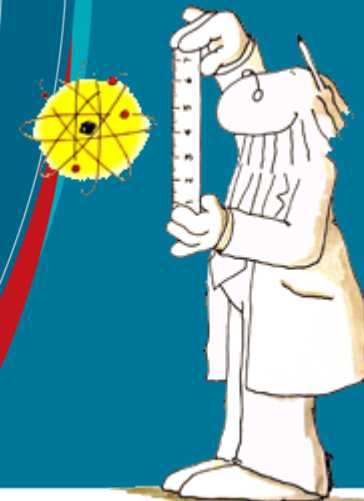


KCDB2.0 Intra-RMO review Ionizing Radiation (RI)

Raphael Galea (NRC) SIM-MWG6 Chair
April 21, 2022





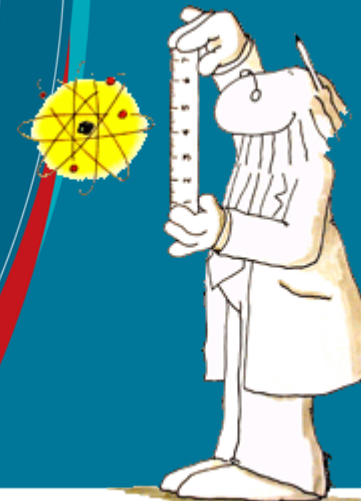
SIM-MWG6

Chair: Raphael Galea (NRC)

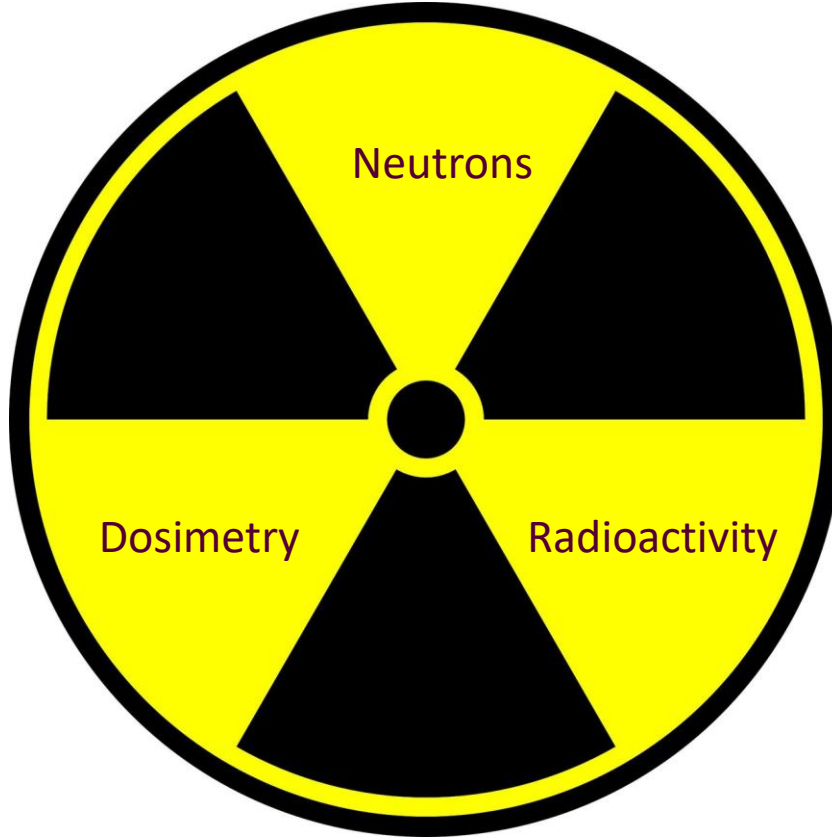
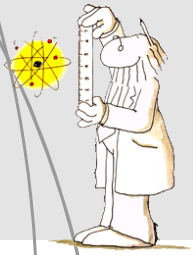
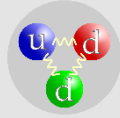
Vice-Chair: Lizbeth Lauren-Perez (NIST)



Hope to grow in the coming years....Ionizing Radiation involves everyone from nuclear medicine/power/security to geo/astro physics communities in private/public/academic sectors.



Rayonnement Ionisant (RI)



Validity of RI comparisons is 10-20 years.

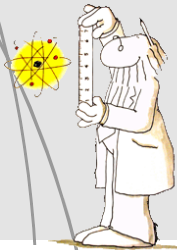


Cancer.gov



Eckert & Ziegler

Measurements Methods Matrix (MMM)



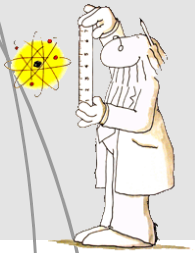
Measurement Methods Matrix of the Radionuclides for Primary Methods
To Establish Key Comparisons to Underpin CIPM MRA CMCs in Radioactivity

CHANGES MADE 12 May (LK) in columns H and I (some moved to J), as well as on Applications (based on November 2010 KCWG meeting)

Many possible CMCs to declare in radioactivity, so it is impossible to perform enough comparisons to cover everything.

Nr	App.	Nuclide	4P-BP/AP-PCIPILS-GR-NAIGH-COAC	4P-XR/AE-PCIPILS-GR-NAIGH-COAC	4P-AP-LS-00-00-HE	4P-BP/AP/XR/AE-NAICS-00-00-HE	4P-PH-NA-00-00-HE	4P-BP/AP-PP-00-00-HE* (*nuclides emitting beta or alpha particles, accompanied by emission of gamma photons)	4P-XG/AE-PP-00-00-HE	SA-AP-PS-00-00-00	4P-BP-PCIPILS-GR-NA-CT/AT	4P-AP/BP/PH/AE/XR-LS-00-00-CN	4P-BP-LS-00-00-TD** (**pure-beta emitting nuclides only)	4P-AP/BP/PH/AE/XR-LS-00-00-TD*** (***all not pure-beta emitting nuclides)	4P-BP-PP-00-00-HE-*** (***pure-beta emitting nuclides only)	4P-BP-PC-00-00-IG	??-XR/AE/PO-??-00-00-??	??-GR-??-00-00-??	4P-??-PC/IP/LS-??-NAIGH-COAC/CT/AT (DS)*	4P-??-LS-00-00-CN/TD (DS)*	4P-??-PP-00-00-HE (DS)*	SA-??-PS-00-00-00 (DS)*	4P-??-PC-00-00-IG (DS)*
1	ENV	H-3										3	2			1							
2	RES	Be-7		3					1														
3	MDD	C-11					1											3					
4	ENV, RES	C-14									3	1	1			1							
5	MDD	F-18	2				1	2				0.6		3									
6	DCA	Na-22	1				1					0.6											
7	DCA	Na-24	0.5				3	2				2											
8	ENV	Al-26	2									2											
9	MDT, RES	P-32									1.5	0.7	1.5		1.5								
10	MDT, RES	P-33									1.5	1	1		1.5								
11		S-35									3	1	1		3								
12	ENV, MDD, FOF	Cl-36									1.5	0.7	1		2								
13		Ar-37																3					
14	ENV	K-40										0.8											
15	MDD, WAS, FOF	Ar-41														2							
16	ENV, WAS, FOF	Ca-41										6					3						
17		K-42	1					1				2											
18		Ca-45									2	2	2		2								

of CMCs is not a reflection of the burden of work to maintain the CMCs



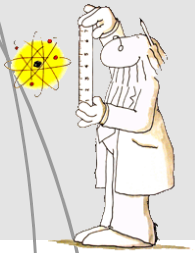
Once a CMC is published:

- It should be peer reviewed/approved by an external NMI/DI or accreditation body every 5 years to determine its ongoing validity. Then presented and approved by the SIM-QSTF depending on the outcome of the peer review of the QMS supporting the CMC claim.
- If approved no update is required in the KCDB2.0, no intra-RMO or JCRB- review is required.
- Rely on the crucial QMS system to determine the vitality of the CMCs.
- Rely on the NMI/DIs to determine if CMCs should be modified/updated/greyed out depending on the conditions in the lab (personnel, equipment, method experience).

BURDEN is in the actual work to establish the support a claim.

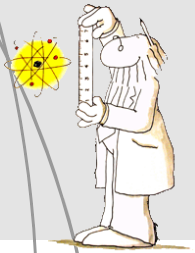
BURDEN of review is in the comparison reports and publications used to support a claim.

Documents for RI to help in review and writing

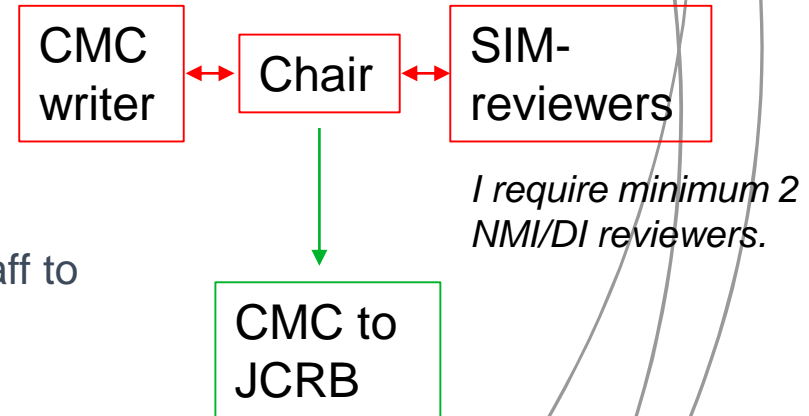


1. **MMM – Use to support CMC claims for other isotopes for which the NMI/DI does not have a comparison.**
2. **RI_services – restricted list of possible CMC claim types.**
 - ie: CMC for Bq only rather than addition old Bq/g or Bq/L.
 - CMCs to be representative not comprehensive.
3. **CCRI-RMOWG-04-CMCRules.**
4. **CIPM-MRA-D04.**

The life of a CMC in SIM-MWG6



- This doesn't happen that often, only 1 Intra-SIM review since the introduction of the KCDB2.0
- **KCDB2.0 improvements**
 - Every CMC has its own life.
 - Hopefully reduces the burden on the BIPM staff to maintain this system.
 - Support from the BIPM in terms of youtube channel, e-learning videos are incredibly valuable.
 - Full transparency in documenting the review in the comments of the CMC.



References

Reference standard used in calibration
4 π (PPC)- γ anticoincidence counting

Source of traceability
NRC

KCDB support for CMC claim

[BIPM.RI\(II\)-K4.F-18](#)

Approved on
2021-10-30

Uploaded documents

Supporting document(s)

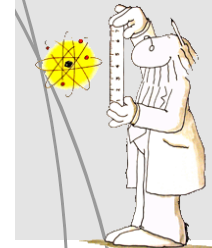
[→ NRC preliminary results.pdf](#)

[→ QSTF_NRC-Radioactivity_22Sep2021_V2.pdf](#)



I confirm that I am authorized by my Institute to submit this CMC for review, and that supporting evidence of the RMO approval of the Quality System is provided.

[→ Read or add comments](#)



References

Reference standard used in
4 π (PPC)- γ anticoincidence

KCDB support for CMC claim

[BIPM.RI\(II\)-K4.F-18](#)

Approved on
2021-10-30

Uploaded documents

Supporting document(s)

→ [NRC preliminary results](#)

→ [QSTF_NRC-Radioactivity measurements report](#)

☒ I confirm that I am authorized by my institute to submit this CMC for review, and that supporting evidence of the RMO approval of the Quality System is provided.

COMMENTS ON SIM-RI-CA-00000K91-1

PILOT, REVIEWER, TC_CHAIR, WRITER

Duncan BUTLER (APMP, ARPANSA) *commented on 30 October 2021*

COMMENT (Editorial)

" Approved APMP

PILOT, REVIEWER, WRITER

Yasushi Sato (APMP, NMIJ AIST) *commented on 26 October 2021*

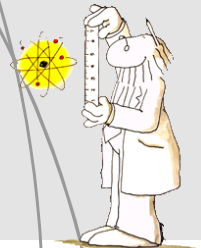
COMMENT (Technical)

"

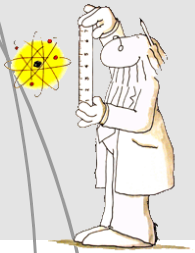
PRINT

QUIT

→ [Read or add comments](#)



Chicken or the egg?



Which comes first?

The QMS review? The Technical Review?

BOTH ARE REQUIRED FOR A VALID CMC DECLARATION

References

Reference standard used in calibration
4 π (PPC)- γ anticoincidence counting

Source of traceability
NRC

KCDB support for CMC claim

[BIPM.RI\(II\)-K4.F-18](#)

Approved on
2021-10-30

Uploaded documents

Supporting document(s)

→ [NRC preliminary results.pdf](#)

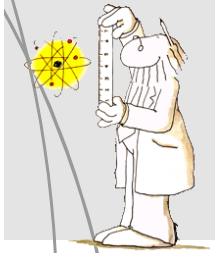


I confirm that I am authorized by my Institute to submit this CMC for review, and that supporting evidence of the RMD approval of the Quality System is provided.

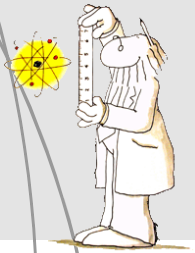
When submitting to the Intra-SIM review, one must confirm the support of the CMC by a QMS which in turn is approved by the QSTF.

So I indicate this in “comments for publication” when writing the CMC.

→ [Read or add comments](#)



Civil not criminal burden of proof



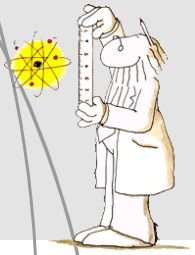
Not beyond a reasonable doubt but probable.

“Burden” has been repeated many times in this presentation but if that is what you remember then I have failed.....the CMC review should be quick and straightforward and should not be a burden.

I created a checklist to quickly determine whether or not to approve and a few of those items should be completed by the Chair for the reviewer.

[CMCreviewChecklist.pdf](#)

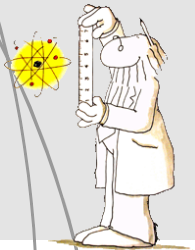
Nothing beats everyone in the same room (even if it is virtual)



In the future:

- Use the checklist.
- *Misery loves company*, so get together and get it done.
- Use the deadline to find a time(s) to review the CMCs together.

Final thoughts....



It is important for all of us that the KCDB2.0 is successful (especially to reduce the workload on our BIPM colleagues).

It is not perfect but I think it is an improvement. Feedback bugs or improvements but be patient.

It belongs to all of us and since we don't actually use it that frequently, you should reach out to your Chairs who can reach out to other Chairs and even international colleagues to ask for help, (re)learn the KCDB procedures or get advice.

The CMCs should work for all countries and all economies.

Misery and burden should not be what you think of when you are asked to review a CMC. If it is then you're doing it wrong.

Thank you, merci, gracias and obrigado

Raphael Galea • SIM-MWG6 Chair • raphael.galea@nrc-cnrc.gc.ca

