4th APMP NMI Directors' Workshop

"Measurement's role in addressing global challenges and ensuring the future relevance and sustainability of NMIs"

27th November 2013

Taipei International Convention Center (TICC), Chinese Taipei

1. BACKGROUND

The Asia-Pacific Metrology Programme (APMP) conducts an "NMI Directors' Workshop" in association with its annual meetings with the goal of providing an ***interactive*** forum for Directors from APMP member NMIs to discuss issues of mutual importance both at economy and regional levels.

- 1st workshop, Nov 2010, Thailand: with 26th annual APMP meetings
- 2nd Workshop, Dec 2011, Japan: with 27th annual APMP meetings;
- 3rd Workshop, Nov 2012, NZ: with 28th annual APMP meetings.

Feedback from these Workshops has endorsed their value in enabling face-to-face interaction and discussion on a focused topic of general interest/importance. The 4th Workshop was held during the 29th General Assembly and related meetings of APMP in Chinese Taipei in November 2013. The topic was: **"Measurement's role in addressing global challenges and ensuring the future relevance and sustainability of NMIs"**.

The Workshop was conducted at the Taipei International Convention Centre for half a day on Wednesday, 27th November 2013. Twenty-three participants attended the workshop, comprising NMI Directors from 17 APMP member economies or their representatives, as well as representatives of the CIPM and the APMP Executive Committee. [1]

The Workshop was sponsored by Dr Peter Fisk (Acting APMP Chairman) and facilitated by Dr Angela Samuel (NMI, Australia). Mrs Noleen Grogan, APMP Secretary, was the scribe for the Workshop.

2. OBJECTIVES AND TIME SCHEDULE

Specific objectives of the 4th NMI Directors' Workshop were to:

1. Exchange information and ideas on how NMIs are addressing the "grand challenges";
2. Review national strategies to ensure the ongoing relevance and sustainability of NMIs; and
3. Explore views on the role of the NMI, APMP and the global metrology community to address issues.

The Workshop was run from 13.30 to 17.00 pm and comprised the following sessions:

- Welcome and introduction of the 4th Workshop.
- Presentations on the Workshop topic from the global and national perspective and associated discussion (see Agenda)
- Participants divided up into smaller groups for more in-depth discussion focused on the Workshop objectives; reporting back to the full meeting on results of these discussions.

Workshop Agenda

Time	Activity
13:30	**Introductions**
13:40	**Opening Address** by Dr Peter Fisk, Acting APMP Chairman
13:50	**Workshop introduction** by Dr Angela Samuel, Facilitator

[1] List of Participants is attached.

14:00	**Global and National Perspectives** (15 mins each) • Mr Andy Henson, BIPM • Dr Peter Fisk, NMI, Australia • Dr Amitava Sen Gupta, NPL, India • Dr Thomas Liew, NMC-A*STAR, Singapore
15:15	**Sub-Group Discussions**
16:30	**Sharing of discussion results in plenary, outputs and proposed actions**
16:50	**Conclusion and Closing** by Dr Peter Fisk

3. SUMMARY OF ACTIVITIES

In introducing the Workshop, Dr Samuel noted that one of the actions following the first Workshop had been to ask participants for priority issues they wished to have as the subject of future Workshops. Each Workshop held since has focused on one of the identified priorities – this 4th Workshop included. The topic of the 4th Workshop is particularly important in light of the ongoing and increasing need for NMIs, not only in the Asia Pacific, to present the case for the relevance and importance of metrology to government and other national stakeholders in terms of societal impacts rather than using traditional metrological arguments.

Global and National Perspectives on Addressing the "Grand Challenges" and the future relevance and sustainability of NMIs

Four speakers were invited to provide brief perspectives at the global and national levels on the addressing the grand challenges (eg, health, environment, energy, food) and the future relevance and sustainability of NMIs. These presentations were intended to provide a context/thought-points for the sub-group discussions following. ***Mr Andy Henson*** (BIPM) provided perspectives at the global level as well as drawing on his extensive experience as one of the key architects of the European Metrology Research Programme (EMRP). The other three speakers provided perspectives at the national level:

- ***Dr Peter Fisk***, NMI, Australia,
- ***Dr Amitava Sengupta,*** NPL, India, and
- ***Dr Thomas Liew***, NMC-A*STAR, Singapore

All four presentations have been posted on the APMP website, in the "NMI Directors" webspace.

Key points raised during the presentations are summarised below.

<u>Global context: Andy Henson</u>

Andy firstly noted that he was also providing his personal views and then highlighted the following:

- Noting metrology's importance in underpinning almost every aspect of daily life and experience, NMI Directors have to make this link from what is done in our laboratories to what is needed in the outside world.
- Metrologists need to articulate the value of measurement in ways that can help others understand metrology's significance.

- EMRP emphasizes this linkage to convince governments of the relevance of metrology to the real issues faced by the region, whether this was energy security, climate change, food security, etc.
- How does metrology contribute to achieving others' (eg, governments') objectives? Consider what motivates government in helping forge strategic thinking

Additional comments were invited from the CIPM members present:

Bob Kaarls: The CIPM has charged the Consultative Committees (CCs) to draft strategic working plans for the next 10 years. This is difficult but at least gives some idea about what needs to be done and what resources will be required, including financial resources etc.

- The emphasis needs to be on what we are really delivering to our customers and stakeholders.
- Metrologists cannot work in isolation and need to cooperate with experts from other fields.
- There is the need for more challenging thinking and cooperation. International cooperation is essential – with the support of the RMOs.

Barry Inglis agreed with the need to sell metrology. However, it is important to be mindful of the differences – and advantages – in Europe compared with the Asia Pacific region. A useful strategy would be to access shared funding within the region. Bob added that an important stage in the Asia Pacific is capacity building.
Takashi Usuda noted that is difficult to focus on strategic planning with limited resources in terms of staff and the constraints of existing responsibilities.

Australian context: Peter Fisk

Peter reviewed the recent developments in NMIA's strategic approach, highlighting the following:

- The level of government investment in measurement does not address current and future measurement needs.
- It is clear that using the classical arguments does not work any longer with governments looking more and more for cost savings. These arguments don't help demonstrate how metrology solves real-world societal problems.
- NMIA is now developing an alternative approach by relating metrology to societal "sectors" such as health, environment, and energy. NMIA's activities are being "repackaged" as well as strategically reviewed in this context to make these more identifiably relevant to government and stakeholders both now and into the future.

Indian context: Amitava Sengupta

NPLI also recognizes these issues:

- While the primary function of an NMI is to realize and disseminate the SI Units, governments are not too enthusiastic about this. They are more interested in issues within sectors such as health, environment, etc.
- NPLI has managed to convince the Indian government of the importance of metrology. A few long term research projects have begun, working at the cutting edge of technology and at the highest level of science.
- Metrology in Chemistry is clearly an important new area for NMIs. At NPLI, this has begun with metrology in health.

Singaporean context: Thomas Liew

The context in Singapore is very specific:

- NMC's objectives are to modernise, while being aware of the context of related issues: what are Singapore's measurement needs in the context of its economic needs.
- Singapore's economic sectors (biomedical, electronics, transport, engineering) support the vision of the nation and metrology must feed into this.
- There is strong investment in R&D and innovation. As a measurement institute NMC has a role in supporting the economy by developing new competencies. Metrology is very much identified as a support function.
- The primary focus of Singapore is trade, and metrology is required to support this activity.

Thomas then outlined some of the key metrological challenges:

- Meeting needs for wider range, higher accuracy, lower uncertainty – to align with technological advances which move extremely quickly; to be the pacesetter in many instances;
- Need for more complex measurements;
- Multi-disciplinary measurement methods needed – noting the silo mentality in NMIs based on scientific discipline;
- A big challenge is understanding the problem before trying to solve the issue;
- Limited resources to deal with bigger issues – need for cooperation with other economies, regionally and globally and for domestic partnerships (with universities, other government stakeholders, industry, and other support services).

Q&A Session:

Following the presentations, Angela began the Q&A session by asking for views on strategies in engaging with stakeholders more effectively:

- Andy noted that importance of listening to stakeholders – not imposing your "metrological" views but being receptive to adapting to what *their* needs are;
- Thomas added: By listening you can identify how to match stakeholders' needs to your organisation's capabilities, moving outside your 'silo' to try and solve identified problems.

Peter also noted that, as well as listening, it is important to do the research beforehand and to study the *intent* of relevant policy.

Angela then invited Directors from the developing economies to comment.
Mr Prayoon noted that traceability does not justify funding; the argument needs to be broader, demonstrating what you have done to support government, industry etc.

Mr Rashid commented that, from the Malaysian perspective, in the past it was easy to secure funding. These days, funding is based on outcome-based arguments. Every dollar sought for metrology must identify the end-of-cycle anticipated outcome. These outcomes must be aligned with government policy and objectives. SIRIM needed to identify stakeholders in the relevant sectors. Working with regulators, for example, helped realise government outcomes and, thereby, maintain funding as well as helping in the development of future project proposals and identification of opportunities. The difficulties are to convince government of the importance of R&D in the context of metrology. While there is

a lot said about metrology underpinning innovation, it is hard to pinpoint this and articulate this to government.

Dr Kustikov highlighted that it would help to have a database listing metrological needs so that other institutes can assist with particular problems. Angela advised that the DEC is planning to prepare such a database to share metrological issues.

Sub-Group Discussions

Participants broke up into 4 sub-groups to discuss the following topics, led by members of APMP's Executive Committee:

1. How are NMIs addressing the "grand challenges"?
2. National strategies to ensure the ongoing relevance and sustainability of NMIs.
3. Views on the role of APMP and the global metrology community

Group 1:

The questions and responses posed by Group 1 are summarised below:

How have we benefited from the MRA?

- The MRA supports Free Trade Agreements
- Meeting regulatory requirements – the CIPM MRA provides the basis for accepting measurements relevant to particular industries
- What would we change?
  - We must be careful not to make the MRA too onerous; the processing for establishing CMCs is not expected to have the integrity of a scientific paper; judgement and practical considerations are involved.
  - Is there a way of inferring competencies from CMCs?

How do we communicate with government re: building metrology capability?

- Need to link capability to government priorities
- There is sometimes a reliance on industry revenue to fund development of capability – securing that funding requires a lot of effort from the NMI

Do we only need 3 NMIs in the world?

In developing a national strategy, need to identify what an NMI needs to do *as well as what it doesn't want to do*. It is very difficult to decide the latter: this is an area where APMP could help by pointing to another resource.

Group 2:

Group 2's responses to the 3 issues are summarised below:

1. **Grand challenges:**
   - Better health care at lower cost
   - Environment & Climate Change
   - Food safety and quality - Lack of harmonisation in measurement procedures
   - Energy: green, non-conventional – lack of standardisation
   - Electronics & manufacturing
   - Industrial innovation – MNCs
2. **National strategies:**
   - Environment & energy
   - Delivering traceability to legal metrology departments (often outside the NMI)
   - NMI-stakeholder engagement – needs to be strengthened

- Stakeholder engagement at the global level needs to be translated at the national level
- Awareness raising: Public outreach programs need to be strengthened
- Prioritising areas of activities

3. **Role of APMP and global metrology community:**
   - Regional cooperation and sharing of resources (neighbouring economies)
   - Global metrology organisations act as facilitators
   - APMP should incorporate the results of today's discussion in its strategy
   - Cooperation between standardisation bodies important to harmonise measurement procedures (eg, food safety and quality)

Group 3:

Group 3 raised the following points in response to the issues posed:

- Making sure that metrology is recognised as part of the wider national research agenda
- Need to take notice of both government strategy and industry sector profile (and changes in profile)
- Conclusive strategy and business plan
- Educated dialogue with the business community
- Importance of articulating impact

And with respect to APMP's role:

- APMP promoting impact through case-studies
- Exploring the possibility of sharing service delivery (CRMs)

An additional note arising from this discussion was that understanding issues relevant to different sectors and how they are changing will be relevant no matter what government is in place.

Group 4:

Group 4's responses to the 3 issues are summarised below:

1. Grand challenges

- Initiatives such as BIPM's agreement with the WMO do encourage traceability at the local level and can increase national collaboration among science organisations;
- Often sectors are spread across a number of ministries, eg, health & food: there may be some collaboration but this does complicate.

2: National strategies

- Working more closely with the national infrastructure;
- Talking to a wider range of govt agencies – note that a lot of joint work is going on but this is not necessarily promoted jointly;
- Collaboration with other science agencies;
- Engagement with the wider community (industry, etc)

3: Role of APMP and global metrology community

- The ongoing collaboration around food CRMs is a good thing and needs to happen in other areas;
- Closer relationships between APMP and APLAC and other Specialist Regional Bodies – this is important in encouraging national collaboration.

As a broader question, noting that the last CGPM highlighted the roles of the RMOs in extending the benefits of the global metrology system to more economies, Angela asked how these benefits are being or planned to be brought to developing economies.

Andy responded that, while there is no specific mandate under the Metre Convention regarding support to developing economies, the BIPM is a partner in the DCMAS[2] network, a dialogue between the global standards and conformance bodies to share information on resources and activities in support of developing economies. Also World Metrology Day can and is being used as a vehicle to raise awareness. Bob added that support for developing economies is seen as a role for the RMOs, given that needs can be identified and addressed more effectively at the regional level. Barry also noted that the category of Associate Member of the CGPM is intended to help emerging economies participate in the global system, in particular the CIPM MRA.

4. CONCLUSION OF WORKSHOP: Dr Peter Fisk

In closing the Workshop, Peter noted the following key points:

- Access to the SI system is essential,
- Engagement with and active listening to stakeholders is essential.
- Cooperation and sharing knowledge is essential.

With the last point, Peter added that the APMP Executive Committee would be reviewing the issues raised that APMP could and should support and will come back to Directors with proposed strategies to address these. He then thanked everyone for their constructive participation in the Workshop.

2 DCMAS: Network on Metrology, Accreditation and Standardization for Developing Countries http://www.dcmas.net/

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