



Australian Government  
Department of Industry,  
Innovation and Science

National Measurement Institute

# Legal Metrology In Australia

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9 – 11 August, 2016

# NMIA's Role

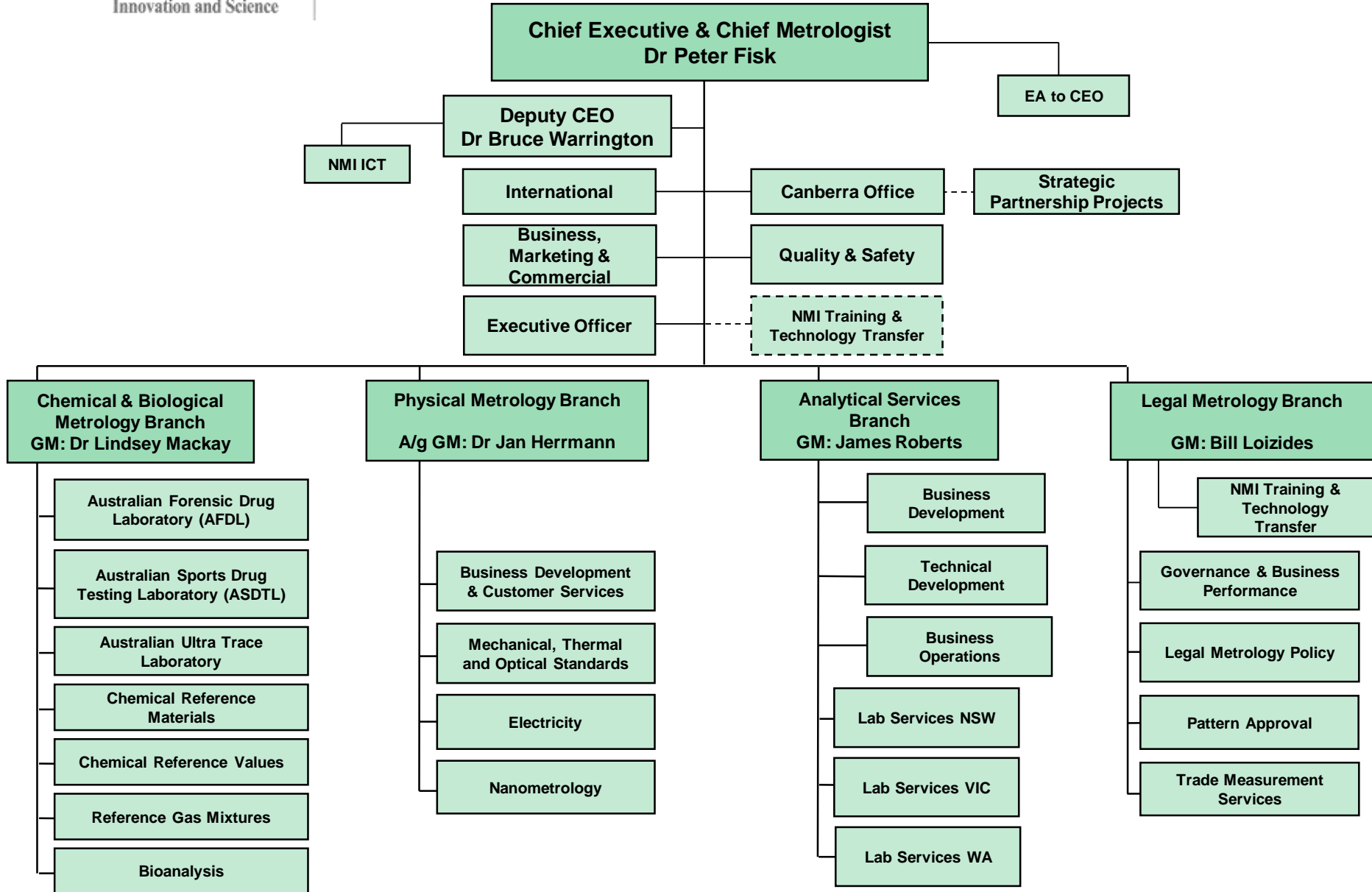


**NMIA** is responsible under the *National Measurement Act (1960)* for Australia's top-level infrastructure for physical, chemical, biological and legal measurement.

NMIA delivers **measurement infrastructure and services to Australia**, to

- ensure that measurements in Australia can be reliable and fit-for-purpose
- ensure that measurements made in Australia can be accepted internationally
- contribute measurement expertise to national policy development
- manage Australia's national trade measurement system (value ~ B\$ 400 p.a.)
- support the adoption of measurement technologies in real-world situations

in support of Australian productivity and innovation



# Overview – Legal Metrology External Relationships



**National  
Measurement  
Institute**

NMI-  
appointed

NMI-issued  
licences

Approving authorities

Certifying authorities

Verifying authorities

Utility meter verifiers

Standardisation bodies:  
NATA  
Standards Australia  
JAS-ANZ

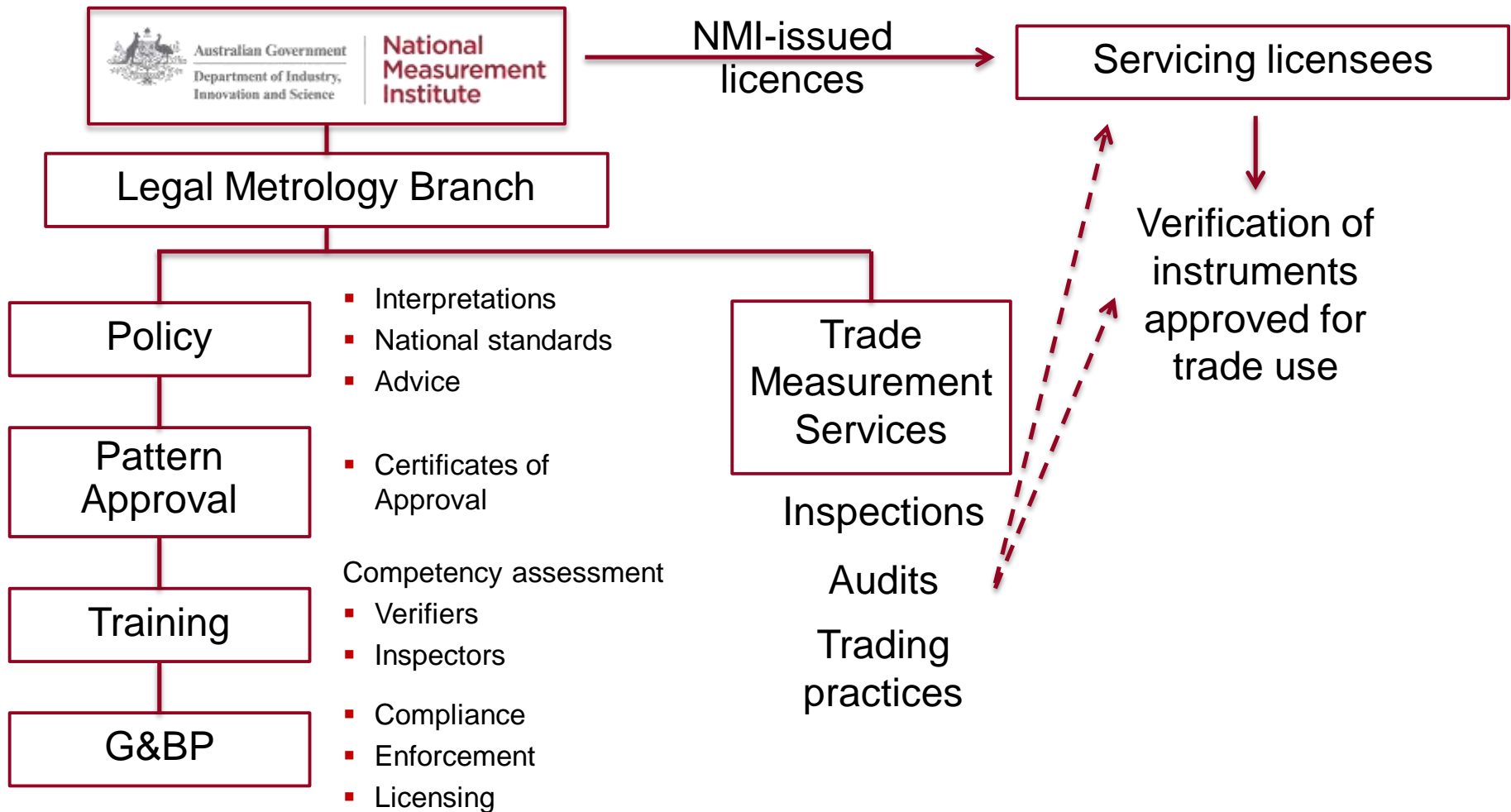
Verification of  
instruments approved  
for trade use

Servicing licensees

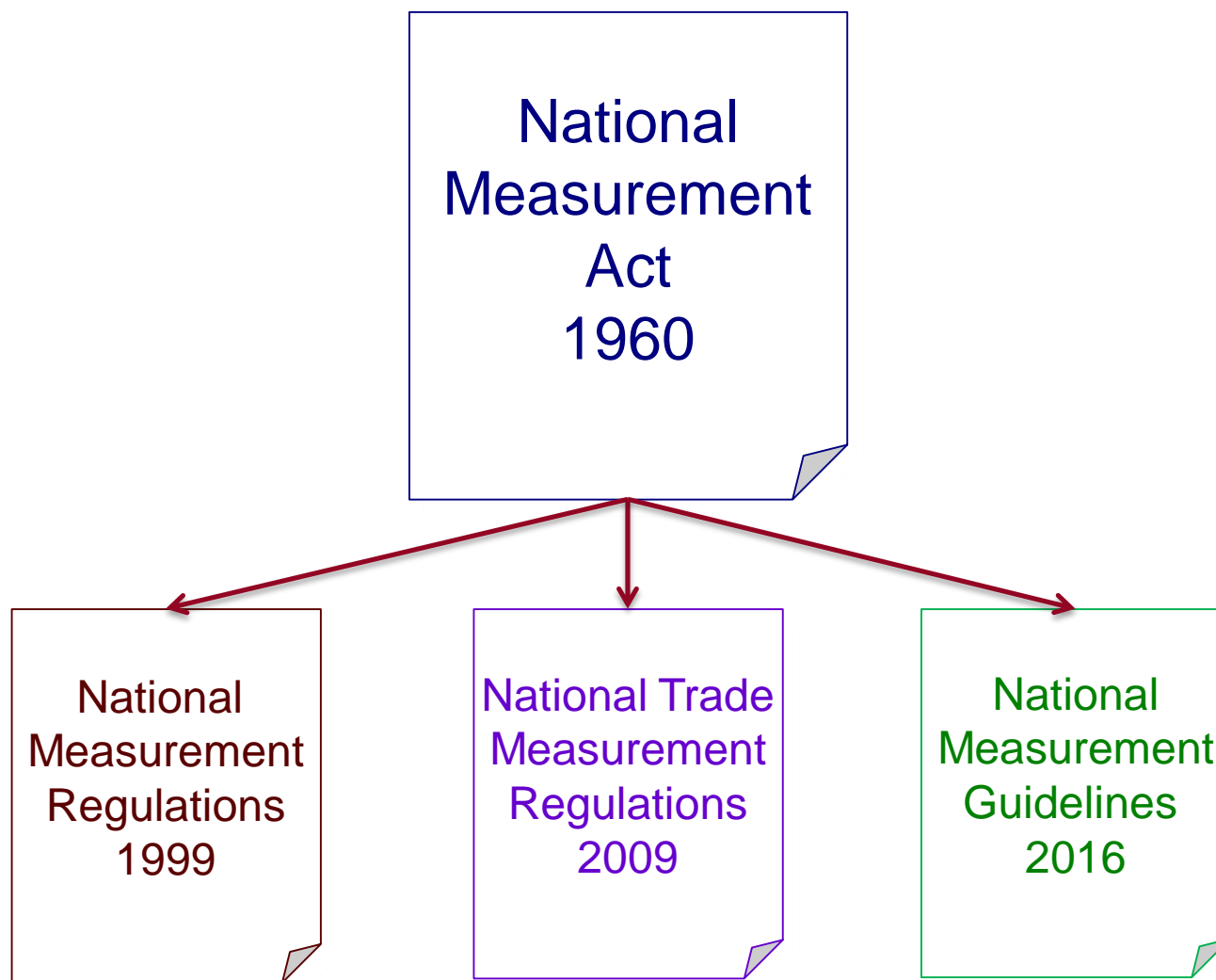
Public weighbridge  
licensees

Operation of public  
weighbridges

# Overview – Legal Metrology Branch Functions



# National Measurement Legislation

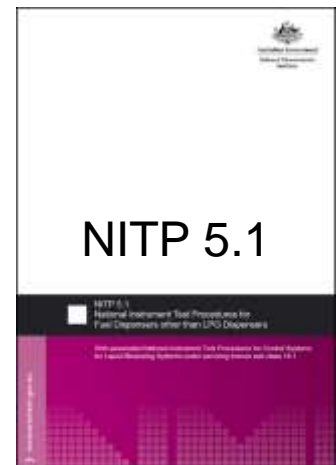
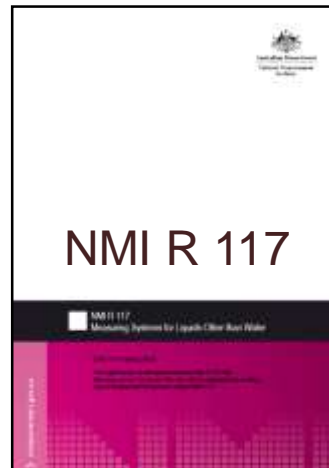


# The Journey of a Fuel Dispenser



# Legal Metrology Policy

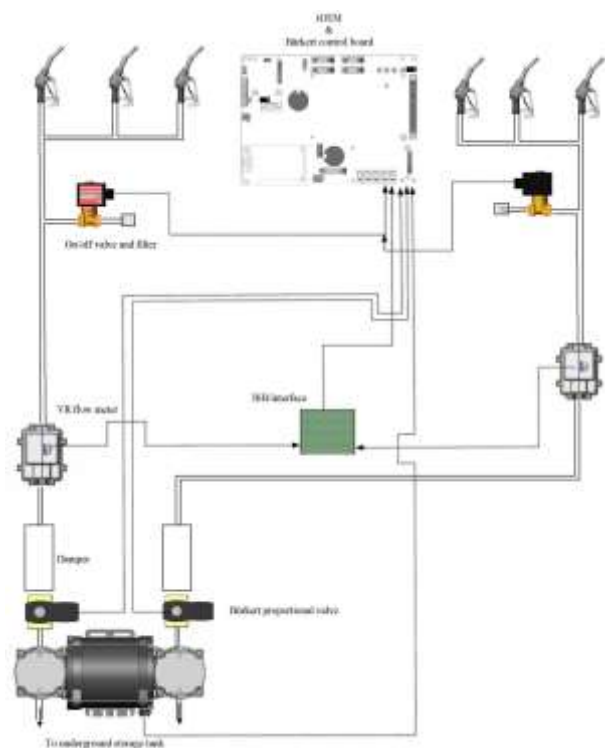
- Consultation with stakeholders to develop:
  - Policies & Regulations
  - National/International Pattern Approval Standards
  - National Instrument Test Procedures
- Providing advice and interpretation
- Receiving advice and feedback e.g. TMS testing instruments





# Pattern Approval

- Consideration of the design or “pattern” of an instrument, including software and hardware to ensure it is fit for trade use



# Pattern Approval Testing

## What we test

Instrument Performance

Temperature and Humidity

Power Variation Testing

Radiated Interference

Line borne interference

Electrostatic discharge

“ Does the instrument perform as intended, to within allowable maximum permissible errors over a range of environmental and usage conditions ”

## The Laboratory



# Training and Technology Transfer

- TTT is a Registered Training Organisation (RTO)
  - comply with national standards for vocational education providers
  - TMS inspectors that hold appropriate qualifications are an integral part of delivering training and conducting assessment
- TTT has two broad touch-points on the journey of a fuel dispenser:
  1. Training and assessment of ATMOs and TMOs
    - Competency = Qualification
  2. Assessment of verifiers
    - Competency = Statement of attainment
    - Online training for fuel dispensers



# Online Training

**FUEL DISPENSERS**

WELCOME TO THE COURSE

A fuel dispenser is a measuring system intended for refuelling of motor vehicles, small boats and small aircraft. Similar dispensers are also used to dispense certain diesel exhaust fluids, such as AdBlue and you may be required to test such dispensers using similar equipment and test procedures. For the purpose of this course, these instruments shall be referred to as Fuel Dispensers.

This online training program forms part of the training to become a verifier of fuel dispensers. It provides the underpinning knowledge to verify fuel dispensers. It also provides information for those who intend to verify consoles (control systems for fuel dispensers).

Further training will be required through mentoring and practical workplace experience.

You will submit your completed recognition kit at the end of this course. Your recognition kit will be assessed by a qualified assessor.

If you don't complete the recognition process within six months your enrolment may be cancelled.

**Section 1: Verification Fundamentals**

**Section 2: Test Procedures**

5. Introduction to NITP 5.1	✓	10 mins	6. Safety	✓	10 mins
7. Characteristics of the Instrument	✓	10 mins	8. Test procedures	✓	5 mins
9. Checking facility	✓	5 mins	10. Zero setting	✓	10 mins
11. Price computation	✓	10 mins	12. Nozzle cut-off test	✓	5 mins
13. Interlock test	✓	5 mins	14. Pre-set indications	✓	2 mins
15. Maximum flow rate	✓	10 mins	16. Accuracy test	✓	10 mins
17. Accuracy of pre-set volume test	✓	5 mins	18. Gas elimination test	✓	10 mins
19. Anti-drain / hose-dilation test	✓	5 mins	20. Sequence for testing	✓	5 mins

**Section 3: Consoles**

# Licensing Section

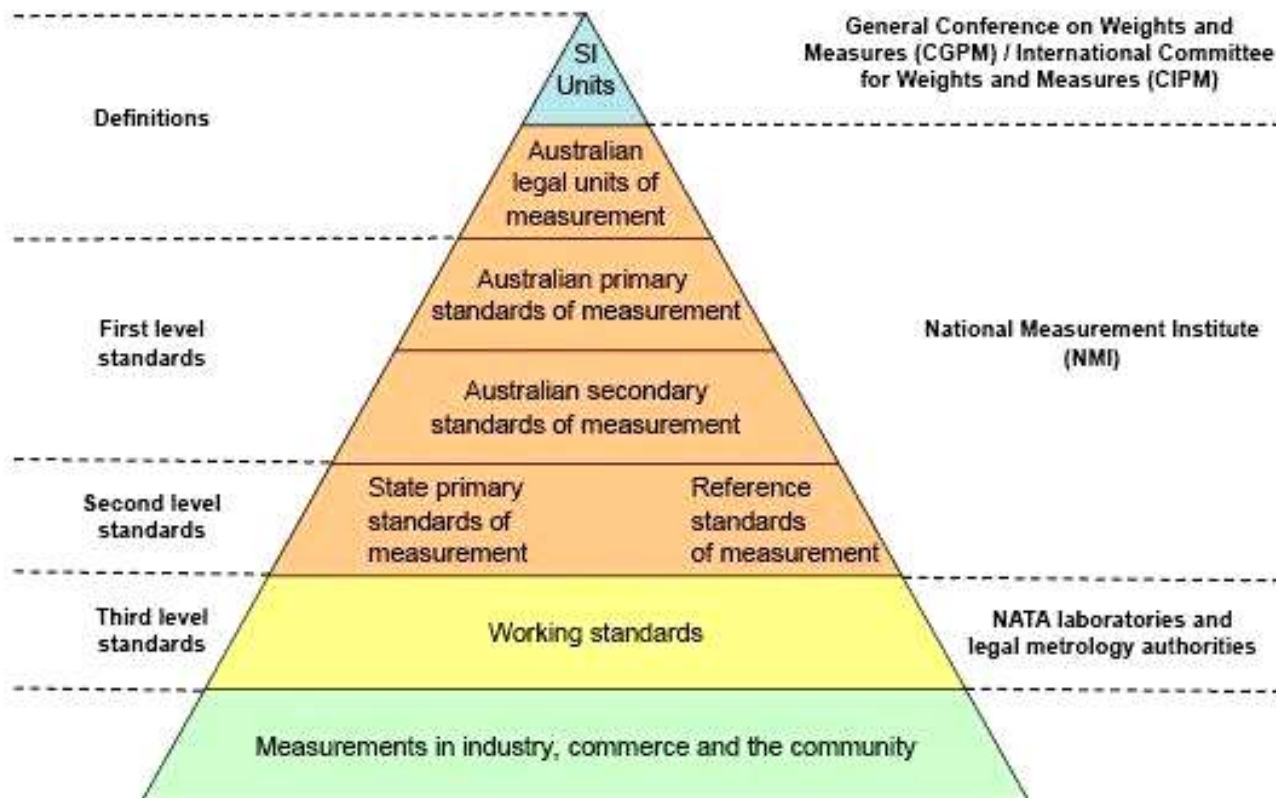
## Regulatory Oversight

- Licensee and their verifiers are authorised to verify fuel dispensers to ensure they operate accurately
  - class 5.1 needs to be identified on the licence
- Traceability
  - licensees must have the required current Regulation 13 certificate (e.g. 15 to 200 L reference measures as appropriate)
  - Regulation 13 certificates must be issued by NATA-accredited verifying authorities
  - Regulation 13 certificate provides legal and scientific traceability



# Reference Standard Traceability

Reference standards are considered to be traceable when the standard's physical measurement can be traced back through Australia's Metrological Pyramid to the relevant base unit.



# Licensing Section

## Compliance Program:

- Competency – do the verifiers hold a Statement of Attainment to verify fuel dispensers (sub-class 5.1)
- Verification forms for fuel dispenser verifications are received and processed
- Risk-based approach to identifying targeted compliance activities, Licensees/verifiers that are identified as high-risk are put on a targeted list for TMS compliance activities
  - Advise TMS when a form 6 has been submitted by a Licensee/verifier in the targeted program
  - TMS investigates the fuel dispenser identified in the Form 6
  - TMS reports to Licensing on outcome and appropriate action is determined

# Trade Measurement Services

The role of a trade measurement inspector is to:

- Educate, monitor and consult businesses about their trade measurement obligations.
- Ensure all measuring instruments used for trade are verified and used correctly.
- Monitor activities of servicing licensees and public weighbridge licensees.
- Check pre-packed articles for correct packer identification, measurement markings and accurate measure.





# Trade Measurement Services

The role of a trade measurement inspector is to:

- Check public weighbridges for conditions and accuracy.
- Investigate complaints and resolve questions with trade measurement matters
- Take appropriate enforcement action where there have been breaches of the laws.



# Compliance & Enforcement

NMI exercises its compliance & enforcement powers using three principles:

- Proportionality
- Consistency
- Transparency

Consequence of non-compliance:

- Education
- Warning
- Infringement notice
- Undertaking / Prosecution

**National Measurement Act 1960**  
**INFRINGEMENT NOTICE**  
(Section 18LF)

**Infringement Notice Number**  
EA-009999

**Date of Infringement Notice**  
15 April 2016

Recipient Details	
Name	Fuel Pump Pty Ltd
ACN	123 456 789
Address	34 Fuel Street, FUELDALE VIC 3000

Alleged Contravention of the <i>National Measurement Act 1960</i>					
Count	Section	Date of alleged contravention	Alleged contravention	Legislated penalty units <sup>1</sup>	Penalty units in this Infringement Notice <sup>2</sup>
1	18GE(2)	17 March 2016	That Fuel Pump Pty Ltd, made available for use, a measuring instrument for trade, namely a Gilbarco Fuel Dispenser, model T088A, serial number 60922, fuel grade ULP 91 (hose number 2) which was tested at the premises of Fuedale Service Station and Convenience Store, 34 Fuel St, Fuedale, VIC 3000, and was found to have an average error of 1.22% which was outside the allowable maximum permissible error (MPE) of +/-0.3%	40	5

**Penalty Payable in this Infringement Notice**  
Total Penalty Units for this notice: **5**  
Total Penalty Payable in this Infringement Notice: **\$900**  
In words: **EIGHT HUNDRED AND FIFTY DOLLARS**

<sup>1</sup> Each Legislated Penalty Unit is \$180.00 under s4AA of the *Crimes Act 1914* (Cth). The Legislated Penalty Units stated in this Infringement Notice apply to a natural person upon conviction. For a body corporate, under s4B of the *Crimes Act 1914* (Cth), the court may impose a pecuniary penalty not exceeding an amount equal to five times the amount of the pecuniary penalty that could be imposed by the court on a natural person convicted of the same offence.  
<sup>2</sup> Each alleged contravention stated in an Infringement Notice given under the *National Measurement Act 1960* carries 5 penalty units.

**Reasons for giving this Infringement Notice**

The alleged contravention of Section 18GE(2) of the *National Measurement Act 1960* is based on the evidence that on 17 March 2016, Fuel Pump Pty Ltd, made available for use a measuring instrument for trade, and that the measuring instrument gave an inaccurate measurement. The 1.22% deficiency represented a significant shortfall of greater than three times the maximum permissible error. A second dispenser was also found to be outside its maximum permissible error with a deficiency of 0.4%. The trader had not carried out any accuracy checks on any of the dispensers on site since acquiring the business in December 2014.

For the above reasons I have reasonable grounds to believe you have contravened the provision of the *National Measurement Act 1960* specified in this Infringement Notice.

.....  
**David Gittins**  
Regional Compliance & Enforcement Officer, South-East Region



# The International Standards & Conformance System

*Metre Treaty*

*OIML Convention*

**BIPM/CIPM**

**OIML/CIML**

*International System*

*Asia Pacific System*

*Australian System*

**APMP**

**APLMF**

**NMIA\***

**Physical, Chemical,  
Biological & Legal Metrology  
Measurement Standards**

**ILAC**

**ISO**

**IAF**

**IEC**

**ITU**

**APLAC**

**PASC**

**PAC**

**NATA**

**Laboratory  
Accreditation**

**SA**

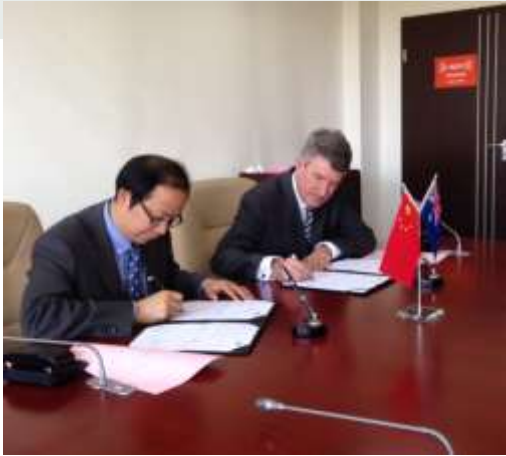
**Documentary  
Standards**

**JAS-ANZ**

**Quality Systems  
& Certification**

**\*Plus ANSTO and ARPANSA**

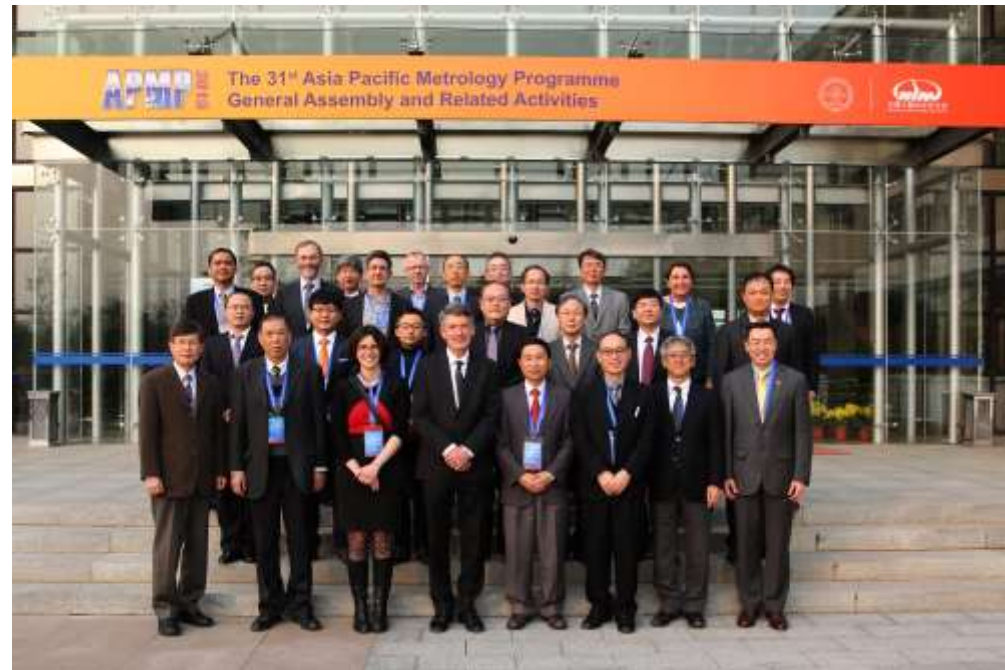
# Measurement cooperation : China & Australia



Successful bilateral 5-year Memorandum of Understanding (MoU) to promote research cooperation between the **National Institute of Metrology (NIM)**, China and **NMIA** renewed in Beijing in October 2015

## Leadership in peak Asia Pacific measurement forums:

- *Department of Metrology, AQSIQ, China* chaired Asia Pacific Legal Metrology Forum (APLMF) to Oct 2015
- NMIA chairs the *Asia Pacific Metrology Programme (APMP)*, scientific measurement) to Nov 2016:
  - NIM, China is a member of APMP's Executive Committee



*NIM hosts of annual 2015 APMP meetings*

# Key Messages

- NMIA is a national resource for measurement needs
- Exceptionally skilled, motivated and dedicated staff
- Unique set of resources in buildings, equipment
- Special regulatory role for measurements for domestic trade
- Provides essential support for development of innovation in Australia
- One of Australia's four standards and conformance agencies, playing a lead role in international and regional forums



OIML Pilot Training Center  
国际法制计量组织培训中心（示范）

# Template for OIML Seminar on Metrology Management System

9-11 August 2016 Guangzhou, China

# Contents

- OIML D1
- Raising awareness of metrology
- Training course or seminar topic mostly needed in near future

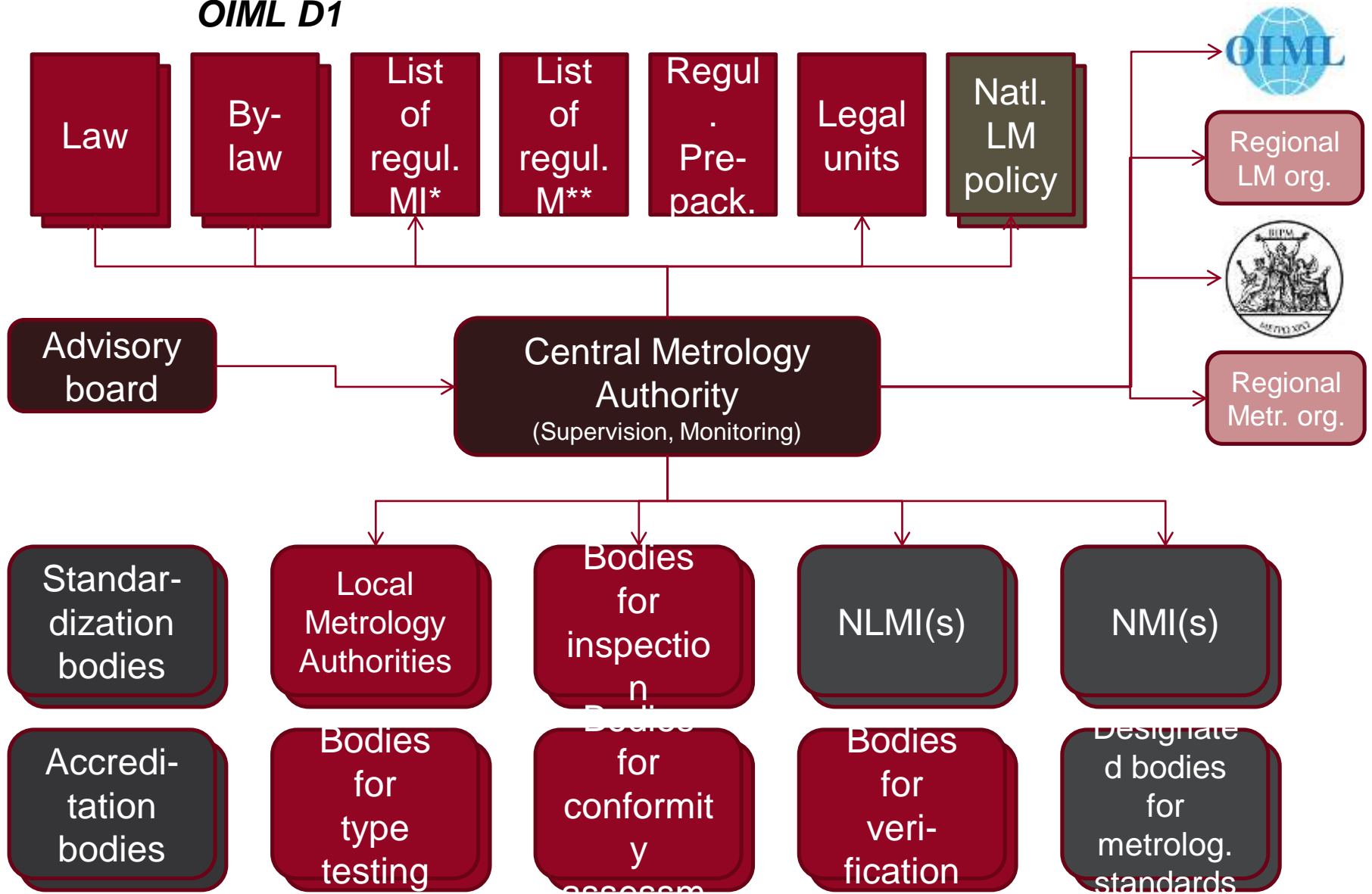
### How to compare legal metrology management systems of several countries most efficiently?

- ➔ By giving **key information** in a structured manner.
- ➔ **Proposal: Taking OIML D1 as a basis and answering related questions (see sketch on next page)**



# OIML D1

## Legal Metrology Management System according to OIML D1



\*MI = Measuring Instruments

LM = Legal Metrology

NMI = National Metrology Institute

\*\*M = Measurements

NLMI = National Legal Metrology Institute

## OIML D1

**OIML D1** gives very useful information about **essential elements** for a legal metrology management system, however, it gives also several degrees of freedom to set-up such a system.

For example, OIML D1 mentions the necessity of many institutes and bodies to realize all the **necessary functions of a legal metrology** management system. But depending on the given situation in a country one institute or body may be responsible for different functions resp. tasks.

In the following **a set of questions was written down** to cover the most relevant aspects of a legal metrology management system according to OIML D1 in order to be able to compare the systems of different countries.

## 1) Questions related to the Central Metrology Authority

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Which authority was given the task to be the Central Metrology Authority?

National Measurement Institute

Is it responsible for all laws resp. by-laws dealing with metrology?

Yes.

Is it responsible for the supervision/monitoring of institutes or bodies?

No – Only one national agency with no state bodies.

Is it a member of a regional metrology organization resp. regional legal metrology organization?

Yes – APLMF (Asia Pacific Legal Metrology Forum)

Is it a member of the metre convention and the OIML?

Yes

Is there any advisory board for the Central Metrology Authority?

No

~~(If yes, how many people from which stakeholder groups are taking part?)~~

## 2) Questions related to legal documents

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Is there one law or are there several lawing with metrology?

One law – the *National Measurement Act 1960*

Is there one by-law or are there several by-laws dealing with metrology?

Supporting legislation – *National Measurement Regulations 2009, National Trade Measurement Regulations 2009 and National Measurement Guidelines 2016*

Is there a list of regulated measuring instruments?

No, but there is a list of classes and subclasses of instruments specified in Schedule 2 of the National Trade Measurement Regulations. A list of pattern approval requirements is also published on the NMI website.

Is there a list of regulated measurements?

No specific list. However, all measurements made for legal purposes must be traceable. Also, some specific items are required to be sold using specified measurements (e.g. meat by weight).

Are prepackages regulated?

Yes – NMI has responsibility for this.

Is there any legal document related to legal units?

Yes - *National Measurement Guidelines* define how legal units must be expressed.

### 3) Questions related to a national legal metrology policy

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Is there a written national legal metrology policy?

No single over-arching policy. However, there are broadly applicable policies related to certain aspects of the legal metrology framework (e.g. Compliance and Enforcement).

~~(If yes, what is covered by this policy? Is it valid for a certain time period?)~~

Who is responsible for the development of the national legal metrology policy?

NMI/ Department of Industry, Innovation and Science.

Which interested parties took part in the development?

Industry, the Australian public and other Government agencies have input into various aspects of LM policy.

## 4) Questions related to National Metrology Institutes

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Is there a National Legal Metrology Institute?

Legal Metrology is a branch within the National Measurement Institute.

Or is the National Metrology Institute responsible for Legal Metrology, too?

Yes.

Or is there another institution responsible for Legal Metrology?

No.

What are the tasks of the responsible institute resp. institution in relation to legal metrology?

Responsible for administering the national legal metrology framework.

Are there any Designated Institutes dealing with Legal Metrology?

Appointed legal metrology authorities

## 5) Questions related to all kinds of bodies

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Which kinds of legal metrology bodies do exist in your country?

- Servicing licensees and their verifiers
- Public weighbridge licensees
- Legal metrology authorities; including verifying authorities, certifying authorities, approving authorities and utility meter verifiers

What are there specific tasks?

- **Servicing Licensees** – initial and reverification of instruments approved for trade use
- Public Weighbridge Licensees – operation of public weighbridges
- **Verifying Authorities** – verify reference standards of measurement and physical quantities of an artefact
- **Certifying Authorities** – certify certain measuring instruments (e.g. Evidential Breath Analysers and grain protein measuring instruments) and Australian certified reference materials (CRMs)
- **Approving Authorities** – conduct pattern approval testing of electricity meters, water meters and evidential breath analysers
- **Utility Meter Verifiers** – verify electricity meters and water meters

## 5) Questions related to all kinds of bodies

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How are they financed?

Clients are charged at rates set by the market

(Are they private enterprises?) Yes.

Is there an obligation to demonstrate competence?

Yes. Compliance and enforcement officers (NMI Trade Measurement Inspectors) are required to hold specific qualifications; industry verifiers employed by licensees are required to hold a statement of attainment demonstrating competence for each instrument subclass that they verify. Legal metrology authorities are required to be National Association of Testing Authorities (NATA) accredited.

Is there any supervision resp. monitoring of such bodies?

NMI issues licenses and conducts licensee and verifier audits. NATA conducts periodic audits of verifying authorities and other laboratories.

Are standardization bodies (or at least one) taking part in the legal metrology system

of your country?

Yes – OIML and Standards Australia (as a member of ISO)

Are accreditation bodies (or at least one) taking part in the legal metrology system

of your country? Yes – NMI and NATA.



## 6) Questions related to some general topics

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How many people are working for the legal metrology management system in your country (CMA, LMA, NMI, NLMI, bodies, etc.)?

Approximately 120 in the Legal Metrology Branch of NMIA.

Are fees for legal metrology services fixed by the state?

Only in cases where a government entity (e.g. NMI) provides the service.

Otherwise the price is set by the market.

How does your Legal Metrology Management System deal with measuring instruments

coming from other countries?

Instruments used for trade must be approved and verified.

Do you see any need for improvements of your Legal Metrology Management System?

There is always room for improvement.

Would like to have any support or further information exchange with colleagues concerning specific topics?

Yes – open and frank discussion is always appreciated.

What would you like to discuss with other participants during the group discussions?

Ideas and initiatives to harmonise legal metrology systems to facilitate trade, economic development and productivity for business trading by measurement across borders.

## Raising awareness of metrology

**How important do you think of raising awareness of metrology?**

High importance.

**Which way do you think is most efficient to do so?**

- Positive media coverage of measurement-related topics and enforcement activities
- Effective marketing strategies to industry, other government sectors and the public
- Education of traders via pamphlets and online resources and with licensees via forums held around Australia

**What is your successful story?**

- Annual report published on website
- Prosecutions for infringements that are reported in the national media
- Indigenous awareness program
- Media reporting on legal metrology data included in the annual report which is published on website

**What do you expect to learn from others?**

- Intelligence on other OIML Member States' Legal Metrology Management Systems
- Sharing experiences
- Understand the legal metrology infrastructure and mechanisms of other national systems
- Harmonising trade between member nations

**Training course or seminar topic mostly needed in near future**

## **What subject do your urgent need for training?**

- The alignment of training courses and priorities between regional legal metrology bodies (for example, APLMF) and national/international authorities

## **Which seminar topic do you care for the most?**

- Relevance and applicability of OIML D 1
- To understand more about the legal metrology management systems of OIML Member States and key trading partners with a view to the harmonisation of legal metrology management systems

## **Speak of capacity building, what is the strongest needs of your organization?**

- Confidence in international trade involving legal metrology

## **Other request?**