APMP/TCRI Activity Summary 2005

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1. Introduction

The Asia Pacific Metrology Program (APMP) Technical Committee on Ionizing Radiation (TCRI) was established in August 1998. The initial Chair was Mr Wen-Song Hwang from INER, Taiwan, who was succeeded in 2000 by Dr Tae-Soon Park from KRISS. The present Chair, David Webb of ARPANSA, was elected to the position in November 2002. While the nominal term is 2 years, the term of the current Chair was extended by another year until September this year when Dr Yoshio Hino of the AIST/NMIJ will take up the position.

Workshops have been held in conjunction with APMP General Assemblies. including Singapore, December 2003 and most recently in Beijing, China, October 2004. In each case there was an opportunity to also visit the laboratory of the host institute with the exception of Singapore which has no radiation laboratory. As an alternative the TCRI participants visited the 800 MeV electron synchrotron facility at the University of Singapore.

The TCRI has four working groups. Three working groups (Photon & Electron Dosimetry, Radioactivity and Neutron Dosimetry) support the program of regional key and supplementary comparisons. The CMC Review working group undertakes the assessment of submissions from laboratories before being passed to the JCRB for external review. It also evaluates the CMCs from other RMOs in the inter-RMO review process.

2. CMC submission and review schedule

As indicated below, CMCs from eight economies were submitted in March, 2003 to the JCRB for inter-RMO review as APMP.RI.1.2003. Two submissions (BARC/India, MINT/Malaysia) were withheld, as the laboratories involved had not been formally designated by the signatory of the MRA in the appropriate country. BARC has since obtained Designated Institute status for the MRA and is now also an APMP member. The Office of Atoms for Peace (OAP) in Thailand has recently been designated by the MRA signatory in that country (NIMT). Both these countries can have their CMCs re-introduced or introduced respectively.

By October 2003, the ionizing radiation CMCs had been reviewed by the COOMET and SADCMET RMOs. These RMOs dealt mainly with the radioactivity entries. Following the RMO Ionizing Radiation Working Group meeting at the BIPM in September 2003, EUROMET made a detailed review of the uncertainties in the APMP radioactivity CMCs.

The different approaches taken to review either the radioactivity or dosimetry (and neutron) CMCs made it clear that two separate streams needed to be considered. Consequently the first stream was redefined as APMP.RI.1.2003 (activity) and the other areas (dosimetry and neutron) were re-submitted for inter-RMO review in February 2004 as APMP.RI.2.2004. APMP.RI.2.2004 involves 7 laboratories including BARC. It also included MINT expecting that laboratory to obtain DI status, however this has not occurred to date. Reviews of the dosimetry and neutron entries have been received from EUROMET and from SIM.

After modification, the APMP.RI.1.2003 (activity) CMCs were submitted to the JCRB in June 2004 for final acceptance into the KCDB database. However further queries from SIM were received and responses have been provided with appropriate changes to the CMC tables. The APMP.RI.1.2003 (activity) CMCs for 5 countries (Japan, Australia, China, Korea and Taiwan) were finally published in the BIPM KCDB on 17 February 2005.

- CMCs under inter-RMO review

  APMP.RI.2.2004 (dosimetry & neutrons)

Economy	NMI	No. of CMCs	Date submitted for Inter-RMO	Comments
Japan	AIST	20	3/2/2004	
Australia	ARPANSA	21	3/2/2004	
China	NIM	20	3/2/2004	
Korea	KRISS	21	3/2/2004	
Taiwan	INER	10	3/2/2004	
India	BARC	42	3/2/2004	

- In preparation for Inter-RMO Review

Economy	NMI	No. of CMCs	Category	Date of Submission*	Comments
Thailand	OAP	34	Activity		Questionnaire to be submitted
		11	Dosimetry		
India	BARC	18	Activity		
Malaysia	MINT	17	Dosimetry		Deferred - non signatory of MRA

- Over the past two years, the TCRI CMC Review WG has reviewed the ionising radiation CMCs from the following Regional metrology Organisations (RMOs): COOMET - 2 institutes; SIM – 5 institutes; EUROMET – 14 institutes.

RMO	Economy	NMI	ID	CMCs	Date received	Date approved
COOMET	Cuba	CPHR		13	13/4/04	
		CENTIS	RI.5.2004	31		9/3/05
	Belarus	BelGIM	RI.6.2004	72	22/9/04	
SIM	Argentina	CNEA	RI.4.2004	106	13/1/04	3/11/04
	Brazil	LNMRI		82	20/12/03	
	USA	NIST		275	20/12/03	
	Canada	NRCC	RI.3.2004	17	20/12/03	4/11/04
	USA	NIST		29	20/12/03	
	Mexico	ININ		45	20/12/03	
	Argentina	CNEA		14	13/1/04	

	Brazil	LNMRI		10	20/12/03	
EUROMET	AT,CH,CZ,DE ,FI,FR,HU, IT,NE,PO,PT, SE,UK		RI.3.2001	Dosimetry		28/2/05
	FR,CZ,DE,IT, UK		RI.4.2001	Neutrons		6/4/05

3. Key comparison schedule

The following comparisons have been organised or are in the process of being developed.

Name of Comparison	Field	Pilot Lab	Participating Laboratories	Period or Status
APMP.RI(I)-K1	Air kerma (radiation: Co-60 gamma rays)	KRISS	AIST, ARPANSA, BARC, INER, KRISS, MINT, PNRI, *CSIR, IAEA*	2003.1 to 2005.12 – in progress; measurements began August 2004
APMP.RI(I)-K3	Air kerma (radiation: medium energy X-rays)	INER	AIST, ARPANSA, BARC, INER, KRISS, MINT, P3KRBiN, *CSIR, IAEA, MOPH, NSCL*	2000.7 to 2003.6 – completed; draft A report written
APMP.RI(I)-K4	Absorbed dose to water (radiation: Co-60 gamma rays)	BARC	ARPANSA, BARC, INER, SIRIM, *CSIR, NSCL*	1999.11 to 2000.8 – completed; report delayed
APMP.RI(II)-K2.Y-88	Activity of radionuclide ^{88}Y	AIST	AIST, ANSTO, BARC, INER, KRISS, MINT, NIM, OAEP, P3KRBiN, *CIAE,CNEA, LNMRI, NIST, NPIC*	2000.3 to 2000.7 – approved for equivalence (August 2004)
APMP.RI(II)-K2.Ce-139	Activity of radionuclide ^{139}Ce	NMIJ	BARC, INER, KRISS, NIM, NMIJ, OAP, PSKRBiN, *CSIR, VNIIM*	2004.1 to 2005.1 – in progress
APMP.RI(II)-S1.Cl-36	Surface emission rate of large area source	NMIJ	AIST, INER, KRISS, *CSIR,PTB NIST, VNIIM*	2000.7 to 2002.12 – measurements completed
APMP.RI(II)-S2.Ho-166m	Response function of ion chamber PA/r(E)/Ho-166m	NMIJ	AIST, BARC, INER, KRISS, OAEP, P3KRBiN	2002.4 to 2004.3 – in progress

The APMP.RI(I)-K4 comparison for absorbed dose from Co-60 gamma radiation was completed as far as the collection of results was concerned in August 2000, but it is yet to be reported in a publishable form. The comparison coordinator has retired and the data has been recently reviewed to complete the report.

The APMP.RI(I).K1 comparison for air kerma from Co-60 gamma radiation has been planned for nearly 4 years. The protocol was ratified by the CCRI in June 2003 but the comparison commenced in August 2004 after a delay due to damage to one of the two NE2571 ionization chambers sent by ARPANSA to the coordinating laboratory KRISS. KRISS replaced it with a PTW chamber of their own. A third chamber (NE2571) was supplied by INER (Taiwan). Six laboratories have completed the measurements.

4. Other matters

The TCRI now has its own webpage hosted by the INER (Taiwan) website, to encourage communication and to list the TC's activities. Its address is http://nrsl.iner.gov.tw/tcri-home-e.asp. At the present time, there are no links to the TCRI page from the APMP website.

The 4th meeting of TC Chairs in the APMP region was held in Bangkok, Thailand, on May 19-21. This provided useful discussions of the CMC review process and problems that have been experienced in the different TCs. The procedures to be followed in the APMP for review and acceptance of quality systems required by the MRA were also presented and discussed. The 5th meeting was held at the time of the 20th APMP General assembly in Bejing and the 6th meeting will be held in Bangkok in the last week of May 2005.