.7E-03.
9.17.16 Coverage factor (*)

The coverage factor $k$ represents the term for which $k \times u$ has a coverage factor of 95 %, $u$ representing the standard uncertainty of the measurand value. The default value is $k = 2$.

9.17.17 % confidence interval (*)

The default value of the coverage factor is 95 %, as stated in the CIPM MRA.

9.17.18 Absolute or Relative Uncertainty (*)

The absolute or relative nature of the stated uncertainty must be selected from the drop-down menu.

9.17.19 Edit table

When several services are covered by the same instrument or technique, they may be grouped into one single CMC with an associated uncertainty table.

Applications are for example

i) measured AC voltage at different frequencies

ii) mass standards of a set

iii) a radionuclide measured using different techniques.

This grouping can then be indicated in a common table indicating the uncertainty for each case. This grouping facilitates, in general, the review of the CMCs and the overview of the services.

First indicate the unique name of the table under “Uncertainty table name”.

---

www.bipm.org/kcdb

58 / 99

V. 2020-12-07
The table is edited by first indicating the number or rows and columns (headers included). Each field is then completed.

In the table comment field an indication of units (for example “Uncertainties given in µV”) or other essential information can be given.

A table may also be imported from an Excel file. This file must contain only the uncertainty table, and will populate the table including indicating the numbers of rows and columns. Each cell must contain a symbol – indicate empty cells by a hyphen symbol (-).18

**Figure 8-q** Table for uncertainties - Chemistry and Biology.

### 9.17.20 Edit an uncertainty equation

Uncertainties expressed as an equation are edited in this pop-up. A comment on the equation can be given, where notably the representation of different symbols may be indicated, for example “c representing molar concentration”.

---

18 Excel 2010 or later version is supported. If the table data is already listed in an Excel file of a previous version, it must be copy/pasted as “values” (not reproducing the original format).
The format of quantity-based equations was adopted at the Consultative Committee Presidents’ meeting in June 2018 [Report CIPM 2018]. Information on quantity-based equations is given in in “Guidance on quantity-based equations”.

### 9.17.21 CRM Value

Registering a CRM value is optional. The type of content is identical to that described above for CMCs.

![Equation Definition Form](image)

**Figure 8-r**  *Field for equation - Chemistry and Biology.*
Figure 8-s  Field for CRM - Chemistry and Biology.
9.17.22 Mechanism(s) for service delivery (*)

The mechanism for the delivery of service is indicated here.

9.17.23 Source of traceability

The source of traceability refers to the institute to which measurement traceability is connected.

The contents here will be published on the KCDB web for open access.

The contents here are intended for the Writer, TC Chairs and Reviewer during the review process. Please indicate possible modifications of the CMC here.

Indicate the institute by its acronym.
9.17.24 Measurement technique(s) used
Give information on the measurement technique(s).

9.17.25 Group identifier
The Group identifier is a “tag” that can be attributed to a set of CMCs that are related. The identifier should be unique for the metrology area.

Examples:

iv) In electricity and magnetism, amplitude and phase of a measurand are declared as separate CMCs, but are related.

v) In chemistry and biology, several analytes may be detected simultaneously within the same chemical matrix. These are regarded as separate CMCs, but are related.

vi) In ionizing radiation, several radionuclides may be detected simultaneously within the same matrix. These are regarded as separate CMCs, but are related.

When the CMC is published on the open KCDB website, it will be indicated by a special “link” symbol.

Clicking on this symbol will display the related CMCs.

9.17.26 Uncertainty convention
The expanded uncertainty range may be expressed according to two conventions. For ‘Uncertainty convention 1’, the expanded uncertainty range spans from the smallest numerical value of the uncertainty to the largest numerical value of the uncertainty found within the quantity range. For ‘Uncertainty convention 2’, the expanded uncertainty range is expressed as the uncertainty of the smallest value of the quantity to the uncertainty of the largest value of the quantity.

9.17.27 KCDB support for CMC claim
You may add one or several references to comparisons published in the KCDB.

9.17.28 Other support
Indicate support other than comparisons published in the KCDB.
9.17.29 Comments for publication

These comments will be published on the open website.

9.17.30 Comments for review

The contents here are intended for the Writer, TC Chairs and Reviewer during the review process. Indicate possible modifications of the CMC here.

9.17.31 Uploaded documents

Please upload the documents to which you refer (other than KCDB comparisons) to allow the reviewing experts to access the documents.

9.17.32 Clear description of supporting evidence for this claim

This information is specific for Chemistry and Biology.

---

Information to reviewer

- Clear description of supporting evidence for this claim *

- Details of calibrants used and assessment of their purity/certification *

- Exact nature of service delivered *

- Supporting evidence for Quality System provided

---

**Figure 8-u**  Information to reviewer - Chemistry and Biology.

9.17.33 Details of calibrants used and assessment of their purity/certification

This information is specific for Chemistry and Biology.
9.17.34 Exact nature of service delivered

This information is specific for Chemistry and Biology.

9.17.35 Supporting evidence for Quality System provided (*)

The Writer confirms that a validated Quality System exists before engaging the review procedure. The CMC cannot be submitted without having confirmed this information.

9.17.36 Broad claims

CMC broad claims did not reach consensus within the Consultative Committee for Amount of Substance (CCQM) and its associated working groups before that the KCDB platform was initially implemented.

For more information on broad claims the delegated RMO coordinator should be consulted.
10 REVIEWER

A reviewer has access to review dashboards under

i) **My RMO space** for Intra-RMO review

ii) **JCRB space** for JCRB review

The **Reviewer** and **JCRB Reviewer dashboards** give access to the CMCs that have been submitted to the Reviewer by the TC Chair. The actions made by the Reviewer for the intra-RMO review and the JCRB review are identical.

The deadlines for review are set by the TC Chair, and are not fixed for the intra-RMO review – nothing will happen automatically after having passed the date. However, the JCRB rules are applied in the JCRB review in which the indicated deadlines are fixed; if the review is not completed before the date, the review will not be accepted.

The Reviewer has access to a set of filters, placed to the left of the dashboard.

The condition of a CMC is indicated by a combination of colour-and-letter, where

- **N** – New
- **M** – Modified

The actions on the CMC can be triggered by

i) using the blue buttons displayed above the dashboard

ii) the actions available in the column listed to the far right of the table. These actions allow indication of “Will review/Will not review” and subsequently “CMC accepted/CMC not accepted”.

If the Reviewer indicates “Will not review” the CMC is no longer displayed in the dashboard.

Once the Reviewer has indicated whether to accept or not accept the CMC, the CMC is no longer displayed in the dashboard.

The Reviewer may read the CMCs by
i) clicking on the CMC identifier (one-by-one)

or by

ii) clicking on the blue button “COMPARE” (one or several)

It is possible to export selected CMCs to an Excel file. The exported data represents all of the information registered in the KCDB on that particular CMC.

The Reviewer can add documents to support the review. The Reviewer may indicate comments at the bottom of the form.

The Reviewer will also be requested to give a comment/reason when not accepting the CMC. The comment will be accessible for the TC Chair. The Writer will access the comments when the CMC has been returned for revision.
Figure 9-a Reviewer dashboard (example for Mass and related quantities).
11 TC CHAIR

The TC Chair has access to two sections:

i) **My RMO space** for Intra-RMO review

ii) **JCRB space** for JCRB review

Each contains a number of dashboards.

The TC Chair has access to a set of filters, placed to the left of the dashboard.

The condition of the CMC is indicated by a combination of colour-and-letter, where

N - New  M – Modified  G – Greyed out for reinstatement

The actions on the CMC can be triggered by

i) using the blue buttons displayed above the dashboard

ii) the actions available in the column listed to the far right of the table.

The deadlines for review are set by the TC Chair. The deadline is not fixed for the intra-RMO review – nothing will happen automatically after having passed the date. However, the JCRB rules are applied for the JCRB review, for which deadlines are fixed. If the review is not completed before the date, the review will not be accepted.

The TC Chair may read the CMCs by

i) clicking on the CMC identifier (one-by-one)

or by

ii) clicking on the blue button “COMPARE” (one or several)
It is possible to export selected CMCs to an Excel file. The exported data represents all of the information registered in the KCDB on that particular CMC.

The TC Chair can add documents associated with review and indicate comments in the bottom of the form.

Greyed out CMC submitted for re-instatement will appear as indicated below.

| G | 849-MTR-01 | AC current | AC voltage, current, and power | AC current up to 100 A sources | AC current source multifunction calibrator | Argentina | writer@ntia@kcdb.fr |

### 11.1 TC Chair: Intra-RMO Review

#### 11.1.1 Asking for review (“CMC without reviewer”)

In My RMO space for Intra-RMO review, the TC Chair has access to two dashboards:

1. CMC without reviewer
2. CMC with reviewer

All CMCs submitted by the Writers within the RMO for intra-RMO review are initially available in CMC without reviewer.

#### 11.1.2 Ask for review (“CMC without reviewer”)

The TC Chair may ask experts within the same RMO to review one or several CMCs. By clicking on the blue “ADD REVIEWER” button, all Reviewers that have user accounts and who cover the same expertise can be selected by the TC Chair. The TC Chair ends the action by indicating a deadline.
A TC Chair may also review a CMC without engaging an external reviewer.

If the TC Chair submits a CMC to the JCRB, the CMC is automatically considered as accepted in the intra-RMO review.

The CMC remains in the “CMC without reviewer” dashboard until at least one of the selected reviewers has indicated “Will review” or the TC Chair has indicated his review conclusion at this stage. The TC Chair may indicate “Accept” or “Not accept” for the CMC. In each of these 3 situations, the CMC will no longer be available as “CMC without reviewer” but will become available on the “CMC with reviewer” dashboard.

The TC Chair may also ask the Writer for revision at this stage. In this case the CMC will become directly available to the Writer and will no longer appear in either “CMC without reviewer” or “CMC with reviewer”.

CMCs having undergone only editorial modifications, reduced measurand range or increased uncertainty [CIPM MRA D-04] can be submitted directly by the TC Chair to the KCDB Office (bipm.kcdb@bipm.org) for publication in the KCDB.

Figure 10-a TC Chair can select reviewers within the RMO and metrology area (example for Mass and related quantities).
Figure 10-b  Without-reviewer dashboard (example for Mass and related quantities).
11.1.3 Complete the intra-RMO review (“CMC with reviewer”)

Reviewed CMCs that have been commented have their CMC ID in bold in the “CMC with reviewer” dashboard.

The conclusion of the Reviewer(s) and TC Chair are shown by pictograms: green “tick” represents “Accepted” while a red cross represents “not accepted”.

Those CMCs that have been accepted are now ready to be submitted to the JCRB for review by selecting the CMCs and clicking on the blue button “SUBMIT TO THE JCRB”.

CMCs that have been submitted to the JCRB are no longer available in the “CMC without reviewer” or “CMC with reviewer” dashboards.
11.1.4 CMCs from my RMO

CMCs that have been submitted to the JCRB are available in the menu JCRB space “CMCs from my RMO” dashboard. The TC Chair has the possibility to follow the review progress. The TC Chair may also submit CMCs for voting in this dashboard.

![Figure 10-c “CMCs from my RMO” dashboard (several metrology areas in this example)](image)

11.1.5 CMCs not needing review

When an updated CMC fulfill a combination of the following conditions only:

i) Editorial modification

ii) Enlarged uncertainty

iii) Reduced range for measurand

The CMCs does not need a new review and approval.

The TC Chair should in this case submit the CMC directly to the KCDB Office by using the blue button SUBMIT TO THE KCDB.
11.2 TC Chair: JCRB Review

All information on the JCRB review is listed in the menu JCRB space.

When a TC Chair has submitted one or several CMCs to the JCRB for review they are listed as "Pending actions".

Figure 10-d Use SUBMIT TO THE KCDB when no CMC review is requested.
TC Chairs from the other RMOs are requested to consult “JCRB request to review” to indicate

   i) If they Will or Will not review
   ii) Indicate a deadline for the review

It is mandatory to indicate “Will review” to get access to the CMCs to review in “JCRB space / CMC without reviewer”.

There are a few distinct differences for the JCRB review compared to the intra-RMO review:

   a) Deadlin dates are fixed and follow the JCRB rules.
   b) If all reviewing TC Chairs approve the CMC, the CMC will not be submitted to vote but will automatically become available to the KCDB Office for publication.
   c) If at least one of the reviewing TC Chairs asks for revision, the revised CMC will be submitted for voting.
   d) A CMC at this stage can be revised only once by the Writer.
   e) The outcome of the review is concluded at the latest date set for review deadline by the reviewing TC Chairs.

11.2.1 Ask for review (“JCRB space / CMC without reviewer”)

The facilities to select a reviewer are the same as described for the intra-RMO review.

11.2.2 Complete the review (“JCRB space / CMC with reviewer”)

Reviewed CMCs that have been commented have their CMC ID in bold in the “JCRB CMC with reviewer” dashboard.
The conclusion of the Reviewer(s) and TC Chair are shown by pictograms: green “tic” represents “Accepted” while a red cross represents “Not accepted” for the reviewers. A green “tick” represents “Approved” while a red cross represents “Not accepted/ask for revision” for the TC Chair.

The CMC that has been concluded by the TC Chair (Approve – not approve – ask for revision”) will no longer be displayed in the “JCRB CMC with reviewer”.

<table>
<thead>
<tr>
<th>REVIEW LIMIT</th>
<th>REVIEWER LIST</th>
<th>REVIEW STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019-10-11</td>
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<td>X</td>
</tr>
<tr>
<td></td>
<td>tcchair/APMPph2 ANSTO</td>
<td>X</td>
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<tr>
<td>2019-10-11</td>
<td>tcchair/APMPph2 ANSTO</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>reviewer/APMPph2 NIMA</td>
<td>✓</td>
</tr>
</tbody>
</table>
12 Vote and Vote Tracking

A CMC that has been revised during the JCRB review will be subject to a vote.

12.1 Originating RMO

The revised CMC is submitted by the Writer to the corresponding TC Chair. This CMC will appear in “CMCs from my RMO” in the TC Chair JCRB menu and has the status “JCRB: Revision completed”. The TC Chair selects the CMC(s) in question and submits these to the JCRB for voting by clicking on the blue button at the top of the dashboard.

12.2 Voting RMOS

The voting TC Chair will find the revised CMC, submitted for vote, in “JCRB CMC with reviewers” carrying the status “JCRB: Waiting for vote”.

The vote is carried out by clicking “Approve” or “Not approve”.

The conditions and progress of vote may be consulted in the dashboard “JCRB vote tracking”. By clicking on the CMC ID, the details of the voting process are displayed.

Figure 11-a “JCRB CMC with reviewers” carrying the status “JCRB: Waiting for vote” (encircled in red) are available for vote for the voting RMO.
Getting started – KCDB restricted web portal v2.0

Figure 11-b  “CMCs from my RMO” dashboard where the CMCs that can be submitted for vote by the originating RMO are encircled in red.

12.3 Vote tracking

The results and status of the voting process may be consulted in the dashboard “JCRB vote tracking”. By clicking on the CMC ID, the details of the voting process are displayed.

Figure 11-c  “Vote tracking” dashboard.
Figure 11-d  “Vote tracking” details. The RMOs that are not authorized to vote are indicated with “N/A”.
13 PENDING ACTIONS

The list of pending actions gives information on what the different RMOs are expected to do during the JCRB review.

Figure 12-a List of pending actions.

The pending actions indicated are:

- Acknowledge receipt of submitted CMC
- To complete review
- To respond to comments and submit revised CMC
- Proceed to vote
14 **JCRB REQUEST FOR REVIEW**

A TC Chair is requested to indicate the intention to review or not a CMC that has been submitted for JRCB review. When indicating the intention to review the TC Chair sets the deadline which allows access to the CMCs in **“JCRB space / CMCs without reviewer”**.

15 **CMC WG CHAIR**

The coordinator of a CMC WG\(^{19}\), usually the CMC WG Chair, has access via his profile to a form where all CMCs that have been submitted to the JCRB space for JCRB review are listed.

On the form, the CMC WG Chair may indicate his selection of which RMO(s) should review which CMCs. RMO TC Chairs that have accepted to review are indicated with a green field in the form.

The selected RMO TC Chair should indicate his wish to review in **“JCRB request for review”**. RMOs that have not been selected are not prevented from registering their wish to review.

The CMC WG Chair may review the CMCs himself without involving the TC Chairs when appropriate.

All TC Chairs have access to the form in ‘read-only’ mode.

---

\(^{19}\) The coordinator of the JCRB (inter-RMO) review, usually represented by the CMC WG Chair.
If the CMC WG Chair does not distribute the CMCs for review, it is still possible for the TC Chairs to identify which RMO has already registered to carry out the review.
Figure 14-b  Example of WG CMC form.
16 COMPARISONS

The process concerning comparisons is carried out within the frame of document [CIPM MR-D-05] The review of the Final Report is not supported by the platform.

The following steps are supported by the KCDB platform and should be employed by the comparison pilot:

- New comparisons should be registered on the KCDB web platform by the person piloting the comparison.\(^{20}\)
- The pilot should keep the information that is posted on the KCDB platform up to date during the comparison.
- The draft B report should be submitted for review by e-mail to the appropriate reviewing group, following the instructions of CIPM MRA-D-05.

When the comparison has been approved, the person in charge of reviewing group\(^{21}\) communicates the final version to the BIPM with a copy to the Pilot. The Pilot posts the associated documents onto the platform for publication by the KCDB office:

- a form that can be downloaded to be completed with the degrees of equivalence and result tables for key comparisons.
- A form that can be downloaded to be completed if the final comparison report is to be published in Metrologia Technical Supplements https://iopscience.iop.org/journal/0026-1394

The Pilot will be requested to update the status of the comparison by an automatic e-mail issued at regular intervals via an automatic e-mail notification.

E-mail notifications are automatically generated and distributed to the TC Chairs, WG Chairs, Executive Secretary, Pilot and KCDB Office when

- the Pilot registers a comparison;
- the KCDB Office attributes a comparison code and make the comparison available on the KCDB website;
- the Pilot updates the status;
- the Pilot submits the results to the KCDB Office for publication;
- when the KCDB Office publishes the results on the KCDB website.

16.1 COMPARISON DASHBOARD

\(^{20}\) Pilot studies are not included in the KCDB and should not be registered on the platform. Registration forms are no longer used.

\(^{21}\) Usually the Executive Secretary for the Consultative Committee, but in some cases represented by a working group chair or TC Chair.
If the Pilot has already piloted comparisons, these will be listed in “Dashboard” under the menu “Comparisons”.

By clicking on the comparison, the form will open and can be updated when applicable.

It is also possible to import the templates for publication in *Metrologia Technical Supplements* and the form to provide the Degrees of Equivalence. The latter are only applicable when the comparison is linked to a key comparison.

### 16.2 Register a comparison

The comparison Pilot should log into the KCDB platform and will find the registration form in the menu “Comparisons” under “new comparisons”.

*Figure 15-a  Comparison dashboard.*
Figure 15-b  Comparison registration form
16.2.1 Comparison conducted by
The Consultative Committee or organization conducting the comparison should be indicated.

16.2.2 Approved by
To indicate the Consultative Committee concerned.

16.2.3 Comparison identifier
The comparison identifier is given by the KCDB office after submitting the form. If the Pilot has a suggestion, this can be indicated in the bottom of the form under “Optional message to the KCDB Office”.

16.2.4 Comparison type
“Key Comparison” or “Supplementary Comparison”.

16.2.5 Metrology area
Indicate the metrology area concerned.

16.2.6 Comparison sub-field
Indicate the sub-field concerned.

16.2.7 Comparison linked to
If the comparison should be linked to a key comparison that is carried out by the Consultative Committee, the comparison code should be indicated here.

16.2.8 Summary description
Short description of the comparison.

16.2.9 Measurand
Indicate the measurand.

16.2.10 Measurand values
Indicate the nominal measurand value(s) or range and unit.

16.2.11 Parameters
Any parameters applied for the measurements (optional).
16.2.12 Transfer device or sample
Indicate the transfer device or the type of sample that is circulated or distributed to the comparison participants.

16.2.13 Progress status
Indicate the present status of the comparison.

16.2.14 Additional contact person
Only one person can be identified as the Pilot. If there are co-pilots, these persons should be listed as “Additional contact person”.

16.2.15 Measurement start year
Indicates the year when measurements started (or are planned to start).

16.2.16 Measurement end year
Indicates the year when measurements ended (or are planned to end).

16.2.17 Supporting document(s)
Documents linked to the comparison, such as the Technical Protocol. When uploaded, these documents will appear automatically on the KCDB web.

16.2.18 Supporting link(s)
Indicates one or more URLs, each associated with a title.

16.2.19 Comments
Comments to be published on the KCDB web.

16.2.20 Optional message to the KCDB Office
Messages to the KCDB Office. This message will not be published on the KCDB web.

16.2.21 Save and Register
The contents can be saved at any time by pressing SAVE. To submit the information for publication on the KCDB web, press SUBMIT TO KCDB OFFICE.

After having submitted the information to the KCDB Office, only the information on Measurement start and end year, Comments and Optional message to the KCDB Office can be edited by the Pilot.

The contents of the fields listed above might be edited by the KCDB Office so that the text harmonizes with other similar comparisons.
The review process is not supported by the platform. The comparison report should be submitted to the appropriate reviewing group for approval [CIPM MRA-D-05].

16.4 SUBMIT THE FINAL REPORT OF A COMPARISON

When the comparison has been approved, the person in charge of reviewing group will confirm approval to the BIPM/KCDB Office and communicates the final version to the BIPM/KCDB Office with a copy to the Pilot.

The Pilot posts the associated documents onto the platform for publication by the KCDB office:

The Pilot posts the associated documents for publication via the tab “FINAL REPORT”.

Key Comparisons

- The form “table-doe.xlsx” can be downloaded and be completed with the degrees of equivalence and result tables.
- The form "publication-form.docx" that can be downloaded and completed if the final comparison report is to be published in Metrologia Technical Supplements https://iopscience.iop.org/journal/0026-1394

Supplementary Comparisons

- The form "publication-form.docx" that can be downloaded and completed if the final comparison report is to be published in Metrologia Technical Supplements https://iopscience.iop.org/journal/0026-1394

Pilot Studies

- Pilot studies are not covered by the KCDB.

The final report should be submitted by the Pilot in a non-protected pdf format via the tab “FINAL REPORT”. In the case of key comparisons, the Pilot should also submit the determined degrees of equivalence using the template form available on the platform (only applicable when the comparison is linked to a key comparison). It is also recommended to provide the source document (e.g. the Word document) of the report.

---

22 Procedure depending on the Consultative Committee.
23 Protected files cannot be uploaded via the KCDB web platform.
Figure 15-c  Form for posting associated documents for the final comparison report.

16.5  UPDATE OF STATUS

The Pilot will receive an automatic notification at regular intervals (twice each year) with the request to update the status. If the status has not change, the Pilot is still invited to consult the comparison status and indicate “save” to confirm that the comparison is still active.
17 STATISTICS

17.1.1 CMC statistics

The menu on Statistics allows the user to:

- Get information on number of CMCs for each state economy and branch or category.

- Generate customized statistics on the number of CMCs according to RMO, state economy, metrology area or approval year.

A logged-in user can also consult the list of greyed-out CMCs and obtain statistics on CMC review performance.

17.1.2 Comparison statistics

The menu on Statistics allows the user to:

- Get information on the number of Key Comparisons for each state economy participating in the CIPM MRA, and branch or category, with statistics on piloting.

- Get information on the number of Supplementary Comparisons for each state economy participating in the CIPM MRA, and branch or category, with statistics on piloting.

- Generate customized statistics on the number of Key and Supplementary comparisons according to organization, selected state economies, metrology area or registration year on the platform.

A logged-in user can also consult the number on not yet completed comparisons for which the measurement start year dates since 5 years or more.
**Figure 17a**  Menu on statistics for all users.

**Figure 17b**  Menu on statistics for logged-in users.
18 REFERENCES


CIPM MRA D-04: Calibration and Measurement Capabilities in the context of the CIPM MRA

CIPM MRA D-05: Measurement comparisons in the CIPM MRA
https://www.bipm.org/utils/common/documents/CIPM-MRA/CIPM-MRA-D-05.pdf

Guidance on quantity-based equations
https://www.bipm.org/utils/common/pdf/KCDB_2.0/Conversion_of_equations_KCDB.pdf

19 BROWSER INTEGRATION

The versions listed below are guaranteed. More recent versions function but are not guaranteed.

19.1 DESKTOP

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19.2 MOBILE AND TABLET

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<td>Android Browser</td>
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<tr>
<td>IOS 9 to 10.6.8</td>
<td>Android 7 to 9</td>
<td>10</td>
</tr>
</tbody>
</table>

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## 20 APPENDIX

### 20.1 BRANCH CODES USED FOR IMPORTATION

The following branch codes should be used for importation of CMCs:

<table>
<thead>
<tr>
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<td>AUV/V</td>
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<td>AUV/W</td>
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<td>AC voltage, current, and power</td>
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<td>EM/AC</td>
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<td>DC voltage, current, and resistance</td>
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<td>EM/DC</td>
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<td>Electric and magnetic fields</td>
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<td>EM/Field</td>
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<td>EM/RF</td>
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<td>M/FF</td>
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<tr>
<td>Force</td>
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<td>M/Force</td>
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<td>M/Mass</td>
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<tr>
<td>Pressure</td>
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<td>M/Pres</td>
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<tr>
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<td>M/TVHG</td>
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<td>PR/Detector</td>
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<td>Photometry</td>
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<td>TF/TSD</td>
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<td>Dosimetry</td>
<td>RI</td>
<td>DOS</td>
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<td>Radioactivity</td>
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<td>Neutron Measurements</td>
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<td>NEU</td>
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## 20.2 Field size

### 20.2.1 Accessible field size of CMC interactive forms

<table>
<thead>
<tr>
<th>CMC FIELD</th>
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<tbody>
<tr>
<td>Institute service identifier</td>
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<td>Web link to individual service</td>
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<td>Quantity</td>
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<tr>
<td>Source of traceability</td>
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<td>Comments for publication</td>
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<tr>
<td>Other support</td>
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<td>Instrument or artifact (PH, RI)</td>
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<tr>
<td>Instrument type or method (PH, RI)</td>
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<tr>
<td>International standard (PH, RI)</td>
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<tr>
<td>Parameter (PH, RI)</td>
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<tr>
<td>Information on parameter (PH, RI)</td>
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<tr>
<td>Reference standard used... (PH, RI))</td>
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<tr>
<td>Nuclide (RI)</td>
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<tr>
<td>Specification of nuclide or source (RI)</td>
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<tr>
<td>Matrix (QM)</td>
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<tr>
<td>Analyte or component (QM)</td>
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<td>Mechanism for service delivery (QM)</td>
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<tr>
<td>Measurement technique(s) used (QM)</td>
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<td>Clear description of supp... (QM)</td>
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<td>Details of calibrants used... (QM)</td>
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<td>Exact nature of service delivered (QM)</td>
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(*) Using less characters is recommended
### 20.2.2 Accessible field size of Comparison interactive forms

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<th>COMPARISON FIELD</th>
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<td>Summary description</td>
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<td>Measurand</td>
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<td>Measurand value</td>
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<tr>
<td>Parameters</td>
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<tr>
<td>Transfer device or sample</td>
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<tr>
<td>Comments</td>
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<tr>
<td>Optional message to the KCDB Office</td>
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(*) Using less characters is recommended
# Revision History

<table>
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<tr>
<th>Version</th>
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<tr>
<td>2020-03-24</td>
<td>Complete version</td>
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<tr>
<td>2020-06-16</td>
<td>Editorial modifications. WG CMC Chair dashboard now available for TC Chairs in mode “read-only”. Guide for quantity-based uncertainty equations made available. Revision history added.</td>
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<tr>
<td>2020-06-29</td>
<td>Added information on KCDB training platform (4.1), on user accounts (4.2) and updated flow chart schemes (6.1) and (6.2).</td>
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<tr>
<td>2020-08-17</td>
<td>Added sections 8.8.1 “Grey out a CRM”, 8.9.1 “Reinstate a greyed out CRM”, 10.1.5 “CMCs not needing review”.</td>
</tr>
<tr>
<td>2020-12-07</td>
<td>Added information on writers comments and restructured Section 9.</td>
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