

EXPLANATORY STATEMENT

Issued by the authority of the Minister for Industry, Science and Technology

National Measurement Act 1960

National Measurement Amendment (SI Redefinition) Regulations 2019

Purpose and Operation

The *National Measurement Amendment (SI Redefinition) Regulations 2019* update Australia's legal units of measurement in the *National Measurement Regulations 1999* (the NM Regulations). Amending the NM Regulations maintains alignment with the International System of Units of measurement (the SI).

In November 2018, the General Conference on Weights and Measures (CGPM) endorsed a redefinition of the base units of the SI with an international implementation date of 20 May 2019. The CGPM was established under the Metre Convention (an intergovernmental treaty to which Australia became a signatory in 1947) and, among other responsibilities, discusses and examines the arrangements required to ensure the propagation and improvement of the SI. It is made up of delegates of the governments of Member States of the Metre Convention and Associates of the CGPM. It meets in France usually once every four years.

In the revised SI, the SI base units for mass, electric current, thermodynamic temperature and amount of substance –the [kilogram](#), the [ampere](#), the [kelvin](#) and the [mole](#)– are redefined in terms of constants of nature, with the new definitions based on fixed numerical values of the Planck constant (h), the elementary charge (e), the Boltzmann constant (k), and the Avogadro constant (N_A), respectively. In addition, the revised definitions of all seven base units of the SI are also uniformly expressed using the [explicit-constant formulation](#), and specific guidance will be developed by the international community to explain the practical realisation of the definitions of each of the base units.

The amendments to the NM Regulations to implement the redefined base units of the SI are necessary to maintain international harmonisation and to fulfil Australia's obligations under the Metre Convention. The Metre Convention is the basis of international agreement on units of measurement.

The redefined SI amendments will only impact measurements requiring the very highest levels of precision, such as the work performed by the National Measurement Institute to maintain top-level reference standards of measurement. The changes are expected to provide greater consistency, reliability and precision for measurements, and to have a positive impact on scientific discovery and innovation. Otherwise, there is no impact on businesses or the community.

The Regulations reference a document for the new definitions of the SI base units of measurement. The document is Appendix 3 to Resolution 1 adopted by the General

Conference on Weights and Measures at its 26th meeting, held at Versailles from 13 to 16 November 2018. The document is incorporated as in force at the time it was determined in November 2018 and is available on the [website](#) of the International Bureau of Weights and Measures (www.bipm.org). As such, the definitions of the Australian legal units of measurement can be changed in future only by further amendment of the NM Regulations.

The document is expected to remain available on the above website and is free and accessible by the public. The National Measurement Institute can provide hard copies upon request.

Authority

Subsection 20(1) of the *National Measurement Act 1960* (the Act) provides, in part, that the Governor-General may make regulations, not inconsistent with the Act, prescribing all matters required or permitted by the Act to be prescribed, or necessary or convenient to be prescribed for carrying out or giving effect to the Act.

Consultation

No regulatory consultation was required because the amendments have minor regulatory impact. However, there have been many years of consultation in international fora about the redefinitions.

Regulatory Impact

The Office of Best Practice Regulation (OBPR) advised that a regulation impact statement is not required based on the assessment that there would be minor impact on businesses, not for profits organisations and individuals. The OBPR reference number is 24051.

Details of the *National Measurement Amendment (SI Redefinition) Regulations 2019*

Section 1 Name of Instrument

This section specifies the name of the instrument as the *National Measurement Amendment (SI Redefinition) Regulations 2019* (the Amending Regulations).

Section 2 Commencement

This section provides that the Amending Regulations commence on 20 May 2019.

Section 3 Authority

This section sets out that the Amending Regulations are made under the *National Measurement Act 1960*.

Section 4 Schedules

This section is a machinery clause that enables the Schedule to amend the *National Measurement Regulations 1999* (the NM Regulations).

Schedule 1—Amendments

Part 1—Main amendments

Item 1 Regulation 3

Item 1 amends regulation 3 of the NM Regulations to insert a new definition for the term ***SI definition***, which references Appendix 3 to Resolution 1 adopted by the General Conference on Weights and Measures at its 26th meeting, held at Versailles from 13 to 16 November 2018. The note to the definition provides a reference to the website where the document could, in 2019, be viewed online.

This new definition relating to the SI definition of a unit of measurement does not affect the existing definition of ***SI***, in regulation 3 of the NM Regulations for a unit of measurement.

Item 2 Part 1 of Schedule 1 (cell at table item 1.1, column headed “Definition”)

Table item 1.1 of Part 1 of Schedule 1 is amended to redefine the Australian legal unit of measurement for mass as the *SI definition* of the ***kilogram***. The *SI definition* is inserted by item 1 of the Amending Regulations.

The definition of the *kilogram* is now expressed in terms of fixed values of physical constants.

Item 3 Part 1 of Schedule 1 (cell at table item 1.2, column headed “Definition”)

Table item 1.2 of Part 1 of Schedule 1 is amended to redefine the Australian legal unit of measurement for amount of substance as the *SI definition* of the ***mole***. The *SI definition* is inserted by item 1 of the Amending Regulations.

In Appendix 3 to Resolution 1 adopted by the General Conference on Weights and Measures at its 26th meeting, held at Versailles from 13 to 16 November 2018 the terms “amount of substance” and “elementary entities” are defined as they are essential elements in relation to the *SI definition* of the *mole*.

The definition of the *mole* is now expressed in terms of fixed values of physical constants.

Item 4 Part 1 of Schedule 1 (cell at table item 1.3, column headed “Definition”)

Table item 1.3 of Part 1 of Schedule 1 is amended to redefine the Australian legal unit of measurement for length as the *SI definition* of the *metre*. The *SI definition* is inserted by item 1 of the Amending Regulations.

The definition of the *metre* is now expressed in terms of fixed values of physical constants.

Item 5 Part 1 of Schedule 1 (cell at table item 1.4, column headed “Definition”)

Table item 1.4 of Part 1 of Schedule 1 is amended to redefine the Australian legal unit of measurement for time as the *SI definition* of the *second*. The *SI definition* is inserted by item 1 of the Amending Regulations.

The definition of the *second* is now expressed in terms of fixed values of physical constants.

Item 6 Part 1 of Schedule 1 (cell at table item 1.5, column headed “Definition”)

Table item 1.5 of Part 1 of Schedule 1 is amended to redefine the Australian legal unit of measurement for luminous intensity as the *SI definition* of the *candela*. The *SI definition* is inserted by item 1 of the Amending Regulations.

The definition of the *candela* is now expressed in terms of fixed values of physical constants.

Item 7 Part 1 of Schedule 1 (cell at table item 1.6, column headed “Quantity”)

The amendment made by this item to table item 1.6 of Part 1 of Schedule 1 is a technical amendment that replaces the term *thermo-dynamic* with *thermodynamic* for the purposes of consistency of phrasing.

Item 8 Part 1 of Schedule 1 (cell at table item 1.6, column headed “Definition”)

Table item 1.6 of Part 1 of Schedule 1 is amended to redefine the Australian legal unit of measurement for thermodynamic temperature as the *SI definition* of the *kelvin*. The *SI definition* is inserted by item 1 of the Amending Regulations.

The definition of the *kelvin* is now expressed in terms of fixed values of physical constants.

Item 9 Part 1 of Schedule 1 (cell at table item 1.7, column headed “Definition”)

Table item 1.7 of Part 1 of Schedule 1 is amended to redefine the Australian legal unit of measurement for electric current as the *SI definition* of the *ampere*. The *SI definition* is inserted by item 1 of the Amending Regulations.

The definition of the *ampere* is now expressed in terms of fixed values of physical constants.

Part 2—Transitional provisions

Item 10 Part 12 (heading)

The heading to Part 12 is amended to insert “and saving” into the heading to reflect that the Part deals with both transitional and saving provisions.

Item 11 At the end of Part 12

Part 12 is amended to add a saving provision that provides that the amendments to Schedule 1 of the NM Regulations made by the Amending Regulations do not affect the validity of relevant verifications, certifications, determinations and recognitions in force immediately before 20 May 2019.

This regulation provides continuity of verifications, certifications, determinations and recognitions in force immediately before the commencing day so they are recognised as ascertained by means of, by reference to, by comparison with or by deviation from the items listed in section 10 of the *National Measurement Act 1960* after the commencing day.

Statement of Compatibility with Human Rights

Prepared in accordance with Part 3 of the Human Rights (Parliamentary Scrutiny) Act 2011

National Measurement Amendment (SI Redefinition) Regulations 2019

These Regulations are compatible with the human rights and freedoms recognised or declared in the international instruments listed in section 3 of the *Human Rights (Parliamentary Scrutiny) Act 2011*.

Overview of the Legislative Instrument

The purpose of the *National Measurement Amendment (SI Redefinition) Regulations 2019* is to update Australia's legal units of measurement to maintain alignment with the International System of Units of measurement (the SI).

In November 2018, the General Conference on Weights and Measures endorsed a redefinition of the base units of the SI with an international implementation date of 20 May 2019. The amendments are necessary to maintain international harmonisation and to fulfil Australia's obligations under the Metre convention.

The amendments will only impact measurements requiring the very highest levels of precision. The changes are expected to provide greater consistency, reliability and precision for measurements, and to have a positive impact on scientific discovery and innovation. Otherwise, there is no impact on businesses or the community.

Human rights implications

These Regulations do not engage any of the applicable rights or freedoms.

Conclusion

These Regulations are compatible with human rights as it does not raise any human rights issues.

The Hon Karen Andrews MP
Minister for Industry, Science and Technology