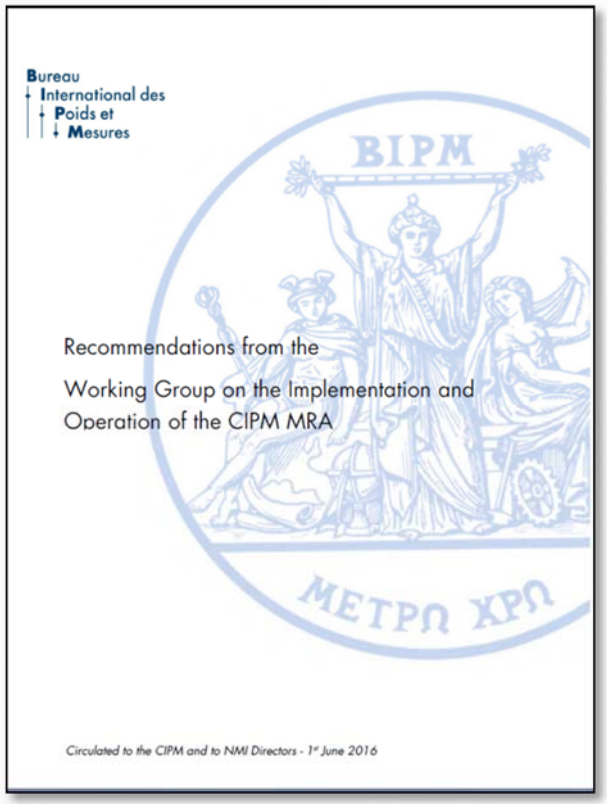
# Towards KCDB 2.0

Andy Henson

Bureau International des Poids et Mesures

# Context: CIPM MRA review WG recommendations




***Related directly to KCDB 2.0 design***

**Recommendation 2 - (On providing better visibility of the services supported by the CMCs in the KCDB)**

a. The BIPM should work with the JCRB and the CCs to develop the scope for KCDB 2.0

   Action: BIPM, JCRB, CCs

b. The BIPM should implement KCDB 2.0 with (for example) an improved web interface and an improved search facility.

   Action: BIPM

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# Context: CIPM MRA review WG recommendations

***Related directly to KCDB 2.0 design (continued)***

**Recommendation 4 - (On improving the efficiency of the CMC review processes)**

a. The CCs should develop a “risk-based” approach to CMC review procedures, that defines the need for intra- and inter-RMO reviews, with inter alia the aim to minimize, or even avoid, the inter-RMO review where justified

   Action: CCs, RMOs, JCRB

….

d. More training should be provided, together with improved guidance material to help ensure ‘right first time’ CMCs and common understanding of expectations when review.

   Action: CCs, RMOs, JCRB

e. The BIPM should investigate the feasibility of a web-based tool for the complete CMC submission and review giving full tracking of the CMC review process, for example as part of the KCDB 2.0.

   Action: BIPM

**Key points:** 17 Mechanisms to improve access to NMI services (e.g. by providing web links in the KCDB)

# Context: CIPM MRA review WG recommendations

***Indirect influences affecting product which must be considered***

**Recommendation 2 - (On providing better visibility of the services supported by the CMCs in the KCDB)**

c. The CCs should work towards better consistency in the expression of CMCs (e.g., units, uncertainty ranges)

Action: CCs

**Recommendation 3 - (On constraining the proliferation of CMCs)**

c. The CCs and NMIs are encouraged to use uncertainty equations and matrices to reduce the number of CMCs where possible.

Action: CCs, NMIs

**Key points:** 10 Actively monitoring progress of CIPM and RMO key and supplementary comparisons

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# Plus: *Voice of the people*

- Use of outdated EXCEL versions and non-validated CMC files produces errors and delays in CMC submissions/revisions
- Requirements for supporting evidence (QMS, technical) can not be enforced currently: many submissions occur without QMS evidence
- Batching and debatching (for review purposes) using EXCEL is cumbersome and leads to errors
- Batched CMC submissions can delay publications if there are problematic entries
  - *CMC review takes too long*
- Web searching of published CMCs is difficult
- Comparing published CMCs with similar parameters (ranges, etc.) is difficult

*At current rates of CMC submissions, legacy CMCs will still outnumber new submissions for the next 10 to 20 years*

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# BIPM process toward KCDB 2.0

- External consultancy in August/September 2015 on possible modifications and resources.
- Input from the NMIs, RMOs, CCs and JCRB and the BIPM and in particular the ***Recommendations from the Working Group on the Implementation and Operation of the CIPM MRA*** guides us towards the specification.
- **Information solicited from CCs**
- Information of possible improvements were communicated to the JCRB in August 2016 ***and discussed at JCRB in September 2016***
- We do not expect Appendix B (comparisons) to have significant changes
- Not everything presented may - in the end – prove to be possible/affordable!

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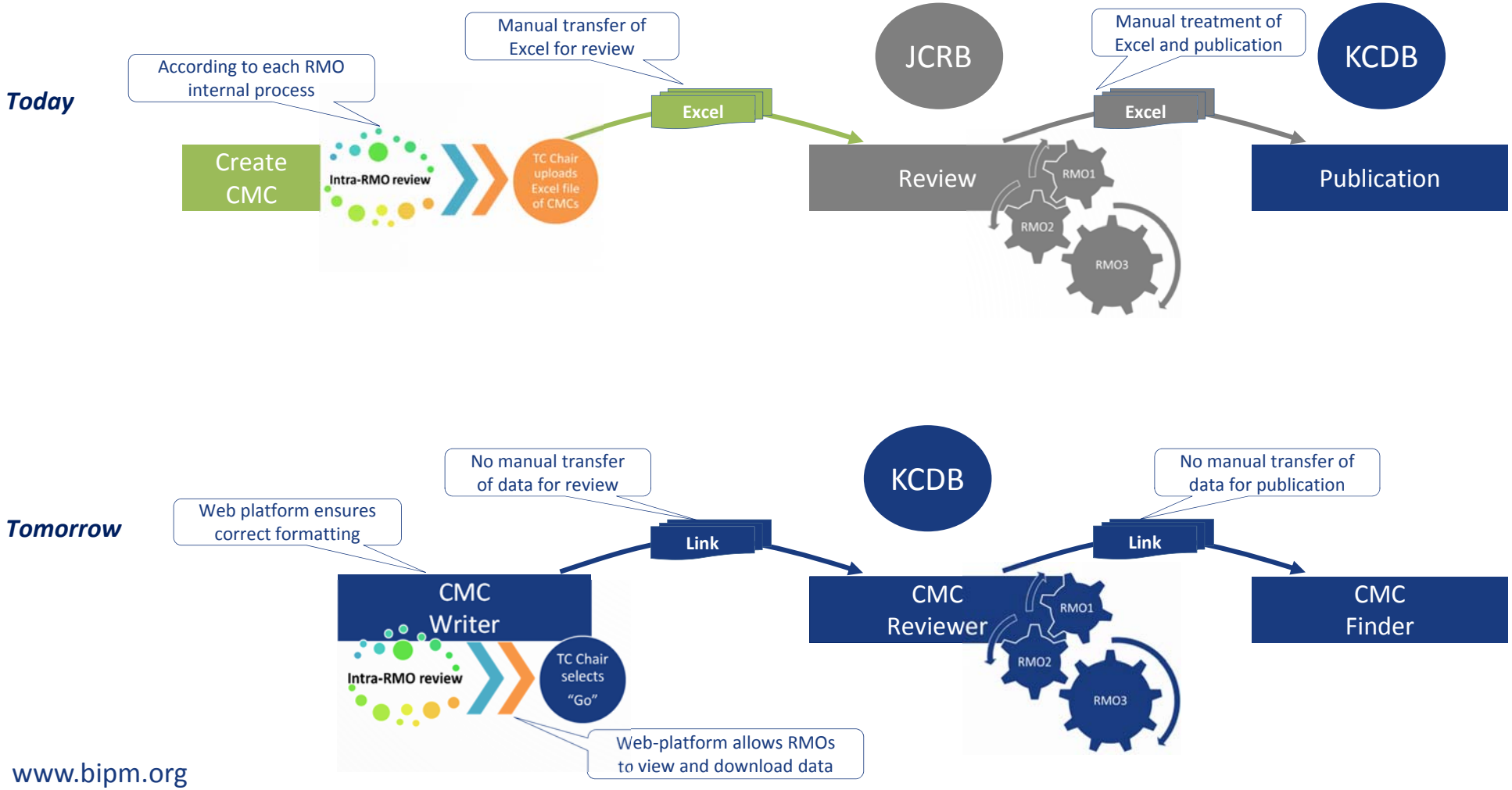
# JCRB discussions in September 2016

The potential specifications for a revised KCDB is presently progressing… feedback from various players still expected

A number of issues must be foreseen and/or clarified, such as:

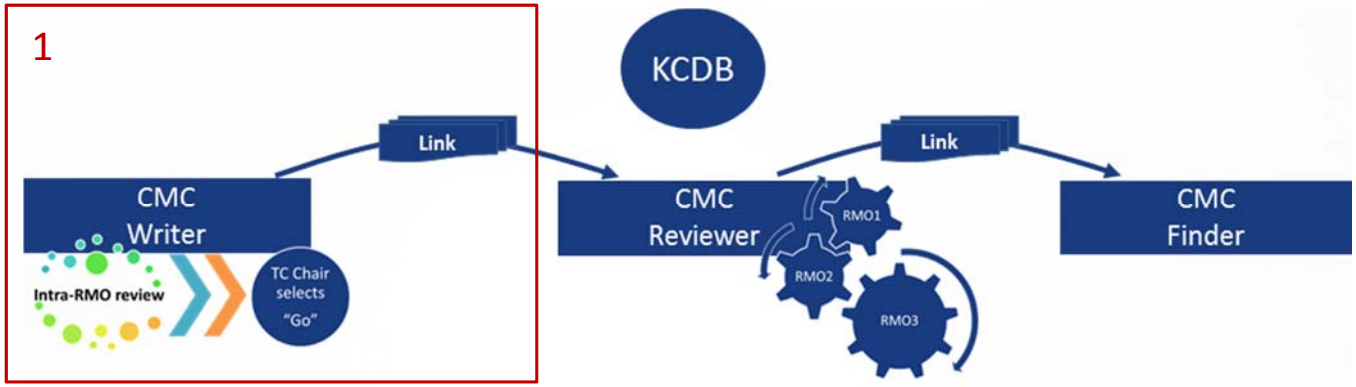
- **Whether to extend the platform back to originating NMI/DIs** ✓
- Challenge of effectively integrating historical data
- What is chemistry/IR going to do (Chemistry have a WG on this.. output end Oct)?
- Maintaining desired links to NMI services
- Risk-based CMC reviews, not widely developed yet within the CCs but we do anticipate this approach being adopted (but how will it look?)
- Broad-scope CMCs… what does that mean – if anything for the database?
- Harmonization of measurement units?

# KCDB 2.0 – *General concept*



# Proposed KCDB 2.0: ***CMC Writer*** *Software Portal*

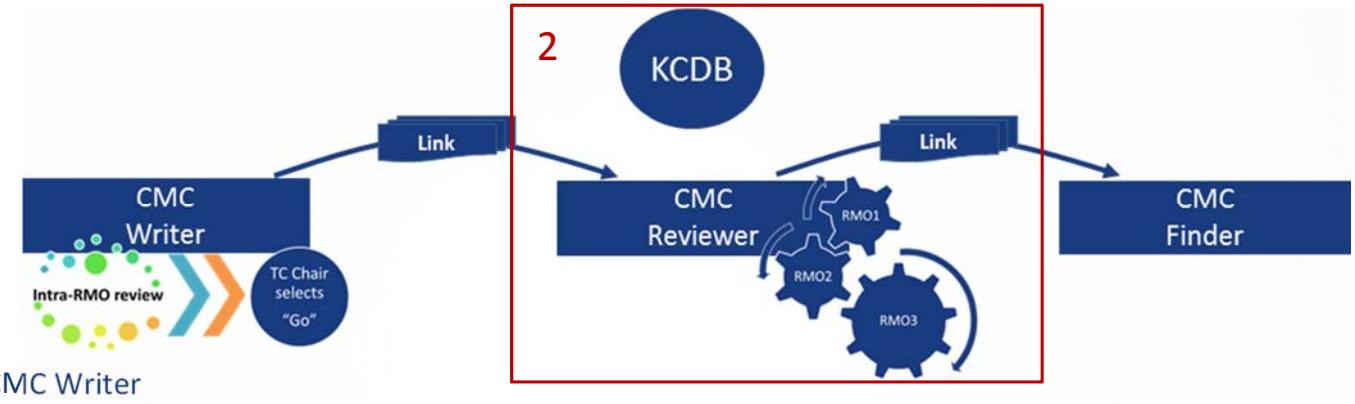
## ***CMC Writer:*** *Entry of CMC data into a web portal*




- Available to all CIPM MRA NMIs/DIs with controlled-access for data entry
- Data entry directly to **web platform … possibly** still from excel spreadsheet (uploaded to platform)
- Output is a unique Link per CMC. Formatting ensured by web platform for field type (physical, chemical, or RI)
- Originator can incorporate link to "NMI Service" if required
- CMCs can be viewed and referred to on web throughout the review process
- Status identified "new", "revised" "greyed out" "deleted"
- Require attachment of QMS evidence

# Proposed KCDB 2.0: ***CMC Reviewer***

## ***CMC Reviewer:*** *Managing review to publication*



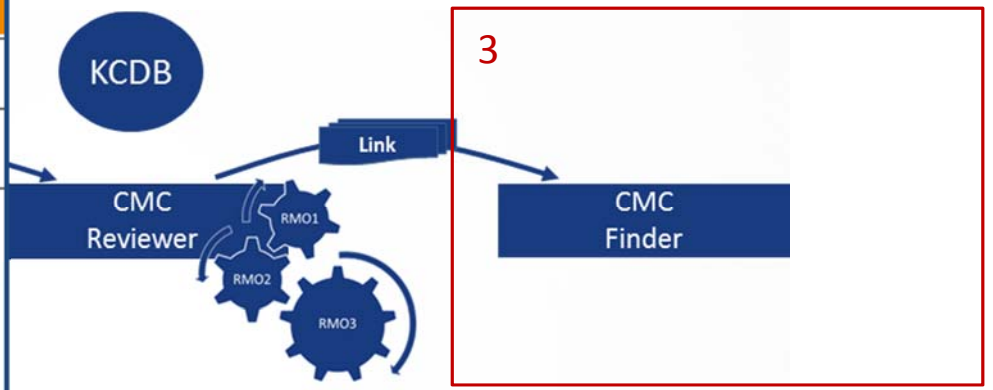

- Accesses data from CMC Writer
- For the intra-RMO review:
  - Light touch using RMO process rules but with CMC already on the platform and the ability to comment
- For Inter RMO review
  - RMO TC chair can batch and debatch
  - Draft CMCs are viewed on web platform, rather than being passed to reviewer as a file
  - Technical reviewers can comment
  - Originator can revise via "CMC Writer"
  - Enforces process requirements for approval as far as is practical (criteria established by JCRB)
  - No post processing for publication
- For publication: once approved, CMCs are available for unrestricted viewing and searching

# Proposed KCDB 2.0: ***CMC Finder***

**Electricity : AC : current**

| | Dissemination range of measurement capability: | | | |
|---|---|---|---|---|
| **Country Institute** | **AC current / A** | **Uncertainty** | **Parameters** | **Comments** |
| **Germany PTB** | **10 to 20** | 20 to 200 µA/A | ***where Q is given in nm.*** **Frequency: DC to 40 GHz** **Temperature: 15 °C to 25 °C** | The uncertainty represents the expanded uncertainty for $k = 2$ with a confidence level of 95%. Approved on 6 May 2009 **Reference:** PTB/2.2.537 Quality Certificates |
| **United Kingdom NPL** | **5 to 22** | 0.020 to 0.2 mA/A | | |
| **Kenya** | **5 to 95** | 0.030 to 1 mA | | |

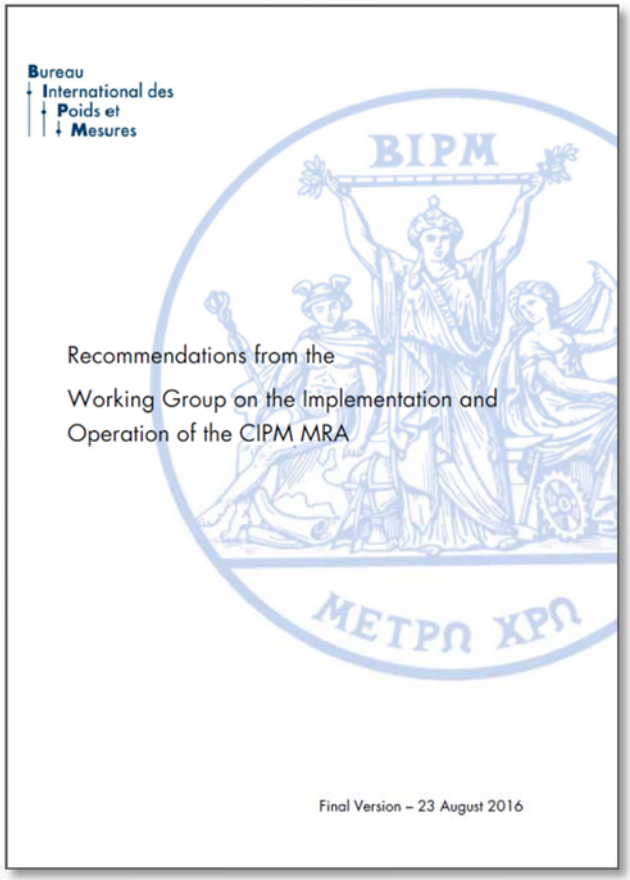
***CMC Finder:*** *Intelligent display of published CMCs*




Features

- Enhanced thesaurus of search terms (in collaboration with the CCs)
- Free search and menu search options
- Tabular (or other data display forms) to allow more direct comparison of CMC lines ***in addition to traditional display?***

# Towards KCDB 2.0 …



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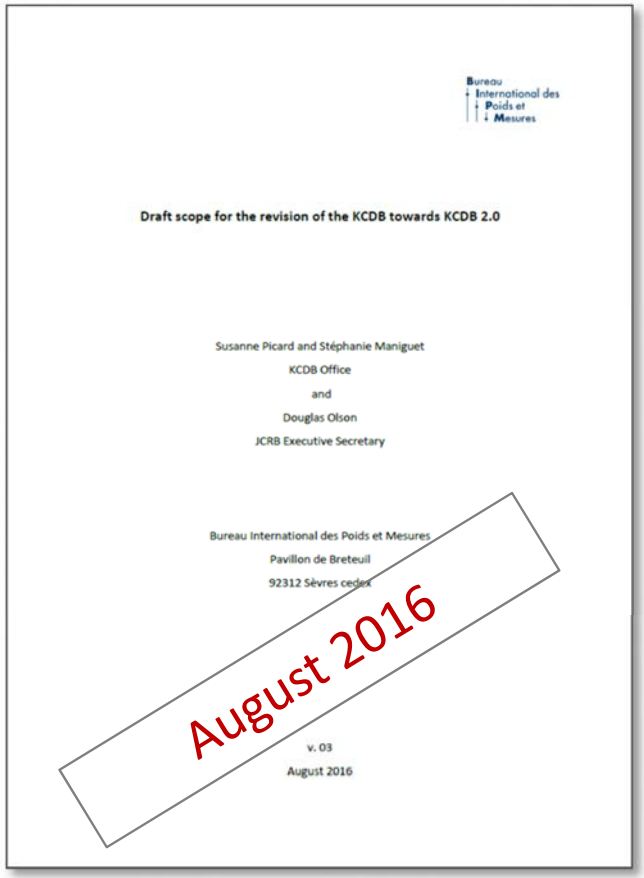
Recommendations from the Working Group on the Implementation and Operation of the CIPM MRA

Final Version – 23 August 2016



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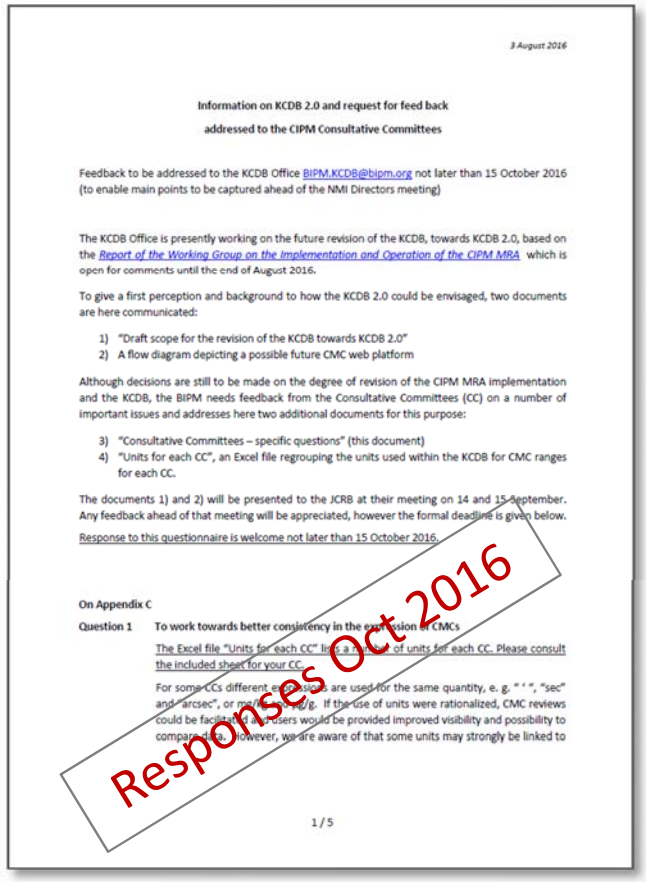
**Draft scope for the revision of the KCDB towards KCDB 2.0**

Susanne Picard and Stéphanie Maniguet
KCDB Office
and
Douglas Olson
JCRB Executive Secretary

Bureau International des Poids et Mesures
Pavillon de Breteuil
92312 Sèvres cedex

v. 03
August 2016

August 2016



3 August 2016

**Information on KCDB 2.0 and request for feed back addressed to the CIPM Consultative Committees**

Feedback to be addressed to the KCDB Office BIPM.KCDB@bipm.org not later than 15 October 2016 (to enable main points to be captured ahead of the NMI Directors meeting)

The KCDB Office is presently working on the future revision of the KCDB, towards KCDB 2.0, based on the *Report of the Working Group on the Implementation and Operation of the CIPM MRA* which is open for comments until the end of August 2016.

To give a first perception and background to how the KCDB 2.0 could be envisaged, two documents are here communicated:

1) "Draft scope for the revision of the KCDB towards KCDB 2.0"
2) A flow diagram depicting a possible future CMC web platform

Although decisions are still to be made on the degree of revision of the CIPM MRA implementation and the KCDB, the BIPM needs feedback from the Consultative Committees (CC) on a number of important issues and addresses here two additional documents for this purpose:

3) "Consultative Committees – specific questions" (this document)
4) "Units for each CC", an Excel file regrouping the units used within the KCDB for CMC ranges for each CC.

The documents 1) and 2) will be presented to the JCRB at their meeting on 14 and 15 September. Any feedback ahead of that meeting will be appreciated, however the formal deadline is given below.

Response to this questionnaire is welcome not later than 15 October 2016.

**On Appendix C**

**Question 1** **To work towards better consistency in the expression of CMCs**

The Excel file "Units for each CC" lists a number of units for each CC. Please consult the included sheet for your CC.

For some CCs different expressions are used for the same quantity, e. g. " ' ", "sec" and "arcsec", or mg/kg and µg/g. If the use of units were rationalized, CMC reviews could be facilitated and users would be provided improved visibility and possibility to compare data. However, we are aware of that some units may strongly be linked to

1 / 5

Responses Oct 2016

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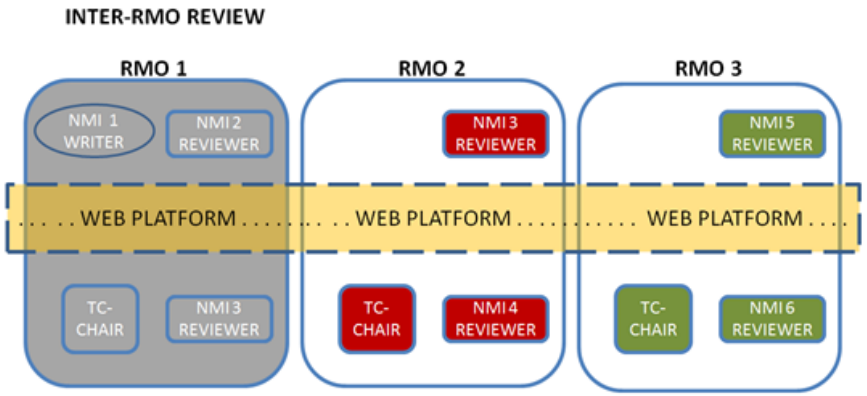
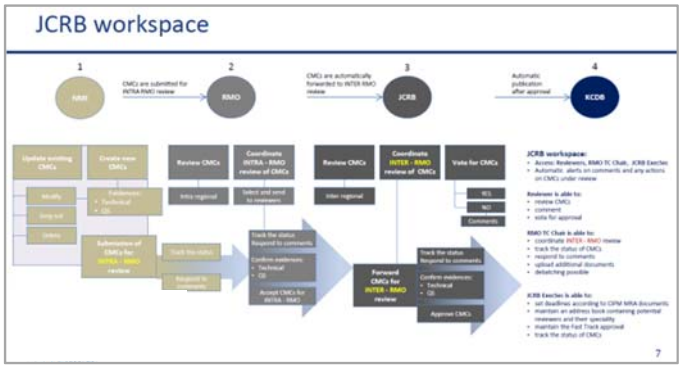
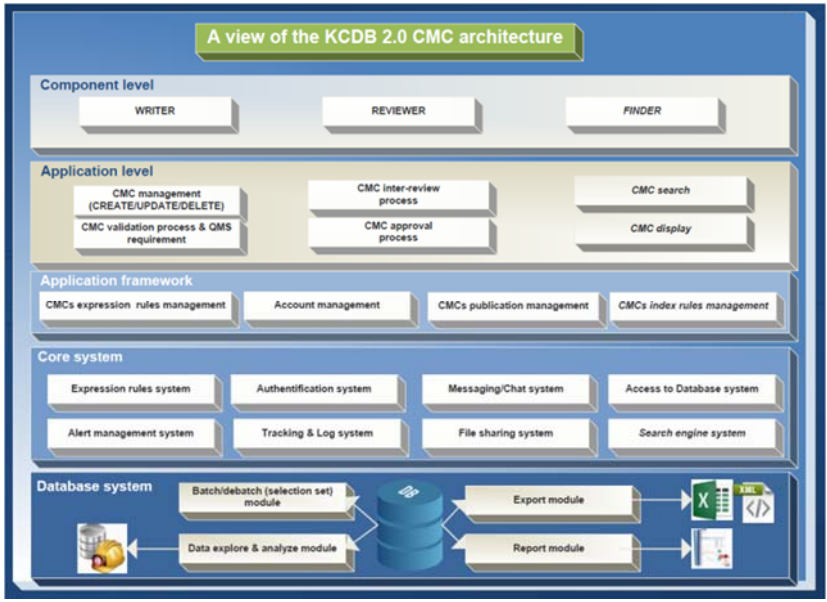
# Towards KCDB 2.0 … Summary of the software project

## WRITER – REVIEWER – FINDER concept

- **Refurbished back-office and front-office** in an modern programming language (ASP is dead!)
- Take advantage of IT technologies and provide a **WEB PLATFORM** from the beginning with controlled restricted access.
- Possibility to **follow progress of comparisons**
- published data on CMCs and comparisons in **user friendly environment**.
- Improved search facilities

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# CIPM MRA CIPM/JCRB Document Structure

**Policy documents**

## CIPM MRA

- CIPM/2005-06:Rev.2013 The CIPM MRA: 2005 Interpretation Document
- CIPM MRA-G-01 Guide to the implementation of the CIPM MRA
- CIPM/2005-05:Rev.2012 Services available to Associates States and Economies of the CGPM and their participation in the CIPM MRA
- CIPM MRA-D-06 Designated Institutes participating in the CIPM MRA: Expectations and nomination form
- CIPM/2005-09 Subcontracting of measurements under the CIPM MRA
- CIPM MRA-P-01 Procedure for approval of the entry of a new RMO to the JCRB
- CIPM/2009-24 Traceability in the CIPM MRA
- CIPM MRA-D-02 Use of the CIPM MRA logo and certificates statement

**Guidance documents**

### Guidance documents on CMCs

- CIPM MRA-D-04 Calibration and Measurement Capabilities in the context of the CIPM MRA
- JCRB-8/9 Uncertainty contributions of the device under calibration or measurement
- Additional instructions and templates for CMC excel files
- Classification of services in the various fields

### Guidance documents on Comparisons

- CIPM MRA-D-05 Measurement comparisons in the CIPM MRA
- CIPM MRA-G-04 CIPM MRA Guidelines for Authorship of Key, Supplementary and Pilot Study Comparison Reports
- Key and supplementary comparison registration and progress form
- Form on Publication of a Final Report in *Metrologia's Technical Supplement*

### Guidance documents on QS

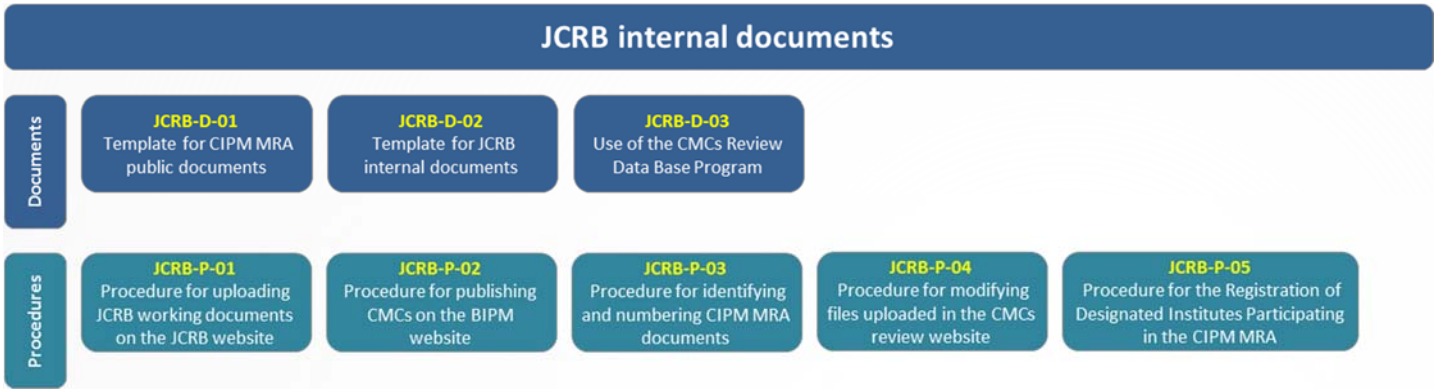
- CIPM MRA-G-02 JCRB guidelines for the monitoring and reporting of the operation of quality systems by RMOs
- CIPM/2007-25 Recommendations for on-site visits by peers and selection criteria for on-site visit peer reviewers
- CIPM MRA-G-03 Guidelines for the review of Quality Systems operated by IGO institutes and/or designated institutes, and the review of their calibration and measurement capabilities (CMCs)

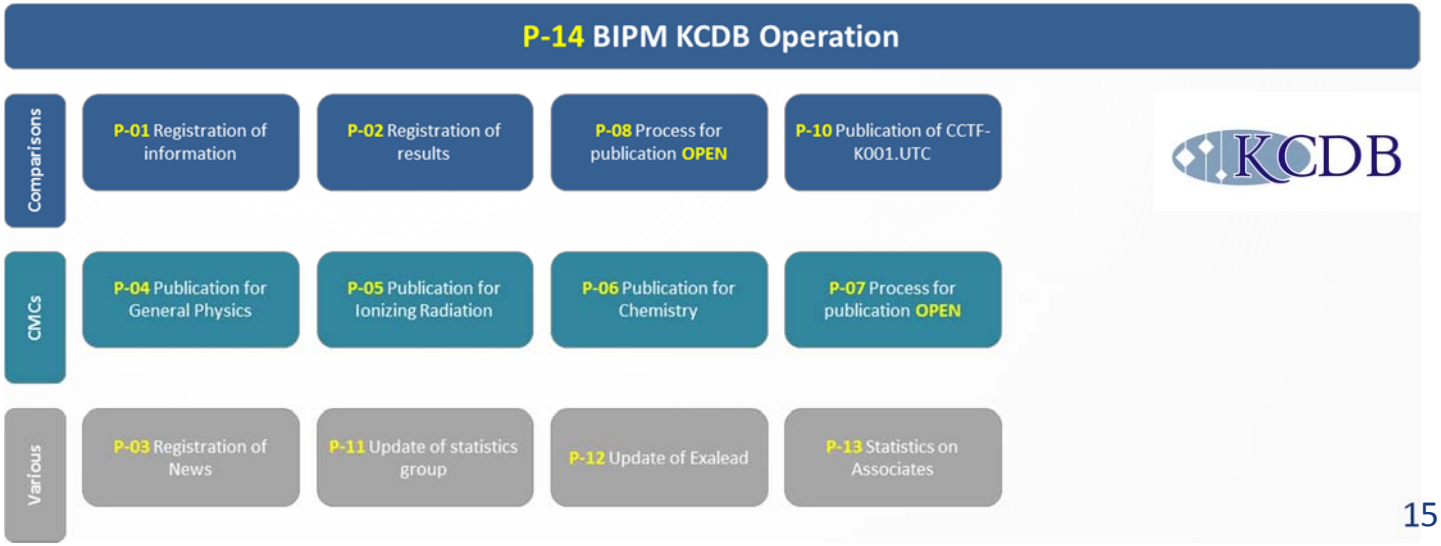
**Other information**

- CIPM MRA-D-01 Rules of procedure for the JCRB
- CIPM MRA statement for calibration certificates
- Joint BIPM, OIML, ILAC and ISO declaration on metrological traceability
- JCRB directory
- JCRB CMC-REVIEW WEB PAGE MANUAL
- CIPM/2007-11 Calibration and measurement capabilities - A paper by the joint BIPM/ILAC working group
- Joint ILAC-CIPM communication regarding the accreditation of calibration and measurement services of national metrology institutes
- Common statement and declaration by the BIPM, OIML and ILAC on the relevance of various international agreements on metrology to trade, legislation and standardization

CIPM MRA

# JCRB and KCDB back office documents



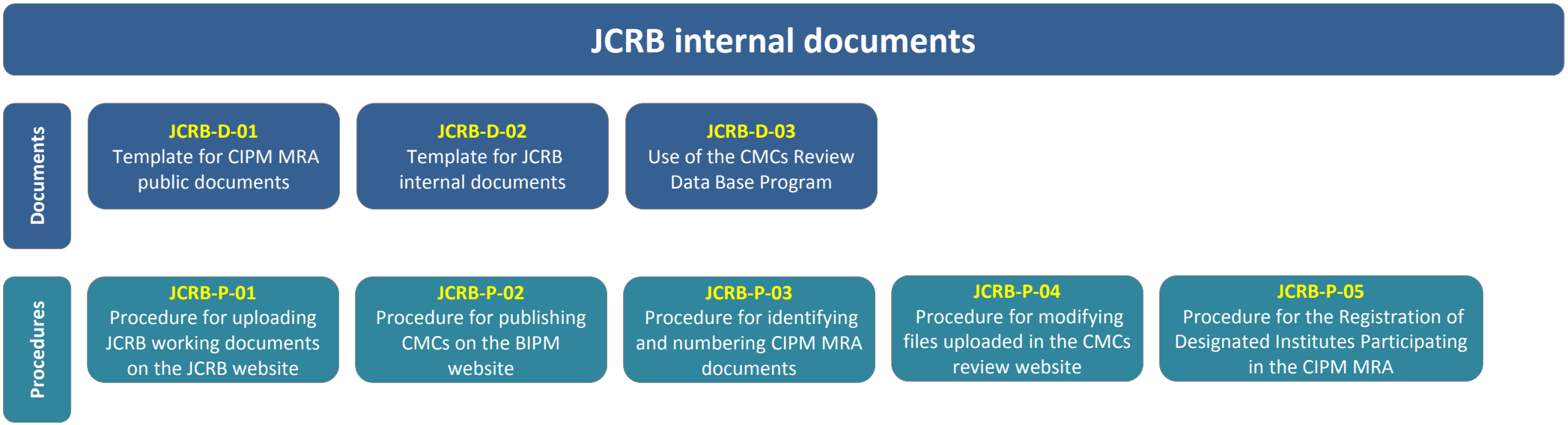



# KCDB Document Structure

**P-14 BIPM KCDB Operation**

| | | | | |
|---|---|---|---|---|
| Comparisons | P-01 Registration of information | P-02 Registration of results | P-08 Process for publication OPEN | P-10 Publication of CCTF-K001.UTC |
| CMCs | P-04 Publication for General Physics | P-05 Publication for Ionizing Radiation | P-06 Publication for Chemistry | P-07 Process for publication OPEN |
| Various | P-03 Registration of News | P-11 Update of statistics group | P-12 Update of Exalead | P-13 Statistics on Associates |

# JCRB Document Structure



# Timeline

| Nov-16 | Dec-16 | Jan-17 | Feb-17 | Mar-17 | Apr-17 | May-17 | Jun-17 | Jul-17 | Aug-17 | Sep-17 | Oct-17 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Write specifications | | | | | | | | | | | |
| | | | | Prepare, launch call for tenders and select company | | | | | | | |
| | | | | | | | Create KCDB 2.0 | | | | |

| Nov-17 | Dec-17 | Jan-18 | Feb-18 | Mar-18 | Apr-18 | May-18 | Jun-18 | Jul-18 | Aug-18 | Sep-18 | Oct-18 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Create KCDB 2.0 | | | | Adjust | | Adjust | | | | Adjust | |
| | | | Test period | | | | | | | | |
| | | | | | | | Launch KCDB 2.0 | | | | |

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# Thanks…

- Significant effort from the interlocutors and the BIPM Team:
  - *Susanne Picard (KCDB Coordinator)*
  - *Stéphanie Maniguet (KCDB Office)*
  - *Doug Olson (JCRB Executive Secretary)*
  - *Laurent le Mee  and Thierry N'Guyen (IT)*
  - *Chingis Kuanbayev (ILC Department)*

# Thank you


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