



## **Report from APMP Technical Committee for Acoustics, Ultrasound and Vibration (TCAUV)**

Dr. Takashi USUDA, Chair of APMP/TCAUV

### **TCAUV Membership and Meetings**

The APMP TCAUV has active members from NMIs of 12 regional full member economies (Australia, China, Chinese Taipei, Hong Kong, India, Indonesia, Japan, Korea, Malaysia, Singapore, Thailand and Vietnam) and 2 associate member economies (Egypt and South Africa). The TCAUV was created in 1999 and holds annual meetings just prior to the annual APMP General Assembly meetings. The 10th TCAUV meeting was held in December 2009 in Malaysia and the next meeting is due on 15-16 November 2010 in Thailand

The current Chairperson of the APMP TCAUV is Dr. Takashi USUDA of NMIJ elected at the APMP GA in 2009 for the term until the GA in 2011.

### **Regional Key and Supplementary Comparisons**

#### **APMP.AUV.A-K3 Comparison of LS2P Microphone Calibrations**

This regional Key Comparison involves determination of pressure sensitivity of two LS2P microphones in the frequency range 63 Hz to 20 kHz with 31.5 kHz as the optional frequency. KRISS, Korea is the pilot laboratory and ten NMIs from the APMP region (CMS/ITRI, KRISS, NIM, NIMT, NMIA, NMIJ, NML-SIRIM, NPLI, SCL, A\*STAR) are participating. Draft B of the report has been reviewed by the participants. Circulation to the CCAUV members is delayed due to recalculation of linking value.

#### **APMP.AUV.A-K3.1 Comparison of LS2P Microphone Calibrations**

A bilateral comparison of pressure sensitivity calibration of an LS2P microphone has been performed between the KRISS, Korea and KIM-LIPI, Indonesia, in 2008, with KRISS acting as the pilot laboratory. The Draft B report will be presented at the CCAUV meeting in 2010.

#### **APMP.AUV.A-S1 Supplementary Comparison on Multi-frequency Sound Calibrator**

This Supplementary Comparison was started on 1 September 2008. Started with eleven NMIs, and then thirteen NMIs from the APMP region (NIMT, NMIA, SCL, KIM-LIPI, CMS/ITRI, SIRIM, NIM, KRISS, A\*STAR, NMIJ, NPLI) including South Africa (NMISA) and Egypt (NIS) are participating. NIMT, Thailand is acting as the pilot laboratory. The artefact consists of a Bruel & Kjaer type 4226 multifunction acoustic calibrator. The measurands are generated sound pressure level (dB) at nominal 94 dB and 114 dB settings, output frequency (Hz) and total distortion (%). The frequencies for measurements are: 31.5, 63, 125, 250, 500, 1000, 2000, 4000, 8000, 12500 and 16000 Hz. The measurement at each NMI has been finished on March 2010. The artefact returned to NIMT each time two participants had completed their measurements to monitor its stability. The draft A report will be discussed during APMP meeting in November.

#### **APMP.AUV.V-K1.1 Comparison of Charge Sensitivity of Accelerometers**

This regional Key Comparison involves determination of charge sensitivity of single-ended and back-to-back accelerometers in the frequency range 40 Hz to 5 kHz. NMIJ, Japan is the pilot laboratory and two NMIs (NIMT and A\*STAR) participated. Measurements were completed in 2009 and Draft A of the report was reviewed at the APMP meeting in 2009. Due to the sensitivity shift occurred on single-ended accelerometer during the comparison, it was decided to start over the measurements again. The protocol was also slightly changed due to improvements of the participant including a new participant of CMS/ITRI. A new accelerometer set of single-ended and back-to-back accelerometer is provided for the comparison by NMIJ. The circulation will start in October 2010 after the acceptance of the protocol at the CCAUV meeting in 2010.

#### **APMP.AUV.V-K1.2 Comparison of Charge Sensitivity of Accelerometers**

This regional Key Comparison involves determination of charge sensitivity of single-ended and back-to-back accelerometers in the frequency range 40 Hz to 5 kHz. NIM, China is the pilot laboratory and two NMIs (KIM-LIPI and NPLI) participated. Measurements were successfully finished in 2009 and Draft B report has been published in March 2010. The results of this APMP KC have been approved for equivalence and linked to CCAUV.V-K1 via pilot laboratory as the foundation of the participating NMIs for their registration of CMC in the framework of the CIPM MRA.

#### **CMC Reviews and Additions**

- CMC submission from NIM, China in vibration and acceleration was posted for inter-RMO review.
- CMC submission from NPLI, India in acoustics was approved and published in the KCDB (Appendix C) on October 2009. Their vibration CMC has been pending. With the completion of Draft B report of the APMP.AUV.V-K1.2, the vibration CMC of NPLI will be able to proceed to the next stage of the approval.
- CMC submission from SCL, Hong Kong China of the improvements in acoustics was approved and published in the KCDB (Appendix C) on August 2009.
- CMC submission from KRISS, Korea of the improvements in acoustics and vibration was approved and published in the KCDB (Appendix C) on January 2009.
- Technical peer reviews of NIM, KIM-LIPI, SIRIM and NMIA by technical experts from other NMIs were completed or planned during the last and coming year.

#### **Other Topics**

- TCAUV meeting along with the 26th APMP GA at Pattaya, Thailand will be held in the week of 15th November, 2010. It is also noted that IMEKO-TC22 (Vibration Measurement) Congress with other two TCs (TC3 Measurement of Force, Mass and Torque and TC 5 Hardness Measurement) will be held in the next week at the same venue. A workshop will be held on 19<sup>th</sup> (seminars and discussions) and 20<sup>th</sup> (lab visit) November. This workshop is also opened to non-APMP-members.
- Feasibility of some new key comparisons (e.g. Ultrasound Power, Low Frequency Vibration and Acceleration) are under discussion among members.
- Problems are said that the many developing NMIs do not have basic acoustic and vibration metrology capability due to lack of facilities.

October 2010