MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

COVERSHEET

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In Confidence

Office of the Minister of Research, Science and Innovation

Chair, Cabinet Economic Development Committee

Changes to National Standards Regulations 1976

Proposal

1 This paper seeks Cabinet's policy agreement for changes to be drafted to the National Standards Regulations. The proposed regulatory amendments will modernise the National Standards for measurement to allow for the implementation of the changes to the International System of Units expected to come into force in May 2019. If Cabinet approves these changes, new regulations will be drafted to come into force in 2019.

Background

2 The Measurement Standards Laboratory (MSL) maintains and disseminates the International System of Units (internationally referred to as SI) in New Zealand under the National Standards Regulations 1976.

3 The National Standards Regulations 1976 govern what may be used as a standard of measurement. These regulations are still relevant under the Measurement Standards Act 1992, which establishes and maintains standards of measurement of physical quantities.

4 Officials expect major revisions to the SI to be endorsed by Member States (which includes New Zealand) of the Metre Convention in November 2018. Member States to the Metre Convention are represented through their National Metrology Institutes, and MSL is New Zealand's National Metrology Institute. The SI revisions are adopted as Resolutions of the General Conference on Weights and Measures and do not require amendments to the Metre Convention.

5 The changes that are expected to be made to the SI involve no longer relying on artefacts to derive some units (such as the kilogram prototype in Paris) and instead use fundamental physical constants.

6 A fundamental physical constant is a physical quantity that is both universal in nature and has a constant value in time (e.g. the speed of light). Internationally-agreed fixed-values of seven of these constants will form the new basis of the SI. The values of the seven base SI units deduced from these defining constants will be consistent with the current values. A simplified version of the impact of the SI changes is at Annex A.

7 The SI changes the scientific basis for the realisation of all standards and needs to be specifically recognised in New Zealand standards regulations. Changes to the National Standards Regulations 1976 are required to clarify the use of fundamental physical constants as an approved standard for national measurement.

8 These changes are technical in nature and will ensure that the regulations are updated to be clear and robust, in the context of rapidly changing technology. If the revisions to the SI are not endorsed at the Metre Convention in November 2018 the regulatory changes will allow for flexibility if they are endorsed later.

9 Budget 2018 provided new funding to support MSL's move to the new system of measurement. These regulatory changes ensure MSL has legislation to support this move.

Changes to the National Standards Regulations 1976 are required

10 A review of the National Standards Regulations 1976 was undertaken in advance of the changes to the SI. The review found that technical changes were required to ensure New Zealand's regulations are up to date. Changes to the regulations will allow MSL to disseminate the newly approved SI units that are based on fundamental constants.

Changes will clarify that a standard of measurement can be based on a fundamental constant

11 Clause 3 of the National Standards Regulations gives four options for what a 'standard of measurement' may be, based on the state of scientific knowledge in 1976.

12 Parts (a) and (b) anticipate many possible forms of a standard all based on the properties of matter from an atomic to macroscopic scale. Part (c) allows a standard to be the result of measurements made by characterised instruments and part (d) allows for importation of standards from other nations:

Current Clauses – A standard of measurement may:	**Comment**
(a) be associated with a particular material object	This clause is unlikely to be used following the 2018 change in the definition of the kilogram to a fundamental constant. Currently the kilogram is based on a physical kilogram object held in Paris.
(b) be based on the bulk properties of a pure material, or the atomic properties of a single isotope	This clause primarily needs to be retained for chemistry but also for the definition of the 'second'.
(c) result from a series of measurements made by means of an instrument, or instruments, of stable and proven characteristics	This clause permits 'comparable standards': standards that are repeatable with specific instruments and methods. The values of these standards change over time and with changing technology and are not recognised under the Convention of the Metre.
(d) result from measurements made by means of an instrument that has been calibrated by an overseas national laboratory in terms of units that are the same magnitude as units for the time being accepted by the nations adhering to the Convention of the	This clause is not adequately restrictive. Accepting accredited measuring services through the National Metrology Institutes of other nations now has a formal process managed under the Convention of the Metre. Under this process only measurement services from specific 'national laboratories' are recognised. See paragraph 18 below.

13 In order that the regulations clearly allow for these changes to measurement, I recommend that Cabinet agrees for the regulations to be updated to add a new standard that allows for measurement through a fundamental physical constant. The existing standards of measurement will be retained in the regulations.

14 If Cabinet agrees to the amendment of these regulations, they will be drafted by the Parliamentary Counsel Office for consideration by the Cabinet Legislation Committee and Cabinet later in 2018, so that they can come into force by 2019.

Removing an outdated definition of physical quantity

15 The current definition of 'physical quantity' in clause 2 of the regulations also states that 'physical quantity' does not include calendar elements in time. This is no longer correct, as MSL's time service now does have a calendar element. I recommend removing the definition of 'physical quantity' completely, as it is not necessary for the functioning of the regulations.

Clarifying the process for cross-country mutual recognition of calibration

16 The decision-making body for the Metre Convention makes decisions based on advice from the International Committee for Weights and Measures (referred to internationally as CIPM). In 1999, mandated by the CIPM, National Metrology Institutes, including New Zealand's, signed an international mutual recognition arrangement that created robust processes for recognition of calibration certificates from other countries (the CIPM MRA).

17 Changes to the regulations will also provide an opportunity to formally authorise:

17.1 New Zealand's Chief Metrologist to operate under the CIPM MRA; and to advise the responsible Minister on designating other countries' National Metrology Institutes for mutual recognition of calibration; and

17.2 The Minister responsible for the Measurement Standards Act to appoint verifying authorities under the CIPM MRA.

Minor changes to modernise references

18 The National Standards Regulations were first drafted in 1976. If Cabinet agrees to amend the regulations to introduce a new standard into the National Standards Regulations, a number of minor changes could also be made to the regulations to bring them up to date. These changes would recognise that:

18.1 The description of the international system of units (SI) is by reference to New Zealand Standard 6501: 1982 (NZS 6501: 1982) and this standard has not been updated to include changes in the SI as approved through subsequent Metre Convention meetings. NZS 6501 has also been superseded by ISO 80000 and IEC 80000.

18.2 References to preserving the use of the imperial measurement system have since been superseded by the Weights and Measures Act 1987, which requires the use of the metric system.

Consultation

19 The Ministry of Business, Innovation and Employment prepared this Cabinet paper.

20 The following agencies were consulted during the development of the Cabinet paper: Callaghan Innovation, Department of Internal Affairs, and the Ministry of Foreign Affairs and Trade.

Financial Implications

21 There are no financial implications. Budget 2018 provided additional funding to enable the Measurement Standards Laboratory to make the necessary process and equipment adjustments required to respond to the changes to the SI.

Human Rights

22 There are no human rights implications.

Legislative Implications

23 The National Standards regulations will be amended consistent with the recommendations.

Regulatory Impact Analysis

24 The Treasury's Regulatory Quality Team determined that the regulatory decisions sought in this paper are exempt from the requirement to provide a Regulatory Impact Assessment on the basis that they have no or only minor impacts on businesses, individuals or not-for-profit entities.

Gender Implications

25 There are no gender implications.

Disability Perspective

26 This paper is consistent with the Convention on the Rights of Persons with Disabilities, the New Zealand Disability Strategy and the Disability Action Plan 2014-2018.

Publicity

27 No publicity is planned. Government may wish to announce the international changes to measurement once the agreement is signed in November 2018.

Recommendations

The Minister for Research, Science and Innovation recommends that the Committee:

1 Note that the Minister of Research, Science and Innovation is responsible for establishing and maintaining standards of measurement

2 Note that officials expect new international measurement standards will come into force in May 2019 based on agreed values of fundamental physical constants

3 Make the policy agreement that the National Standards regulations are amended to –

(a) introduce a new standard of measurement to allow for a measurement based on a fundamental physical constant, and

(b) update the regulations in light of new ISO standards and the imposition of the metric system under the Weights and Measures Act 1987

4 Agree that minor technical amendments be made to modernise the National Standards Regulations to:

4.1 Authorise the Chief Metrologist to operate with the international mutual recognition arrangement, whereby calibration certificates from other countries National Metrology institutes are recognised under the *International Committee for Weights and Measures Mutual Recognition Agreement* (CIPM MRA);

4.2 Allow the Chief Metrologist to advise the Minister on designating other countries' National Metrology Institutes for mutual recognition of calibration, and for the Minister to appoint verifying authorities under the CIPM MRA;

4.3 Update references to replace an obsolete New Zealand Standard (NZS 6501:1982);

4.4 Remove references to preservation of the imperial system (section 6), as these have since been superseded by amendments to the Weights and Measures Act 1987 which require the use of the metric system;

4.5 Remove the definition of physical quantity.

5 Note that the proposed regulatory changes will be drafted by the Parliamentary Counsel and presented to Cabinet later in 2018 for approval, in order to come into force in 2019.

Authorised for lodgement

Hon Dr Megan Woods

Minister for Research, Science and Innovation