

Activities of TCM to the DEC Economies

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A) Final report APMP.M.M-K6 Comparison of Mass standards multiples and submultiples of the kilogram 1 kg, 500 g, 20 g, 2 g and 100 mg (Class OIML E2) ¹

Coordinated by: Vietnam Metrology Institute, The Mass Laboratory - Vietnam Metrology Institute, 8 Hoang Quoc Viet – Cau Giay – Ha noi (Viet Nam) and Assisted by: National Measurement Institute, Australia. The list of participants are :

1. Vietnam Metrology Institute (VMI)
2. South Africa National Metrology Laboratory (CSIR-NML, CSIR for short)
3. Syria National Standards and Calibration Laboratory (NSCL)
4. National Measurement Institute, Australia (NMIA)
5. Industrial Technology Development Institute (ITDI)
6. National Institute of Metrology Thailand (NIMT)
7. Mongolia Agency for Standardization and Metrology (MASM)
8. Egypt National Institute for Standards (NIS)
9. Measurement Units, Standards and Services Department (MUSSD)
10. Nepal Bureau of Standards and Metrology (NBSM)
11. National Physical Laboratory of India (NPLI)
12. National Physical & Standards Laboratory of Pakistan (NPSL)
13. Indonesian Institute of Sciences (KIM-LIPI)
14. Industrial Laboratory Center of Cambodia (ILCC) formerly Cambodia Department of Metrology (DoM-MIME)

Final report : This report summarizes the results of a comparison of Mass Standards conducted between fourteen participating members of the Asia-Pacific Metrology Program. Two weights sets with five nominal mass values: 1 kg, 500 g, 20 g, 2 g, and 100 mg (OIML Class E2) were used as travelling artifacts. These nominal values were chosen as they followed the nominal values of CCM.M-K1 and CCM.M-K2 except the 10 kg. The program was sponsored by Physikalisch-Technische Bundesanstalt (PTB) and Vietnam Metrology Institute, VMI was the coordinating laboratory with National Measurement Institute (NMIA) being a technical assisting laboratory as well as a link

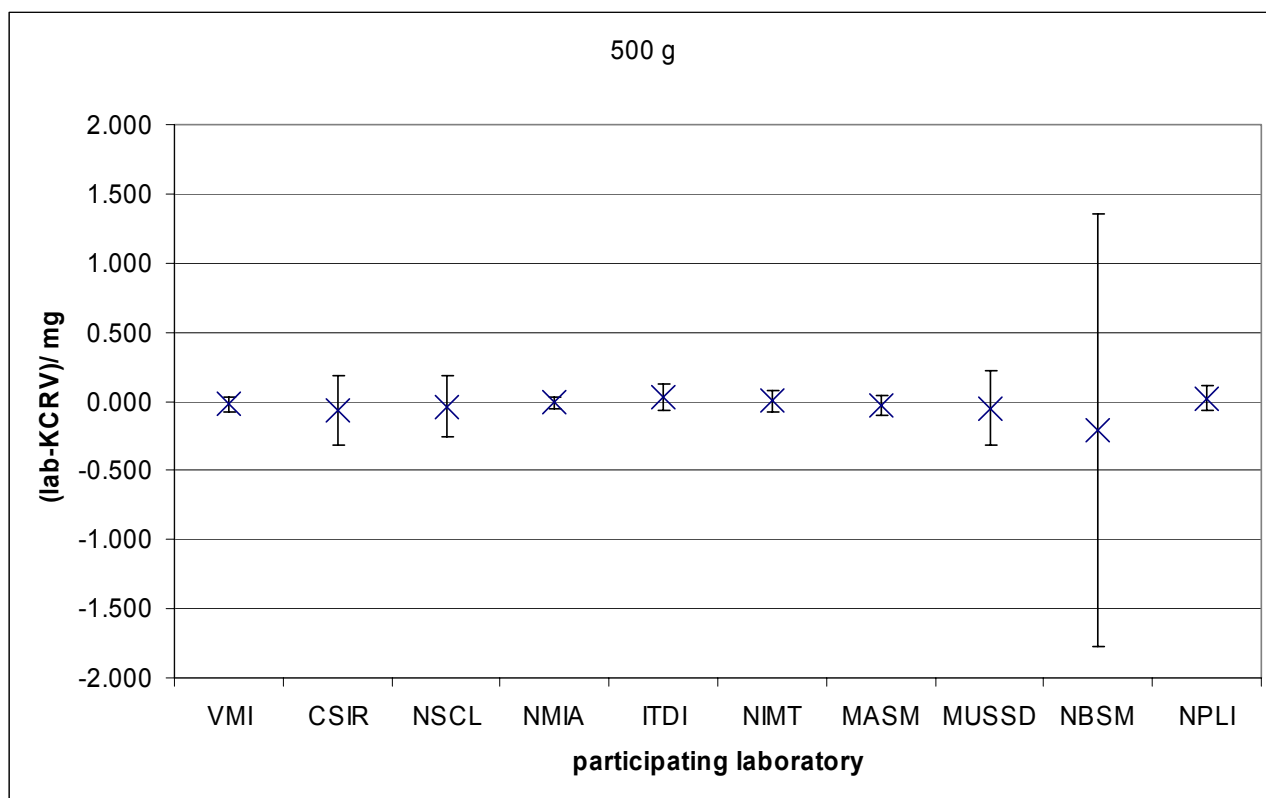
¹ The Draft B report was sent Dr Philippe Richard, Chair of the working group on mass of the CCM. He suggested a few minor modifications. After incorporating his comments, it was sent to Dr. Claudine Thomas, Coordinator, KCD, BIPM on 10th October, 2008. She has promised to upload as early as possible.

laboratory to the CCM comparisons. The comparison was carried out from May 2005 to November 2006.

Conclusion

The majority of the results of the participating laboratories are consistent with each other and with the KCRVs of CCM.M-K1, CCM.M-K2 and APMP.M.M-K1. These participating laboratories have demonstrated their measurement capabilities of OIML Class E₂ weights.

Figure 1: Mass values assigned by the participating laboratories with bars representing expanded uncertainties. Zero mass value corresponds to the key comparison reference value of CCM.M-K2. The uncertainty of the reference value is 8 µg (k=2).



B) PTB / APMP-DEC pressure comparison:

The pressure comparison project will provide an opportunity for the DEC NMIs which have no earlier experience in any pressure comparison to become prepared for a comparison and gain greater confidence in their measurement capabilities towards achieving international recognition. The first meeting between PTB and NML-SIRIM was conducted at NML, Sepang on 16 February, 2007 to discuss about the necessary preparation of the DEC comparison. The meeting also discussed on a draft of invitation letter and a questionnaire form prepared by PTB. NML-SIRIM compiled all responses from 8 interested DEC members [i.e. NBS (Nepal), NIMT (Thailand), NCSL (Syria), NPSL (Pakistan), VMI (Vietnam), KIM-LIPI (Indonesia), ITDI-NML (the Philippines), DPR

(Korea) and MUSSD (Sri Lanka)]. The APMP-DEC Preparatory Workshop was held at the National Metrology Laboratory, SIRIM Berhad (NML-SIRIM), Sepang from November 5 to 7, 2007 with the support of APMP-TCM and PTB. All participating NMIs presented a country report on the current status of their measurement capabilities. At the same time, they were requested to confirm their measurement capabilities based on what they had officially declared in the questionnaire form. Based on the current needs, participating NMIs agreed to have pressure comparisons (unofficial and official) using a 100 MPa hydraulic pressure transducer; instead of 10 MPa pressure transducer that has been agreed earlier. PTB agreed to provide a suitable pressure transducer of 100 MPa range as a transfer standard for a replacement. There are three NMIs among the participating NMIs (in this preparatory workshop) which have never participated in any key comparison before. They are NML-ITDI, NPSL and MUSSD. These NMIs need some technical assistance from other NMIs to prepare themselves better for the forthcoming intercomparison. Three NMIs have voluntarily agreed to provide some technical assistance for the needy participating NMIs. An arrangement of this technical assistance is tabulated in Table 3 below.

Table – 1 : An arrangement of the technical assistance to be provided

No.	Needy NMI	Volunteering NMI
1.	NML-ITDI, Philippines	NIMT, Thailand
2.	NPSL, Pakistan	NML-SIRIM, Malaysia
3.	NBSM, Nepal	NPL, India
4.	BSTI, Bangladesh	
5.	MUSSD, Sri Lanka	

The APMP-TCM Chair contacted KIM-LIPI, MUSSD, BSTI, JNMI and NIS and invited them to join this exercise. NIS and JMM rejected the request. A final draft of measurement protocol has been prepared by Dr. Wan Abd Malik Wan Mohamed with the help of Dr. Wladimir Sabuga and circulated to the members.

Current Status of Circulation of the Transfer Standard

The comparison started as scheduled in March 2008 with PTB completing the first measurement towards the end of the same month and despatching it to NML-SIRIM as the next laboratory. The movement of the transfer standard to date is as shown in Table 2 below:

Table 2: Movement of the transfer standard to date

No.	NMI	Economy	Arrival Date	Departure Date
1.	PTB	Germany	-	27 March 2008

2.	NML-SIRIM	Malaysia	7 April 2008	6 May 2008
3.	KIM-LIPI	Indonesia	3 July 2008 ²	31 July 2008
4..	VMI	Vietnam	20 August 2008	9 September 2008
5.	NIMT	Thailand	18 September 2008	4 October 2008
6.	NSCL	Syria	Awaiting arrival	

Table -3 : Future Plan of Intercomparison

No.	Period of Measurement	Economy	NMI	ATA Carnet
9.	November, 2008	Germany	PTB	Yes
10.	December, 2008	Malaysia	NML-SIRIM	Yes
11.	January, 2009	Philippines	NML-ITDI	No
12.	February, 2009	Pakistan	NPSL	Yes
13.	March, 2009	Sri Lanka	MUSSD	Yes
14.	April, 2009	Bangladesh	BSTI	No
15.	May, 2009	Nepal	NBSM	No
16.	June, 2009	Malaysia	NML-SIRIM	Yes
17.	July, 2009	Germany	PTB	Yes

C) Status report APMP.M.M-S1 program:

The third meeting of the Standing Group on Standards, Quality Control and Measurements held on (18 and 19th May, 2004 at New Delhi, India, has decided to have inter-laboratory comparisons in the SAARC region for the standards of Mass. With the financial support of PTB, Germany, first preparatory workshop for inter laboratory comparison was held on 28th and 29th August, 2006 at National Physical & Standards Laboratory (NPLSL) Islamabad, Pakistan and second such workshop on 8th and 9th December 2006 and also February, 2008 at National Physical Laboratory, New Delhi, India. It was agreed that for the Mass Comparison the pilot laboratory will be NPSL, Pakistan. The inter laboratory comparison in Mass Standards in the SAARC region will be similar to that of APMP.M.M-K6 and uses a set of three weights of nominal mass 1000g, 20g, 100mg of Class E2 while the participating laboratory can use their F1 or F2 class weights in this inter comparison. The participating laboratories are NPSL-Pakistan, NPL-India, MUSS-SriLanka, BSTI- Bangladesh, NBSM-Nepal.

² NML-SIRIM completed the measurements in April 2008 and despatched the transfer standard to Indonesia in early May 2008. However, there was a delay of almost two months before KIM-LIPI managed to clear the transfer standard with the Indonesian customs. During this transition it was discovered that the ATA Carnet could not be traced. KIM-LIPI is currently making all efforts to trace the ATA Document with its appointed transportation agent. In the meantime the transfer standard has moved on to Vietnam and Thailand after the measurements in Indonesia. NSCL, Syria is now awaiting its arrival from Thailand.