

APMP Member Report 2021

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Australian Nuclear Science and Technology Organisation (ANSTO), Australia

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Please submit this report to APMP-Secretariat@nim.ac.cn no later than 14 November 2021.

Section 1: General Management

ANSTO is the Designated Institute authorised by the Chief Metrologist of the National Measurement Institute (NMI) to maintain Australian primary and secondary standards for the measurement of activity of radionuclides. This authorisation was last renewed in January 2019.

Radioactivity Standards are maintained by Radionuclide Metrology, one of four capability areas within the Nuclear Stewardship platform. Nuclear Stewardship is a cohesive set of Nuclear Science and Technology (NST) capabilities and functions that are either mandated by Government, regulators or otherwise considered essential to ongoing ANSTO operations. Many of the functions maintained by Nuclear Stewardship support ANSTO's Government appropriation settings. Jennifer Harrison was appointed as the platform leader in November 2020.

Nuclear Science and Technology (NST) incorporates ANSTO's research, innovation, landmark research infrastructure and associated platforms and capabilities. NST conducts research and development in relation to nuclear science and technology and connects people, transfers knowledge and provides nuclear-based products and services for the benefit of Australia. Prof. Andrew Peele was appointed the Group Executive Nuclear Science and Technology in July 2021.

ANSTO Executive recently approved additional resources for Radionuclide Metrology, which will increase the headcount from 4.5 to 6 FTE. This will strengthen the technical competency of the group, facilitate implementation of an ISO/IEC 17025 quality management system, and enable us to complete development projects and pursue growth opportunities.

Section 2: Technical Highlights

TCRI

A comprehensive validation of all systems for standardisation of gamma-emitting radionuclides by coincidence/anti-coincidence counting, together with validation of a digital data acquisition system based on CAEN digitisers, is nearing completion.

Following a critical review of ANSTO's ionisation chamber quality assurance and measurement strategy, an improved measurement capability is being implemented. In addition, ANSTO acquired an Ultrastable Low-noise Current Amplifier (ULCA), which will be implemented with a new Centronic IG-12 to enhance our ionisation chamber capability.

These activities form part of ANSTO's Asset Management Framework which is aligned to the ISO-5500X Asset Management standards published in 2014. Radionuclide Metrology annually reviews asset condition and alignment with strategy to ensure safe and sustainable operation, capability development and asset renewal through the Nuclear Stewardship asset management plan.

Section 3: CIPM MRA Related Matters

ANSTO reviewed the radioactivity CMCs for NRC-Canada (SIM-RI-CA).

ANSTO participated in three international comparisons during 2017-2019. The Draft A report is being prepared by BIPM staff.

- BIPM.RI(II)-K4.F-18
- BIPM.RI(II)-K4.Cu-64
- BIPM.RI(II)-K4.Tc-99m

ANSTO plans to participate in international comparisons for key radionuclide standards over the next few years, including:

- CCRI(II)-P1.Co-60 (pilot study for extension of SIR to beta-emitters)
- BIPM.RI(II)-K1.Co-60 (SIR ongoing comparison)
- BIPM.RI(II)-K1.Cu-67 (SIR ongoing comparison, new radionuclide)
- BIPM.RI(II)-K1.Ga-67 (SIR ongoing comparison)
- BIPM.RI(II)-K1.Mo-99 (SIR ongoing comparison)
- BIPM.RI(II)-K1.Cr-51 (SIR ongoing comparison)
- BIPM.RI(II)-K4.I-123 (SIRTI comparison for short-lived radionuclides)
- BIPM.RI(II)-K4.Tc-99m (SIRTI comparison for short-lived radionuclides)
- BIPM.RI(II)-K4.F-18 (SIRTI comparison for short-lived radionuclides)
- BIPM.RI(II)-K4.Cu-64 (SIRTI comparison for short-lived radionuclides)
- APMP-RI(II)-S4 (Surface emission rate comparison)

Section 4: Future plans

Development of primary standards and participation in international comparisons, for key radionuclides, e.g., Co-60, Cu-67, Ga-67, Mo-99, I-123, Cr-51.

Renewal of primary standards for F-18, Cu-64, Tc-99m.

Development of primary standard for surface emission rate and participation in APMP-RI(II)-S4 comparison.