

## **1. General Aspects**

This report summarizes activities of the Technical Committee for Acoustics, Ultrasound and Vibration (TC AUV) in 2012.

All TC AUV activities are organized in the following way: general issues are within the responsibility of the Technical Committee and technical issues are handled within the three Sub-Committees (SC) covering different subject fields. The activities of each Sub-Committee are coordinated by the appointed Convenor. The membership within Sub-Committees is as follows:

SC "Acceleration and Vibration"	: 15
SC "Sound in Air"	: 16
SC "Ultrasound and Underwater Acoustics"	: 4

All in all, the TC AUV has representatives from 25 of the 38 members of EURAMET.

## **2. Projects**

New project proposals have been discussed, and these may be formalised in the near future. Projects that are labelled as "comparisons" are mentioned below identified by the corresponding EURAMET project number.

## **3. Comparisons**

### **3.1. Key Comparisons**

NMIs from EURAMET are participating in the following CCAUV comparison:

**CCAUV.A-K5 "Comparison of laboratory standard microphone calibrations."** This key comparison is an update of CCAUV.A-K1 but with enhanced scope. Among the participants from EURAMET there are four NMIs: DFM (DK); GUM (PL); INRIM (IT); NPL (UK); and one Designated Institute: BKSVDPLA (DK). The comparison is piloted by NPL. The draft B report is to be produced.

**CCAUV.U-K3 "Ultrasonic power."** This key comparison covers the measurement of the time-averaged, ultrasonic power output of an ultrasonic standard transducer. Among the participants there are four NMIs from EURAMET: INRIM (IT), NPL (UK), PTB (DE), and UME (TR).

**CCAUV.U-K4 "Comparison of laboratory reference hydrophone calibrations."** This key comparison is an update of CCAUV.U-K2 but with enhanced scope. The participating EURAMET NMIs are NPL (UK), and PTB (DE).

**CCAUV.V-K2 "Complex charge sensitivity, measurement according to ISO 16063-11."** developments in technology and improvements at the NMIs expanded the general range of the calibration capabilities currently available. Therefore during the meeting of CCAUV in 2008 the decision was taken to make preparations for a further KC with an appropriately extended measurement range.. Among the participants from EURAMET there are 6 NMIs: CMI (CZ), GUM (PL), LNE (FR), METAS (CH); PTB (DE), UME (TR); and one Designated Institute: BKSVDPLA (DK). The measurement round is in progress. The comparison is piloted by PTB.

The following EURAMET AUV comparisons are in progress:



**EURAMET.AUV.A-S1** (EURAMET project 1126). Comparison of pressure reciprocity calibration of microphones among CENAM (MX), DFM (DK), DMDM (RS), and INM (RO). The role of Pilot laboratory is undertaken by DFM and CENAM. The draft B report has been sent to the CCAUV, and final modifications are underway. It is expected that the draft B is approved and published in the KCDB.

**EURAMET.AUV.V-S1** (EURAMET project 1204). 9 NMIs participate CEM (ES), CMI (CZ), GUM (PL), INRIM (IT), LNE (FR), METAS (CH), MIKES (FI), PTB (DE), SP (SE), and one Designated Institute BKSVDPLA (DK). LNE is acting as the pilot of the comparison.

EURAMET NMIs are also involved in the following key comparison within other RMO.

**COOMET.AUV.V-K1**: 3 participants from EURAMET (GUM, UME, INM). VNIIM (RU) is the pilot of the comparison. The Measurement stage has been completed. The Draft A of the comparison report is under preparation.

### 3.2. Bilateral Comparisons

There are three bilateral comparisons underway at different stages.

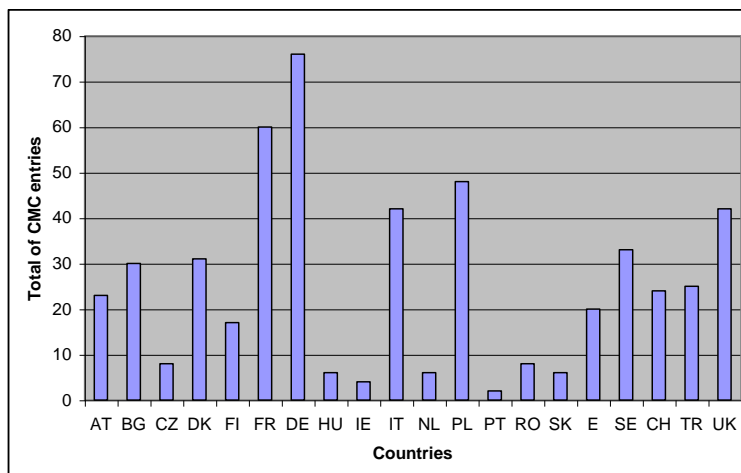
**EURAMET project 1062**: Bilateral comparison in hydrophone calibration up to 50 MHz between NPL (UK) and PTB (DE).

**EURAMET.AUV.V-K1.2** (EURAMET project 1066) is a comparison on the calibration of accelerometers between METAS (CH) and PTB (DE). This comparison has been approved for equivalence and the results published in the KCDB.

**EURAMET project 1142**: Bilateral Comparison of Accelerometer Calibration between MIKES (FI) and SP (SE). This project has been finished and the final report is to be used as supporting evidence for a CMC batch to be submitted by MIKES.

## 4. CMCs

A total of 20 EURAMET countries have CMC entries approved and published on the BIPM KCDB. The overall number of published CMCs is above 500. The distribution by country is shown in the figure below.





A batch from BMI, Bulgaria has been received, and it is under preparation for submission to intra-regional review. However, this batch may be problematic since it is known for the TC that the person in charge of some of the services is no longer working at BMI. Another batch from DMDM is waiting for the EURAMET.AUV.A-S1 Comparison to be finished. A CMC Batch from Spain has been recently approved and published in the KCDB. Finally, a batch from LNE concerning free-field calibration will be soon submitted to intra-regional review.

In 2012 several batches containing CMCs from NMIs from other RMOs have been reviewed by the TC's Working Group. All these batches have been approved or the review process is underway without further complications.

## **5. Activities of the Sub-Committees**

The activities of each Sub-Committee are coordinated by the appointed Convenor. The level of participation in Sub-Committees varies significantly. Each Sub-Committee meets annually. The work of the Sub-Committees is reflected mostly in the many EURAMET joint projects. The Sub-Committees were confirmed during the joint BoD-TCC meeting in Delft, The Netherlands in March 2013.

During the TCAUV meeting in May 2013, Thomas Bruns announced his decision to step down as Convenor for the Sub-Committee for Vibration and Acceleration. The Sub-Committee elected by acclamation Claire Bartoli (LNE) as the new Convenor. The Convenors for the Sub-Committees for Sound in Air, Claudio Guglielmo (INRiM) and for Ultrasound and Underwater Acoustics, Stephen Robinson (NPL) were confirmed in their posts.

## **6. Participation in EMRP**

The TCAUV participates actively in the EMRP. There is an active JRP from the 2010 Call, and two JRP from the 2011 call had already started.

The project IND09 Dynamic (Call 2010 Industry) is concerned with the generation of the knowledge and infrastructure needed for establishing and ensuring the traceability for the mechanical quantities force, torque and pressure for measurements under dynamic conditions.

The project HLT01 Ears (Call 2011 Health II) is concerned with the metrology underpinning the development of a universal ear simulator and methods for quantifying the perception of non-audible sound.

The project HLT03 DUTy (Call 2011 Health II) is planned to start in 06/2012 deals with the challenges of establishing the metrological basis for therapeutic ultrasound.

Two proposals were submitted to the 2102 call. One concerned with the development of acousto-optical measurement methods for Sound in air and Underwater Acoustics, and another with the realisation of the Acoustic Watt. The latter was successful while the first one was not considered for funding.

Several PRTs concerned with noise pollution from windmills have been submitted by diverse stakeholders for the call 2013.



## 7. Roadmapping

A set of roadmaps and explaining documents has been produced by the Sub-Committees with the hard work from all Technical Contacts. It is the general impression among Contact Persons that the challenges described in the current roadmaps fit very well with the objectives of the EMPIR. No activities other than the continuous updating of these documents are expected to occur.

## 8. Meetings

The TCAUV and the three Sub-Committees meet typically on a yearly basis. In 2012 the joint meeting of the TCAUV, and all three Sub-Committees was held in the 15<sup>th</sup> -17<sup>th</sup> of May. The meeting was hosted by the Czech metrology Institute (CMI) in Prague, Czech Republic.

Once again, the experience of holding a joint meeting of the TC and the Sub-Committees has been positive, and now the TC and the SCs will continue meeting in this way, although with some small changes in the format. Such changes will be aimed to increase the dynamics of the meeting while keeping the overall objectives of exchanging technical experiences, and networking. The next meeting will be held in Torino, hosted by the INRiM in May 2014.

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May 2013  
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