



**SIM REFERENCE DOCUMENT Nº 05**  
**SIM Procedure for Review of Calibration and Measurement Capabilities**  
**Submitted on the KCDB 2.0 Platform of the CIPM MRA**

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## OBJECTIVE AND SCOPE

### Objective

Published Calibration and Measurement Capabilities (CMCs) represent a laboratory’s claims as to their metrological capabilities available to customers. As such, CMCs undergo a rigorous review process by technical experts from both within (intraRMO) SIM and among (JCRB) other Regional Metrology

Organizations (RMOs). The SIM intraRMO review process consists of two parts: a technical review and a quality system review; this document describes only the technical review process for submitted CMCs.

## Scope

This SIM Reference Document no. 05, henceforth denoted SIM-D-05, specifies requirements and the procedures for reviewing CMCs declared by NMIs being Member or Associate of SIM under CIPM's *Mutual Recognition Arrangement* (CIPM MRA) of national measurement standards and of calibration and measurement certificates issued by national metrology institutes (NMIs) or their designated institutes (DIs) (<http://www.bipm.org/en/cipm-mra>).

The CMCs of each NMI are published after final approval in the BIPM key comparison database (KCDB 2.0), maintained by the BIPM and publicly available on <https://www.bipm.org/kcdb/>. In order for CMCs to be approved for publication, they must first be reviewed and accepted by the relevant SIM MWG (intraRMO review). Once this approval is obtained, CMCs undergo an interregional review (previously referred to as "interRMO" review, this is now called the "JCRB review" throughout documents of the JCRB and the KCDB) in which TC/WGs from other RMOs verify that the *Criteria for acceptance of CMCs* (<https://www.bipm.org/en/cipm-mra/cipm-mra-documents/>) of the Joint Committee of Regional Metrology Organizations and the BIPM (JCRB) have been followed, thus providing the technical confidence required for publication.

## DEFINITIONS AND ACRONYMS

### Definition

*Calibration and Measurement Capability (CMC)* For the purpose of this reference document, the definition of a CMC and associated notes are as provided in Section 1 of the CIPM MRA-G-13 (<https://www.bipm.org/en/cipm-mra/cipm-mra-documents/>):

***"A CMC is a calibration and measurement capability available to customers under normal conditions:  
(a) as published in the BIPM key comparison database (KCDB) of the CIPM MRA; or  
(b) as described in the laboratory's scope of accreditation granted by a signatory to the ILAC Arrangement."***

Throughout documents of the CIPM MRA, reference to Designated Institutes (DIs) is encompassed by the term, "NMI." This is maintained throughout this document itself (i.e., "NMI" is taken to mean either/both NMI and DI).

NMIs disseminate their CMCs to customers through calibrations/measurements and through the provision of certified reference materials (CRMs). To be published as a CMC, the measurement or calibration should be:

- performed according to a documented procedure and have an established uncertainty budget under the quality management system of the NMI;

- performed on a regular basis (including on demand or scheduled for convenience at specific times in the year); and
- available to all clients.

The availability of “special” calibrations or CRMs with exceptionally low uncertainties and not considered performed “under normal conditions” (usually offered only to a small sub-set of clients for research or for reasons of national policy) is acknowledged but are not considered within the scope of the CIPM MRA and bear neither the equivalence statement drawn up by the JCRB nor the logo of the CIPM MRA.

In the KCDB, a CMC is described by the measured quantity and its range; it is characterized by an uncertainty, generally given at a 95 % level of confidence, together with the method or instrument used, the values of any influence parameters, and any other relevant information. A complete statement of uncertainty may be expressed in a variety of ways but should always comply with the Guide to the Expression of Uncertainty in Measurement (GUM) and should include the components listed in relevant comparison protocols of the CIPM Consultative Committees and other documents. Reviewers of CMCs are encouraged to consult the KCDB (<https://www.bipm.org/kcdb/>) when reviewing the uncertainty statement and budget of a laboratory to ensure that the claimed uncertainties are consistent with those of the NMI through which the laboratory claims traceability and with the validation used to support the CMC claim.

## Acronyms

BIPM	Bureau International des Poids et Mesures
CIPM	Comité International des Poids et Mesures
CMC	Calibration and Measurement Capability
DI	Designated Institute
FAQ	Frequently Asked Questions (a reference to address specific questions)
intraRMO	Within the RMO (e.g., within SIM)
interRMO	Among the RMOs (“interRMO review” is now called, “JCRB review”)
JCRB	Joint Committee of RMOs and the BIPM
KCDB	Key Comparison Database
MRA	Mutual Recognition Arrangement
MWG	Metrology Working Group
NMI	National Metrology Institute
QMS	Quality Management System
QSTF	Quality System Task Force
RMO	Regional Metrology Organization
SIM	Sistema Interamericano de Metrología
TC	Technical Committee

## PROCEDURES

### Drawing Up and Revising Existing CMCs

The following rules should be followed to ensure the reliability of the information included in the KCDB (<https://www.bipm.org/kcdb/>). With the implementation of KCDB 2.0, the major change in the handling of CMC files is that each CMC will now be considered individually (in other words, the review process will no longer look at an entire CMC table, but will rather review each CMC one at a time).

With the establishment of the KCDB 2.0, CMCs are created directly by registered Writers using the dedicated tools of the KCDB web platform (at <https://www.bipm.org/kcdb/>). Excel files are no longer uploaded but may be used to systematically document all of the necessary information to be put onto the platform.<sup>1</sup> There are several instructional videos on the KCDB 2.0 on the BIPM YouTube site (<https://www.youtube.com/thebipm>) including the setting-up of user accounts and the drafting of a CMC in General Physics (see [https://www.youtube.com/playlist?list=PL-vj-3\\_a7wTAYsdaoMzT5FAsQMrwTxxR4](https://www.youtube.com/playlist?list=PL-vj-3_a7wTAYsdaoMzT5FAsQMrwTxxR4)).

Access to the site for anything other than read-only is controlled through registration. For access and additional information please refer to “Getting Started on the KCDB platform” on <https://www.bipm.org/en/cipm-mra/kcdb-help> webpage.

The KCDB search engine is based on the categories defined by the Consultative Committees. Therefore, it is critical to accurately use the relevant “Classification of Services” currently available on the KCDB website. A manual for getting started on using the web platform is available ([https://www.bipm.org/utils/common/pdf/KCDB\\_2.0/Getting\\_started\\_KCDB\\_platform.pdf](https://www.bipm.org/utils/common/pdf/KCDB_2.0/Getting_started_KCDB_platform.pdf)) as is additional information on the KCDB website at <https://www.bipm.org/en/cipm-mra/kcdb.html#help>.

The drafting of a CMC on the KCDB 2.0 platform begins at the link, “Create a New CMC” on the “My CMC space” page. The CMC input page is formatted to ask for specific information including the service, the measurand, the associated uncertainty, and the reference standard and source of traceability. Information used for the intraRMO and JCRB reviews (for example, the reference used to validate the CMC claim during the review) are entered on the platform but are not part of the publicly available information of the KCDB 2.0.

The policy for drawing up CMCs are presented in *CMCs in the context of the CIPM MRA: Guidelines for their review, acceptance and maintenance* – Document CIPM MRA-G-13, which can be downloaded from <https://www.bipm.org/en/cipm-mra/cipm-mra-documents/>).

There are two different cases to be taken into consideration:

- CMCs not previously submitted (New CMCs);
- CMCs that are a modification or expansion of CMCs already published.

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<sup>1</sup> If the Writer wishes to import the CMCs using an Excel sheet, a template can be downloaded containing all the necessary information.

The documents cited above provide guidelines for both new CMCs and modification or expansion of CMCs already published.

Modifications of a published CMC usually arise for reasons falling into one of three categories:

- a) material or editorial errors and improvements to the explanatory text;
- b) increase of the uncertainty or reduction in scope;
- c) change of the method of measurement, reduction of the uncertainty, or increase in scope.

CMC modifications are made through the KCDB web platform. Since CMCs are handled individually all modifications are to be done one CMC at a time as described in Question 3 of the KCDB 2.0 FAQ ([https://www.bipm.org/utis/common/pdf/KCDB\\_2.0/FAQs\\_3.pdf](https://www.bipm.org/utis/common/pdf/KCDB_2.0/FAQs_3.pdf)). In brief, the Writer of the CMC logs into the KCDB and selects the CMC to be modified (see listing under “Institute CMCs”), activates the “update” button (under “Actions;” scroll to the far right column) and makes the required changes in the form (indicating the changes made in the “Read and add Comments” tool) and submits the modified CMC. The MWG Chair then verifies the changes and, if no further review is required, submits the CMC directly to the KCDB Office (“submit to the KCDB”). CMCs to be updated are to be exported directly from the KCDB platform to make sure that the latest version of the CMC is used as a basis. For modifications of larger sets of data, it is possible to export CMCs to an Excel file, carry out the update (respecting the preset format) and then import the updated file.

If additional review is required (category “c” above), modifications should follow the full procedure of the intraRMO and JCRB reviews presented here as if they were new CMCs.

### **IntraRMO Review of CMCs**

SIM TC and QSTF establish the general guidelines and procedures for SIM MWG to follow during the intraRMO review. In addition each SIM MWG can establish its own mechanisms that follow the SIM TC and QSTF procedures and JCRB rules.

This section covers the process for the review from the moment the SIM CMCs are submitted to the SIM MWG, including the timelines for the intraRMO review and the criteria for acceptance of CMCs by the relevant SIM MWG or from other RMOs. The next section covers the review of SIM CMCs by other RMOs for publication on the KCDB 2.0 platform, as well as the SIM review of CMCs from other RMOs and the timelines for this JCRB (interRMO) review.

Direct participation in the CIPM MRA is limited to signatories of the CIPM MRA: NMIs of member States of the Meter Convention and their DIs, those who have agreed to participate in the CIPM MRA through an RMO as the NMI of an Associate State of the CGPM, or those which are signatory international organizations. NMIs submitting CMCs might have a designated person to act as coordinator for that NMI. Each NMI should submit its CMCs proposed for the KCDB 2.0 directly after consultation with the relevant SIM MWG chair. Submission of a CMC for SIM review starts when the Writer submits the CMC to the KCDB platform for review. For the intraRMO review of a CMC, the assigned Writer may re-submit a revised CMC an unlimited number of times

during the intraRMO review process. The status of the CMC is indicated in the KCDB dashboards (under “CMCS” – “My RMO Space” – “Reviewer Dashboard”) available to the Writer, Reviewer(s) and SIM MWG Chair during the review process.

The MWG Chair, upon receiving the notification from the KCDB that a new CMC has been submitted should send a request to SIM QSTF to confirm the validity of the QMS scope for the new CMCs. The request should be made via email to the SIM QSTF Chair and Secretary for the QSTF approval of the quality management system that supports the CMCs. SIM QSTF records would include the minutes of the meeting, the CMC file that was submitted for the QMS review, and the Certificate of Approval for the QMS.

Though all members of the SIM MWG are encouraged to participate in the review process, the technical basis of the CMC submissions from each NMI are usually reviewed mainly by select experts assigned by the SIM MWG. Participation in the technical review is not restricted to those NMIs listed at <https://www.bipm.org/en/cipm-mra/participation/signatories.html>, even though only those have the right to vote.

One practice can be to name a reviewer and a deputy reviewer for each service category (this is so that CMC reviewers and their deputies can work closely together, especially when the reviewer may not be available, in order to ensure CMCs are reviewed within the committed time period). In this case, the CMC submissions from each NMI are grouped into service categories and “distributed” by the chair of the MWG to the corresponding reviewers.

IntraRMO reviewers, either directly or through the SIM MWG Chair, should contact the NMI for any interpretation doubts, inconsistencies with the CIPM MRA requirements that are identified, reports of comparisons or other publications that support the CMCs presented (if they are not available from the KCDB <https://www.bipm.org/kcdb/>) and other missing information, or any additional actions that should be taken.

Once a basic understanding of the CMC has been reached by all reviewers, subsequent comments on a given CMC entry should be indicated on the KCDB platform so that all reviewers can consider them during the review. If an Excel spreadsheet has been distributed, the corresponding cell of the “Reviewer’s Comments” column may be used, or comments may be directly sent by email to the NMI. The NMI will then respond to the reviewer’s comments. Finally, the reviewer will decide on the acceptance (or partial acceptance) or not of the given CMC entry. An accepted (or partially accepted) CMC is one that is judged to be consistent (or partially so) with, and contains, the relevant information such as QMS and validation support, uncertainties and traceability.

Based on discussions with the reviewers, the NMI may modify its submitted CMCs, or withdraw its submission. If the NMI decides not to withdraw its CMCs without resolving the inconsistencies or completing the actions recommended, this will be noted, and the CMCs will continue to be considered as “under review.” In this case, the SIM WG chair will contact the interested parties and try to resolve the situation, since only those entries for which an agreement has been reached are to be submitted to JCRB review for approval. If, even after discussions, the remaining issues are not successfully resolved, another group of experts, specifically appointed by the SIM MWG chair to finally decide if the CMCs are to be approved or withdrawn, may discuss the issue.

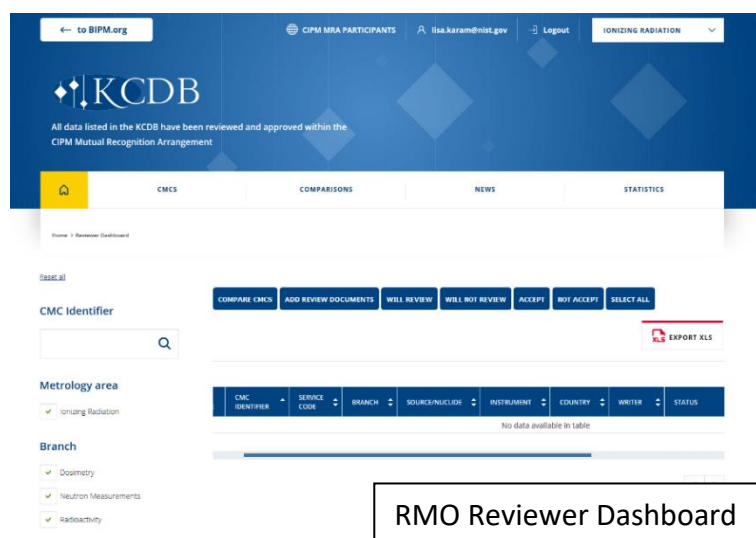
The review process is expected to be finished within 50 calendar days (except for those cases in which an extension of the deadline is agreed among the SIM WG chair, the NMI CMC submitter, and the reviewer). The MWG chair will follow up, keep a record of the CMCs sent to him/her, and collaborate by conducting discussions among the interested parties when applicable.

Once the discussions and any modifications have been completed and all intraRMO revision findings have been addressed, the NMI will forward the final version to the SIM MWG Chair, including all comments from the reviewers. Once the SIM MWG chair has confirmed that each CMC has been approved by its reviewers, they will notify the Writer who will upload SIM-approved (possibly revised) CMCs for JCRB review.

Only those CMCs that are supported by a fully implemented quality system, reviewed and approved by SIM, may be submitted for the JCRB review. All SIM submissions for publication in the KCDB must be accompanied by supporting documents that include the technical note (detailed explanation of the submitted CMC edits/changes with the supporting technical validation information), SIM QSTF approval of the QMS scope for these CMCs, and the record of all relevant correspondence between the MWG Chair, the intraRMO reviewers and the Writer. This material should be labeled as “Other support” under “References,” and added under the “Add supporting document” link on the “create CMC” page;

If an NMI decides to “gray out” a CMC, they are required to notify the MWG Chair and SIM TC Chair.

### Timelines for IntraRMO Review



The flowchart in Appendix 1 describes the step-by-step process for a single CMC (recall that each CMC is reviewed individually although several CMCs may be submitted at the same time). The intraRMO review is tracked on the KCDB platform on the Reviewer Dashboard under CMC → My RMO Space (<https://www.bipm.org/kcdb/rmo/reviewer-dashboard>), where the list of CMCs to be reviewed in the specific technical area are found. During this review, a CMC may be revised an unlimited number of times.

- i. NMI drafts a summary document (technical note) of the CMC(s) being submitted containing a detailed explanation of the submitted CMC edits/changes with the supporting technical validation evidence. The NMI Writer forwards this and any relevant associated NMI QMS documents to the SIM MWG chair (if these are CMCs to be modified only for editorial reasons, the SIM MWG chair or the NMI makes the modification directly on the KCDB 2.0 platform).

- ii. MWG Chair (or Writer) sends an email request to the SIM QSTF Chair and Secretary asking them for the minutes of the meeting, the Certificate of Approval of the QMS for this measurement area, and for the CMC file that was submitted for the QSTF review.
- iii. After confirmation from the SIM MWG chair, the Writer uploads the CMC information to the KCDB 2.0 (“create a CMC”).
- iv. The SIM MWG chair assigns proposed reviewers on the KCDB platform and includes a date when the SIM review needs to be completed, generally within 50 calendar days from the date the CMCs are available to the reviewers on the KCDB.
- v. The SIM MWG Chair sends notice of a new CMC review and the summary file of new or modified CMCs to proposed reviewers (copying the originating NMI) and directs them to indicate their intent to review on the KCDB Reviewer Dashboard. Reviewers respond on the KCDB Reviewer Dashboard, either agreeing to review the CMCs or declining to review some or all services. This shall occur within 10 working days.
- vi. The SIM MWG chair assigns additional reviewers if necessary.
- vii. Reviewers study the new or modified CMCs and determine which are acceptable, and which are in question, updating the status of the CMC (including review documents) on the KCDB platform. If needed, they may make direct contact with the submitting NMI by e-mail copied to the SIM MWG chair; the first direct contact should describe the CMC in question and the issues under consideration. Any direct message should be sent within 20 calendar days of the CMC(s) posting.
- viii. The NMI should respond to any questions (either sent directly or posted on the CMC review page on the KCDB platform) within 10 calendar days
- ix. Reviewers should consider the response as soon as possible after it is received or posted. If the issues are not yet resolved, they should reply immediately on the KCDB and (if communications have been occurring directly) to the submitting NMI. If possible, all technical issues should be resolved within 20 calendar days after the posting of the CMCs. If any issues are not resolved by this time, the Reviewer should notify the SIM MWG chair and the submitting NMI. The SIM WG chair should explain to everyone that if the issues cannot be resolved within 10 additional calendar days, the CMC(s) in question would not be approved.
- x. By 30 calendar days after receipt of the CMCs, all reviewers should either approve or not approve each submitted CMC that they have agreed to review. The NMI should make any changes to their CMC(s) on the KCDB platform and then send a notification of the reviewed (and perhaps revised) CMC(s) to the SIM MWG chair.
- xi. The CMCs that have been approved during the intraRMO review process should be sent to the SIM MWG chair by (calendar) day 50. The MWG Chair should create a report with a summary of SIM-approved CMCs and associated documents (including required NMI QMS documents) and forward this to the Writer (with a copy to the submitting NMI, if different)
- xii. The Writer then uploads the approved CMCs and necessary supporting documents to the KCDB platform for JCRB review by (calendar) day 60.



## The Process of Reviewing CMCs for Acceptability

The reviewers will check the CMC(s) of the submitting NMI for consistency with the following:

- a) General instructions for drawing up CMCs as described in document CIPM MRA-G-13, which can be downloaded from <https://www.bipm.org/en/cipm-mra/cipm-mra-documents/>;
- b) Additional instructions for drawing up CMCs in the various technical areas, including uncertainty matrices (<https://www.bipm.org/en/cipm-mra/kcdb-help/>);
- c) CMCs already published by the NMI in the KCDB (<https://www.bipm.org/kcdb/>), when available.

The reviewers will then check the range and uncertainty of the submitted CMCs for consistency with information from some or all of the following sources as described in Section 3.3 of CIPM MRA-G-13:

- Results of key and supplementary comparisons
- Publicly available information on technical activities including publications
- On-site peer-assessment reports, including those from accreditation assessment with appropriate technical peers
- Active participation in RMO projects
- The minutes of the QSTF meeting, the Certificate of Approval of the QMS for this measurement area, and the CMC file that was submitted for the QSTF review
- Other evidence of knowledge and experience, as agreed by the appropriate Consultative Committee

While the results of key and supplementary comparisons are the ideal supporting evidence, all other sources listed above may be considered to underpin CMCs.

The NMIs that submit CMCs are primarily responsible for providing the SIM MWG with the information that they believe is necessary to support their claims. This information shall be provided at the earliest stage of the review process to avoid delays in the analysis.

Though recognizing that the implications of comparison results on published CMCs is the responsibility of the participating NMIs, the reviewer should check the CMCs of the submitting NMI for agreement between the results of the comparisons and the entries for similar levels claimed by the submitting NMI. The comparison results consist of the difference from the comparison reference value (CRV) at each level and its associated expanded uncertainty at a coverage factor  $k = 2$ . The reviewer will compare these benchmark *differences* and *uncertainties* to the CMC entries for the same level and measurement technique. Presumably, a CMC uncertainty should be approximately as large as its uncertainty in the comparison if the method used by the NMI is substantially the same and if the comparison achieved its goal of benchmarking the participant's capabilities.

NMIs that do not hold primary standards or primary measurement capabilities are required to have traceability to the SI (or, if not feasible, to another internationally agreed reference) of their national standards or measurement capabilities established through the BIPM or through adequate calibration services of another NMI or other designated institute as published in the KCDB (<https://www.bipm.org/kcdb/>). A CMC entry shall not have its *traceability* based on equipment calibrated by an accredited commercial laboratory, unless the latter is a designated institute listed among the participants of the CIPM MRA (<https://www.bipm.org/en/cipm-mra/participation/signatories.html>) and has relevant CMCs published in the

KCDB. However, calibration certificates from such laboratories may be allowed for auxiliary equipment whose contribution exerts a negligible influence on the total expanded uncertainty for the CMC entry as well as part of the validation of the CMC claim.

CMCs should be referenced by their Internal NMI service identifier number (e.g., SIM-RAD-CNEA-2109). Once the CMCs have been approved at the intraRMO level, a similar process is followed for the JCRB review, including discussions by email between the submitting NMI and reviewers (as described in Section 5.2 of CIPM-MRA-G-13 (<https://www.bipm.org/en/cipm-mra/cipm-mra-documents/>))

## JCRB Review of CMCs

### Submission for JCRB Review and Publication in the CIPM MRA's Key Comparison Database (KCDB)

Once the CMCs have been approved at the intraRMO level, a similar process is followed for the JCRB review, including discussions by email between the submitting NMI and reviewers (as described in Section 5.2 of CIPM-MRA-G-13 (<https://www.bipm.org/en/cipm-mra/cipm-mra-documents/>)). The SIM MWG chair submits the CMCs, along with supporting documentation, to the KCDB platform review area.

CMCs submitted for JCRB review on the KCDB should be accompanied by documents (such as comparison reports or published papers, declaration from the SIM QSTF concerning the status of the supporting quality system, etc.) that support the CMC claim, or a SIM MWG report (an example is available in Appendix 3) attesting that the working group has approved the range and uncertainty of the CMCs. This report may include:

- a) Months between which the SIM review of the CMCs was carried out;
- b) Number of new entries and matrices submitted;
- c) Number of modified entries and matrices submitted;
- d) Number of entries submitted with minor changes;
- e) Number of entries deleted;
- f) Number of entries that were not approved and consequently were not submitted for JCRB review;
- g) A table detailing all information from the above items for the NMI (see Appendix 3);
- h) List of contact persons for the submitting NMI and, where applicable, for each service category.
- i) List of SIM reviewers for each service category.

The process leading to the publication of the SIM submission in the KCDB is described in “CMCs in the context of the CIPM MRA: Guidelines for their review, acceptance and maintenance” (from <https://www.bipm.org/en/cipm-mra/cipm-mra-documents/>). That document covers the process followed for the review from the moment that the SIM submission (comprising the NMI CMCs reviewed by SIM, the SIM QSTF declaration, and any additional documents) is uploaded to the KCDB platform.

SIM CMC submissions are named according to the following nomenclature, which is automatically generated by the KCDB during submission:

**SIM- XX-YY-CN-VN**

where,

**XX** is an acronym for the measurement field,  
**YY** is the 2-letter ISO country code  
**CN** is an 8-digit alphanumerical code; each number/letter spans from 0 to Z  
**VN** is the alphanumerical version number, from 1 to Z

For example, “SIM-RI-US-00000INC-1” is a SIM CMC in ionizing radiation from the US (version 1); this name is unrelated to the fact that this CMC is for a radioactivity measurement of Th-228.

The JCRB review is a dynamic process; CMCs generally require changes due to comments from other RMOs doing the review. Each NMI will likely be managing a number of CMC files: those reviewed and commented on by each RMO and one which will be created to incorporate changes due to all the reviewers’ comments, CMC modifications and NMI responses resulting from the JCRB review. The KCDB 2.0 platform automatically accumulates the comments from the different RMOs for each CMC.

During the first stage of the JCRB review, comments or requests may arrive to the SIM MWG from other regions. Such comments must be forwarded to the submitting NMI to be answered and, perhaps, responded to by sharing an updated CMC file with modifications; this process takes place outside of the KCDB platform (by email, for example).

Once discussions and any modifications have been completed, and the SIM submission has been reviewed and *tentatively* approved by all participating RMOs, the NMI will forward the final version of their CMCs for approval to the Writer with a copy to the SIM MWG chair. The Writer will again access the CMC in the KCDB, once the latest date limit for review has passed, to make all of the requested revisions. The Writer may re-submit a revised CMC only once during the JCRB review, so it is critical that all revisions are made before final submission.

The MWG chair *may* summarize the CMC review results in a report to be added to the submission for final voting and publication in the KCDB. All interested parties, including the SIM TC chair, are informed about both the submission and the final publication of the CMC set in the KCDB.

The report issued by the SIM MWG chair may include:

- List of contact persons at the submitting NMI and, where applicable, for each service category;
- A summary report of the intraRMO review.
- The date when the SIM CMC set had been initially posted in the JCRB CMC website, if relevant

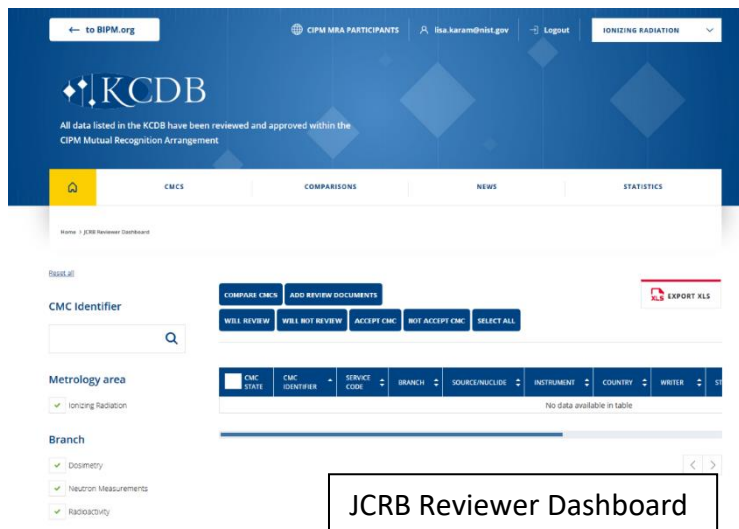
### **Review of CMCs from other RMOs**

For most technical areas, the JCRB review is done under the JCRB space (under the JCRB Reviewer Dashboard, <https://www.bipm.org/kcdb/jcrb/reviewer-dashboard>). Submissions from other RMOs awaiting JCRB review are indicated in the KCDB under

- Pending actions (available to all)

- JCRB request to review (available to the MWG Chairs)

The relevant SIM MWG Chair will be alerted by email as to the availability of CMCs for JCRB Review (a batch of individual CMCs in the same technical area may be presented in a small time window so to be considered as a **round** of reviews). The Chair should indicate the intention to review or not the CMC(s), and the date for review (under “CMCS” – “JCRB Space” – “JCRB Reviewer Dashboard”). The Chair may approve the CMC or ask the Writer for revision. The MWG Chair may also consult reviewers within the same RMO.



JCRB Reviewer Dashboard

The RMO may provide a list or table of the service categories covered in the CMC(s). If this listing has not been posted by the submitting RMO, the MWG chair may indicate to the reviewers the service categories that have been submitted for review. This information can be helpful to the reviewers.

The reviewer and MWG Chair may add comments to each CMC during the JCRB review process following the same general process as for an intraRMO review (section 1). Occasionally, if the number of CMCs in the RMO submission is large, the SIM MWG chair may request additional reviewers from among the MWG.

Reviewers may exchange information with the submitting NMI regarding any questions or interpretation doubts and corresponding answers by email. Once a basic understanding of the CMCs has been reached by the Reviewer, all the subsequent comments on a given CMC entry should preferably be summarized and forwarded to the SIM MWG Chair.

The review process should be finished by the date that was registered in the KADB (45 calendar days is a reference every MWG can take as recommended). The deadline accorded will depend on the size of the RMO submission and the time of year (to account for holidays); SIM will relinquish its right to review if the self-imposed deadline is passed. The MWG Chair will follow up and keep a record of all correspondences and CMCs sent to him/her.

Once the RMO submission review is completed within SIM, the reviewers will forward the final version of the CMCs reviewed containing all their comments and approvals to the SIM MWG chair. The process followed for the review of the RMO submission from this point on is described in detail in “CMCs in the context of the CIPM MRA: Guidelines for their review, acceptance and maintenance” (from <https://www.bipm.org/en/cipm-mra/cipm-mra-documents/>).

A report issued by the SIM MWG chair may include one or more of the following:

- a) List of SIM CMC reviewers and guest reviewers for the CMC;
- b) Time period for the SIM review of the RMO submissions;

- c) Number of individual CMC entries reviewed during the round (if several were submitted):
  - Number of reviewed entries that were approved as submitted;
  - Number of reviewed entries that were approved with comments;
  - Number of entries that were yet not approved;
  - Number of entries that were not reviewed;
- d) Number of submitting service categories of the RMO submission;
- e) A table detailing the information (see Appendix 4).

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 revisions; a CMC can be revised only once by the Writer during the JCRB review. The revised CMC is returned to the TC/MWG Chair and must be submitted for vote. Unanimous approval will enable the KCDB Office to publish the CMC.

CMCs in Chemistry (under CCQM) are usually reviewed in face-to-face meetings associated with the CCQM meetings. The procedures followed can be found at <https://www.bipm.org/en/cipm-mra/kcdb-help> in *Comparisons in Chemistry and Biology*.

### Timelines for SIM Review of CMCs from other RMOs

The flowchart in Appendix 2 should be followed. Date limits are fixed according to the JCRB rules, and the outcome of the review is concluded at the latest date set by the RMOs for reviewing

The SIM MWG chair sends notice of a new CMC review to (as appropriate) the SIM NMI CMC coordinators and to the SIM assigned reviewers, along with any summary or additional information from the originating RMO. This includes a date when the SIM review needs to be completed, generally within **45 days** from the present date.

Reviewers either agree or decline to review the CMC(s) on the Reviewer Dashboard. This should occur within **5 days**. The MWG chair requests additional reviewers as needed, starting with the secondary reviewer if necessary.

Reviewers evaluate each individual CMC and determine if it is acceptable or if there are issues (requiring an exchange of information with the originating NMI). This first contact message should describe the CMC in question and the specific issue. This message should be sent as soon as possible, and before half the time allotted for review has passed.

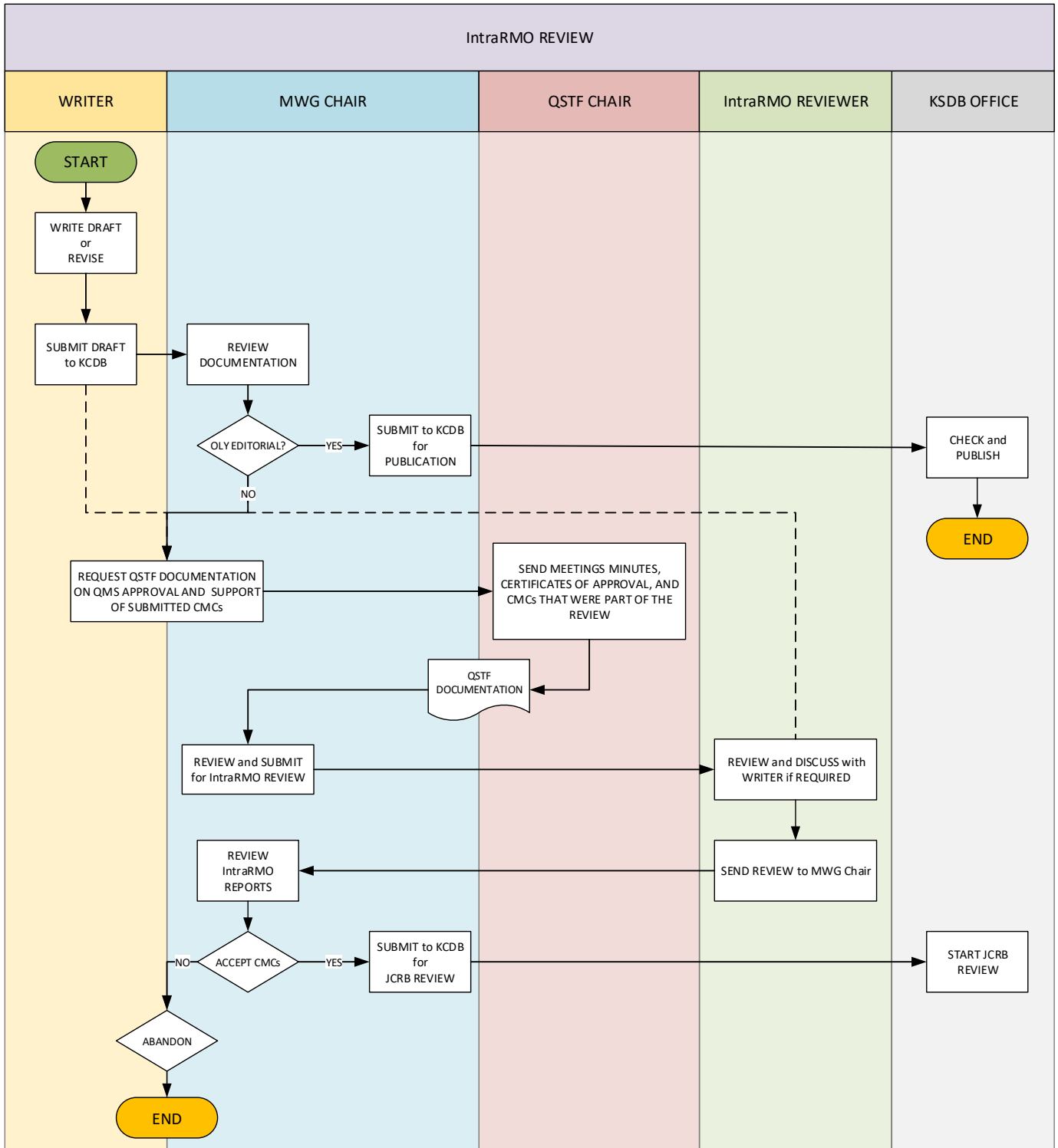
The CMC reviewers should request a response within **10 days** and should review the response as soon as possible after it is received. If the issues are not yet resolved, they should reply immediately to the NMI contact persons. If possible, all technical issues should be resolved within 10 calendar days before the review due date registered in the KCDB.

If any issues are not resolved by this time, the reviewers should notify the SIM MWG chair, their own NMI CMC coordinator (if relevant), and the originating NMI's contact persons, as well as the NMI technical

expert. The SIM MWG chair should contact the RMO TC/WG chair and explain that if the issues cannot be resolved within **10 additional days** the CMC(s) in question will not be approved.

Within **5 days** of the review deadline, all reviewers should either approve or not approve the CMC that they have agreed to review and notify the SIM MWG Chair. The Chair may summarize the reviews, and upload this and any other documents to the “Add Review Documents” on the KCDB. Based on the reviews, the NMI may modify its CMCs to be ultimately submitted for voting or withdraw its submission.

Appendix 1. IntraRMO Review process



## Appendix 2. JCRB Review Process (SIM and other regions)

The InterRMO (JCRB) review process and flowchart can be found in CIPM-MRA-G-13 at <https://www.bipm.org/en/cipm-mra/cipm-mra-documents/>.



Appendix 3: Example of Format for reporting intraRMO review of CMCs

### Questionnaire Which May Be Used for the Review of CMCs

<b>NMI/DI:</b>	
<b>Person responsible:</b>	
<b>Metrology area</b> <b>Branch:</b> <b>Service:</b> <b>Sub-service:</b>  (Consistent with items in KCDB)	(Please specify area, branch and service to which the information reported below applies)

<b>Review Process</b>			
	<b>Yes</b>	<b>No</b>	<b>Comments</b>
<b>Participation in comparisons</b>			
<b>CC or RMO KCs?</b>			(Please name comparison identifier)
<b>Supplementary Comparisons?</b>			(Please name comparison identifier)
<b>Past comparisons?</b>			(CIPM, RMO or others, please specify)
<b>Bilateral comparisons?</b>			(Please specify)

<b>Technical activities</b>			
	<b>Yes</b>	<b>No</b>	<b>Comments</b>
<b>Measurement methods</b>			(Brief description of method used)
<b>Traceability of standards</b>			(Name NMIs/DIs which provide traceability)
<b>Written measurement instructions</b>			(Written procedures available? Language?)
<b>Uncertainty budgets</b>			(Are they already available? If yes, are they calculated following the ISO Guide to the Expression of Uncertainty in Measurement?)
<b>Key publications</b>			(Please specify)

Quality management system			
<b>Status of implementation of QMS?</b>			(ISO/IEC 17025 and/or 17034 fully implemented?)
<b>Self-declared or accredited QM system?</b>			(If accredited, please name accreditation body)
<b>Which CMCs are covered by the accreditation?</b>			(Are all CMCs covered by the accreditation? If no, please specify the corresponding areas of measurement)
<b>Which CMCs are covered by self-declaration?</b>			(List here all areas of measurement which are not covered by accreditation)
<b>Engagement in TC-Quality</b>			. (Participation in meetings and other activities)
<b>QM system reviewed by SIM-QSTF?</b>			(Meeting when the QMS was presented, status of review)

Additional information			
<b>Participation in RMO technical activities?</b>			(Projects, meetings, etc.; please specify)
<b>Visits of technical experts?</b>			(Please specify name and date of visit)
<b>On-site visits by peers?</b>			(Please specify name and date of visit)
<b>Any other information?</b>			(i.e. publications, etc.)

**SIM-D-05**  
**SIM Procedure for Review of Calibration and Measurement Capabilities**  
**Submitted for Appendix C of the CIPM MRA**

<b>Version</b>	<b>Date</b>	<b>Modification (editorial/substantive)</b>
1.0	September 2016	Original document
2.0	April 2019	First full revision submitted to SIM Council for acceptance
2.5	February 2020	Version as approved by SIM Council for discussion at TC meeting
3.0 DRAFT	May/November 2020	Version revised to reflect KCDB 2.0 operations (draft for TC approval)
3.0	November 2020	Second full revision submitted to SIM Council for acceptance
3.5	December 2020	Further revision after input from SIM Council
3.6	2022	Revised for clarifications: Records from the SIM QSTF, ect...