

METROLOGY BILL 2014

SAMOA

Explanatory Memorandum

Introduction

The Bill seeks to repeal and replace the Measures Ordinance 1960.

The objectives of the Bill are:

- (a) to develop a national system of measurement harmonized with technical international standards; and
- (b) to provide for standards for units of measurements; and
- (c) to provide approval process of all types of weights, measures or measuring instruments used in trade; and
- (d) to provide the functions of the Ministry in relation to certification inspection of agencies, measurement standards, packaging, verification, inspection and adjustment of equipment and measuring instruments; and
- (e) to provide for enforcement and offence provisions.

Clauses:

PART 1 **PRELIMINARY**

- Clause 1:** - provides for the short title and the commencement (date nominated by the Minister) provisions.
- Clause 2:** - provides for the interpretation of certain words in the Bill.

PART 2
UNITS OF MEASUREMENT

- Clause 3:** - provides that the units of measurement in Samoa are those international systems of units of measurement sets out in Schedule 1 of the Bill.
- Clause 4:** - provides that international systems of units set out in Schedule 2 of the Bill are the units of measurement for trade.

PART 3
NATIONAL STANDARDS

- Clause 5:** - obligates the Chief Executive Officer to provide national standards for a unit of measurement considered necessary for the purposes of the Act.
- Clause 6:** - provides that a standard may be a primary standard if it is a national standard of another country that is a signatory to the Convention of the Metre.
- Clause 7:** - provides that a standard may be a secondary standard if it is one of the denominations set out in Schedule 3 of the Bill.
- Clause 8:** - provides that standards may be working standards if it is a denomination specified in Schedule 3 of the Bill.
- Clause 9:** - empowers the Minister to declare a secondary standard as a temporary standard if there is no primary standard.
- Clause 10:** - empowers the CEO to assign custodian of standards.

PART 4
**SALE OF GOODS BY WEIGHT,
MEASURE OR NUMBER**

- Clause 11:** - obligates persons who sell goods by weight or measure to sell the goods by net weight or measure.
- Clause 12:** - imposes an obligation on a person who sells goods by weight or measure to weigh or measure the goods in presence of that person.
- Clause 13:** - creates the offence of selling goods at an incorrect weight or measure.
- Clause 14:** - provides that regulations may be made to prescribe the tests and limits of error to be applied to packaged goods.
- Clause 15:** - obligates the person selling goods by package to mark the product or package by net weight or net measure using the authorised units of measurement.
- Clause 16:** - creates the offence of selling goods by package (other than a catch weight package) that do not comply with the tests and limits of error specified in regulations.
- Clause 17:** - creates the offence of making any false or incorrect declaration or statement as to the number, quantity, measure or weight of any goods.
- Clause 18:** - empowers the Court to make an order for persons convicted of an offence under section 13 or 16 to make good any deficiency.

PART 5
WEIGHING AND MEASURING EQUIPMENT

*Division 1 - Stamping, Verification and
Approval of Weights and Measures*

- Clause 19:** - lists the requirements for weighing and measuring equipment.
- Clause 20:** - obligates a person to ensure that the equipment complies with the units of

- measurement and denomination and is marked and verified.
- Clause 21:** - provides for the right of a person to apply to the CEO for a certificate of pattern approval for equipment to be used in the conduct of trade.
- Clause 22:** - obligates the owner or person in possession of an equipment to present the equipment to an inspector for verification before initial use and after any repair or modification.
- Clause 23:** - creates the offence of refusing to produce any equipment when required and resisting or obstructing the CEO, etc.
- Clause 24:** - creates the offence of forgery in relation to markings on equipment or alteration of equipment after proper marking.
- Clause 25:** - creates the offence of counterfeiting in relation to stamp or impression of any such stamp used by the Ministry for the purposes of this Act.

*Division 2 - Manufacture, Sale
and Repair of Equipment*

- Clause 26:** - provides for the definition of ‘a person’ for the purpose of this Division.
- Clause 27:** - requires a person who manufactures, sells or repairs equipment to be licensed. It also empowers the CEO to issue the licence.
- Clause 28:** - creates the offence of selling equipment which does not meet the requirement sets out in section 19(2).

PART 6
ADMINISTRATION

- Clause 29:** - provides for the responsibilities and functions of the Ministry.

- Clause 30:** - provides for the powers of the Chief Executive Officer.
- Clause 31:** - provides for the appointment and termination of inspectors.
- Clause 32:** - provides for the duties of inspectors, such as verification and inspection of equipment.
- Clause 33:** - provides that the CEO may in writing authorise an inspector to adjust, alter or repair weights, measures or measuring instruments.
- Clause 34:** - empowers the Minister to appoint inspection agencies.
- Clause 35:** - provides for the offences by inspectors.

PART 7 **MISCELLANEOUS**

- Clause 36:** - provides for a general penalty and forfeiture orders.
- Clause 37:** - makes the principal liable for offences committed by employees and agents.
- Clause 38:** - provides for use of equipment and standards as evidence in Court.
- Clause 39:** - provides that if a company commits an offence, the directors also commit the same offence and also provides for defences for directors.
- Clause 40:** - provides settlement of dispute by the CEO whose determination is final.
- Clause 41:** - empowers the Minister to determine fees subject to the approval of the National Revenue Board. The CEO is empowered to approve forms.
- Clause 42:** - provides for the Regulations making powers of the Head of State.

Clause 43: - repeals the Measures Ordinance 1960 and provides for saving and transitional matters.

Schedule 1: - provides for units that belongs to the international system of units which sets out the base units and derived units which can be used for trade in Samoa. It is normally denoted as SI.

Schedule 2: - sets out international system of units as authorised units of measurements for trade in Samoa.

Schedule 3: - sets out denominations for standards of units of measurements.



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(Hon FONOTOE Nuafesili Pierre Lauofo)
MINISTER FOR COMMERCE,
INDUSTRY AND LABOUR

METROLOGY BILL 2014

SAMOA

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2014, No.

A BILL INTITULED

AN ACT to provide for metric weights and measures, and for related purposes.

BE IT ENACTED by the Legislative Assembly of Samoa in Parliament assembled as follows:

PART 1
PRELIMINARY

1. Short title and commencement-(1) This Act may be cited as the Metrology Act 2014.

(2) This Act commences on a date or dates to be nominated by the Minister.

2. Interpretation - In this Act, unless the context otherwise requires:

- “approved fee” means fees determined under section 41;
- “catch weight package” means a package that, because of the nature of the goods within the package, cannot normally be portioned to a predetermined quantity and is, as a result, usually sold in varying quantities;
- “Chief Executive Officer” means the Chief Executive Officer of the Ministry;
- “company” means a company incorporated under the Companies Act 2001;
- “Convention of the Metre” means the mutual recognition agreement of the Bureau International *des Poids et Mesures* for national measurement standards and for calibration and measurement certificates issued by national measurement institutes, and includes any amendment to the agreement as agreed to by the Government of Samoa;
- “correct” in relation to a weight, measure, or weighing or measuring instrument, means correct within the limits of maximum error permitted by regulations for the weight, measure, or weighing or measuring instrument;
- “equipment” means a weight, measure, weighing or measuring instrument or sub-assembly of a weighing or measuring instrument;
- “international system of units” or “SI” means the units that belong to the international system of units, abbreviated as « SI » and consists of base units and derived units described in Schedule 1;
- “initial verification” means the verification of a new or repaired weight, measure or weighing or measuring instrument prior to being placed in service;
- “in-service verification” means the periodic verification of a weight, measure or weighing or measuring instrument that is in service;
- “inspection agency” means an agency appointed by the Minister pursuant to section 34;
- “inspector” means an inspector of metrology appointed under section 31;

- “licence” means a licence issued under section 27;
- “licensee” means a person who has a valid licence;
- “measure” means a vessel of determinate capacity for determining the volume of a liquid or the length of a graduated rod or line;
- “measuring instrument” means an instrument used for the measurement of length, area, volume, capacity or mass (weight) or any instrument for the measurement of any quantity;
- “metrological traceability”, in relation to a measurement result, means the result that can be related to a reference through a documented unbroken chain of calibrations, each contributing to the measurement uncertainty;
- “metrology” means the science of measurements including weights and measures;
- “Minister” means the Minister responsible for this Act;
- “Ministry” means the Ministry responsible for this Act;
- “National Measurement Institute” means a National Measurement Institute of a country that is a signatory to the Convention of the Metre;
- “primary standard”:
- (a) means a standard provided in section 6; and
 - (b) includes a national standard metre, a national standard kilogram or standard for any unit of measurement declared as a national primary standard.
- “secondary standard” means a standard for any unit of measurement declared as a national secondary standard under section 7;
- “Organisation” or “OIML” means the International Organisation of Legal Metrology recognised by the World Trade Organisation as an international standardization organisation;
- “overseas weights and measures authority” means a weights and measures authority of a country that is a full member of the OIML;
- “package” includes anything in or by which goods are cased, covered, contained, or packed;

- “pattern approval” means pattern approval of equipment under section 21;
- “premises”, includes any building, factory, shop, store, warehouse, shed, land, vehicle, vessel or aircraft;
- “regulations” means regulations made under this Act;
- “sell” includes to expose or offer for sale, purporting to sell, to possess for purpose of sale, or to supply whether or not for sale;
- “standard” means a national primary standard, national secondary standard, working standard or temporary standard declared or procured under this Act;
- “trade” means any contract, bargain, sale or dealing under which any work, goods, wares, merchandise or other thing is to be done, sold, hired, delivered, carried, measured, computed, paid for or agreed to by a unit of measurement;
- “temporary standard” means a standard for any unit of measurement temporarily used as the national primary standard under section 9;
- “weight” means a body of determinate weight for use with a weighing instrument;
- “working standard” means a standard procured under section 8.

PART 2

UNITS OF MEASUREMENT

3. Legal units used for trade-(1) Subject to subsection (2), the units of measurement in Samoa are the international system of units in Schedule 1.

(2) The customary units of measurement in Part 2 of Schedule 2 may be legal units of measurement used for trade in Samoa for one (1) year from the commencement of this Act.

4. Authorised units-(1) The international system of units in Schedule 2 are the authorised units of measurement for trade.

(2) Subject to subsection (4) a person must:

- (a) use the authorised units of measurement in the conduct of trade;

- (b) use the authorised units of measurement in advertising, displaying or exposing goods for sale.
- (3) A person who contravenes subsection (2) commits an offence and is liable on conviction to a fine not exceeding 30 penalty units or to imprisonment for a term not exceeding three (3) months, or both.
- (4) This section does not apply to:
 - (a) trade in connection with the export of goods to, or the importation of goods from, a country where a system, other than the international system of units, is used; and
 - (b) the weighing or measuring of goods or any other action in connection with the export of goods to, or the importation of goods from, a country where a system other than the international system of units is used;
 - (c) the advertisement, display or exposure for sale by retail or on the package of any such goods if -
 - (i) the goods are imported; or
 - (ii) the goods are part of a line of goods intended for sale by retail in another country, where the goods are required by the law of that country or a contract relating to import, to be marked according to a system other than the international system of units.

PART 3

NATIONAL STANDARDS

5. Standards-(1) The Chief Executive Officer must provide national standards for a unit of measurement the Chief Executive Officer considers necessary for the purposes of this Act.

- (2) The Chief Executive Officer must procure, maintain or recognise standards as a:
- (a) primary standard; or
 - (b) secondary standard; or
 - (c) working standard.

(3) The Minister may by notice declare or revoke a standard in accordance with regulations.

(4) The Chief Executive Officer must ensure that the standards are verified as follows:

- (a) primary standards - verification and authentication at a National Measurement Institute at least once every 10 years;
- (b) secondary standards - verified as true and correct at least once every five (5) years, in comparison with the primary standard;
- (c) working standards - verified as true and correct at least once every two (2) years.

(5) If a standard is damaged, the standard must be re-verified in accordance with the methods of comparison determined by the Chief Executive Officer.

(6) The Chief Executive Officer may make a determination on the following:

- (a) the nature, form, material, and derivation or specification of a standard;
- (b) the markings to verify that a standard complies with this Act;
- (c) the methods of comparison and certification of copies of primary standards and secondary standards derived from primary standards;
- (d) the method of comparison of a working standard with an appropriate level standard of that unit of measurement which has metrological traceability to the primary standard.

6. Primary standards - A standard may be a primary standard if it is:

- (a) a national standard of another country that is a signatory to the Convention of the Metre; or
- (b) equivalent to a unit of measurement defined in Schedule 1 or any multiple or sub-multiple of the unit of measurement, and is to be made of materials and in a manner as to be, as far as practicable, proof against mechanical and atmospheric agents and other sources of error.

7. Secondary standards - A standard may be a secondary standard if it is one of the denominations set out in Schedule 3.

8. Working standards - A standard may be a working standard if it is one of a denomination specified in Schedule 3.

9. Temporary standards-(1) The Minister may, in the absence of a primary standard, declare the secondary standard of that unit of measurement as the temporary primary standard.

(2) A temporary standard may only be used for the purposes of this Act if it is verified and authenticated as the Chief Executive Officer may direct and placed in the custody of the custodian of standards.

10. Custodian of standards-(1) The Chief Executive Officer is the custodian of standards.

(2) The Chief Executive Officer may assign custody of a standard to an officer of the Ministry, an inspector or an authorised agency.

(3) A custodian of standards must keep and preserve each standard in their custody.

PART 4
**SALE OF GOODS BY WEIGHT,
MEASURE OR NUMBER**

11. Obligation to sell by net weight or measure-(1) A person who sells goods by weight or measure must sell the goods by net weight or measure.

(2) A person who contravenes subsection (1) commits an offence and is liable on conviction to a fine not exceeding 60 penalty units or to imprisonment for a term not exceeding six (6) months, or both.

12. Obligation to weigh or measure-(1) A person who sells goods by weight or measure, and on demand made by the person to whom the goods are to be delivered, must weigh or measure the goods in the presence of that person.

(2) This section does not apply to packaged goods.

(3) A person who contravenes subsection (1) commits an offence and is liable on conviction to a fine not exceeding 60 penalty units or to imprisonment for a term not exceeding six (6) months, or both.

13. Offence to supply short weight, measure or number-(1) If a person sells any goods by weight or measure or numbers, the person must supply to the buyer the quantity that corresponds with the price charged for the goods.

(2) A person who contravenes subsection (1) commits an offence and is liable on conviction to a fine not exceeding 60 penalty units or to imprisonment for a term not exceeding six (6) months, or both.

14. Packaged goods - The tests and limits of error to be applied to a package, other than a catch weight package, bearing a statement of the net weight or measure of the goods in that package are to be prescribed by regulation.

15. Obligation to mark packages-(1) A person who sells goods by package must mark the product or package by net weight or net measure using the authorised units of measurement and as prescribed by regulations.

(2) A person who contravenes subsection (1) commits an offence and is liable on conviction to a fine not exceeding 60 penalty units or to imprisonment for a term not exceeding six (6) months, or both.

16. Obligation to sell packaged goods by weight or measure - A person who sells goods by package, other than a catch weight package, by weight or by measure that does not comply with the tests and limits of error specified in regulations commits an offence and is liable on conviction to a fine not exceeding 60 penalty units or to imprisonment for a term not exceeding six (6) months, or both.

17. Offences for false or incorrect declaration or statement - A person who makes any false or incorrect declaration or statement as to the number, quantity, measure,

gauge or weight of any goods or things in connection with their purchase, sale, weighing or measurement, or in the computation of any charges for services rendered on the basis of weight or measure commits an offence and is liable on conviction to a fine not exceeding 60 penalty units or to imprisonment for a term not exceeding six (6) months, or both.

18. Court may order offender to make good any deficiency - The Court may order a person convicted of an offence under section 13 or 16 to make good to the person in respect of whom the offence was committed (other than an Inspector), either in goods or in money:

- (a) the deficiency between the quantity of goods actually delivered and that charged for or purported to be sold; or
- (b) the deficiency between the quantity of goods actually delivered and that stated on the package or label attached to the package.

PART 5

WEIGHING AND MEASURING EQUIPMENT

Division 1 - Stamping, Verification and Approval of Weights and Measures

19. Requirements for equipment-(1) In this section, “a person” means, a person who:

- (a) owns weighing or measuring equipment for use in the conduct of trade; or
 - (b) uses weighing or measuring equipment in the conduct of trade; or
 - (c) both owns and uses weighing or measuring equipment for and in the conduct of trade.
- (2) Before any equipment is used a person must ensure that the equipment is:
- (a) in accordance with authorised units of measurement specified in Schedule 2; and
 - (b) in accordance with denomination specified in Schedule 3; and

- (c) marked in accordance with section 20; and
 - (d) issued with a certificate of pattern approval in accordance with section 21; and
 - (e) verified in accordance with section 22.
- (3) A person who contravenes subsection (2) commits an offence and is liable on conviction, to a fine not exceeding 60 penalty units or to imprisonment for a term not exceeding six (6) months, or both.

20. Marking-(1) A person must mark:

- (a) a measuring instrument, to indicate the maximum it is designed to measure; and
 - (b) a weighing and measuring equipment, with an authorised denomination on its top side in legible figures and letters.
- (2) The form, size and other criteria for marking may be prescribed by regulations.
- (3) The marking required under subsection (1) does not apply if the small size of the equipment renders the marking impracticable.

21. Pattern approval-(1) A person may apply to the Chief Executive Officer for a certificate of pattern approval for the type of weighing or measuring equipment used in the conduct of trade.

(2) The Chief Executive Officer may issue a certificate of pattern approval in accordance with regulations.

(3) Despite section 43, the Chief Executive Officer may, if the Chief Executive Officer considers it appropriate or necessary for the administration of this Act, issue a pattern approval at any time within five (5) years from the commencement of this Act.

(4) If a pattern approval is found to be defective at a later examination, the Chief Executive Officer must:

- (a) cancel the certificate of pattern approval; and
- (b) notify the person to whom pattern approval was issued.

22. Verification-(1) A person who owns or is in possession of any equipment for use in the conduct of trade must present the equipment to an inspector for verification in accordance with regulations:

- (a) for initial verification, before the equipment is used;
- (b) after repair or modification; and
- (c) at the time and place fixed in a notice issued under subsection (2), if subject to periodical examination.

(2) The Chief Executive Officer must by notice published in the *Savali* fix the time and place within an area at which verification of weighing or measuring equipment subject to periodical examination is to be conducted by inspectors.

(3) An inspector must, upon payment of the approved fee:

- (a) inspect and examine equipment presented for verification; and
- (b) test a weight and measure by comparison with a working standard equivalent to the nominal value of that weight or measure; and
- (c) test a measuring instrument in the prescribed manner.

(4) An inspector may stamp a weight, measure or measuring instrument with the prescribed mark of verification, in the prescribed manner, if the weight, measure or measuring instrument:

- (a) is correct; and
- (b) meets the requirements for initial verification, verification after repair or modification or in-service verification; and
- (c) complies with this Act and regulations.

23. Refusal to produce equipment - A person who:

- (a) refuses to produce equipment when required to do so under this Act; or
- (b) resists or obstructs the Chief Executive Officer or inspector in exercising power under this Act to produce any equipment,

commits an offence and is liable on conviction to a fine not exceeding 300 penalty units or to imprisonment for a term not exceeding one (1) year, or both.

24. Forgery-(1) A person commits an offence who makes a false document within the meaning of Part 17 of the Crimes Act 2013:

- (a) with the intention of using it to obtain privilege, service, pecuniary advantage, benefit, or valuable consideration; or
- (b) knowing it to be false, with the intent that it in any way be used or acted upon as genuine; or
- (c) uses the document to obtain any property, privilege, service, pecuniary advantage, benefit, or valuable consideration; or
- (d) uses, deals with, or acts upon the document as if it were genuine; or
- (e) causes any other person to use, deal with, or act upon it as if it were genuine.

(2) Forgery is complete as soon as the document is made with the intent described in subsection (1)(a) or with the knowledge and intent described in subsection (1)(b).

(3) Forgery is complete even though the false document may be incomplete, or may not purport to be such a document as would be binding or sufficient in law, if it is so made and is such as to indicate that it was intended to be acted upon as genuine.

(4) A person who is convicted of an offence under subsection (1) is liable to a fine not exceeding 300 penalty units or to imprisonment for a term not exceeding one (1) year, or both.

25. Counterfeiting - A person commits an offence and is liable to a fine not exceeding 300 penalty units or to imprisonment for a term not exceeding one (1) year, or both who:

- (a) unlawfully makes or counterfeits a stamp or impression of any such stamp used by the Ministry for the purposes of this Act; or
- (b) uses any such seal, stamp, or impression, knowing it to be counterfeit;
- (c) sells equipment with any such seal, stamp, or impression, knowing it to be counterfeit.

*Division 2 - Manufacture, Sale
and Repair of Equipment*

26. Meaning of “a person” - In this Division, “person” whose business or a part of whose business is to manufacture, sell or repair equipment.

27. Licence to manufacture, sell or repair equipment-(1)
A person must have a licence to manufacture, sell or repair equipment.

(2) The Chief Executive Officer may issue a licence to manufacture, sell or repair any equipment, subject to terms and conditions determined by the Chief Executive Officer and as prescribed by Regulations.

(3) The application must be supported with the following:

(a) information for the manufacture of equipment, that -

(i) demonstrates the capability of the applicant to manufacture the type of equipment which the applicant seeks to manufacture;

(ii) confirms possession by the applicant of tools and other facilities as may be required for the manufacture or assembly of equipment;

(iii) is required for pattern approval;

(b) information for the repair of equipment, that -

(i) demonstrates the capability of the applicant to repair the type of weight, measure or weighing or measuring instrument which the applicant seeks to repair;

(ii) confirms possession by the applicant of equipment, tools or other facilities required to carry out a proper repair.

(4) The Chief Executive Officer may revoke a licence if the licensee is convicted of an offence under this Act.

(5) A person who:

(a) contravenes subsection (1); or

(b) as a licensee, breaches a condition of the licence,

commits an offence and is liable on conviction to a fine not exceeding 300 penalty units or to imprisonment for a term not exceeding one (1) year, or both.

28. Offence for sale of unverified equipment-(1) A person who sells equipment must ensure that it meets the requirements of section 19(2) before each sale is completed.

(2) A person who contravenes subsection (1) commits an offence and is liable on conviction to a fine not exceeding 60 penalty units or to imprisonment for a term not exceeding six (6) months, or both.

PART 6 **ADMINISTRATION**

29. Responsibilities and functions of the Ministry-(1) The Ministry is responsible for the administration and enforcement of this Act.

(2) For the purposes of subsection (1), the Ministry has the following functions:

- (a) to provide for the use of uniform units of measurement of physical quantities and for the establishment and maintenance of standards of measurement of physical quantities;
- (b) to act as custodian of standards declared for the purposes of this Act;
- (c) to establish and maintain laboratories for conducting scientific, industrial and legal metrology activities;
- (d) to provide summaries and plans for laws, rules and regulations on the management of metrology to the Minister;
- (e) to monitor and evaluate the application of this Act and regulations by other persons;
- (f) to accept, consider and resolve issues arising pursuant to proposals, petitions and demands associated with the enforcement of this Act;

- (g) to conduct and facilitate training of technical employees and inspectors;
- (h) to facilitate co-operation internationally in metrology to advance the economic benefit to Samoa;
- (i) to promote public awareness of metrology and its importance for industrial development and the welfare of citizens;
- (j) to assist in the approval patterns of weights, measures and measuring instruments required under this Act;
- (k) to assist in making of appointments for the purpose of this Act;
- (l) to carry out verification of weighing and measuring equipment;
- (m) to assist in the inspection of any weight, measure, measuring instrument or package to test its compliance with this Act;
- (n) to monitor, assess and evaluate the operations of an inspection agency;
- (o) to ensure that standards are verified in accordance with regulations;
- (p) carry out any function given to it under this Act or any other Act.

30. Powers of the Chief Executive Officer-(1) The Chief Executive Officer has the following powers:

- (a) to enter, at any reasonable time for the purpose of any inspection under this Act, any premises in which any weight or measure or measuring instrument is or is suspected to be kept or used for the purpose of any trade, or any article or goods are offered or exposed for sale;
- (b) to search for, or require the person-in-charge of the premises to produce for courage inspection, all or any of the weights and measures and measuring instruments kept in the premises;
- (c) to inspect any weight or measure which is found in the premises or produced for examination, and compare it with a working standard of the

- equivalent nominal value of that weight or measure;
- (d) to inspect any measuring instrument which is found in the premises or produced for examination and compare it with working standards or with measuring instruments tested with working standards;
 - (e) to seize and detain for the purpose of this Act any weight or measure or measuring instrument which is found upon any comparison or test to be incorrect, or which appears to the inspector to have been or likely to be used in contravention of this Act or regulations;
 - (f) to inspect and weigh or inspect and measure, any article or goods kept in any premises, or to be sold in order to ascertain whether this Act is being complied for the article or goods and to seize and detain the article or goods for which this Act has been or is suspected to have been breached;
 - (g) to require the production of all books, accounts, or documents relating to goods in any premises and to inspect and copy any of those books, accounts or documents;
 - (h) to take samples of goods in any premises as may reasonably be required for the proper performance of the Chief Executive Officer's duties;
 - (i) to remove a stamp of verification on any weight or measure or measuring instrument found not to comply with this Act or regulation;
 - (j) to carry out any other powers given to the Chief Executive Officer under this Act.
- (2) The Chief Executive Officer may delegate in writing to an inspector any or all of the powers in subsection (1).

31. Appointment and termination of inspectors-(1) The Chief Executive Officer may appoint a person as an inspector, subject to terms and conditions the Chief Executive Officer may determine.

(2) The Chief Executive Officer may terminate the appointment of a person as inspector, if the person:

- (a) does not comply with the inspector's duties under this Act; or
- (b) fails to carry out the inspector's functions to a satisfactory standards; or
- (c) has been convicted of an offence under this Act.

32. Duties of inspectors - An inspector has the following duties:

- (a) to verify weighing and measuring equipment;
- (b) to inspect weights, measures, measuring instruments, or packages to establish compliance with this Act;
- (c) to use a working standard for the purpose of testing any weight or measure;
- (d) to use a verified measuring instrument for the purposes of this Act;
- (e) to keep a register to record particulars of performance of duties;
- (f) to provide the register to the Chief Executive Officer at intervals to be determined by the Chief Executive Officer;
- (g) to conduct inspection, repair, alteration or adjustment of weights and measuring equipment in accordance with written authority from the Chief Executive Officer to do so;
- (h) if required by the Chief Executive Officer, to produce all the records, test reports, documents or equipment in the inspector's possession, relating to any verification or inspection conducted by the inspector under this Act;

- (i) to charge the fee for inspection, repair, alteration or adjustment before carrying out any inspection, repair, alteration or adjustment the inspector is authorised to carry out;
- (j) to dispose of fees paid for services under this Act in accordance with section 41;
- (k) to carry out any other duty given to inspectors under this Act or any other Act.

33. Authority to adjust, alter or repair - If the Chief Executive Officer considers necessary, the Chief Executive Officer may in writing authorise an inspector to adjust, alter or repair weights, measures or measuring equipment within a certain area.

34. Appointment of inspection agencies-(1) The Minister, acting on the advice of the Chief Executive Officer, may by written notice appoint and certify an entity as an inspection agency if the Minister is satisfied that the entity:

- (a) has the resources and technical expertise appropriate to carry out the functions to be assigned or powers to be granted under subsection (2); and
- (b) can maintain any working standard in its custody in the manner required under this Act; and
- (c) has paid the approved fee.

(2) When appointing and certifying an entity under subsection (1), the Minister may, acting on the advice of the Chief Executive Officer:

- (a) assign specific functions or duties under this Act to the inspection agency including -
 - (i) verification of weighing and measuring equipment;
 - (ii) inspection of weights, measures, measuring instruments, or packages to establish compliance;
 - (iii) certification of patterns for weighing and measuring equipment; and

- (b) grant an inspection agency -
 - (i) the powers of the Chief Executive Officer under section 30;
 - (ii) the powers of the Chief Executive Officer to authorise an inspector as an adjuster weighing and measuring equipment under section 33;
 - (iii) the power to issue a certificate of pattern approval under section 21;
 - (iv) the power to impose and collect fees for services provided under this Act; and
- (c) authorise an inspection agency -
 - (i) to make appointments necessary for implementation of the functions of the agency;
 - (ii) to procure working standards in accordance with section 8;
 - (iii) to issue notices for periodical examination under section 22; and
- (d) require an inspection agency to carry out its functions in accordance with the scope of its appointment and instructions imposed by the Ministry.

(3) An inspection agency may appoint an inspector as an accredited person who is responsible to the inspection agency for carrying out the inspector's duties.

(4) An accredited person has the same functions, duties, and powers of inspectors of the Ministry.

(5) The Minister may, acting on the advice of the Chief Executive Officer, revoke a notice of appointment and certification made under subsection (1).

35. Offences for inspectors-(1) An inspector commits an offence who:

- (a) breaches the duties provided in section 32; or
- (b) contravenes any regulation relating to the examination, verification or stamping of weights or measures or weighing or measuring instruments; or

- (c) derives any benefit or profit from or is employed in the manufacturing, selling or repairing of weighing and measuring equipment; or
- (d) repairs, alters or adjusts any weighing or measuring equipment without written authorisation from the Chief Executive Officer to do so.

(2) An inspector convicted of an offence under subsection (1) is liable to a fine not exceeding 300 penalty units or to imprisonment for a term not exceeding one (1) year, or both.

(3) A person who impersonates the Chief Executive Officer or an inspector for the purpose of this Act commits an offence and is liable on conviction to a fine not exceeding 600 penalty units or to imprisonment for a term not exceeding three (3) years, or both.

(4) In this section, “inspector” includes the head of an agency appointed under section 34 or any other person authorised to carry out any function, duty or powers under this Act.

PART 7 **MISCELLANEOUS**

36. General penalty and forfeiture orders-(1) A person who is convicted of an offence under this Act or regulation for which no penalty is provided is liable on conviction to a fine not exceeding 30 penalty units or to imprisonment for a term not exceeding three (3) months, or both.

(2) In proceedings for an offence relating to equipment or goods under this Part, the court may order, either at trial or on a subsequent application that the equipment or goods be:

- (a) delivered to the person appearing to the court to be entitled to the equipment or goods; or
- (b) forfeited or destroyed (in the case of instruments or things for falsifying verification of equipment);
or
- (c) otherwise disposed of in a manner determined by the court.

37. Principal liable for offences by employees and agents - If an offence under this Act is committed by the agent or employee of a manufacturer or trader, the offence is deemed to have been committed by the manufacturer or trader unless it proves that the offence was committed without its knowledge.

38. Evidence-(1) A person who carries on any trade, if found in the possession of weighing and measuring equipment is deemed to be in possession of the equipment for use in trade, until the contrary is proved.

(2) A certificate issued by the Chief Executive Officer or inspection agency regarding the condition of any weight, measure or measuring instrument, is admissible in evidence in any court, and is evidence of the facts stated in the certificate.

(3) Subsection (2) does not affect the right to cross-examine a person on the facts stated in the certificate.

(4) A court must take judicial notice of a standard.

39. Defences-(1) If an offence under this Act is committed by a company, the person at the time of commission of that offence who was a director of that company is deemed to have committed the same offence.

(2) It is a defence under subsection (1) for the director to prove that:

- (a) the director took any reasonable and proper steps to ensure that the requirements of this Act would be complied with; or
- (b) the director took any reasonable and proper steps to ensure that the company complied with the requirements of this Act; or
- (c) in the circumstances, the director could not have been expected to take any reasonable and proper steps to ensure that the company complied with the requirements of this Act.

(3) If an offence under this Act is committed by a body of persons other than a company, a person who at the time of the commission of the offence was an officer or member of that body is deemed to have committed the same offence.

(4) It is a defence under subsection (3) for the officer or member to prove that:

- (a) the offence was committed without the officer's or member's knowledge; or
- (b) the officer or member took reasonable precautions and exercised due diligence to prevent the commission of the offence.

40. Dispute settlement-(1) The Chief Executive Officer may, at the request of an inspector or a party to a dispute, hear and determine a dispute between the parties regarding the methods to be adopted in testing any weight, measure or measuring instrument.

(2) A determination by the Chief Executive Officer regarding the dispute is final.

41. Fees and forms-(1) The Minister, with the approval of the National Revenue Board, may by notice published in the Savali, determine the fees and other charges for the purpose of this Act.

(2) All fees and charges are to be paid to:

- (a) the Ministry; or
- (b) for services by an inspection agency, to the inspection agency.

(3) The Chief Executive Officer may approve forms for the purposes of this Act.

42. Regulations and amendment of Schedules-(1) The Head of State, acting on the advice of Cabinet, may make regulations for the purpose of or to give effect to the provisions of this Act, and in particular to make the following regulations:

(a) for the purpose of section 3 -

- (i) assign definitions of the base units in Schedule 1 to a definition that appears to reproduce the international definition adopted by the General Conference on Weights and Measures; and

- (ii) extend the period of time that a customary unit of measurement may remain legal for use in trade; and
 - (iii) remove any customary unit from Schedule 2 and Schedule 3;
- (b) for the purpose of section 14, prescribe the tests and limits of error to be applied to a package, other than a catch weight package, bearing a statement of the net weight or measure of the goods in that package;
- (c) for the purpose of section 15 -
 - (i) the requirements for the marking and labelling of the quantity of a package of goods or goods sold, offered or exposed for sale whether on a price ticket, price list, advertisement or otherwise;
 - (ii) the requirements for the marking and labelling of the name and address of the packer of those goods; and
 - (iii) exempt any package of goods or class of goods from any marking or labelling requirement under section 15;
 - (iv) the requirements for the marking of every package containing food in a liquid medium to be marked with the drained weight of the contents; and
 - (v) specify different types, categories or classes of goods to which the requirements apply;
- (d) for the purpose of section 19, exempt a field from the requirements in section 19 or limit the extent of application to a field;
- (e) for the purpose of section 21, the procedures, conditions, specification, or limits of error to be used for determining pattern approval;
- (f) for the purpose of section 22 -
 - (i) to determine which weights, measures or measuring instruments are subject to periodical examination; and

(ii) the requirements for initial verification, verification after repair or modification and in-service verification;

(iii) the duration of validity for verification;

(g) for the purpose of section 27, for prohibiting licensees from demanding or accepting fees for repair or adjustment of weights, measures, and measuring instruments in excess of approved fees;

(h) any other matter required to be prescribed by this Act.

(2) The Head of State, acting on the advice of Cabinet, may by regulations amend a Schedule.

43. Repeal, saving and transitional-(1) The Measures Ordinance 1960 (“Ordinance”) is repealed.

(2) A weight, measure, or measuring instrument in trade use under the Ordinance continues and is taken to be approved for the purposes of section 21 for a period of five (5) years from the commencement date of this Act.

(3) A verification of any weight, measure or measuring instrument under the Ordinance continues in force until expiry of 12 months from the commencement of this Act.

(4) Any proceedings initiated under the Ordinance pending at the commencement of this Act continue as if they were initiated under this Act.

(5) A reference to the Ordinance in any other enactment (other than this Act) is taken as a reference to this Act, except where the context otherwise requires.

SCHEDULE 1
(Sections 2, 3(1), 6(b) and 42(1)(a)(i))

INTERNATIONAL SYSTEM OF UNITS

1. Definition of the international system of units - The international system of units « SI » consists of:

- (a) the base units; and
- (b) the derived units.

2. Base units - The names and symbols of the base units are respectively for:

length	metre (m)
mass	kilogram (kg)
time	second (s)
electric current	ampere (A)
thermodynamic temperature	kelvin (K)
amount of substance	mole (mol)
luminous intensity	candela (cd)

3. Derived units-(1) The derived units are coherent with the base units and, if necessary, with the supplementary units, and are defined by algebraic expressions in the form of products of powers of the base and supplementary units, with a numerical factor equal to one. Most commonly used derived units are indicated in subclauses (2), (3), (4), (5), (6) and (7).

(2) The units of space and time are as follows:

(a) Plane angle: radian (symbol: rad)

The radian is the plane angle between two radii which cut off on the circumference of a circle an arc equal in length to the radius.

$$(1 \text{ rad} = \frac{1\text{m}}{1\text{m}} = 1)$$

(b) Solid angle: steradian (symbol: Sr)

The steradian is the solid angle, which having its vertex in the centre of a sphere, cuts off an area of the surface of the sphere equal to that of a square with its side of equal length to the radius of the sphere.

$$(1 \text{ sr} = \frac{1\text{m}^2}{1\text{m}^2} = 1)$$

(c) Wave number: 1 per metre (symbol: m^{-1})

1 per metre is the wave number of a monochromatic radiation whose wave length is equal to 1 metre.

$$(1 \text{ m}^{-1} = \frac{1}{1\text{m}})$$

(d) Surface, Area: the square metre (symbol: m^2)

The square metre is the surface of a square having a side of 1 metre.

$$(1 \text{ m}^2 = 1 \text{ m} \cdot 1 \text{ m})$$

(e) Volume: the cubic metre (symbol: m^3)

The cubic metre is the volume of a cube having a side of 1 metre.

$$(1 \text{ m}^3 = 1 \text{ m} \cdot 1 \text{ m} \cdot 1 \text{ m})$$

(f) Frequency: the hertz (symbol: Hz)

The hertz is the frequency of a periodic phenomenon of which the periodic time is 1 second.

$$(1 \text{ Hz} = 1 \text{ s}^{-1} = \frac{1}{1\text{s}})$$

- (g) Angular velocity: radian per second (symbol: rad/s or $\text{rad} \cdot \text{s}^{-1}$)

The radian per second is the angular velocity of a body which, animated by a uniform rotation around a fixed axis, turns 1 radian in 1 second.

$$(1 \text{ rad} / \text{s} = \frac{1 \text{ rad}}{1 \text{ s}})$$

- (h) Angular acceleration: radian per second squared (symbol: rad/s^2 or $\text{rad} \cdot \text{s}^{-2}$)

The radian per second squared is the angular acceleration of a body which is animated by a rotation varying uniformly around a fixed axis, and whose angular velocity varies by 1 radian per second in 1 second.

$$(1 \text{ rad}/\text{s}^2 = \frac{1 \text{ rad/s}}{1 \text{ s}})$$

- (i) Speed: metre per second (symbol: m/s or $\text{m} \cdot \text{s}^{-1}$)

The metre per second is the speed of a body which, animated by a uniform movement, covers 1 metre in 1 second.

$$(1 \text{ m/s} =) \frac{1 \text{ m}}{1 \text{ s}}$$

- (j) Acceleration: metre per second squared (symbol: m/s^2 or $\text{m} \cdot \text{s}^{-2}$)

The metre per second squared is the acceleration of a body, animated by a uniformly varied movement whose speed varies in 1 second by 1 metre per second.

$$(1 \text{ m/s}^2 = \frac{1 \text{ m/s}}{1 \text{ s}})$$

(3) The units of mechanics are as follows:

(a) Linear density: kilogram per metre (symbol: kg/m or $\text{kg} \cdot \text{m}^{-1}$)

The kilogram per metre is the linear density of a homogeneous body of uniform section having a mass of 1 kilogram and a length of 1 metre.

$$(1 \text{ kg/m} = \frac{1 \text{ kg}}{1 \text{ m}})$$

(b) Surface density: kilogram per square metre (symbol: kg/m^2 or $\text{kg} \cdot \text{m}^{-2}$)

The kilogram per square metre is the density of a homogeneous body having a mass of 1 kilogram and a surface of 1 square metre.

$$(1 \text{ kg/m}^2 = \frac{1 \text{ kg}}{1 \text{ m}^2})$$

(c) Density (mass density): kilogram per cubic metre (symbol : kg/m^3 or $\text{kg} \cdot \text{m}^{-3}$)

The kilogram per cubic metre is the density of a homogeneous body having a mass of 1 kilogram and a volume of 1 cubic metre.

$$(1 \text{ kg/m}^3 = \frac{1 \text{ kg}}{1 \text{ m}^3})$$

(d) Force: Newton (symbol: N)

The newton is the force which, when applied to a body having a mass of 1 kilogram, gives it an acceleration of 1 metre per second squared.

$$(1 \text{ N} = 1 \text{ kg} \cdot \text{m/s}^2)$$

(e) Pressure, Stress: Pascal (symbol: Pa)

The Pascal is the uniform pressure which, when acting on a plane surface of 1 square metre, exercises perpendicularly to that surface a total force of 1 Newton. It is also the uniform stress which, when acting on a plane surface of 1 square metre, exercises on that surface a total force of 1 Newton.

$$(1 \text{ Pa} = \frac{1 \text{ N}}{1 \text{ m}^2})$$

(f) Dynamic viscosity: Pascal second (symbol: pa . s)

The Pascal second is the dynamic viscosity of a homogeneous fluid in which the uniform linear movement of a plane surface of 1 square metre leads to a retarding force of 1 newton, when there is a difference in velocity of 1 metre per second between two parallel planes separated by a distance of 1 metre.

$$(1 \text{ Pa} \cdot \text{s} = \frac{1 \text{ Pa} \cdot 1 \text{ m}}{1 \text{ m/s}})$$

(g) Kinematic viscosity: metre squared per second (symbol: m²/s or m².s⁻¹)

The metre squared per second is the kinematic viscosity of a fluid whose dynamic viscosity is 1

Pascal second and whose density is 1 kilogram per cubic metre.

$$(1 \text{ m}^2/\text{s} = \frac{1 \text{ Pa} \cdot \text{s}}{1 \text{ kg}/\text{m}^3})$$

(h) Work, Energy, Quantity of heat: joule (symbol: J)

The joule is the work done when the point of application of a force of 1 newton is displaced through a distance of 1 metre in the direction of the force.

$$(1 \text{ J} = 1 \text{ N} \cdot 1 \text{ m})$$

(i) Power, Energy flow rate, Heat flow rate: watt (symbol: W)

The watt is the power which gives rise to a production of energy equal to 1 Joule per second.

$$(1 \text{ W} = \frac{1 \text{ J}}{1 \text{ s}})$$

(j) Volume flow rate: cubic metre per second (symbol m^3/s or $\text{m}^3 \cdot \text{s}^{-1}$)

The cubic metre per second is the volume flow rate of a uniform flow such that a substance having a volume of 1 cubic metre passes through the cross section considered in 1 second.

$$(1 \text{ m}^3/\text{s} = \frac{1 \text{ m}^3}{1 \text{ s}})$$

(k) Mass flow rate: kilogram per second (symbol: kg/s or $\text{kg} \cdot \text{s}^{-1}$)

The kilogram per second is the mass flow rate of a uniform flow such that a substance having a

mass of 1 kilogram passes through the cross section considered in 1 second.

$$(1 \text{ kg/s} = \frac{1 \text{ kg}}{1 \text{ s}})$$

(4) The units of heat are as follows:

(a) Entropy: joule per Kelvin (symbol: J/K or $\text{J} \cdot \text{K}^{-1}$)

The joule per Kelvin is the increase in the entropy of a system receiving a quantity of heat of 1 joule at the constant thermodynamic temperature of 1 Kelvin, provided that no irreversible change takes place in the system.

$$(1 \text{ J/K} = \frac{1 \text{ J}}{1 \text{ K}})$$

(b) Specific heat capacity: joule per kilogram Kelvin

(symbol : $\text{J}/(\text{kg} \cdot \text{K})$ or $\text{J} \cdot \text{kg}^{-1} \cdot \text{K}^{-1}$)

The joule per kilogram Kelvin is the specific heat capacity of a homogeneous body having a mass of 1 kilogram in which the addition of a quantity of heat of 1 joule produces a rise in temperature of 1 kelvin.

$$(1 \text{ J}/(\text{kg} \cdot \text{K}) = \frac{1 \text{ J}}{1 \text{ kg} \cdot 1 \text{ K}})$$

(c) Thermal conductivity: watt per metre kelvin

(symbol: $\text{W}/(\text{m} \cdot \text{K})$ or $\text{W} \cdot \text{m}^{-1} \cdot \text{K}^{-1}$)

The watt per metre kelvin is the thermal conductivity of a homogeneous body in which a difference of temperature of 1 kelvin between two parallel planes having a surface of 1 square

metre and which are 1 metre apart produces between these planes a heat flow rate of 1 watt.

$$(1 \text{ W}/(\text{m} \cdot \text{K}) = \frac{1 \text{ W}/\text{m}^2}{1 \text{ K}/1\text{m}})$$

(5) The units of Electricity and Magnetism are as follows:

(a) Quantity of electricity, Electric charge: coulomb (symbol: C)

The coulomb is the quantity of electricity carried in 1 second by a current of 1 ampere.

$$(1 \text{ C} = 1 \cdot 1 \text{ s} = 1 \text{ A} \cdot \text{s}).$$

(b) Electric potential, Electric tension, Electromotive force: volt (symbol: V)

The volt is the difference of electric potential between two points of a conducting wire carrying a constant current of 1 ampere, when the power dissipated between these two points is equal to 1 watt.

$$(1 \text{ V} = \frac{1 \text{ W}}{1 \text{ A}})$$

(c) Electric field strength: volt per metre (symbol: V/m)

The volt per metre is the strength of the electric field which exercises a force of 1 newton on a body charged with a quantity of electricity of 1 coulomb.

$$(1 \text{ V}/\text{m} = \frac{1 \text{ N}}{1 \text{ C}})$$

(d) Electric resistance: ohm (symbol: Ω)

The ohm is the electric resistance between two points of a conductor when a constant potential difference of 1 volt, applied to these points, produces in the conductor a current of 1 ampere, the conductor not being the seat of any electromotive force.

$$(1 \Omega = \frac{1 \text{ V}}{1 \text{ A}})$$

(e) Conductance: siemens (symbol: S)

The siemens is the conductance of a conductor having an electric resistance of 1 ohm.

$$(1 \text{ S} = 1 \Omega^{-1} = \frac{1}{1 \Omega})$$

(f) Electric capacitance: farad (symbol: F)

The farad is the capacitance of a capacitor between the plates of which there appears a difference of electric potential of 1 volt, when it is charged by a quantity of electricity of 1 coulomb.

$$(1 \text{ F} = \frac{1 \text{ C}}{1 \text{ V}})$$

(g) Inductance: henry (symbol: H)

The henry is the electric inductance of a closed circuit in which an electromotive force of 1 volt is produced when the electric current in the circuit varies uniformly at the rate of 1 ampere per second.

$$(1 \text{ H} = \frac{1 \text{ V} \cdot 1 \text{ s}}{1 \text{ A}})$$

- (h) Magnetic flux, magnetic induction flux: Weber
(symbol: Wb)

The weber is the magnetic flux which, linking a circuit of 1 turn, would produce in it an electromotive force of 1 volt, if it were reduced to zero at a uniform rate in 1 second.

$$(1 \text{ Wb} = 1 \text{ V} \cdot 1 \text{ s}).$$

- (i) Magnetic induction, magnetic, flux density: tesla
(symbol: T)

The tesla is the uniform magnetic induction, which, distributed normally over a surface of 1 square metre, produces across the surface a total magnetic flux of 1 weber.

$$(1 \text{ T} = \frac{1 \text{ Wb}}{1 \text{ m}^2})$$

- (j) Magnetomotive force: ampere (symbol: A)

The ampere is the magnetomotive force along any closed curve which surrounds once only an electric conductor through which an electric current of 1 ampere passes.

- (k) Magnetic field strength: ampere per metre (symbol A/m or $\text{A} \cdot \text{m}^{-1}$).

The ampere per metre is the strength of the magnetic field produced in vacuum along the circumference of a circle of 1 metre circumference, by an electric current of 1 ampere, maintained in a straight conductor of

infinite length, of negligible circular cross section, forming the axis of the circle mentioned.

$$(1 \text{ A/m} = \frac{1 \text{ A}}{1 \text{ m}})$$

(6) The units of radiation and light are as follows:

(a) Radiant intensity: watt per steradian (symbol W/sr or $\text{W} \cdot \text{sr}^{-1}$)

The watt per steradian is the radiant intensity of a point source emitting a uniform radiant flux of 1 watt in a solid angle of 1 steradian.

$$(1 \text{ W/sr} = \frac{1 \text{ W}}{1 \text{ sr}})$$

(b) Luminance: candela per square metre (symbol: Cd/m^2 or $\text{cd} \cdot \text{m}^{-2}$)

The candela per square metre is the luminance perpendicular to the plane surface of 1 square metre of a source of which the luminous intensity perpendicular to that surface is 1 candela.

$$(1 \text{ cd/m}^2 = \frac{1 \text{ cd}}{1 \text{ m}^2})$$

(c) Luminous flux: lumen (symbol: lm)

The lumen is the luminous flux emitted in the unit solid angle (steradian) by a uniform point source having a luminous intensity of 1 candela.

$$(1 \text{ lm} = 1 \text{ cd} \cdot 1 \text{ sr})$$

(d) Illuminance: lux (symbol: lx)

The lux is the illuminance of a surface receiving a luminous flux of 1 lumen, uniformly distributed over a square metre of the surface.

$$(1 \text{ lx} = \frac{1 \text{ lm}}{1 \text{ m}^2})$$

(7) The units of ionizing radiations are as follows:

(a) Activity (of a radioactive source): becquerel
(Symbol: Bq)

The becquerel is the activity of a radioactive source which one nuclear transformation or transition occurs per second.

$$(1 \text{ Bq} = \frac{1}{1 \text{ s}})$$

(b) Absorbed dose: gray (symbol: Gy)

The gray is the dose absorbed in an element of matter of 1 kilogram mass to which the energy of 1 joule is imparted by ionizing radiations whose energy fluence is constant.

$$(1 \text{ Gy} = \frac{1 \text{ W}}{1 \text{ kg}})$$

(c) Exposure: coulomb per kilogram (symbol: C/kg or $\text{C} \cdot \text{kg}^{-1}$)

The coulomb per kilogram is the exposure of a photonic ionizing radiation, which can produce in a quantity of air of 1 kilogram mass, ions of one sign carrying a total electric charge of 1 coulomb, the energy fluence being uniform in the quantity of air considered.

4. Decimal multiples and sub-multiples of the SI units-(1) The decimal multiples and sub-multiples of SI units are formed by means of the decimal numerical factors set out in subclause (2) by which the SI unit concerned is multiplied.

(2) The names of the decimal multiples and sub-multiples of the SI units are formed by means of SI prefixes designating the decimal numerical factors.

<u>Factors</u>		<u>SI Prefix</u>	<u>Symbol</u>
1 000 000 000 000 000 000	= 10^{18}	exa	E
1 000 000 000 000 000	= 10^{15}	peta	P
1 000 000 000 000	= 10^{12}	tera	T
1 000 000 000	= 10^9	giga	G
1 000 000	= 10^6	mega	M
1 000	= 10^3	kilo	k
100	= 10^2	hecto	h
10	= 10^1	deca	da
0.1	= 10^{-1}	deci	d
0.01	= 10^{-2}	centi	c
0.001	= 10^{-3}	milli	m
0.000 001	= 10^{-6}	micro	μ
0.000 000 001	= 10^{-9}	nano	n
0.000 000 000 001	= 10^{-12}	pico	p
0.000 000 000 000 001	= 10^{-15}	femto	f
0.000 000 000 000 000 001	= 10^{-18}	atto	a

(3) A prefix must be considered to be combined with the name of the unit to which it is directly attached.

(4) The symbol of the prefix must be placed before the symbol of the unit without intermediate space; the whole forms the symbol of the multiple of the unit. The symbol of the prefix is therefore considered to be combined with the symbol of the unit to which it is directly attached, forming with it a new unit symbol which can be raised to a positive or negative power and which can be combined with other unit symbols to form the symbols for compound units.

(5) Compound prefixes, formed by the juxtaposition of several SI prefixes, are not permitted.

(6) The names and symbols of the decimal multiples and sub-multiples of the unit of mass are formed by the addition of the SI prefixes to the word « gram » (symbol: g) $1 \text{ g} = 0.001 \text{ kg} = 10^{-3} \text{ kg}$.

(7) To designate the decimal multiples and sub-multiples of a derived unit which is expressed in the form of a fraction, a prefix can be attached indifferently to the units which appear either in the numerator, or in the denominator, or in both of these terms.

SCHEDULE 2
(Sections 3(2), 4(1), 19(2)(a), and 42(1)(a)(iii))

UNITS TO BE USED IN TRADE

PART 1

1. The international system of units and other metric units-(1) The measurement of length is as follows:

(a) SI units:

kilometre (km)	= 1000 metres
metre (m)	as defined in Schedule 1
millimetre (mm)	= 1/1000 metres
micrometre (μm)	= 1/1 000 000 metres

(b) Other metric units:

nautical mile	= 1852 metres
centimetre	= 1/100 metres

(2) The measurement of area is as follows:

(a) SI units:

square metre (m^2) =	as defined in Schedule 1
square kilometre ($(\text{km})^2$)	= 1 000 000 square metres
square millimetre ($(\text{mm})^2$)	= 1/1 000 000 th of square metre

(b) Other metric units:

hectare (ha)	= 10 000 square metres
are (a)	= 100 square metres
square centimetre ($(\text{cm})^2$)	= 1/10 000 th of a square metre

(3) The measurement of plane and solid angle is as follows:

(a) Plane angle:

radian (rad)	as defined in Schedule 1
degree ($^{\circ}$)	$= \pi / 180$ radians
minute ($'$)	$= \pi / 10800$ radians
second ($''$)	$= \pi / 64800$ radians
gon (gon)	$= \pi / 200$ radians

(b) Solid angle:

steradian (sr)	as defined in Schedule 1
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(4) The measurement of speed is as follows:

(a) SI units:

metre per second (m/s)	as defined in Schedule 1
------------------------	--------------------------

(b) Other metric units:

kilometre per hour	$= 10/36$ metres per second
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(5) The measurement of volume or capacity is as follows:

(a) SI units:

cubic metre	as defined in Schedule 1
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(b) Other metric units:

hectolitre (hl)	$= 100$ litres
litre (l) =	$= 1/1\ 000^{\text{th}}$ of a cubic metre
cubic centimetre ((cm) 3)	$= 1/100\ 000^{\text{th}}$ of cubic metre
decilitre (dl)	$= 1/10^{\text{th}}$ of a litre
centilitre (cl)	$= 1/100^{\text{th}}$ of a litre
millilitre (ml)	$= 1/1\ 000^{\text{th}}$ of a litre

(6) The measurement of mass is as follows:

(a) SI units:

kilogram (kg)	as defined in Schedule 1
gram (g)	= 1/1 000 th of kilogram
milligram (mg)	= 1/100 000 th of a kilogram
microgram (μ g)	= 1/1 000 000 000 th of a kilogram

(b) Other metric units:

tonne (t)	= 1 000 kilogram
metric carat	= 1/5 th part of a gram

(7) The measurement of density (mass density) is as follows:

(a) SI units:

kilogram per cubic metre	as defined in Schedule 1
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(b) Other metric units:

tonne per cubic metre	= 1 000 kilograms per cubic metre
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(8) The measurement of force is as follows:

SI units:

meganewton (MN)	= 1 000 000 newtons
kilonewton (kN)	= 1 000 newtons
newton (N)	as defined in Schedule 1
millinewton (mN)	= 1/1 000 th of a newton

(9) The measurement of pressure and stress is as follows:

SI units:

megapascal (MPa)	= 1 000 000 pascals
kilopascal (kPa)	= 1 000 pascals
pascal (Pa)	as defined in Schedule 1

(10) The measurement of linear density of textiles is as follows:

Other metric units:

tex (tex)	= The mass in grams of one kilometre of yarn. = 1 g/1 km = 10^{-6} kg/m
millitex (mtex)	= 1/1 000 th of a tex
decitex (dtex)	= 1/10 th of a tex
kilotex (ktex)	= 1 000 tex

(11) The measurement of time and frequency is as follows:

(a) Time:

minute (min)	= 60 seconds
hour (h)	= 3600 seconds
day (d)	= 86400 seconds
week	= 7 days
month and year	of the Gregorian calendar

(b) Frequency:

gigahertz (GHz)	= 1 000 000 000 hertz
megahertz (MHz)	= 1 000 000 hertz
kilohertz (kHz)	= 1 000 hertz
hertz (Hz)	as defined in Schedule 1

(12) The measurement of temperature is as follows:

(a) SI units:

kelvin (K)	as defined in Schedule 1
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(b) Other metric units:

degree celsius ($^{\circ}\text{C}$)	= one kelvin (K)
The celsius temperature scale is defined by the following equation:	
$t = T - T_0$ where	

t – temperature in degrees celsius

T – temperature in kelvins

$T_0 = 273.15 \text{ K}$

(13) The measurement of energy and power is as follows:

(a) Energy, work and quantity of heat:

joule (J)	as defined in Schedule 1
kilojoule (kJ)	= 1 000 joules
megajoule (MJ)	= 1 000 000 joules
watthour (Wh)	= $3.6 \cdot 10^3$ joules
kilowatthour (kWh)	= 1 000 watthour
electronvolt (eV)	= The energy acquired by an electron in passing through a potential difference of 1 volt in vacuum.
All other multiples and sub-multiples as defined in clause 4 of Schedule 1.	

(b) Power, energy flow rate and heat flow rate:

milliwatt (mW)	= 1/ 1 000 of a watt
watt (W)	as defined in Schedule 1
kilowatt (kW)	= 1 000 W
megawatt (MW)	= 1 000 000 watts
All other multiples and sub-multiples as defined in Paragraph 4 of Schedule 1.	

(14) The measurement of specific energy is as follows:

(a) SI units:

kilojoules per kilogram (kJ/kg)	= 1 000 joules per kilogram
joule per kilogram (J/kg)	= 1 joule per kilogram

(b) Other units:

joule per gram (J/g)	$1/1\,000^{\text{th}}$ joules per kilogram
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(15) The measurement of electric current is as follows:

SI units:

ampere (A)	as defined in Schedule 1
milliampere (mA)	$= 1/1\,000^{\text{th}}$ of ampere
microampere (μA)	$= 1/1\,000\,000^{\text{th}}$ of ampere

(16) The measurement of electromotive force and potential difference is as follows:

SI units:

kilovolt (kV)	$= 1\,000$ volts
volt (V)	as defined in Schedule 1
millivolt (mV)	$= 1/1\,000^{\text{th}}$ of a volt
microvolt (μV)	$= 1/1\,000\,000^{\text{th}}$ of a volt

(17) The measurement of electric capacitance is as follows:

SI units:

henry (H)	as defined in Schedule 1
millihenry (mH)	$= 1/1\,000^{\text{th}}$ of a henry
microhenry (μH)	$= 1/1\,000\,000^{\text{th}}$ of a henry

(18) The measurement of electric resistance is as follows:

SI units:

megaohm ($\text{M}\Omega$)	$= 1\,000\,000$ ohms
kiloohm ($\text{k}\Omega$)	$= 1\,000$ ohms
ohm (Ω)	as defined in Schedule 1
milliohm ($\text{m}\Omega$)	$= 1/1\,000^{\text{th}}$ of an ohm
microohm ($\mu\Omega$)	$= 1/1\,000\,000^{\text{th}}$ of an ohm

(19) The measurement of quantity of electricity is as follows:

(a) SI units:

coulomb (C)	as defined in Schedule 1
millicoulomb (mC)	= 1/1000 th of coulomb
microcoulomb (μ C)	= 1/1 000 000 th of coulomb

(b) Other units:

amperehour (Ah)	= 3 600 coulombs
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(20) The measurement of luminous intensity is as follows:
SI units:

candela (cd)	as defined in Schedule 1
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(21) The measurement of illumination is as follows:
SI units:

lux (lx)	as defined in Schedule 1
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(22) The measurement of luminous flux is as follows:
SI units:

lumen (lm)	as defined in Schedule 1
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(23) The measurement of activity is as follows:
SI units:

becquerel (Bq)	as defined in Schedule 1
millibecquerel (mBq)	= 1/1 000 of becquerel

(24) The measurement of absorbed dose is as follows:
SI units:

gray (Gy)	as defined in Schedule 1
milligray (mGy)	= 1/1 000 of gray

(25) The measurement of exposure is as follows:

SI units:

coulomb per kilogram (C/kg)	as defined in Schedule 1
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PART 2

2. Customary units of measurement-(1) Weight:

(a) British Imperial/US units:

avoirdupois pound	= 7000 grains, or 256 drams, or 16 avoirdupoir ounces	= 0.453 592 37 kilograms
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(b) US units:

hundredweight	= 100 pounds	= 45.359 237 kilograms
ton	= 2000 pounds	= 907.184 74 kilograms

(2) Capacity or volume:

(a) British Imperial units:

fluid drahm	= 60 minims	= 3.551 632 7
fluid ounce	= 8 fluid drachms, or 480 minims	= 28.413 062 5 millilitres
pint	= 20 fluid ounces, or 160 fluid drachms, or 9600 minims	= 568.261 24 millilitres
gallon	= 160 fluid ounces, or 4 quarts, or 8 pints	= 4.546 09 cubic decimetres/ litres

(b) US units:

cubic inch	= 1/1728 cubic foot	= 16.387 064 millilitres
cubic foot	= 1728 cubic inches	= 28 316.846 592 millilitres or 0.028 316 846 592 cubic metre (cm ³)
pint (US)	= 28.875 cubic inches (in ³), or 16 fluid ounces, or 128 fluid drams, or 7680 minims	= 473.176 47 millilitres
gallon	= 231 cubic inches (in ³), or 4 quarts, or 8 pints	= 3.785 411 7 litres

(3) Dry measures:
US customary units:

dry pint	= 33.600 312 5 cubic inches (in ³)	= 0.550 610 5 litres
dry quart	= 67.200 625 cubic inches (in ³)	= 1.101 221 litres
peck	= 537.605 cubic inches (in ³)	= 8.809 768 litres
bushel	= 2150.42 cubic inches (in ³)	= 35.339 07 litres

SCHEDULE 3
(Sections 7, 8, 19(2)(b) and 42(1)(a)(iii))

WEIGHTS AND MEASURES
LAWFUL FOR USE IN TRADE

PART 1 - THE INTERNATIONAL SYSTEM
OF UNITS AND OTHER METRIC UNITS

1. - (1) Measurement of length

100 metres	10 metres	1 metre
50 metres	5 metres	1 centimetre
30 metres	3 metres	1 millimetre
20 metres	2 metres	1 micrometre

(2) Square Measures:

Measures of, or any multiple of, 1 square decimetre.

(3) Cubic measures:

Measures of, or any multiple of, the cubic decimetre
= 0.001 m³.

(4) Capacity measures:

10 litres, or any multiple of 10 litres	250 millilitres	20 millilitres
5 litres	200 millilitres	10 millilitres
2 litres	100 millilitres	5 millilitres
1 litre	50 millilitres	2 millilitres
500 millilitres	25 millilitres	1 millilitre

(5) Weights:**(a) Metric:**

50 kilograms	100 grams	200 milligrams
20 kilograms	50 grams	100 milligrams
10 kilograms	20 grams	50 milligrams
5 kilograms	10 grams	20 milligrams
2 kilograms	5 grams	10 milligrams
1 kilogram	2 grams	5 milligrams
500 grams	1 gram	2 milligrams
200 grams	500 milligrams	1 milligram

(b) Other metric units:

500 carats metric	1 carat metric
200 carats metric	0.5 carat metric
100 carats metric	0.25 carat metric
50 carats metric	0.2 carat metric
20 carats metric	0.1 carat metric
10 carats metric	0.05 carat metric
5 carats metric	0.02 carat metric
2 carats metric	0.01 carat metric

PART 2 - CUSTOMARY UNITS**2. - (1) Weight:**

British Imperial units:

56 pounds	8 ounces
28 pounds	4 ounces
14 pounds	2 ounces
7 pounds	1 ounce
4 pounds	½ ounce
2 pounds	¼ ounce
1 pound	

(2) Capacity or Volume:
British Imperial units:

5 gallons	$\frac{1}{2}$ pint
4 gallons	8 fluid ounces
3 gallons	4 fluid ounces
2 gallons	2 fluid ounces
1 gallon	1 fluid ounce
$\frac{1}{2}$ gallon	4 fluid drams
$\frac{1}{4}$ gallon (1 quart)	2 fluid drams
1 pint	1 fluid dram
