

# Asia Pacific Metrology Programme

## APMP Report

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**CMS/ITRI**

**Chinese Taipei**

the 15th CCAUV meeting

25-27 Nov 2015

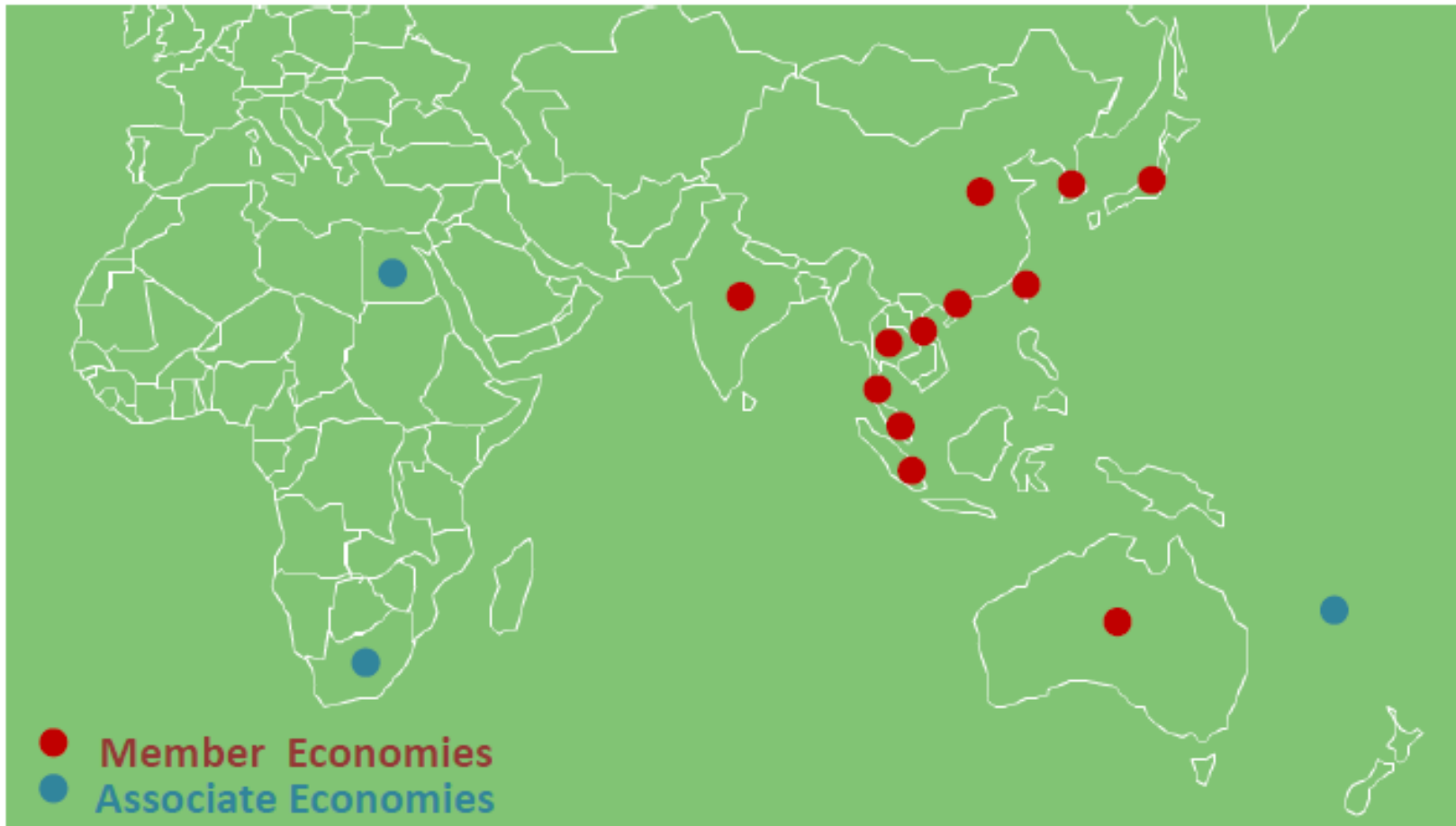


# Outline

- **APMP TCAUV**
- **CMCs in AUV**
- **Comparisons**
- **APMP TCAUV Activities**
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# APMP TCAUV



**Australia, China, Chinese Taipei, Hong Kong,  
India, Indonesia, Japan, Korea, Malaysia, Nepal,  
Singapore, Thailand and Vietnam**

**Egypt, Fiji and South Africa**



# CMCs in AUV



## CMCs in AUV

No.	Economy	Laboratory	Before 2013	Up to date	A	W	V	Status
1	Australia	NMIA	23	23	13		10	
2	China	NIM	53	53	19	3	31	
3	Chinese Taipei	CMS	39	39	21		18	
4	Hong Kong	SCL	15	15	15			
5	India	NPLI	34	34	23		11	
6	Indonesia	KIM-LIPI	15	15	15			
7	Japan	NMIJ	8	8	4		4	
8	South Korea	KRISS	41	41	33		8	
9	Malaysia	NML-SIRIM	21	21	8		13	
10	Thailand	NIMT		18	18			
11	Singapore	A*STAR						Preparation
12	Vietnam	VMI						
<b>Total</b>			<b>249</b>	<b>267</b>	<b>169</b>	<b>3</b>	<b>95</b>	



# CMCs in AUV



Inter-RMO review

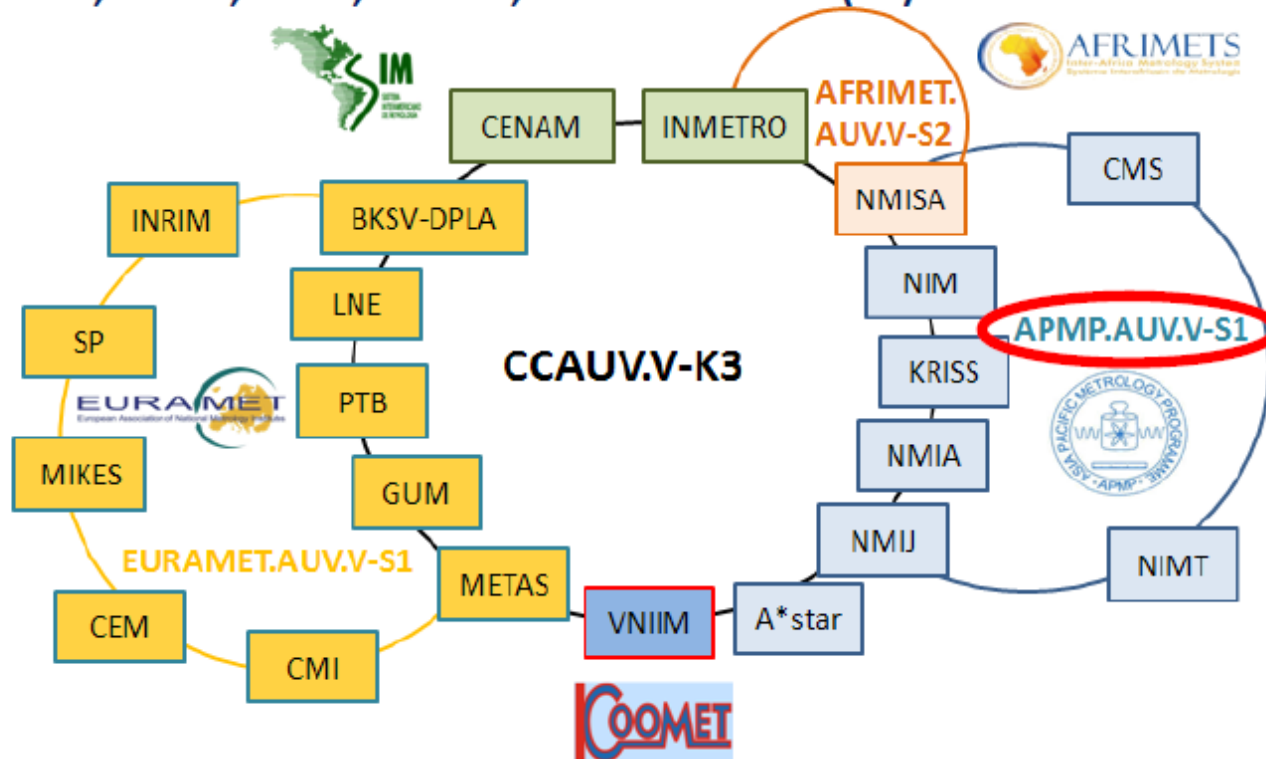
**EURAMET.AUV.16 completed**



# Comparisons

CC Level

- **CCAU.V-K3**      **2013-2015**      *low-frequency vibration comparison*  
with **BKSV-DPLA**, **CENAM**, **GUM**, **INMETRO**, **KRISS**, **LNE**, **METAS**, **NIM**, **NMC**, **NMIA**, **NMIJ**, **NMISA**, **PTB** and **VNIIM** (14).



# Comparisons

TC Level

- **APMP.AUV.A-S1** *Published*  
with NMC A\*STAR, CMS, KIM-LIPI, KRISS, NIM, **NIMT**, NIS, NMIA, NMIJ, NMISA, NML-SIRIM, NPLI and SCL as participants (**13**).
- **APMP.AUV.V-K1.1** *Draft B*  
with NMC A\*STAR, CMS, NIMT and **NMIJ** as participants (**4**).
- **APMP.AUV.V-S1** *Published*  
with CMS, KRISS, **NIM**, NIMT, NMIA, NMIJ and **NMISA** as participants (**7**).



# Comparisons

## TC Level

- APMP.AUV.A-P1 *in progress* *Sound level meter in the free field*  
with KRISS and NIM as participants (2).
- APMP.AUV.A-P2 *Draft B* *Multi-frequency acoustic calibrator*  
with NMC A\*STAR and DPLA as participants (2).
- APMP.AUV.V-P1 *Published* *Shock acceleration*  
with CMS, NIM, NIMT, and SPEKTRA as participants (4).



# TCAUV Activities

Three challenging areas in the fields of A, U and V

◆ **Health**

➔ **Diagnostics, Therapy, Hearing assessment, etc.**  
*Ultrasound and Acoustics*

◆ **Industry**

➔ **Automotive, Aerospace, Equipment manufacturers, etc.**  
*Acoustics and Vibration*

◆ **Environment**

➔ **Air-borne environmental noise, Marine noise pollution, Earth quake monitoring, etc.**  
*Acoustics and Vibration*

# TCAUV Activity\_ Health

2015 TCI project: **Workshop on acoustics and ultrasound metrology for health and medical related application**

## TCAUV Workshop, Technical visit and hands-on training

Sep 21 to 25, 2015  
in Changsha, China

- **Participants: 29**  
including **11** from other economies
- **NMIs: 8**  
A\*STAR, CMS, KIM-LIPI, KRISS, NIM, NIMT, NMIJ, and NMIM.
- **Shareholder & manufacturer: 9**
- **Sessions: 5, including 19 presentations**
- **On-site technical tours: 3**
- **Hands-on training: 1**



# TCAUV Activity\_ Industry

Strategy Document for Rolling Programme Development for 2013 to 2023

The Consultative Committee for Acoustics, Ultrasound and Vibration

## 7.V Vibration

Sub-area/ Reference No.	Description	Rationale	How far the light shines	Expected start
Vibration sine-excitation	Comparison of primary calibration in magnitude and phase	Coverage of traditional calibration services in acceleration	0.1 Hz to 200 Hz This will be a regular KC to be repeated in 8 y intervals (subject to discussion)	2013/14
Vibration sine-excitation	Comparison of primary calibration of magnitude and phase	Coverage of traditional calibration services in acceleration	40 Hz to 10 kHz This will be a regular KC to be repeated in 8 y intervals (subject to discussion)	2013/14 2021/22
<u>Vibration: Shock excitation</u>	Primary calibration with parameter identification	Increasing number of NMIs with the capability and demand for CMCs	100 m/s <sup>2</sup> to 10 <sup>5</sup> m/s <sup>2</sup> This will ultimately be a regular KC to be repeated in an 8 year interval. The precondition is a validated procedure and possibly a pilot study: <b>This area may be split into high intensity shock and low intensity shock</b>	2014/15 2021/2022

13

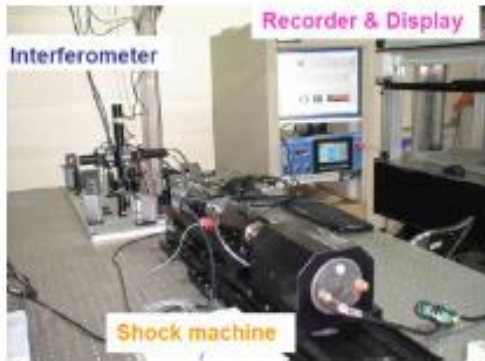


Assessment Program

# TCAUV Activity\_ Industry

## By comparison

- APMP.AUV.V-P1 2013-2014 *low-intensity shock comparison*  
CMS, NIM, NIMT, and SPEKTRA as participants (4).



**Note:**  
Self-developed and commercial types with laser interferometry are employed in the comparison.

**APMP.AUV.V-P1 2013-2014**

Shock Sensitivity from 500 to 5000 m/s<sup>2</sup>



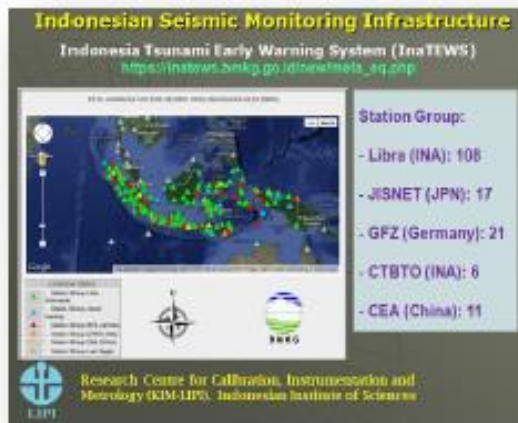
**CCAUV.V-K4 ?**

Shock Sensitivity from ? to ? m/s<sup>2</sup>

# TCAUV Activity\_ Environment

## Workshop on vibration and shock metrology for earthquake related application

- Follow-up of APMP DEC Project 2014
  - NIMT further developed their low-frequency vibration capability in 2015  
68 out of 254 seismometers national-wide are calibrated.
  - KIM-LIPI undergoing project on low-frequency vibration capability in 2015.



# TCAUV Activity\_ 2016 TCI

The technology of **transportation** has been continuously and rapidly developing. Technology of acoustics, ultrasound and vibration measurement applications is necessary for determining the quality of **product and public safety in transportation industry**.

National Institute of Metrology (Thailand)

**Title of Project:**

***“The application of acoustics, ultrasound and vibration metrology in **transportation industry**”***



# TCAUV Activity\_ Task force

- Five focus working groups

**Energy Efficiency, Medical Diagnostic Equipment, Climate Change, Food Safety and Clean Water.**

- The *medical diagnostic equipment focus group* is closely related with TCAUV.
- Two experts from KRISS and NIM China with different backgrounds to join the focus group for a more active role of TCAUV.





**Thanks for your  
attention**

