

33rd Asia Pacific Metrology Programme General Assembly
24 November – 1 December 2017
New Delhi, India

Laboratory Report

Measurement Standards Laboratory of New Zealand

Section 1: Laboratory Related Matters

The Measurement Standards Laboratory of New Zealand (MSL) is New Zealand's national metrology institute. MSL is part of Callaghan Innovation, a government agency whose mission is to grow New Zealand's economy by helping business succeed through technology.

Our Mission:

To accelerate New Zealand's economic growth and well-being through access to world class measurement standards and advice.

Our Vision:

- *New Zealand's measurement infrastructure is nationally and internationally relevant, recognised and respected*
- *MSL ensures the measurement, testing and analysis needs of government, industry, trading partners and the NZ public are met*
- *New Zealand's measurement system is founded on science-led systems and standards.*

Recent Changes:

MSL has implemented a new management structure since April 2017. The previous six team sections have been combined under three new manager positions. The new managers are Kevin Gudmundsson - Length Mass and Related Quantities, Steve Guiney - Electricity Time and Frequency and Dr Annette Koo - Temperature and Light Team.

Callaghan Innovation (MSL's parent organization) and MBIE (the government ministry responsible for MSL) engaged an independent consultancy to undertake a review of MSL in early 2017. The review examined the requirements for and the role of physical metrology within NZ, assessed how MSL is positioned to provide these services, and summarised options for MSL's future. The report has been completed but is not yet publicly available. There are ongoing discussions with government to implement the recommendations of the review. The outcome of the review was very

positive and provides for a secure future for MSL within Callaghan Innovation with the expectation of improved funding in coming years.

Development continues on the MSL Kibble balance, which is based on pressure balance technology. The overall design for the Kibble balance has been established. Key items of equipment have been purchased and construction of the various components has started. An absolute value for the local gravitational acceleration has also been measured. The plan is to have the MSL Kibble balance ready for trials in 2018.

Current scientific staff: 27.

Section 2: CIPM MRA Related Activities

MSL maintains third party accreditation of its calibration services to ISO 17025. It uses IANZ as its accreditation body and peers from other NMIs as technical assessors. The Technical review of Pressure (March 2017, Dr Momoko Kojima, NMIJ, Japan) was successfully completed. Technical Reviews of Length (December 2017, Mr. Agustinus Drijarkara, RCM-LIPI, Indonesia) and Electrical (April 2018, Dr Sze Wey Chua, NMC, Singapore and Mr Lucas di Lillo, INTI, Argentina) are scheduled.

MSL is currently participating in 16 (regional and international comparisons (including those in the planning stages and excluding those in the report-writing stages).

MSL currently has 182 CMCs in Appendix C of the of the BIPM Key Comparison Database. Updated CMCs for gauge block measurements have been submitted with significantly reduced uncertainty, based on improved artefacts. These are at the RMO review stage. It is expected that our Radiation Thermometry capabilities will shortly be covered by our accreditation following our response to the initial assessment.

Section 3: International and Regional Cooperation

Keith Jones continues to work with PTB to assist Myanmar with the strategy for metrology as part of developing the national quality infrastructure. Good progress is being made with implementing the strategy and establishing new laboratory facilities. There is an intent to continue engagement with APMP.

The Johnson noise thermometry collaboration involving NIST, NIM and MSL is coming to a conclusion. NIM published the result of a 100-day measurement of Boltzmann's constant with a relative uncertainty of just 2.7 ppm, in time to be included in the 2017 CODATA Special Adjustment for the revised SI. Leading up to

the NIM measurement, Rod White of MSL visited NIM for 3 months in 2016 to assist with engineering changes made to the input connections to NIM thermometer.

In May 2017, a delegation from NIM China, AQSIQ and MOST visited MSL to share information about our respective research programmes and explore the potential for future collaboration activities.

MSL is a partner in an EMPIR project to produce CIE technical notes on best practice goniospectrophotometry. This project builds on a previous EMRP project in this area.

The leadership team from MSL visited NMIA in October 2017 as part of our activities under the Australia-New Zealand Science, Research and Innovation Cooperation Agreement. MSL renewed its 5-year MOU with NMIA during this visit, discussed progress on technical collaborations, and agreed on plans for future cooperation.

Section 4: Activities relevant to APMP's "Focus Groups"

Independently of APMP, Callaghan Innovation has adopted a Sector Impact model based on seven sectors. Agritech, Food and Beverage, Digital and Health, Energy and Environment, Transport and Logistics, Manufacturing and Niche. There are close connections between many of these Sectors and the APMP Focus Groups. MSL will be working with the new Sector Managers to strengthen our connections with NZ industry particularly in the Food and Beverage, Energy and Environment, and Health Sectors. MSL sector guides can be accessed [here](#).

Section 5: Future Plans, Priorities and the Role of APMP

MSL Strategic Plan 2017 – 2022

MSL's strategic priorities for the next five years are:

- **Greater engagement and connectedness** – lead and coordinate engagement with business and government stakeholders on the benefits of good measurements to enhance productivity and foster innovation
- **Building New Zealand's skills & capability** – assist industry and others to translate measurement skills and best practice into applications
- **Customer focused / market approach** – deliver measurement services that enhance the productivity and growth of New Zealand industries
- **Providing technology leadership** – provide advice on international trends in measurement and standards, and the science and technology required to underpin them to allow New Zealand industry to adopt them

MSL is planning to launch a new website in March 2018. MSL has recently secured the URL www.measurement.govt.nz and updated its logo and visual branding.