

18th CCM meeting: questions and comments on the working documents

#	NMI/WG/RMO	Working document ID	Page	Question or comment	Response
1.	CCM-WGM	CCM-21-08A1_CMS-ITRI-Report CCM-21-08A2_CMS-ITRI-Presentation		Do you plan any additional kit for the XRCD work (towards having a totally independent realisation of the kilogram)?	We currently have only surface layer mass measurement capability, and what may be established in the future is sphere's volume. For other almost fixed "internal parameters" like lattice spacing, purity, molar mass, etc, we do not plan to set up measurement capabilities for those.
2.	CCM-WGM			What is the rationale behind the optical pressure standard development (commercial, primary standard etc.), what is the timescale for delivery and the target uncertainty?	The main reason is to retire our mercury manometers served as our primary pressure standard from 1 Pa to 120 kPa. We expect to perform gaseous refractive index measurement in two years, and conduct the internal pressure comparison with our mercury manometers before 2023, phase 1 target uncertainty is 100 ppm.
3.	CCM-WGM			Could you provide some more detail of what they intend in the dynamic force/torque area and what are the "drivers" for this work?	A project for setting up a periodic dynamic force standard was launched this year, target force amplitude range is 100 N to 1 kN, frequency range is 10 Hz to 2 kHz. The system will be consisted of a shaker, laser interferometric displacement sensing system, weight and force transducers. Some of the main drivers are that we received inquiries about bandwidth calibration for force transducers, another one is bicycle industries here are developing sensors for measuring paddling mechanical power which will need dynamic force calibration to increase accuracy and to develop power measuring standard.
4.	NRC	CCM-21-04G2_WGPV-proposal-JCRB	1	While we agree tying the CMC to a reference standard makes great sense, this should be generalized so as not to be possibly misconstrued as having to designate the exact reference standard. For example a mass artefact can be compared with another similar artefact with no significant increase in uncertainty, so the exact identity of the reference is not relevant. Rather the intended "reference standard type or method" is perhaps more appropriate wording.	
5.	NRC	CCM-21-04G2_WGPV-proposal-JCRB	1	We are not sure we agree with removing the text " <i>noting that more than one instrument type/measurement method can be listed in one CMC,</i> ". Doing so could in fact encourage the	

#	NMI/WG/RMO	Working document ID	Page	Question or comment	Response
				<p>development of CMCs for every poorer quality device that could be calibrated against the reference/instrument of the lowest uncertainty indicated in a CMC.</p> <p>But we do see that there is a logical inconsistency between allowing more than one device type (with different uncertainties) under a single CMC and the sentence from Note 5 of Appendix A of CIPM-MRA-G-13: <i>“CMC uncertainty statements anticipate this situation by incorporating agreed-upon values for the best existing devices.”</i> As only one uncertainty (expression) can be included in a CMC no more than one instrument type can be included if they have different device uncertainties.</p> <p>This is in conflict with part C of Appendix A1 of CIPM MRA-P-11 which allows a service to be covered under a CMC if it has <i>“measurement uncertainty no less than the measurement uncertainty quoted in the CMC, with appropriate treatment, documented in the quality management system, for any methods/instruments listed that are derived, i.e. involve further steps in the metrological traceability chain.”</i> This says nothing about a requirement to incorporate an agreed upon device uncertainty and many devices of differing quality can be covered under a single CMC as long as the uncertainties and evidence is treated and documented in the QS of the NMI providing the service. We favour this latter approach and believe this conflict warrants further discussion/clarification.</p>	
6.					
7.					
8.					
9.					
10.					