PERFORMANCE REPORT AND ANNUAL ACCOUNTS 2018

MEASUREMENT UNITS, STANDARDS AND SERVICES DEPARTMENT

CONTENT

Message of the Director

Welcome to the Measurement Units, Standards & Services Department's Annual Report for the year 2018. Year 2018 was a period of transition and progress on many fronts of the department. We continued to innovate, and we strengthened all extents of Metrology related activities. We streamlined our measures & operations, and that commitment contributed to solid physical & financial progress. Our vision is to implement a well-protected customer community through an accurate and reliable measurements. We are, at present, an institution with annual earnings of approximately LKR 400M and a trans disciplinary staff comprised of nearly 250.

As in any other country, metrology system in Sri Lanka has three levels such as scientific metrology, industrial metrology and legal metrology. Measurement Units, Standards & Services Department (MUSSD) is Sri Lanka's National Metrology Institute and brings together these three levels of metrology under a single organization. MUSSD plays the role of the Central Metrology Authority and is empowered for scientific metrology and legal metrology as well as the coordination of industrial metrology. Establishment, maintenance, and dissemination of national measurement standards in Sri Lanka are executed by the National Measurement Laboratory (NML) established under MUSSD.

In 1974, when Sri Lanka changed its system of measurements from the Imperial System of Units to the International System (Metric System) of Units, the Measurement Standards & Services Division of the Department of Internal Trade was given the responsibility of implementation of the metric conversion program of the country. A Metric Conversion Authority, a statutory body was formed and the National Metric Conversion Law, No. 17 of 1976 was formulated for these purposes. The laboratory equipped itself with metric measurement standards during the transition to the metric system in-between 1970 to 1980. Afterwards in 1997, the Measurement Units Standards & Services Act No. 35 of 1995 was enforced by the Sri Lanka government. It is the contemporary Measurement Law of the country, achieving the optimum required accuracy in all measurements used in trade & commerce, industry, science & innovation, health, public safety and environmental protection. The act incorporates a vast array of fields in metrology and established the MUSSD and the NML.

During year 2009, a decision was made by MUSSD top management to construct a new metrology complex which includes national metrology laboratory, legal metrology division & MUSSD administration to implement the act no. 35 of 1995. It was the most important scientific decision ever made to strengthening the metrology infrastructure in Sri Lanka and we were able to realistic it by 2016. At present, as the apex metrology authority of Sri Lanka, the MUSSD is responsible for establish, maintain & disseminate the national measurement standards in compliance with international standards, ensuring justice & equity for producers, traders, metrological & other service providers & consumers, through the regulatory & service activities based on measurements to uplift the quality of life and standards of Sri Lankans.

Also, on 16 November 2018, the General Conference on Weights and Measures (CGPM) agreed one of the most significant revisions to the International System of Units (the SI) since its inception. The SI units is now based on a set of constants each linked to the laws of physics and have the advantage of being able to embrace further improvements in measurement science and technology to meet the needs of future users for many years to come. For the way forward, as an associate member of CGPM, MUSSD has already appeared research and development into new measurement methods, including those using quantum phenomena, underpin the change.

I am very proud of these accomplishments as well as those reflected in this year's Annual Report.

S.N.Akuranthilaka
Director of Measurement Units, Standards & Services.

Vision

Accurate and reliable measurements for well protected customer community

Mission

To establish, maintain & disseminate the national measurement standards in compliance with international standards, ensuring justice & equity for producers, traders, metrological & other service providers & consumers, through the regulatory & service activities based on measurements to uplift the quality of life and standards of Sri Lankans.

Objectives

The Department is to act as the Apex Institution for Metrology (Science of Measurements) in Sri Lanka and to provide the essential basis to foster the Fundamental, Industrial, and Legal Metrology infrastructure development of the nation by implementing the Measurement Units, Standards & Service Act No.35 of 1995.

Measurements Units, Standards and Services Department

Performance Report and Annual Accounts - 2018

The aim of this report is to show the basic policy, projects of Measurement Units, Standards & Services Department (MUSSD) which have been implemented and to represent the progress of the projects that have been implemented during the year 2018.

1.
Introduction

1.1 The Department and Its Functions

Measurement Units, Standards and Services Department (MUSSD) was established under the Measurement Units, Standards and Services Act No. 35 of 1995. MUSSD functions under the purview of ministry of Industry and Commerce, Resettlement of Protracted Displaced Person Co – operative Development and Vocational Training & Skills Development.

MUSSD has moved to the Science Center of Tech City in Mahenawatta, Pitipana, Homagama in December 2015 from a land situated Colombo 05 (area of 135 perches) due to insufficiency building and land space to accomplish the national requirements and the future developments of the field of Metrology.

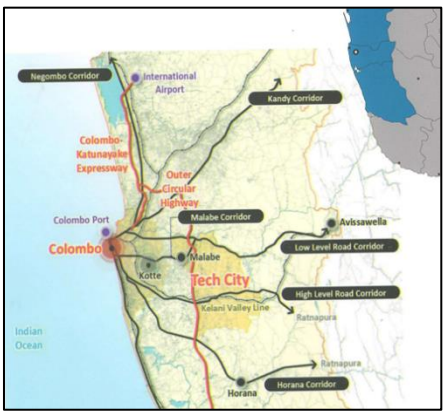

Figure 1: Location of Tech City (Source: Innovation hub of Asia- Tech City Sri Lanka Western Region Tech City Development Project)

The department is responsible for, providing accurate and reliable measurement procedures and metrology services, safeguarding the interests of the consumer by implementing the law and regulations of the act, maintaining and updating the National Measurement Standards in conformity with the international measurement system.

Each country in the world has a special establishment responsible to realize, establish, maintain and disseminate the national measurement standards. It is generally called National Measurement Institute (NMI). MUSSD bears the responsibilities of the NMI in Sri Lanka. Establishment, maintenance, and dissemination of national measurement standards in Sri Lanka are done by the National Measurement Laboratory (NML) established under the department. Moreover, various calibrations and verification services for measuring instruments used in fields such like industry, engineering, environment, health protection, road safety etc; are provided by MUSSD.

Further, the recommendations of International Organization of Legal Metrology (OIML) are followed in legal metrological activities. Pattern approval of electronic and mechanical weighing and measuring instruments, initial and annual verification of such instruments are being done according to those recommendations.

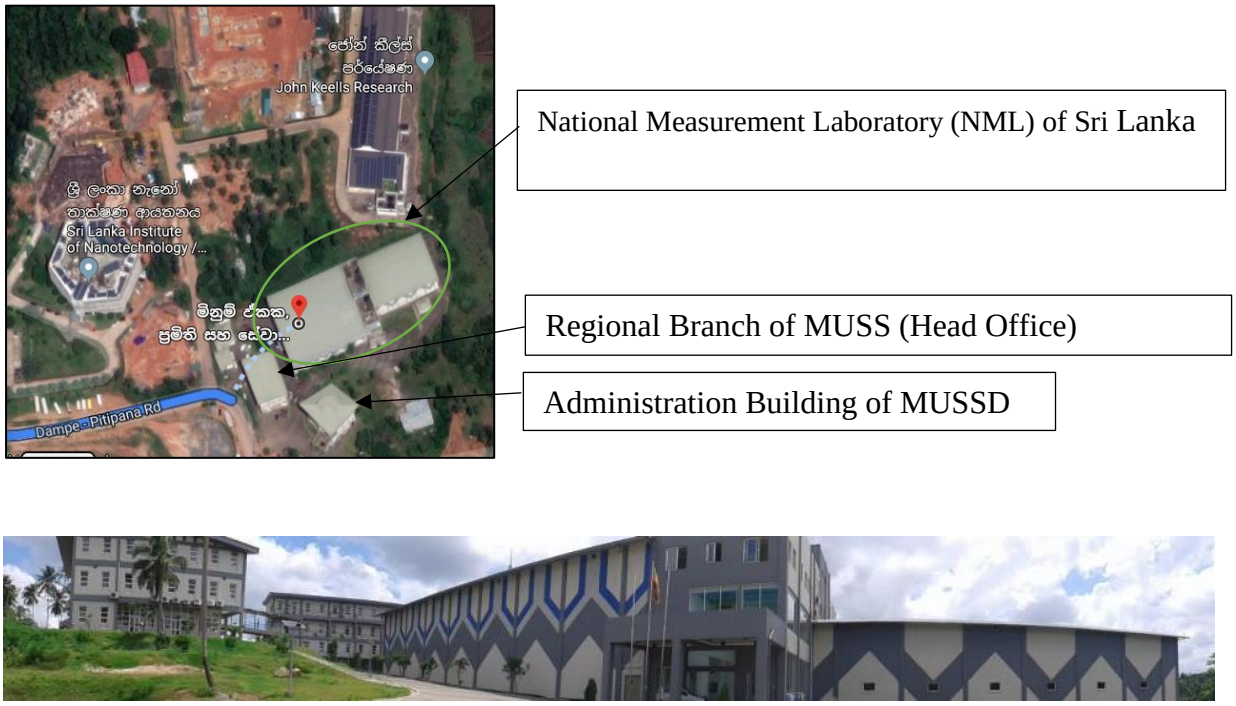

Figure 2: Measurement Units, Standards and Services Department (MUSSD)

1.2 Metrology

Metrology is the science of measurements and its applications. Measurements related to various quantities such like mass, length, time, pressure, volume, electric current, electric resistance etc; are frequently necessary in the daily life activities. All the researches, scientific and regulatory activities carried out internationally and locally for sustaining a unity of physical quantities and units can be defined to be Metrology.

Metrology can be classified into three categories.

01. Scientific metrology: the development and organization of the highest level of measurement standards
02. Industrial metrology: the satisfactory functioning of measurement instruments used in industry, production and testing
03. Legal metrology: the assurance of correctness of measurements where these have an influence on the transparency of trade, on law enforcement, on health, on safety and on the environment

Out of these fields industrial metrology and legal metrology are extensively rely on the basis of scientific metrology.

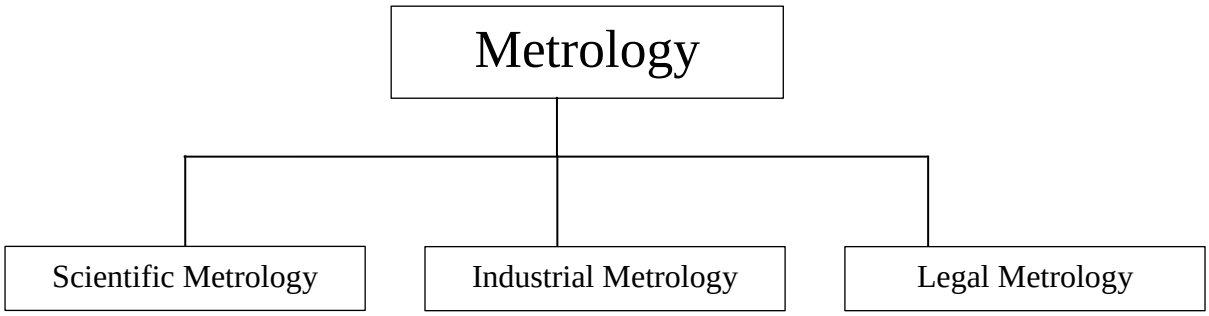

Figure 3: Categories of Metrology

The laboratory within MUSSD is known as National Measurement Laboratory according to the section (3) of the Act. Further the department responsible for establishment, maintenance and dissemination of national measurement standards as per part III, for measurements use in trade as per part IV and for measurements use in industry as per part V and part VI. Thus the department is responsible for National Measurement System (NMS) which consist of three sections: scientific metrology, industrial metrology and legal metrology.

2.

MUSSD as the Apex Institution for Metrology in Sri Lanka

2.1 Activities of Scientific Metrology

Scientific metrology is major out of three fields in metrology, sometimes referred to as Fundamental Metrology, is the subject concerns the establishment of quantity systems, unit system of measurement, development of new measurement methods, establishment, definition, and realization of local and international measurement standards, and transferring traceability to the user in the society through the hierarchy of such standards. Also, scientific metrology covers theoretical and practical aspects of identification and resolving measurement problems and related issues.

Implementation of activities related to Scientific Metrology is as follows.

1. Establishment of National Measurement System of the country by formation the National Measurement Laboratory
2. Realization, establishment, updating, maintenance and dissemination of National Measurement Standards
3. Establishment and maintenance of the National Measurement Standards so as to traceable to International Measurement Standards (SI)
4. Dissemination and promotion of measurement parameters and technology necessary for different fields
5. Upgrading the calibration and measurement capabilities (CMC) by participating in international bilateral and multilateral inter-comparisons related to various quantities
6. Metrology researches
7. Generating Sri Lanka Standard Time and broadcasting via www.sltime.org

2.1.1 National Measurement Laboratory (NML)

MUSSD operated National Measurement Laboratory (NML) with 64 laboratory rooms in its new premises in Mahenawatta, Pitipana, Homagama to establish national unit system, to maintain and disseminate traceability to calibration and testing laboratories, regulated bodies and industrial and legal metrology areas. Currently, MUSSD operates laboratories for 10 measurement fields.

Table 1: Contact details of NML

Laboratory	Head of Laboratory	Contact Details
Mass	Mr.R.D.M.Alanka	0112-182262
Dimensional	Mr.A.D.D.Naminda	0112-182267
Time and Frequency	Mr.R.G.S.A.Perera	0112-128265
Temperature	Mr.S.N.Akuranthilaka	0112-182256
DC Electricity	Mr.R.G.S.A.Perera	0112-128265
AC Electricity	Dr.G.W.C.Wijayasundara	0112-128257
Pressure	Ms.J.S.M.Silva	0112-182264
Volume	Mr.H.L.I.S.Sampath	0112-182266
Electric Power and Energy	Mr.R.D.M.Alanka	0112-182262
Chemical	Mr.S.D.I.Dias	0112-182258
Gas	Mr.R.G.S.A.Perera	0112-182265

Table 2: Standards of National Measurement Laboratory

Measurement	Primary Standards
Mass	1 kg national prototype of kilogram 1 mg – 20 kg E1 weight set.
Length	Standard Gauge block (0.5 mm to 100 mm), Grade K
Time & Frequency	Cs – Primary frequency stranded.
Temperature	7 fixed points cover Mercury triple point to Al freezing point (-39 ^{0}C to 660 ^{0}C)
DC Electricity	DC – Zener DC voltage 1 V,10 V reference Resistance Standards 1 Ω,10 kΩ
AC Electricity	Transfer standard; up to1000 V and 20 A
Pressure	Hydraulic pressure balance range 200 MPa Pneumatic pressure balance range 7 MPa
Volume	Micro pipette calibration unit (1µl to 1ml) Volumetric standards upto 150 L
Electrical power and energy	Phase Comparator (10 mA to 120 A)
Chemical	Secondary Standard buffer Solutions

2.1.2 Establishment of Traceability of Measurements

In 2018, traceability for length measurement was established by recalibrating the ceramic gauge block set (Grade K/00) by National Physical Laboratory (NPL), United Kingdom.

2.1.3 Participation of inter-laboratory comparisons

Local Inter-Laboratory Comparison

On calibration of Liquid-in-Glass Thermometers (LIGT) in the range from 0 °C to 100 °C was organized by MUSSD under technical support of PTB, Germany. The objective of this comparison is to assess the equivalence of the calibration results obtained by the various procedures and methods of calibration of glass thermometers. Two Glass Thermometers (LIGTs) of ranges 0 °C to 50 °C and 50 °C to 100 °C were received as the artifacts of this Inter Laboratory Comparison (ILC) from PTB Germany. MUSSD was successfully participated in this ILC and measurement results are to be evaluated and reported to the participating laboratories by PTB Germany.

2.1.4 Maintenance of SI units

Member states of International Bureau of Weights and Measures (BIPM) voted on 16 November 2018 to revise the SI units, changing the definition of the kilogram, the ampere, the kelvin and the mole.

All SI units are defined in terms of constants that describe the natural world from 20 May 2019 from this decision that made at the 26th meeting of the General Conference on Weights and Measures (CGPM). This will assure the future stability of the SI and open the opportunity for the use of new technologies, including quantum technologies, to implement the definitions. The seven defining constants of the SI are given in Table 3.

Table 3: Seven defining constants of the SI

Defining constant	**Symbol**	**Numerical value**	**Unit**
Ground-state hyperfine transition frequency of Cs	Δ_{Cs}	9 192 631 770	Hz
speed of light in vacuum	c	299 792 458	m s^{-1}
Planck constant	h	6.626 070 15 x 10^{-34}	J s
elementary charge	e	1.602 176 634 x 10^{-19}	C
Boltzmann constant	k	1.380 649 x 10^{-23}	J K^{-1}
Avogadro constant	N_A	6.022 140 76 x 10^{23}	mol^{-1}
luminous efficacy	K_{cd}	683	lm W^{-1}

Definition of SI units:

The second

The second, symbol s, is the SI unit of time. It is defined by taking the fixed numerical value of the caesium frequency Δ_{Cs}, the unperturbed ground-state hyperfine transition frequency of the caesium-133 atom, to be 9 192 631 770 when expressed in the unit Hz, which is equal to s^{-1}.

The meter

The meter, symbol m, is the SI unit of length. It is defined by taking the fixed numerical value of the speed of light in vacuum *c* to be 299 792 458 when expressed in the unit m s^{-1}, where the second is defined in terms of the caesium frequency Δ_{Cs}.

The kilogram

The kilogram, symbol kg, is the SI unit of mass. It is defined by taking the fixed numerical value of the Planck constant *h* to be 6.626 070 15 x 10^{-34} when expressed in the unit J s, which is equal to kg m^2 s^{-1}, where the meter and the second are defined in terms of *c* and Δ_{Cs}.

The ampere

The ampere, symbol A, is the SI unit of electric current. It is defined by taking the fixed numerical value of the elementary charge *e* to be 1.602 176 634 x 10^{-19} when expressed in the unit C, which is equal to A s, where the second is defined in terms of Δ_{Cs}.

The kelvin

The kelvin, symbol K, is the SI unit of thermodynamic temperature. It is defined by taking the fixed numerical value of the Boltzmann constant *k* to be 1.380 649 x 10^{-23} when expressed in the unit J K^{-1}, which is equal to kg m^2 s^{-2} K^{-1}, where the kilogram, meter and second are defined in terms of *h*, *c* and Δ_{Cs}.

The mole

The mole, symbol mol, is the SI unit of amount of substance. One mole contains exactly 6.022 140 76 x 10^{23} elementary entities. This number is the fixed numerical value of the Avogadro constant, N_A, when expressed in the unit mol^{-1} and is called the Avogadro number.

The amount of substance, symbol n, of a system is a measure of the number of specified elementary entities. An elementary entity may be an atom, a molecule, an ion, an electron, any other particle or specified group of particles.

The candela

The candela, symbol cd, is the SI unit of luminous intensity in a given direction. It is defined by taking the fixed numerical value of the luminous efficacy of monochromatic radiation of frequency 540 x 10^{12} Hz, K_{cd}, to be 683 when expressed in the unit lm W^{-1}, which is equal to cd sr W^{-1}, or cd sr kg^{-1} m^{-2} s^3, where the kilogram, meter and second are defined in terms of *h*, *c* and Δ_{Cs}.

The SI was previously defined in terms of seven base units and derived units defined as products of powers of the base units. The seven base units were chosen for historical reasons, and were, by convention, regarded as dimensionally independent: the meter, the kilogram, the second, the ampere, the kelvin, the mole, and the candela. This role for the base units continues in the present SI even though the SI itself is now defined in terms of the defining constants above.

MUSSD organized a technical session as a unit of celebration of "World Metrology Day 2018". A lecture on "Revised SI and its Influence on Science and Industry" was delivered by Dr. H.S.Lee from Korean Research Institute of Standards and Science (KRISS), Republic of Korea. The event was held at the auditorium of MUSSD, Homagama.

2.1.5 Generation and Broadcasting the Standard Time of Sri Lanka

MUSSD possesses the honor to be the pioneer of generating and broadcasting the Standard Time in Sri Lanka since 2011. Sri Lanka Standard Time was launched by Time and Frequency Laboratory of NML as a new project in order to establish the island wide unity of time. For the purpose a Rubidium Atomic Clock has been established to generate the accurate time in Sri Lanka in accordance with Universal Time Coordinates (UTC) and the new website www.sltime.org was launched in April 2011 to broadcast the accurate time. People are now able to set their time correctly via the website at any time in the day. All the respective parties are informed to set their clocks with correct time using the website.

Presently time system consists of Cesium primary frequency standard. Time system was calibrated and now contributing to determination of UTC (Coordinated Universal Time) at BIPM. Time links to BIPM has been established for the traceability. NTP (Network Time Protocol) servers were upgraded to dissemination of accurate time.

2.1.6 Research and Developments

CPEM 2018

The Conference on Precision Electromagnetic Measurements (CPEM) is the most important scientific and technological conference in the domain of electromagnetic measurements at the highest accuracy levels. Attendees of CPEM are from national metrology institutes as well as researchers from university laboratories specialized in precision measurements, metrologists from industrial and government standards laboratories. About 500 participants from 50 countries were registered to attend CPEM 2018. The venue of the conference CPEM2018 was located in the heart of Paris.

An oral presentation has been presented by Dr. G.W.C.Wijayasundara of MUSSD in CPEM 2018. The topic was "Calibration of AC voltage for a high speed sampling ADC board using Thermal Voltage Converters" which is on the research done contribution with Dr. Hyung-Kew Lee, Dr. Mun-Seog Kim, Dr. Seung-Nam Park from Korea Research Institute of Standards and Science (KRISS), South Korea. The work describes a calibration technique for a commercial Analog-to-Digital Converter (ADC) board using Thermal Voltage Converters (TVCs) as reference standard up to 1 MHz with various sampling rates.

SLASS 2018

The Sri Lanka Association for the Advancement of Science (SLAAS), the premier scientific body in the country was founded in 1944 and incorporated by Act of Parliament No 11 of 1966. At present, SLAAS has a membership that numbers over ten thousand, representing almost all disciplines of science. A presentation on "Establishment of primary national standard for time and frequency with internationally accepted performance" was staged in 24th SLASS annual sessions held in University Colombo.

In this research primary national standard for time and frequency was established using a commercial cesium atomic clock. Requirement for traceability of the standards was established through the common view techniques using a multi-channel Global Navigation Satellite System (GNSS) time transfer receiver with choke ring type GNSS antenna. Reporting of comparison data was done using the protocol of Consultative Committee for Time and Frequency (CCTF) Group on GNSS Time Transfer Standards (CGGTTS) format to International Bureau of weight and Measure (BIPM) daily to include in circular T of Key Comparison Data Base (KCDB) published by BIPM. Research includes the precise determination of the antenna location in millimeter accuracy using GNSS Precise Point Positioning (PPP) processing of Receiver Independent Exchange (RINEX) Formatted observation files, Determination of Cable delay measurements of antenna cable and other cables in the system, Data logging and analyzing to determine characteristic behavior the Cs atomic clock and steering and stepping the clock to achieve the internationally accepted variation limits of time with +/-10 ns per day and National Time Scale of Sri Lanka (UTC(SL)) difference with Coordinated Universal Time (UTC) called as UTC-UTC(SL) less than +/-100 ns.

2.2 Activities of Industrial Metrology

Industrial Metrology concerns how to apply measurement science to manufacturing and industrial processes. Ensuring the compliance of use of measuring instruments, industrial metrology addresses the application of measuring instruments in industry, and quality control of them. There the management of measuring instruments and industrial calibration are done according to the requirements of a quality production process.

Activities carried out by the department related to Industrial Metrology are as follows.

1. Providing necessary laboratory facilities for calibration of weights, measures, weighing and measuring instruments/systems used in production industry (including laboratory calibrations and on-site calibrations)
2. Inspection and verification of large-scale measuring instruments established in production and service industries
3. Providing necessary training and consultancy on resolving measurement problems raised in industrial measurements

2.2.1 Industrial Calibrations

Calibration facilities for pressure gauges, thermometers, weights, scales and length measuring instruments, electrical measuring instruments, moisture meters, laboratory balances etc; which are used in industry, engineering or any other related field are now available at MUSSD. Calibration certificates are also issued with such calibrated instruments.

Industrial calibration is one of the main services provided by the National Measurement Laboratory. The calibration provided by NML is given in Table 4. Amendments of calibration charges are as per the extraordinary gazette No. 1921/54 dated 2 July 2015.

Table 4: Calibration services provided by NML

	Laboratory	Calibration Facilities Provided
1	Thermometry Laboratory	1.Clinical Thermometer 2.Industrial & laboratory Thermometers, Digital Thermometers 3.Dial Thermometer Probe 4.RTD & Thermocouple Thermometer 5.Liquid in Glass Thermometer 6.Maximum Registered Thermometer 7.Min Max Thermometer 8.Wall Thermometer 9.Surface Probe 10.Infrared Thermometer 11.Standard Platinum Resistance Thermometer (Comparison Method) 12.Standard Platinum Resistance Thermometer (Fixed Point Method) 13.Industrial Thermocouple (Comparison Method) 14.Industrial Thermocouple (Fixed Point Method) 15.Liquid & Dry Block Calibration Bath 16.Thermal Chart Recorder 17.Laboratory Oven & Furnace 18.Autoclave 19.Incubator & Water Bath 20.Deep Freezer & Refrigerator (Single Chamber, Dual Chamber) 21.Cold Room (Room Temperature Measurement) 22.Cold Room (With Thermal Switch Indicator) 23.Thermal Switch/Controllers 24.Digital Hygrometers 25.Dry -Wet Bulb Thermometer
2	Electric Power and Energy Laboratory	1.kWh meter (single phase) 2.kWh meter (Three phase) 3.kVA meter (Three phase) 4.Potable power/energy meter (single phase) 5.Potable power/energy meter/energy (Three phase) 6.Reference Meter (Used in meter testing benches/single phase) 7.Reference Meter (Used in meter testing benches/three phase) 8.Energy Meter (laboratory/single phase) 9.Energy Meter (laboratory/Three phase) 10.Power Meter (single phase/stationary/Mobile/Lab) 11.Power Meter (three phase/stationary/Mobile/Lab
3	Volumetric Laboratory	1.Un Subdivided Measures 2.Volumetric measures 3.Measuring cylinders 4.Provers and large volume tank 5.Micropipettes, Pipettes & Burettes only for 3 points

	Laboratory	Calibration Facilities Provided
4	Pressure Laboratory	1.Gas Pressure gauges and Transducers 2.Hydraulic Pressure gauges and Transducers 3.Sphygmanometer 4.Digital Blood Pressure Meter
5	Mass Laboratory	1.Weights (OIML Class E2) 2.Weight (OIML Class F1) 3.OIML Class F2, M/Stainless Steel Industrial Weights 4.Other Industrial Weights 5.Balances-Class I 6.Balances-Class II 7.Balances-Class III & IIII 8.Weighs Bridges 9.Button Puller Machine 10.Hopper Scale
6	Dimension Laboratory	1.Gauge Blocks 2.Measuring Ruler 3.Measuring Tapes 4.Calipers 5.Micrometers 6.Height gauges 7.Indicator gauges 8.Thickness gauges 9.Bore gauges 10.Filer gauges
7	Electric Time and Frequency Laboratory	1.Voltmeter 2.Ammeter 3.Ohmmeter 4.Multi-meter 5.Resistor 6.Time/Stop watch 7.Frequency/Tachometer 8.Oscilloscope 9.Function Generator
8	Chemical Laboratory	1.Breath Alcohol Analyzer 2.PH Meter

Table 5: Revenue of calibration services provided by NML in 2018

Month	Mass Laboratory		Length Laboratory		Thermometry Laboratory		Electric Time and Frequency Laboratory		Electric Power and Energy Laboratory	
	No. of Units	Income Rs.	No. of Units	Income Rs.	No. of Units	Income Rs.	No. of Units	Income Rs.	No. of Units	Income Rs.
January	70	78,500.00	12	23,500.00	9	27,050.00	0	0	0	0
February	6	20,700.00	12	24,000.00	7	22,300.00	3	6,000.00	1	2,500.00
March	91	165,400.00	43	89,000.00	17	32,000.00	5	10,500.00	0	0
April	51	42,800.00	8	14,500.00	4	6,050.00	0	0	0	0
May	55	55,700.00	7	13,400.00	0	0	1	2,000.00	2	132,000.00
June	54	43,600.00	17	19675.00	24	41,160.00	0	0	1	4,000.00
July	77	76500.00	15	25,000.00	12	27,450.00	4	11,500.00	1	600,000.00
August	35	84,700.00	19	37,000.00	7	16,800.00	2	4,500.00	1	2,000.00
September	93	215,000.00	21	38,000.00	3	4,750.00	5	19,500.00	0	0
October	61	126,400.00	18	34,500.00	0	0	2	4,000.00	0	0
November	42	18,450.00	12	19,500.00	4	6,550.00	8	20,000.00	2	12,000.00
December	150	317,600.00	4	7,500.00	12	31,410.00	2	2,250.00	3	122,500.00
Total	**785**	**1,245,560.00**	**188**	**347,075.00**	**99**	**215,510.00**	**32**	**80,250.00**	**11**	**335,000.00**

Month	Volumetric Laboratory		Pressure Laboratory		Lidar Laboratory		Chemical Laboratory	
	No. of Units	Income Rs.	No. of Units	Income Rs.	No. of Units	Income Rs.	No. of Units	Income Rs.
January	3	3,400.00	2	3,000.00	15	30,000.00	9	40,000.00
February	0	0	8	48,000.00	1	2000.00	3	15,000.00
March	1	900.00	14	21,000.00	3	6,000.00	3	15,000.00
April	0	0	0	0	1	2,000.00	5	25,000.00
May	7	5,700.00	2	3,000.00	0	0	5	25,000.00
June	0	0	2	7,000.00	0	0	5	25,000.00
July	3	3,500.00	6	9,000.00	1	2,000.00	1	5,000.00
August	0	0	5	7,500.00	0	0	0	0
September	0	0	8	12,000.00	0	0	0	0
October	0	0	1	1,500.00	6	12,000.00	0	0
November	0	0	23	34,500.00	3	6,000.00	0	0
December	2	2,300.00	2	3,800.00	5	10,000.00	1	5,000.00
Total	**16**	**15,800.00**	**73**	**150,300.00**	**35**	**70,000.00**	**32**	**155,000.00**

2.2.2 Training and Consultancy

A series of programme was launched in 2018 to offer training opportunities necessary for the field of metrology for industry. At present MUSSD has had enough resource persons to offer training on Metrology and Uncertainty Calculations. Information on such training programmes conducted in 2018 is given below.

Table 6: Training and consultancy conducted by NML in 2018.

Course	Number of participants
Uncertainty measurement in measurement science for calibration and testing laboratories	29
Metrological aspects of ISO 17025 -for Sri Lanka accreditation Board (SLAB)	42
Metrology training for SGS Lanka (Pvt) Ltd	5
Legal metrology training for Afgan legal metrology institute	1
Metrology awareness program in Vaunia campus	50
Metrology training Industrial Calibration and Service Centre (Pvt) Ltd	9
Total	**136**

2.3 Activities of Legal Metrology

Legal Metrology concerns the field of legal control of measurement. It is the process of certifying measures and measuring instruments to be complied with measurement laws in the country after the inspection of such instruments and measures according to the legal requirements on the use of measuring instruments. Necessary legal provisions have been provided via the act No. 35 of 1995. Accordingly, law and regulations made are implemented throughout the sectors like health, public safety, environment, enabling taxation, protection of consumers and fair trade.

Activities under legal metrology implemented by Measurement Units, Standards & Services Department have been defined in the act and its regulations. Weighing and measuring found in all the commercial transactions are controlled by measurement law. The act empowers the department to regulate legal metrological activities in the following ways.

1. Calibration of working standards and establishment of such standards in district basis (according to the act the District Secretary serves as the Superintendent of Measurement Services also and working standards are kept under the custody of him)
2. Initial and annual verification of weights, measures, weighing and measuring instruments used in trade
3. Registration of manufacturers, importers, repairers and sellers of weights, measures, weighing and measuring instruments used in trade
4. Protect consumers by implementing the penal section of the act

5. Consumer awareness on Legal Metrology
6. Granting pattern approval of weights, measures, weighing and measuring instrument used in trade and industry (This service is provided by the National Measurement Laboratory)
7. Inspection and control of pre-packed commodities
8. Verification of measuring instruments related to health sector, environment protection, and road safety
9. Prosecution against persons who commit fraud measurements by conducting market raids

2.3.1 Re-verification of Working Standards

Working standards used for verifying weighing and measuring instruments related to trade and industry have been retained under the custody of secretary of each district in the country. These standards must be calibrated once in two years. Calibration of working standards is done at the National Measurement Laboratory. Working standards include standard weights, standard volume measures, and standard-length measures.

2.3.2 Pattern Approvals

The pattern approval is an attestation of any weight, measure or weighing/measuring instrument after a pattern test, performed by a recognized laboratory to check whether they are in conform with the measurement law in Sri Lanka, before they are sent to the market by a producer or before they are imported. Pattern approval is a technical assessment. The original model of the instrument is undergone through a series of tests at the National Measurement Laboratory. The design and the structure of each of the components of the instrument are checked against the recommendations on type approval defined by the International Organization of Legal Metrology (OIML). Subsequently based on the evaluation of the test results a pattern approval is granted by MUSSD for the intended weights, and measuring instruments including vehicle emission testing units, and fuel dispensers (Appendix 1).

Table 7: Pattern approval of weighing and measuring instruments in 2018

Type of Pattern Approval	**Number of Units**
Electronic Weighing Machines	67
Volumetric Measures	1
Fuel Dispensers	10
Taxi Meter	2
Vehicle Emission	1
Alcoviser	2
Total	**83**

2.3.3 Verifications, Inspections, and Raids of Weighing and Measuring Instruments Conducted on District Basis

Inspections and raid programmes are implemented by MUSSD to ensure that the weights, measures, weighing and measuring instruments used in the country are utilized in conformity with the weights and measures laws and regulations of the country. These programmes are very helpful, in terms of legal metrology, not only to protect the customer but also to ensure an accurate and reliable measuring practice in the country.

Verification of weights, measures, weighing and measuring instruments used in trade is done by Measurement Services and Devices Inspectors who assume duties at Measurement Units, Standards & Services Divisions of each District Secretariat. Verification centers are held at Pradeshiya Sabha and any other government institutes of each district under the prior approval of the District Secretariat. Moreover, a mobile verification unit for weighbridges has been commissioned to verify annually all weigh bridges placed in every district. All fuel dispensers mounted at every fuel station in the country are verified once every year. For the particular purpose a Fuel Dispensers Verification Unit has been introduced. More over verification of vehicle speed detectors and vehicle emission testing instruments has been started.

Table 8: Contact details of district offices

District Name	Address	Telephone No.
Colombo	District Secretary, Measurement Units, Standards and Services Division, District Secretariat Narahenpita, Colombo 5	0112-391079
Gampaha	District Secretary, Measurement Units, Standards and Services Division, District Secretariat, Gampaha	0332-222900
Kaluthara	District Secretary, Measurement Units, Standards and Services Division, District Secretariat, Kaluthara	0342-222635
Puttlama	District Secretary, Measurement Units, Standards and Services Division, District Secretariat, Puttalama	0322-266189
Kurunegala	District Secretary, Measurement Units, Standards and Services Division, District Secretariat, Kurunagala	0372-222134
Kegalle	District Secretary, Measurement Units, Standards and Services Division, District Secretariat, Kegalle	0352-232620
Rathnapura	District Secretary, Measurement Units, Standards and Services Division, District Secretariat, Rathnapura	0452-226299
Galle	District Secretary, Measurement Units, Standards and Services Division, District Secretariat,Galle	0912-222233
Matara	District Secretary, Measurement Units, Standards and Services Division, District Secretariat, Matara	0412-237079
Hambantota	District Secretary, Measurement Units, Standards and Services Division, District Secretariat, hambantota	0472-256247

District Name	Address	Telephone No.
Monaragala	District Secretary, Measurement Units, Standards and Services Division, District Secretariat, Monaragala	0552-277406
Badulla	District Secretary, Measurement Units, Standards and Services Division, District Secretariat, Badulla	0552-222292
Nuwaraeliya	District Secretary, Measurement Units, Standards and Services Division, District Secretariat, Nuwaraeliya	0522-222610
Kandy	District Secretary, Measurement Units, Standards and Services Division, District Secretariat, Kandy	0812-222233
Mathale	District Secretary, Measurement Units, Standards and Services Division, District Secretariat, Mathale	0662-222235
Anuradhapura	District Secretary, Measurement Units, Standards and Services Division, District Secretariat, Anuradhapura	0252-225190
Polonnaruwa	District Secretary, Measurement Units, Standards and Services Division, District Secretariat, Polonnaruwa	0272-226706
Batticaloa	District Secretary, Measurement Units, Standards and Services Division, District Secretariat, Batticaloa	0652-224465
Ampara	District Secretary, Measurement Units, Standards and Services Division, District Secretariat, Ampara	0632-222236
Vavuniya	District Secretary, Measurement Units, Standards and Services Division, District Secretariat, Vavuniya	0242-222187
Jaffna	District Secretary, Measurement Units, Standards and Services Division, District Secretariat, Jaffna	0212-222355
Mulative	District Secretary, Measurement Units, Standards and Services Division, District Secretariat, Mulative	0212-290045
Manar	District Secretary, Measurement Units, Standards and Services Division, District Secretariat, Manar	0232-222232
Kilinochchi	District Secretary, Measurement Units, Standards and Services Division, District Secretariat, Kilinochchi	0212-285662
Trincomallee	District Secretary, Measurement Units, Standards and Services Division, District Secretariat, Trincomallee	0262-050800

Table 9: Verification income on district basis

District	Verification Fees (Inclusive All Taxes) Received from each District (Data from 2014 to 2018)				
	2014	**2015**	**2016**	**2017**	**2018**
Colombo	58,536,277	86,693,931	130,712,937	136,014,517	146,275,819
Gampaha	12,950,324	16,271,296	27,545,201	29,347,519	28,316,491
Kalutara	6,855,189	7,978,818	11,474,642	12,673,950	12,854,085
	78,341,790	**110,944,045**	**169,732,780**	**178,035,986**	**187,446,395**
Kandy	11,139,456	14,012,409	21,620,097	25,313,869	26,151,103
Matale	3,795,006	4,520,843	7,988,421	8,717,368	9,116,889
Nuwara Eliya	5,266,936	5,587,098	8,584,030	9,725,814	9,841,753
	20,201,398	**24,120,350**	**38,192,548**	**43,757,051**	**45,109,745**
Galle	5,295,133	7,699,509	10,977,361	12,694,011	13,450,025
Matara	5,615,023	6,693,814	10,280,441	11,735,600	13,838,950
Hambantota	4,017,363	5,129,383	10,119,069	11,955,389	11,618,500
	14,927,519	**19,522,706**	**31,376,871**	**36,385,000**	**38,907,475**
Batticoloa	2,373,352	3,205,015	5,625,221	6,508,574	6,866,995
Ampara	4,694,333	5,006,882	7,769,257	9,731,150	9,549,772
Trincomalee	1,506,958	1,991,689	3,789,316	3,640,751	4,311,200
	8,574,643	**10,203,586**	**17,183,794**	**19,880,475**	**20,727,967**
Kununegala	11,990,847	13,817,069	23,779,336	23,919,321	24,484,601
Puttalama	4,511,899	5,743,748	9,201,545	10,322,464	10,535,156
	16,502,746	**19,560,817**	**32,980,881**	**34,241,785**	**35,019,757**
Anuradhapura	7,337,244	8,992,501	14,846,516	16,459,826	16,642,244
Polonnaruwa	3,816,287	4,717,437	8,266,819	7,563,883	8,005,081
	11,153,531	**13,709,938**	**23,113,335**	**24,023,709**	**24,647,325**
Badulla	6,509,075	8,148,777	11,924,573	14,580,367	14,739,389
Monaragala	3,784,969	4,638,176	8,090,344	7,966,717	8,570,731
	10,294,044	**12,786,953**	**20,014,917**	**22,547,084**	**23,310,120**
Ratnapura	11,800,266	8,539,852	12,504,982	13,974,267	15,362,254
Kegalle	5,363,518	7,355,280	10,555,329	9,582,340	10,847,639
	17,163,784	**15,895,132**	**23,060,311**	**23,556,607**	**26,209,893**
Mullativu	339,203	408,207	734,486	835,337	877,496
Mannar	328,231	370,549	667,173	835,717	849,815
Kilinochchi	372,175	461,692	982,477	1,023,661	1,140,455
Jaffna	2,117,287	2,778,039	5,033,464	5,627,755	6,014,086
Vavuniya	956,032	1,317,567	2,201,828	2,314,271	2,480,895
	4,112,928	**5,336,054**	**9,619,428**	**10,636,741**	**11,362,747**
Total	**181,272,383**	**232,079,581**	**365,274,865**	**393,064,438**	**412,741,424**

Table 10: Number of units verified on district basis

District	Number of Units Verified from 2014 to 2018				
	2014	**2015**	**2016**	**2017**	**2018**
Colombo	183,608	177,201	167,897	129,812	129,481
Gampaha	48,956	46,671	39,706	36,022	33,278
Kalutara	29,538	29,762	27,201	26,900	23,129
	262,102	**253,634**	**234,804**	**192,734**	**185,888**
Kandy	82,709	76,426	71,353	61,791	63,067
Matale	30,490	24,362	23,383	20,920	19,984
Nuwara Eliya	28,328	25,333	22,165	18,149	18,044
	141,527	**126,121**	**116,901**	**100,860**	**101,095**
Galle	40,472	37,758	34,061	25,127	29,637
Matara	37,916	33,401	30,289	28,275	28,695
Hambantota	29,049	27,902	26,954	25,477	23,290
	107,437	**99,061**	**91,304**	**78,879**	**81,622**
Batticoloa	29,353	27,639	29,510	28,680	27,978
Ampara	38,728	32,722	29,614	28,075	23,991
Trincomalee	13,098	12,285	12,037	10,535	10,120
	81,179	**72,646**	**71,161**	**67,290**	**62,089**
Kununegala	84,251	68,842	61,949	52315	45,699
Puttalama	27,897	26,420	22,071	18,703	16,989
	112,148	**95,262**	**84,020**	**70,388**	**62,688**
Anuradhapura	37,158	35,569	32,028	36,554	28,740
Polonnaruwa	20,674	18,467	16,288	13,886	12,478
	57,832	**54,036**	**48,316**	**50,440**	**41,218**
Badulla	37,990	31,823	30,292	29,162	26,821
Monaragala	31,947	31,434	29,699	27,420	24,816
	69,937	**63,257**	**59,991**	**56,582**	**51,637**
Ratnapura	49,954	53,708	38,470	35,679	31,393
Kegalle	39,790	38,255	36,454	32,268	25,725
	89,744	**91,963**	**74,924**	**67,947**	**57,118**
Mullativu	2,527	2,401	2,098	2,216	1,846
Mannar	1,890	1,372	1,399	1,706	1,781
Kilinochchi	3,373	3,022	2,918	2,338	2,210
Jaffna	22,010	21,792	18,486	18,604	14,060
Vavuniya	3,602	3,855	4,249	4,435	4,023
	33,402	**32,442**	**29,150**	**29,299**	**23,920**
Total	**955,308**	**888,422**	**810,571**	**714,419**	**667,275**

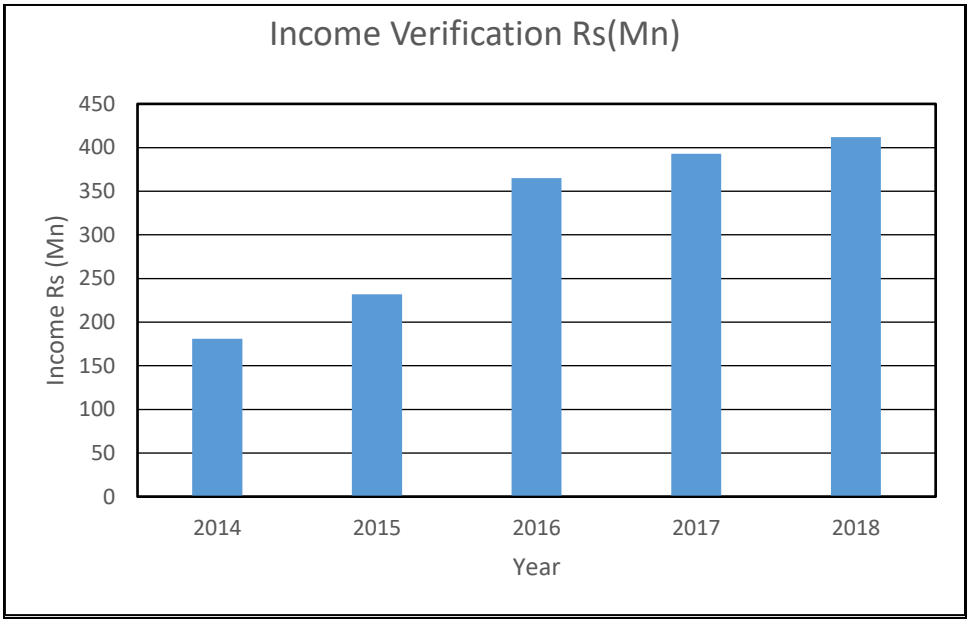

Figure 4: Graph of income of verification

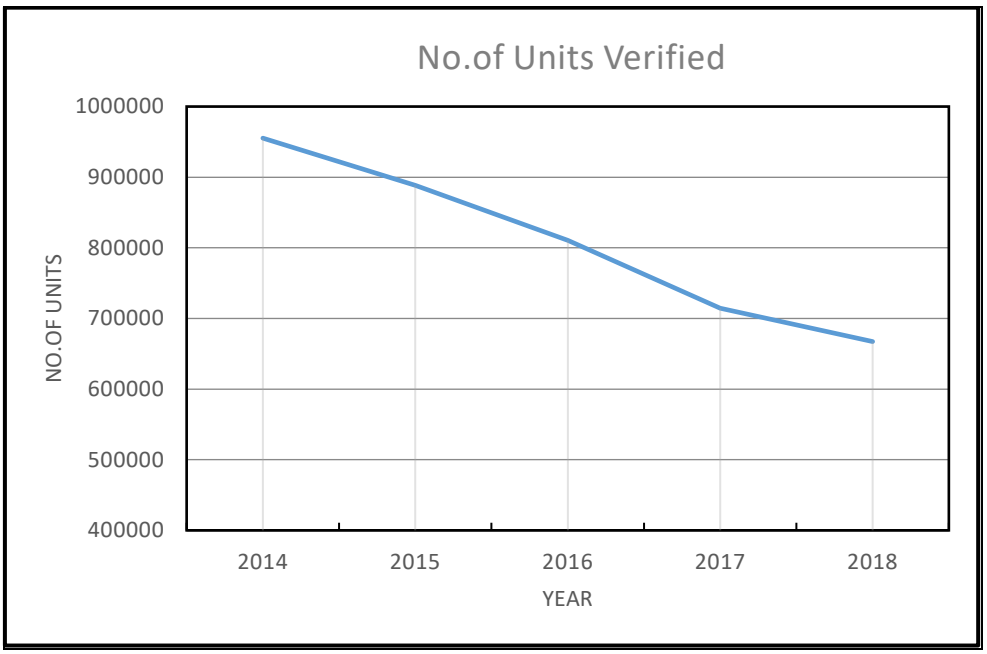

Figure 5: Graph of number of units verified

Table 11: Verification programme – Income in 2018

Month	Income in Rupees		Number of Units Verified in 2018
	Year 2017	Year 2018	
January	32,750,792	28,353,563	67,238
February	37,286,119	29,319,474	60,652
March	46,096,427	33,556,960	72,898
April	21,403,213	22,871,425	40,866
May	33,719,060	30,345,307	52,046
June	31,466,599	27,055,476	52,916
July	37,816,919	35,191,518	53,569
August	33,841,286	31,057,745	57,998
September	24,632,156	31,814,202	58,187
October	27,785,059	32,066,562	58,409
November	33,008,011	28,213,454	52,635
December	33,258,797	29,059,908	39,861
Total	**393,064,438**	**358,905,594**	**667,275**

Table 12: Raids programme – Progress in 2018

	Number of Raids		Fines in Rupees		Number of Cases Concluded	
Month	**2017**	**2018**	**2017**	**2018**	**2017**	**2018**
January	710	776	26,500	4000	17	52
February	869	724	191,000	84,500	85	31
March	1,206	703	119,000	102,000	65	53
April	818	903	47,500	42,000	19	43
May	854	983	120,000	121,500	53	42
June	599	1,473	80,000	115,500	54	47
July	1,899	1,509	115,000	151,000	76	70
August	1,432	1,430	88,500	119,250	56	50
September	1,267	1,897	204,500	131,500	120	66
October	796	2,162	86,500	224,500	49	120
November	1,055	1,070	75,000	137,000	41	75
December	862	1,573	59,000	68,000	34	28
Total	**12,367**	**15,203**	**1,212,500**	**1,300,750**	**669**	**677**

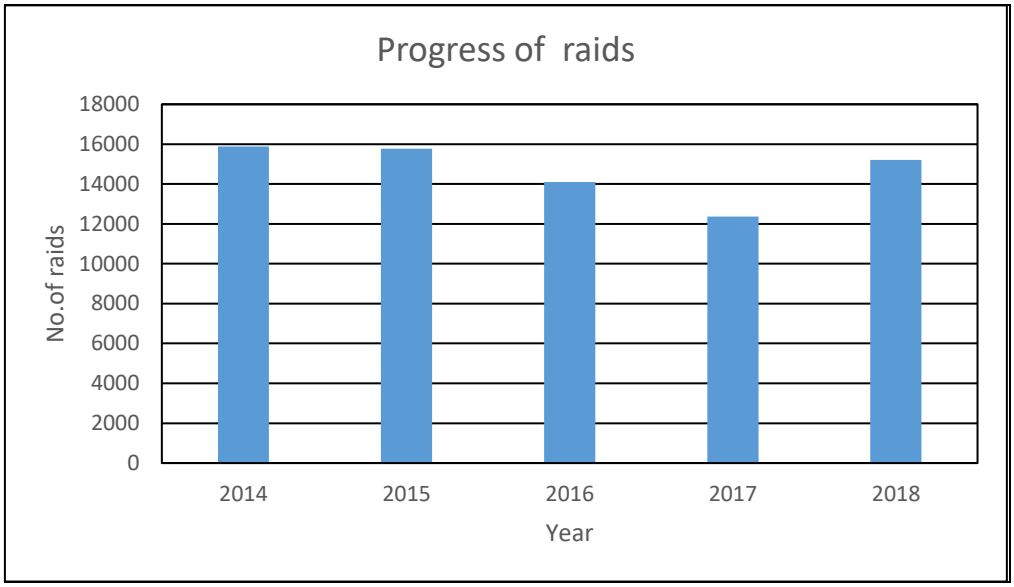

Figure 6: Progress of raids

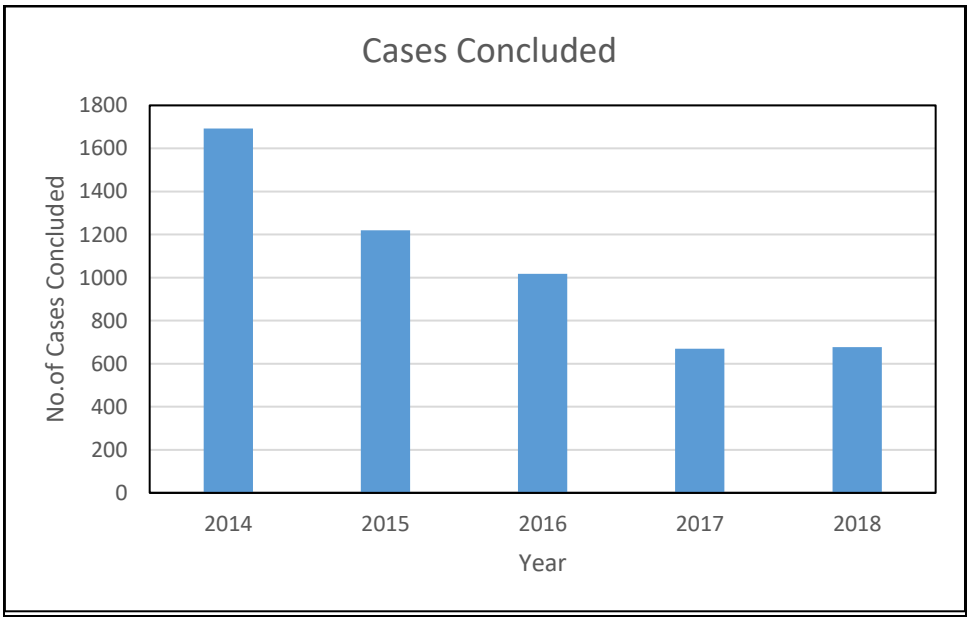

Figure 7: Progress of concluded cases

Table 13: Number of awareness programmes conducted in each month in 2018

District	Jan	Feb	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
HQ Colombo	3	4	4	0	3	2	2	2	7	6	4	5	37
Colombo	3	3	3	3	3	5	4	1	14	4	5	6	53
Gampaha	3	4	4	5	3	3	6	4	5	6	4	8	59
Kalutara	2	3	3	2	2	4	3	3	3	0	3	3	28
Puttalam	2	3	3	3	5	5	2	3	3	4	4	0	38
Kurunegala	3	4	4	3	4	4	4	3	8	7	8	20	61
Kegalle	2	3	3	0	3	1	3	3	4	0	2	3	24
Ratnapura	2	3	3	9	14	2	4	3	6	8	4	3	57
Galle	2	3	3	2	2	2	2	2	2	2	2	0	22
Matara	2	3	3	6	8	3	6	4	7	5	5	6	59
Hambantota	2	3	3	1	3	3	4	3	8	8	4	4	47
Monaragala	2	3	3	0	0	0	0	0	0	0	0	12	12

District	Jan	Feb	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Badulla	2	3	3	4	2	4	4	5	3	3	3	2	46
Nuwara Eliya	2	3	3	3	3	3	3	3	2	4	3	6	39
Kandy	2	3	4	3	6	4	3	1	5	3	3	3	41
Matale	2	3	3	2	4	3	3	2	3	3	2	3	25
Anuradhapura	2	3	3	2	2	4	2	4	4	4	4	4	44
Polonnaruwa	2	2	3	2	2	2	2	2	2	2	2	2	24
Trincomalee	2	2	3	2	2	1	2	2	2	2	1	3	23
Batticoloa	2	2	3	4	4	4	2	2	2	0	0	0	18
Ampara	2	2	3	2	2	2	2	2	2	2	2	6	30
Vavuniya	1	1	2	1	2	4	3	2	4	2	2	2	29
Jaffna	2	2	3	1	1	0	1	1	2	4	0	1	14
Mullativu	1	1	2	1	0	0	0	1	0	1	1	2	8
Mannar	1	1	2	2	2	2	2	1	2	0	2	2	18
Kilinochchi	1	2	2	1	1	0	1	1	0	1	1	1	7
Total	**53**	**69**	**78**	**64**	**83**	**67**	**70**	**60**	**100**	**81**	**71**	**107**	**863**

Table 14: Quarterly Progress of Awareness Programmes in 2018
(Target number of programmes and actual number held)

District	January–March		April - June		July - September		October – Dec.	
	Target	Achieved	Target	Achieved	Target	Achieved	Target	Achieved
HQ Colombo	11	6	11	5	11	11	11	15
Colombo	9	8	9	11	9	19	9	15
Gampaha	11	15	11	11	11	15	11	18
Kalutara	8	5	8	8	8	9	8	6
Puttalama	8	9	9	13	8	8	8	8
Kurunegala	11	0	11	11	11	15	11	35
Kegalle	8	5	9	4	8	10	8	5
Ratnapura	8	4	8	25	9	13	7	15
Galle	8	6	9	6	8	6	8	4
Matara	8	9	8	17	9	17	7	16
Hambantota	8	9	9	7	8	15	8	16
Monaragala	8	0	8	0	8	0	8	12
Badulla	8	16	9	10	8	12	9	8
Nuwara Eliya	8	9	8	9	8	8	7	13
Kandy	10	10	11	13	10	9	11	9
Matale	8	0	8	9	8	8	8	8
Anuradhapura	8	14	9	8	8	10	8	12
Polonnaruwa	7	6	6	6	7	6	6	6
Trincomalee	7	6	7	5	6	6	6	6
Batticoloa	7	0	7	12	6	6	6	0
Ampara	7	8	7	6	6	6	6	10
Vavuniya	4	7	5	7	4	9	4	6
Jaffna	7	3	7	2	8	4	6	5
Mullativu	4	2	4	1	5	1	4	4
Mannar	4	3	4	6	5	5	4	4
Kilinochchi	5	0	4	2	4	2	4	3
Total	**200**	**160**	**206**	**214**	**201**	**230**	**193**	**259**

2.3.4 Inspection of Pre-Packed Commodities

The commodities that have been packed before selling to the consumers are called Pre-Packed Commodities. Net content mentioned (weight, volume, length etc) on the pre-packed item is undergone to inspections for verifying whether the right content is available at the display of goods in the market. Inspection of pre-packages is performed according to OIML regulations.

When inspecting pre-packages, samples of a particular item available at the display in the market are arbitrarily selected and subsequently the net content of the item is measured. Here a definite number of replicas of such pre-packed item are inspected in their content. The results are then analyzed statistically. The final decision on the pre-package would be based on the statistical analysis and regulations made on prepackages by the department after comparing the net content and the results against the recommended tolerance/permissible error. Further details are referred to the extraordinary gazette No. 1499/7 dated 29 May 2007.

2.3.5 Registration of Private Entrepreneurs Engaged in Commercial Activities Controlled Over Legal Metrology

Any organization or individual who is engaged in selling, manufacturing, importing or repairing of weights, measures, weighing and measuring instruments must get registered with the department as per section 21 of the Measurement Units, Standards and Services Act. For that the person must apply via a prescribed application form determined by the Director of Measurement Units, Standards and Services and the corresponding fees must be paid. The certificate issued in such registrations will be expired on 31st December of the year.

Before starting a business of repairing weights or measuring instruments the interested person should first face to a practical test hold by MUSSD to prove his competencies and qualification related to such repair activities. Examination fees should be paid by the person.

Subsequently the workshop of the applicant who is qualified through the practical examination is inspected by the officers of MUSSD to check whether the necessary tools and equipment are readily available for the repair purpose.

After qualifying through the practical test and satisfactory witness of the workshop a registration certificate is issued to the applicant (tables 15, 16). The certificate empowers the person to be a qualified repairer. This certificate is not transferable. In case of any change of the business ownership, a qualified technician must be appointed in the business immediately.

Registration fees and all related details have been published in the extraordinary gazette No. 1921/54 dated 2 July 2015.

Table 15: Distribution of private entrepreneurs engaged in commercial activities controlled over legal metrology

District	Number of Registered Persons in Each Category			
	Manufacturers	**Importers**	**Traders**	**Repairers**
Colombo	05	27	38	53
Gampaha	05	06	25	32
Kalutara	03	-	17	22
Galle	01	-	12	12
Matara	01	-	10	08
Hambantota	-	-	08	07
Kandy	01	03	15	22
Nuwara Eliya	-	-	10	03
Matale	01	01	07	04
Badulla	-	01	03	15
Kegalle	01	-	03	08
Ratnapura	-	-	16	06
Kurunegala	-	01	21	16
Anuradhapura	-	-	07	08
Monaragala	01	-	08	03
Vavuniya	-	-	05	02
Jaffna	-	-	02	03
Ampara	-	-	07	02
Batticaloa	-	-	04	02
Polonnaruwa	-	-	03	01
Puttalama	-	-	7	03
Trincomalee	-	-	03	-
Total	**19**	**39**	**231**	**232**

Table 16: Registrations of private entrepreneurs engaged in commercial activities controlled over legal metrology -Year 2018

Registration Category	**Number of Registered Persons in 2018**	**Total Registration Fee Rs.**
Manufacturers of weighing / measuring instruments	19	44,000.00
Importers of weighing / measuring instruments	39	372,000.00
Sellers of weighing / measuring instruments	231	138,600.00
Repairers of weighing / measuring instruments	232	677,400.00
Total	**521**	**1,232,000.00**

(Face value of the stamps is included in the above table)

3.

MUSSD as an International Representative

3.1 Memberships

Relations in metrological perspectives are created with various countries in order to maintain the international and regional corporation of Metrology. It also helps to establish international traceability of measurement and overcome the technical barriers arise in trade. International relations are essential further to provide a secure basis for scientific and other measurement practices we have and to reduce technical disputes arising in many countries.

Associate member of Metre Convention and CGPM

The Metre Convention (Convention du Mètre) is a treaty that created an intergovernmental organization under the authority of the General Conference on Weights and Measures (CGPM).This is bond with the International Committee for Weights and Measures (CIPM) as an executive body and the International Bureau of Weights and Measures (BIPM) as its administrative and scientific organ.

The General Conference on Weights and Measures (CGPM) is made up of delegates of the governments of the Member States and observers from the Associates of the CGPM. The CGPM meets in Paris, usually once every four years. One of main activity of CGPM is to discusses and examines the arrangements required to ensure the propagation and improvement of the International System of Units (SI).

MUSSD has singed meter convention on behalf of government of Sri Lanka and become an associate member of CGPM in 2007.

In 2018, one member of MUSSD participated a training program on “Effective Participation in universal coordinated time (UCT) in BIPM, France.

Signatory of CIPM Mutual Recognition Arrangement (CIPM-MRA)

The CIPM Mutual Recognition Arrangement (CIPM MRA) is the framework through which National Metrology Institutes demonstrate the international equivalence of their measurement standards and the calibration and measurement certificates they issue. The outcomes of the Arrangement are the internationally recognized (peer-reviewed and approved) Calibration and Measurement Capabilities (CMCs) of the participating institutes. Approved CMCs and supporting technical data are publicly available from the CIPM MRA database (the KCDB) in BIPM web site.

MUSSD has become a signatory of CIPM-MRA in 2007 and is in the process of publishing CMC values in KCDB.

The International Organization of Legal Metrology (OIML)

The International Organization of Legal Metrology (OIML) is an intergovernmental treaty organization which develops model regulations, standards and related documents for use by legal metrology authorities and industry, provides mutual recognition systems which reduce trade barriers and costs in a global market etc. The OIML can be considerd as "international standard-setting body" of the World Trade Organization's Technical Barriers to Trade Agreement. OIML publications should therefore be applied, when appropriate, by all signatories of the TBT Agreement when developing technical regulations.

The International Committee of Legal Metrology (CIML) is the functional decision-making body of OIML. Sri Lanka is full member state of OIML and MUSSD is the main permanent contact of the OIML designated by government of Sri Lanka.

The Asia Pacific Metrology Programme (APMP)

The Asia Pacific Metrology Programme (APMP) is a grouping of national metrology institutes (NMIs) from the Asia-Pacific region engaged in improving regional metrological capability through the sharing of expertise and exchange of technical services among Member laboratories. APMP is also a Regional Metrology Organization (RMO) recognized by the International Committee for Weights and Measures (CIPM) for the purpose of worldwide mutual recognition of measurement standards and of calibration and measurement certificates.

MUSSD is a member of APMP since 1977. The department actively participate nine technical committees and one focus group.

MUSSD has actively participated in following APMP meetings in 2018.

- APMP mid-year meeting and related meeting in Hong Kong, China with the support of MEDEA project
- APMP General Assembly (GA) meeting and related workshops in Singapore
- Six APMP Technical Committee meetings and related workshops in Singapore.
    - Technical Committee meeting -Temperature (TCT)
    - Technical Committee meeting -Mass and related quantities (TCM)
    - Technical Committee meeting -Time and Frequency (TCTF)
    - Technical Committee meeting -Amount of substance (Metrology for Chemistry and Biology) (TCQM)
    - Technical Committee meeting -Electricity and Magnetism (TCEM)
    - Technical Committee meeting - Photometry and Radiometry (TCPR)

3.2 Benefits of projects

PTB-Sri Lanka bi-lateral Project
Strengthening Quality Infrastructure in Sri Lanka

PTB is the National Measurement Institute (NMI) of Germany. It supports developing and emerging countries to develop and apply an internationally recognized quality infrastructure that suits the countries' needs. Objective of the PTB-Sri Lanka bi-lateral Project is to increase the use of the enhanced offer of quality-assurance services based on international good practices by Small and Medium-sized Enterprises (SME) located in the northern region. The project includes the core institutions of the national Quality Infrastructure (MUSSD, ITI, SLSI and SLAB) as well as regional laboratories, local chambers and federations in the north.

Following activities have been done with the support of PTB-Sri Lanka bi- lateral project in 2018.

- Consultation for obtaining international recognition for measurements done in fields of pressure, temperature and mass of NML
- Support for a staff member of MUSSD to participate training on Proficiency Testing
- Support for knowledge dissemination- awareness sessions in Metrology in Vauniya Campus
- Patronage for World Metrology Day 2018

SAARC-PTB Project
Strengthening regional integration and cooperation in the field of quality infrastructure in South Asia

The project focuses on capacity development in quality infrastructure by facilitating the exchange of expertise and information among SAARC Member States. MUSSD has been a beneficiary of the SAARC-PTB project (i.e: Training programmes, workshops) of the project as the NMI of Sri Lanka. Furthermore, MUSSD has participated interlaboratory comparisons organized under SAARC-PTB project to demonstrate measurement capacities of the national measurement Laboratory (NML) of MUSSD. This project is financing by Federal Ministry for Economic Cooperation and Development (BMZ), Germany through National measurement institute of Germany, PTB.

In 2018, director of MUSSD participated the kick -off workshop of the SAARC-PTB project-stage 2 which held in Kathmandu, Nepal.

UNIDO Project

UNIDO has been working closely with Sri Lanka's national quality infrastructure (NQI) institutions to facilitate the strengthening of compliance and quality infrastructure services. Special areas of focus are those underpinning the export-oriented sectors, such as spices and processed foods. These activities take place within the framework of a European Union (EU)–Sri Lanka trade-related assistance project, funded by the EU.

Following activities have been done with the support of UNIDO project

- Opportunity for 8 staff members of MUSSD to participate training on ISO 17025:2015
- Support to symposium of World Metrology Day 2018 organized by MUSSD
- Support for essay and art competition for school kids as a function of World Metrology Day 2018 celebration.

MEDEA-PTB Project

The project aims to improve the ability of the regional metrology specialist networks in Asia – the Asia Pacific Metrology Programme (APMP) and the Asia-Pacific Legal Metrology Forum (APLMF) – to promote the metrological systems of developing economies, which provide special offers for national metrology institutes (NMI) and legal metrology authorities (LMA) in Asia, respectively. This project is financing by Federal Ministry for Economic Cooperation and Development (BMZ), Germany through National measurement institute of Germany, PTB.

Following activities have been done with the support of MEDEA project

- Workshop on "Metrology in Photometry Radiometry (PR)" in Global Academy (GMA)- KRISS ,South Korea
- OIML/APMLF training course on pre-packed goods, in China
- Concluding Work Shop for the Hydraulic Pressure Standard in National Metrology institute Thailand (NIMT).
- Training Course on the Verification of Non – Automatic Weighing Instrument including Weighbridges in Malaysia.
- APMP mid-year meeting and related activities held in Hong Kong, China.
- "Capacity building In Technical and Scientific Organization using regional Experience and Knowledge workshop (CABUREK) in Thailand.
- Training Course on the Verification of Rice Moisture meter in Thailand.

3.3 Cooperation with overseas NMIs

As the National Metrology Institute (NMI) of Sri Lanka MUSSD has maintain cooperation with overseas NMIs in the Asia -Pacific regional level as well as international level.

Korea Research Institute of Standards and Science (KRISS)

Korea Research Institute of Standards and Science (KRISS), South Korea operates a Graduate School of Metrology in cooperation with the University of Science and Technology (UST). The Graduate School of Metrology offers master and doctoral courses in measurement science and technology to foster highly qualified R&D professionals. Student-oriented customized courses are offered by utilizing KRISS' facilities and workforce.

A staff member has obtained the first PhD in MUSSD from KRISS campus of UST in Science of Measurement in 2018. It was obtained under the full scholarship from UST, South Korea.

4.

MUSSD as a Supporter for Sustainable Development Goals

4.1 Sustainable Development Goals and Metrology

The 2030 Agenda for Sustainable Development that adopted by all United Nations Member States including Sri Lanka provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries - developed and developing - in a global partnership.

Metrology is a fundamental pillar of the quality infrastructure system and essential for most SDGs. It is essential for trade, scientific comparison, innovation and emerging technologies. With rapid change in the world, there is a continuing increase in demand for improved measurement standards and for the adoption of metrological concepts on regulatory activities, health, public safety and environment safety and quality assurance of producing and testing.

MUSSD has identified 04 SDGs that it gives active contribution for the "The 2030 Agenda for Sustainable Development".

Goal 01 - No Poverty

The regulation of measurements through a metrology system aims a level playing field for all in many fields of measurement.

- Making trade fairer, even in the smallest markets, will ensure that all farmers receive the correct payment for their produce,
- The control of prepacked goods will also help to reduce fraud in this increasingly important area which often concerns staple foodstuffs.
- The correct measurement will ensure that not only price paid, that governments are able to collect the correct taxes on exports.

Applying legal metrology controls to measurements of vehicle speed and blood alcohol, which are relevant to road safety can reduce accident rates. Apart from the human cost accidents can contribute to a significant drain in scarce national resources which can otherwise be used for everyone's benefit can increase poor people's cost of living and reduce their daily income.

In the field of health, accurate measurement of even the most basic parameters, such as the patient weight, temperature, and blood pressure can lead to more accurate diagnoses and health improvement.

Goal 03 - Good Health and well being

Medical measurements are an everyday part of healthcare and fundamental to prevention, diagnosis and treatment of diseases and other medical conditions. Internationally recognized and accepted equivalence of measurements in laboratory medicine and traceability to appropriate measurement standards will lead to:

- Improvements in the quality of healthcare for the patient,
- Reduction in “false positive” and “false negative: test results,
- Reduction in costs for governments and healthcare insurers and an improvement in the efficiency of health care,
- Reduction in the numbers of repeat tests due to improvements in quality,
- Reduction of costs for the in vitro diagnostic (IVD) in quality,
- Removal of redundant written standards by unification of regional standards, and
- Global acceptability of measurements and tests, which removes technical barriers to trade

Goal 07 - Affordable and clean Energy

As a lifeblood of modern society, we use energy for industry, transport, cooling and lighting our homes, powering digital communications.

By Increasing use of energy, carbon based fuels are highly impact to increased CO_2 emissions to the environment.Measurements and metrology play critical role to control the CO_2 and other negative emissions to the environment.

Goal 09 - Industry innovation and Infrastructure

High performance product and manufacturing systems require accurate measurements for a wide range of parameters and production environments. Most of the developing and industrial developed countries control their manufacturing process and guarantee the quality of their products, companies are constantly concerned with aligning their instruments to reference standards and ensuring measurement traceability. In the global market effective metrology facility and calibrated infrastructure is the “added value” to their products and influenced to their bargaining power.

Measurement infrastructure directly performs effective calibration and testing to ensure that

- components and finished products meet regulatory requirements, documentary standards and specifications,
- consumer and industrial quality expectations are met, including product value/price and reliability
- typically through the use of the CIPM MRA and for commercial laboratories, accreditation, leading to measurement and test results that are internationally recognized and accepted, thus avoiding trade barriers through repeat tests

5. Strength of MUSSD

5.1 Staff Information

Table 17: The cadre composition – 2018

Position	Salary Scale	Service Category	Class	Approved Cadre	Actual Cadre			Vacancies
					Permanent	Casual	Acting	
Director MUSS	SL-1-2016	SLSS	I	01	-	-	01	01
Deputy Director MUSS/ Assistant Director MUSS	SL-1-2016	SLSS	III/II/I	15	9	-	-	06
Assistant Director (Admin)	SL-1-2016	SLAS	III	01	-	-	01	01
Accountant	SL-1-2016	SLACS	II/I , II/II	01	01	-	-	-
Accountant (Internal Audit)	SL-1-2016	SLACS	II/I , II/II	01	-	-	-	01
Administrative Officer	MN-7-2016	Public Management Assistant Service	Supra	01	-	-	01	01
Assistant Superintendent of MUSS	MN-7-2016	Departmental		04	-	-	01	04
Inspector of MSD	MN-7-2016	SLTS	special	25	08	-	-	17
Metrology Experimental Officer	MN-4-2016	Departmental		36	17	-	-	19
District Metrology Investigation Assistant	MN-4-2016	Departmental		03	03	-	-	-
Information &Communication Technology Officer	MN-4-2016	IT Service		01	01	-	-	-
Development Officer	MN-4-2016	Development Officers Service		60	36	-	-	24

Position	Salary Scale	Service Category	Class	Approved Cadre	Actual Cadre			Vacancies
					Permanent	Casual	Acting	
Librarian measurements	MN-3-2016	Sri Lanka Government Librarian Service		01	-	-	-	01
Inspector of MSD	MN-3-2016	SLTS	III/II/I	91	63	-	-	28
Laboratory Assistant	MN-3-2016	Departmental		04	-	-	-	04
Public Management Assistant	MN-2-2016	Public Management Assistant Service		20	20	-	-	
Technician	PL-3-2016	Departmental		02	-	-	-	02
Mechanic	PL-3-2016	Departmental		02	02	-	-	-
Driver	PL-3-2016	Combined Service		17	11	-	-	06
Measurement Standards & Services Assistant	PL-2-2016	Departmental		63	38	-	-	25
Laboratory Attendant	PL-2-2016	Departmental		10	03	-	-	07
Lorry Assistant	PL-1-2016	Departmental		02	02	-	-	-
Office Assistant	PL-1-2016	Departmental, and Combined Service		05	05	-	-	-
Security	PL-1-2016	Departmental		01	-	-	-	01
Sanitary Worker	PL-1-2016	Departmental		01	-	-	-	01

Table 18: Staff Updates in 2018

Position	New recruitments	Retirements	Transfer Arrivals	Transferred Out	Promotions	Resignations	Leave the Position
Inspector of MSD (Special)	-	02	-	-	-	-	-
Inspector of MSD	14	-	-	-	-	-	-
Development Officer	*02	-	02	01	-	-	01
Inspector of MSD	-	01	-	-	-	-	-
Management Assistant	-	-	07	01	-	-	-
Driver	-	-	05	03	-	-	-
Measurement Standards & Services Attendant	-	02	-	-	-	-	-

*Development Officer Training

5.2 Local and Foreign Training Programmes

MUSSD is always actively interested in identifying necessary training needs of all officers in every section. It is believed that every officer of the department must have to maintain a proven track record of skills related to his daily work. Necessary training is provided to officers so that they can improve their gained knowledge further and enable them to have promotions with updated knowledge and well experience at work. Information on local training programmes in which MUSSD officers were participated in 2018 is represented in the table below.

Table 19: Local training programs provided for the staff

	Name of the officer	Designation	Training	Institute	Time Period
01	Mr. T.P.G.Karunarathna	Development Officer	Awareness for EB Examination	SDFL Institute	2018.02.02 2018.02.03
02	Ms.K.S.V.Gunapala				
03	Ms.B.L.P.Karunarathna				
04	Ms.P.D.Asoka				
05	Mr. J.W.P.P.M.Jayawardhana	Administrative Officer	Operation & Maintenance of Generator	CETRAC	2018.03.27 2018.03.28
06	Mr. N.G.S.Dilshan	Measurement Standards & Services Assistant			
07	Mr. S.D.I.Dias	Assistant Director	Work shop on Drinking & west Water Analysis Techniques	University of Kalaniya (Chemistry Division)	2018.06.08 2018.06.09

	Name of the officer	Designation	Training	Institute	Time Period
08	Mrs.R.C.Karunasena	District Assistant Lab Inspector	Work shop on Drinking & west Water Analysis Techniques	University of Kalaniya (Chemistry Division)	2018.06.08 2018.06.09 2018.06.10
10	Mr.K.A.C.J.Gunasekara	Inspector of MSD	Diploma in English level III	SLIDA	3 Month
11	Ms.I.G.S.S Idamawaththa	Development Officer	Database Management using MS Access	MILODA Institute	2018.08.19 2018.08.20
12	Ms.G.D.S.C.Garusinghe	Metrology Experimental Officer	Documentation Laboratory Quality Management System	SLAB	2018.09.27 2018.09.28
13	Ms S.N.Samaraweera	Metrology Experimental Officer			
14	Ms.R.C. Karunasena	District Metrology Investigation Assistant			
15	Mr K.A.D.S.P.Kumarapeli	District Metrology Investigation Assistant			
16	Mr.A.M.K.Ganapathi	Development Officer			
17	Mr.S.N.Akuranthilaka	Director	Speechcraft Training with the Toastmasters International for special grade and class 1 Officers of All Island Services	SLIDA	10 Days from 2018.10.16

Table 20: Foreign training programs and conferences participated by the staff in 2018

	Name of the officer	Designation	Country	Time Period	Training/ Conference
01	Mr. R.G.S.A.Perera	Deputy Director	France	12.02.2018 14.02.2018	Effective Participation in Universal Coordinated Time (UTC) BIPM France
02	Mr. R. D. M. Alanka	Assistant Director	South Korea	26.03.2018 – 05.04.2018	Workshop on Metrology in Photometry Radiometry (PR) Global Academy (GMA) KRISS -Korea
03	Mr. S.D.Rubasigha	Inspector of MSD	China	10.04.2018-14.04.2018	OIML/APMLF Training Course on Pre-Packaged Good.
04	Mr. D.D.Asoka				
05	Mr. H.L.I.S. Sampath	Assistant Director	Thailand	23.04.2018-25.04.2018	Concluding Work Shop for the Hydraulic Pressure Standard
06	Mr. A.M.K.Ganapathi	Development Officer			
07	Mr. S.N.Akuranthilaka	Director	Nepal	08.5.2018 – 09.05.2018	SAARC-PTB Kick – Off Workshop of the project “Strengthening Regional Integration and Co-Operation in the field of Quality Infrastructure in SAARK.”

	Name of the officer	Designation	Country	Time Period	Training/ Conference
08	Mr. U.P.P.S.Uggaldeniya	Inspector MSD	Malaysia	08.05.2018 –12.05.2018	Training Course on the Verification of Non – Automatic Weighing Instrument including Weighbridges.
9	Mr. B.C.Jayawicrama				
10	Ms. G.D.S.C.Garusigha	Meteorological Experimental Officer	China	30.05.2018-02.06.2018	Hand carry the Standard platinum Resistance Themometer (SPRT)to National Institute of Metrology ,China
11	Mr. S.D.I.Dias	Assistant Director	Hong Kong China	03.07.2018-06.07.2018	APMP Mid Year Meeting & Related Activities
12	Dr.G.W.C.Wijayasundara	Assistant Director	France	08.07.2018-15.07.2018	Conference on precision Electromagnetic Measurements (CPEM)
13	Mr.R.D.M.Alanka	Assistant Director	Thailand		Capacity building In Technical and Scientific Organization using regional Experience and Knowledge workshop.(CABUREK)
14	Mr. R.P.S.A.Perera	Deputy Director		29.10.2018-02.11.2018	
15	Mr Mr. H.L.I.S. Sampath	Assistant Director	China	06.11.2018-26.11.2018	Seminar on Certification & Accreditation between China & Countries along the Belt and Road.
16	Mr.S.N.Akurantilaka	Director	Singapore	23.11.2018-01.12.2018	APMP Technical Committee Meeting (TCT) and workshop

	Name of the officer	**Designation**	**Country**	**Time Period**	**Training/ Conference**
17	Ms.J.S.M.Silva	Deputy Director	Singapore	23.11.2018-28.11.2018	APMP Technical Committee Meeting (TCM) and workshop
18	Mr. R.G.S.A.Perera	Deputy Director		23.11.2018-28.11.2018	APMP Technical Committee Meeting (TCTF) and workshop
19	Mr.S.D.I.Dias	Assistant Director		23.11.2018-28.11.2018	APMP Technical Committee Meeting (TCQM) and MEDEA workshop
20	Dr.G.W.C.Wijayasundara	Assistant Director		23.11.2018-28.11.2018	APMP Technical Committee Meeting (TCEM) and workshop
21	Ms.K.S.Mallawarachchi	Assistant Director		23.11.2018-28.11.2018	APMP Technical Committee Meeting (TCPR) and workshop
22	Mr.R.D.N.Alanka	Assistant Director	Japan	02.12.2018-15.12.2018	Training Courses on Implementation for Social and Industrial Infrastructure in Metrology
23	Mr.I.P.Janaka Wewala	Inspector MSD	Thailand	03.12.2018-07.12.2018	Training Course on the Verification of Rice Moisture meter – MEDEA Project
24	Mr.A.L.Nuzath				

5.3 Special Programs

5.3.1 Metrology Day 2018

The department celebrated World Metrology Day on May 25 to commemorate the anniversary of the signing of the Meter Convention on May 20, 1875.The Meter Convention provides the basis for a universal measurement system, which lays the platform for scientific discovery and innovation, industrial manufacturing, and trade as well as socioeconomic and environmental development.

The theme of World Metrology Day 2018 is the "Constant Evolution of the International System of Units (SI)". World Metrology Day celebration was commenced with a symposium on May 25 at MUSSD's main auditorium in Homagama. The main speech on "Revised SI and its Influence on Science and Industry" was done by a metrologist from the Korea Research Institute of Standards and Science (KRISS), South Korea. The United Nations Industrial Development Organization (UNIDO) and Physikalisch-Technische Bundesanstalt (PTB) co-hosted the event.

MUSSD organized an essay competition on five metrology-related topics and an art competition on three metrology-related topics held at schools' island-wide. The competition was held in both Sinhala and Tamil. A series of awareness program was conducted in government schools in district basis. Booklets broachers and posters with SI unit definitions were distributed in the schools.

5.3.2 Two-day workshop

The two day workshop that held every other year to develop efficiency and attitudes of MUSSD staff was held at Aqua Pearl Lake Resort, Moratuwa in August 2018. A motivational speaker, Mr.A.G.S.Senadeera conducted a lecture with "Way of Success". The evening was decorated by lyrical poet, Rathna Sri Wijesingha and his group to refinement literature entertainment of the staff. Well-known personality in the counselling and psychology field - Prasanna Kamalasiri Perera conducted a programe in "Mortivation and Attitude Development" for the staff in the second day.

5.3.3 National survey on measurement services

In order to continually improve the services given by the department, MUSSD conducted a National Survey on Measurement Services in November 2018. The objective of the survey to identify current and future demand of measurement services in the country. Furthermore, it was focused in implementing the survey as MUSSD is now on an emerging path expanding its curricula in established new premise with modern facilities to meet future measurement needs of the clients. As a result of the survey MUSSD would be able to welcome new trends of metrology which are expected to be appeared in near future and provide our service covering a vast area in industrial and scientific needs of metrology in Sri Lanka.

Two form sets were used for the survey; one is distributed for calibration laboratories, other is distributed for government institutes, industries and testing laboratories. Survey forms were distributed and information were collected from government institutions through their ministries. Accreted calibration and testing laboratories were contacted by mail/e-mail. Survey forms were also sent to the industries that registered under Ministry of Industry and Commerce. Furthermore, paper advertisements were published in newspapers about the survey and facilities were provided to download the survey forms from MUSSD website.

6. Future Projects

International recognition for the calibration capabilities of the National Measurement Laboratory (NML) Measurement Units, Standards and Service Department has signed the CIPM Mutual Recognition Arrangement (CIPM MRA) on behalf of the government of Sri Lanka. It is the framework through which a National Metrology Institute (NMI) demonstrates the international equivalence of their measurement standards, and the calibration and measurement certificates they issue. The outcomes of the arrangement are the internationally recognized Calibration and Measurement Capabilities (CMCs) of the participating institutes. For that, the laboratories of the institutes should be peer-reviewed and approved its measurement capabilities from internationally accepted metrology experts.

Next year, the National Measurement Laboratory (NML) of the department is going for pre assessment from Sri Lanka Accreditation Board (SLAB) as a part of obtaining international recognition according to the CIPM-MRA. As the first step, Time and Frequency Laboratory and Pressure Laboratory will initiate the peer review process followed by other existing laboratories. At the same time, expanding the scope of the laboratory for new measurement parameters, upgrade the knowledge of the laboratory staff through the international co-operation (ex: UNIDO, PTB, APMP) and dissemination of the metrology awareness by organizing training programs and workshops for industry, trade and testing and calibration laboratories will be continued as an on-going project.

Furthermore, A programe to be initiate with ministry of health to calibrate or test measuring instruments use in government hospitals. It is ensured the accuracy of measuring instruments such like weighing machines, scales, blood pressure meters, and thermometers, used in health sector by calibrating them which in turn results in a reliable diagnose and treatment. In this regard MUSSD is capable of providing calibration/verification facilities for hospitals and other related institutes.

Moreover, Time and Frequency laboratory of MUSSD to be participated an interlaboratory comparison on for Time Interval using a stopwatch as an artifact. The National Metrology Institute of Malaysia (NMIM) and the National Measurement Institute of Australia (NMIA) will be act as the pilot and supporting laboratory, respectively. The artefact will be prepared by NMIM and funded by the APMP under the Technical Committee Initiative project (TCTF_01_TCI2018). Inter comparison was started in 2018 July and MUSSD is Planinnig to participated in 2019. Twelve NMIs including MUSSD going to participate the comparison.

One trip for calibrating GPS time transfer equipment of APMP-Group 2 labs was organized by Telecommunication Laboratories (TL), Taiwan and started from August 2018. MUSSD is

planning to participate in 1st quarter of 2019 to achieve better accuracy for time measurements in the country.

Second workshop of "Capacity Building in Technical and Scientific Organization using regional Experience and Knowledge workshop. (CABUREK)" will be held in Colombo in April, 2019 as a decision made on the first CABUREK meeting held in Thailand in 2018.

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In conclusion, I would like to extend my sincere thanks to all the staff of the department and the District Secretaries for their corporation and support in carrying out the duties and bearing responsibilities that are reposed on me of this department in an efficient manner.

S.N.Akuranthilaka
Director of Measurement Units, Standards and Services

Appendix 1

Approved Patterns of Weighing and Measuring Instruments

2018

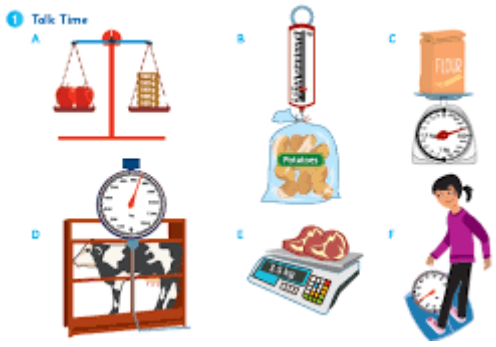

Table 21: Pattern approved weighing instruments in 2018

No	Weighing Instrument	Markings					Manufacture	Local Agent	Approved Date
		Class	***Max***	***Min***	***e=d***	***T***			
1	Price Computing Scale AQUA ACS-C-KP5	(III)	15 kg	100 g	5 g	7.5 kg	Yongkang Shente Industry & Trade Co. Ltd., 210, Xishan Road, Economic Development Zone, Yongkang, Zhejiang, China. Tel. +8615268672842 Fax. +8657987503866 E-mail: santrine521@gmail.com	Pathirana Scale Marketing (Pvt) Ltd. No. 156, Colombo Road, Galloluwa Junction, Minuwangoda Tel. +94776155539 E-mail: pathiranascale@slt.lk	2017-12-22
2	Electronic Crane Scale Alpha Tea Leaf OCS-G3 (Blue, Yellow)	(III)	50 kg/100 kg	400 g	20 g/50 g	50 kg	Shanghai Baiying Scales, Co.Ltd, No.318, Cheng Yin Road, Baoshan Industrial Zone, Shanghai, China. Tel. 0086-21-61077828, Fax: 0086-21-61077838, email by@shbydc.com	Alpha Tec, No.D55/78, Jayantha Weerasekara Mw., Colombo 10. Tel. 0712342023, alphaweighing@gmail.com	2018-01-19
3	Weigh bridge Indicator Caisun XK315A-6	(III)	40000 kg	500 kg	10 kg	#N/A	Shanghai Caisun Electronics Technology Co. Ltd, No. 369, Datuanzhen Sandun, Sanxuan Road, Pudong Shanghai, China. Tel +8621-5823785-8 email caisun@caisun.com	Weigh Right Pvt Ltd. No. 78/1, Main Street, Battaramulla. Tel 0112953825 Fax: 0112953826 weighrighttm@gmail.com	2018-01-19
4	Barcode Price Computing Printing Scale TM - 15Ab	(III)	15 kg	100 g	5 g	7.5 kg	Ocom Technologies Limited , No 4/F, Block 10, Zhongxing Industrial Park, Chuangye Road, Nanshan District, Shenzhen, 518054, China. Tel. +86-75586053207 email: www.ocominc.com	E-W Information Systems Limited, No 441/7, Second Lane, cotta Road, Rajagiriya Tel. 0779101159 Fax: +94112447303 Email : Udayas@ewisl.net	2018-03-13

No	Weighing Instrument	Markings					Manufacture	Local Agent	Approved Date
		Class	***Max***	***Min***	***e=d***	***T***			
5	Receipt Printing Retail Scale AUQA BP 30	(III)	15 kg/30 kg	100 g	5 g/10 g	10 kg	Yongkang Jieli Weighing Apperatus Co. Ltd, 16, Yililai Road, Fangyan Industrial Base, Yongkang, Zhejiang, China. Tel. 0086-0579-87309266 Fax. 0086-0579-87309177 e-mail info@zjjieli.com	Pathirana Scale Marketing (Pvt) Ltd. No. 156, Colombo Road, Galloluwa Junction, Minuwangoda Tel. 0112-2298025/07776155539 Fax. 0112-2298025 E-mail: pathiranascale@ slt.lk	2018-03-23
6	Gold Balance YZ 202	(II)	200 g	200 mg	10 mg	-	Changshu Yongtai Imp & Exp. Co. Ltd.., Room 4001, Wuhui Mansion, No. 14, North Haiyu Road, Changshu, Jiangsu, China. Tel. 0512-81563230/81563232 Email kent_zhoa@126.com	Mezzetta International (Pvt) Ltd, No.12-1/1, De Silva Lane, Off Watarappala Road, Mount Lavinia. Tel. 0777 307935/,0112723931 Fax. +94112718575 E-mail: tamino@eureka.lk	2018-03-13
7	Price Computing Scale CITIZAN-XH-6601	(III)	15 kg	100 g	5 g	7.5 kg	Yongkang Xianghai Weighing Scale Factory, No. 5, Xilushan Road, Yongkang, Zhejiang, China 321300 Tel. 0086-18072352258/0086-579-87512689 Fax. 0086-579-87513302 e-mail: chqinchina@gmail.com	RGS Enterprises, No. 606/A, Jayanthi Road, Athurugiriya Tel. 0774453958 E-mail: rgsudaya@gmail.com	2018-04-26
8	Barcode Label Print Scale FASHION FBS-909	(III)	15 kg/30 kg	100 g	5 g/10 g	14.955.5 kg	Xiamen Rongta Technology Co. Ltd, 3F/E Building, Gaoqi Industrial Area, Gaoqi Beisan Road, Dianqian Huli Area, Xiamen, Fujian, China. Tel. +865925666129 Fax, +865925659169	Fashion Holdings (Pvt) Ltd. No. 22/3, Kandawatta Road, Pelawatta, Battaramulla Tel. 0112786116, 0112787400 Fax: 0112787400 E-mail: fashonholding@gmail.com	2018-07-04

No	Weighing Instrument	Markings					Manufacture	Local Agent	Approved Date
		Class	***Max***	***Min***	***e=d***	***T***			
9	Platform Scale ZM 201- PD2	(III)	150 kg	1 kg	50 g	75 kg	Avery Weigh-Tronix, Foundry Lane, Smethwick, West Midlands B66 2LP, United Kingdom Tel. +44(0)8453667788 Fax +44(0)1212248183 E-mail: info@awtxglobal.com, www.averyweigh-tronix.com	Ceylon Weighing Machines Limited, 257, Grandpass Road, Colombo14 Tel. 0112498337/8 E-mail: umas@edna.lk	2018-07-05
10	Electronic Platform Scale ZM 201-H400	(III)	2000 kg	10 kg	500 g	1000 kg	Avery Weigh-Tronix, Foundry Lane, Smethwick, West Midlands B66 2LP, United Kingdom Tel. +44(0)8453667788 Fax +44(0)1212248183 E-mail: info@awtxglobal.com, www.averyweigh-tronix.com	Ceylon Weighing Machines Limited, 257, Grandpass Road, Colombo14 Tel. 0112498337/8 E-mail: umas@edna.lk	2018-09-10
11	Platform Scale BV-PS2018	(III)	60 kg	500 g	100 g	60 kg	Bellvantage (Pvt) Ltd. 63, Norris Canal Road, Colombo 10 Tel. 94 115334455 Fax 94 115753754 Email: support@bellvantage.com Web: bellvantage.com	Bellvantage (Pvt) Ltd. 46, Vauxhall Street, Colombo 2 Tel. 94 115753753 Fax 94 115753754 Email: info@bellvantage.com Web: bellvantage.com	2018-10-19
12	Barcode Label Print Scale RONGTA LABEL SCALE	(III)	15 kg/30 kg	100 g	5 g/10 g	-14.995 kg	Xiamen Rongta Technology Co. Ltd, 3F/E Building, Gaoqi Industrial Area, Gaoqi Beisan Road, Dianqian Huli Area, Xiamen, Fujian, China. Tel. +865925666129 Fax, +865925659169	New Matale Scale (Pvt) Ltd. No. 255/3, Main Street, Matale Tel.0777479919Email: newmatalescale@yahoo.com	2018-10-03

No	Weighing Instrument	Markings					Manufacture	Local Agent	Approved Date
		Class	***Max***	***Min***	***e=d***	***T***			
13	Weighing Scale ALPHA ACS-A9	(III)	6 kg/15 kg	40 g	2 g/5 g	7.5 kg	Yongkang Zhujiang Weighing Apparatus Co. Ltd., Gutangli Industrial Zone, Yongkang, Zhejiang, China 321306 Tel. 0086-579-87432899 Fax 0086-579-87432699 Email: qua.angela.zhujiang@aliyun.com	Alpha Tec, No.D55/78, Jayantha Weerasekara Mw., Colombo 10. Tel. 011 2987411, Fax 0112 987411 email : alphaweighing@gmail.com	2018-10-26
14	Price Computing Scale CRYSTAL JW-618	(III)	15 kg	100 g	5 g	7.5 kg	Yongkang Zhujiang Weighing Apparatus Co. Ltd., Gutangli Industrial Zone, Yongkang, Zhejiang, China Tel. +8657987432899 Fax +8657987432699	Champika Scales, No. 187, Central Road, Colombo 12. Tel. 0777844865 email: champikascale029@gmail.com	2018-10-26
15	Dual Range Price Computing Scale AQUA T30	(III)	15 kg/30 kg	100 g	5 g	10 kg	Yongkang Jieli Weighing Apperatus Co. Ltd, 16, Yililai Road, Fangyan Industrial Base, Yongkang, Zhejiang, China. Tel. +0086-0579-87309266 Fax. 0086-0579-87309177 e-mail info@zjjieli.com	Pathirana Scale Marketing (Pvt) Ltd. No. 156, Colombo Road, Galloluwa Junction, Minuwangoda Tel. 0777468409 E-mail: pathiranascale@sltnet.lk	2018-11-07

No	Weighing Instrument	Markings					Manufacture	Local Agent	Approved Date
		Class	***Max***	***Min***	***e=d***	***T***			
16	Price Computing Scale UNIQUE ACS-30	(III)	15 kg/30 kg	100 g	5 g/10 g	15 kg	Zhejiang Haoyu Industry & Trade Co.Ltd, Guihua Road, Baihuashan Industry Zone, Wuyi, Jinhua, Zhejiang, China Tel.+86 131777772539 Email: barry@zghaoyu.com	New Matale Scale (Pvt) Ltd. No. 255/3, Main Street, Matale Tel. 0777479919 Email: newmatalescale@yahoo.com	2018-11-19
17	Price Computing Scale UNIQUE ACS-A2	(III)	15 kg	100 g	5 g	7.5 kg	Zhejiang Haoyu Industry & Trade Co.Ltd, Guihua Road, Baihuashan Industry Zone, Wuyi, Jinhua, Zhejiang, China Tel.+86 57987613686 Email: +86 57987613995 E-mail: nicole@zghaoyu.com	New Matale Scale (Pvt) Ltd. No. 255/3, Main Street, Matale Tel. 0777479919 Email: newmatalescale@yahoo.com	2018-11-18

Table 22: Pattern approved fuel dispensers in 2018

	Local Agent	Manufacturer	Fuel Dispenser Model	Application Received on	Test Date	Approved Date
01	NPS Equipment (PVT) Ltd, No229/1, Kirula Road, Colombo 05.	Midco Limited, Metro Estate, Vidyanagiri Marg, Kalina, India	MIDCO-SFK2224ASSP1 (Dual Nozzle, Dual pump, Four displays with printer) Max 70 *l*/min, Min 7 *l*/min Max 35 *l*/min,Min 3.5 *l*/min(2 nos of nozzel)& 70 *l*/min, Min 70 *l*/min (one nozzel)	2017.10.11	2018.02.19	2018.03.22
02	NPS Equipment (PVT) Ltd, No229/1, Kirula Road, Colombo 05.	Midco Limited, Metro Estate, Vidyanagiri Marg, Kalina, India	MIDCO-SFE2444ASSPL (Dual Nozzles, Dual pump, Four displays with printer) Max 35 *l*/min, Min 3.5 *l*/min	2017.08.04	2018.02.14	2018.03.22
03	NPS Equipment (PVT) Ltd, No229/1, Kirula Road, Colombo 05.	Midco Limited, Metro Estate, Vidyanagiri Marg, Kalina, India	MIDCO-SFD2422ASHPI (Four Nozzle, Dual pump, Two displays with printer) Max 35 *l*/min Min 3.5 *l*/min Max 70 *l*/min, Min 70 *l*/min	2017.08.04	2018.02.14	2018.03.22
04	Supreme Trading Company (PVT) Ltd, No 221/3,Dharmapala Mawatha, Colombo 07	Wayne Fueling System Sweden , AB,Hanogatan, 10 BOX 50559,SE - 202 15 Malmo, Sweden	WAYNE – HELIX 1000 S(NL/ID) 11-110S (Single Products, Single Nozzle, To displays) Max 40 *l*/min, Min 4 *l*/min	2018.02.12	2018.03.02	2018.03.15
05	Supreme Trading Company (PVT) Ltd, No 221/3,Dharmapala Mawatha,Colombo 07	Wayne Fueling System Sweden , AB,Hanogatan, 10 BOX 50559,SE - 202 15 Malmo, Sweden	WAYNE – HELIX 2000 S(WL/ID) 22-211S (To Products, Single Nozzle Four displays with) Max 40 *l*/min, Min 4 *l*/min	2018.02.12	2018.03.02	2018.03.15

	Local Agent	Manufacturer	Fuel Dispenser Model	Application Received on	Test Date	Approved Date
06	Colombo Machinery & Equipment (PVT) ltd No 591/1,Chitra Lane. Colombo 05	ZHEJIANG LANFENG Machina Cooperation Ltd, No 02 Minor District Of the Hi Tech Park, Wenzhouecon - Tech Development Zone, Zhejiang Province, China	LANFENG – JDK 180c2221(To Products, Two Nozzle Tow displays Max 180 *l*/min, Min 18 *l*/min			2018.03.13
7	Halith Supplier No.49Q/A, Perera Place, Dehiwala.	Wenzhou Changlong Fuel Dispenser manufacture Co.Ltd, No.6, Heqi Road, West Industrial Zone, Zhejiang Province, P.R. China	CHANGLONG-DJY 218A One product, One nozzle, Two displays. Max: 45 , *l*/min, Min: 4.5 *l*/min	2018-02-20	2018-05-15(visual Inspection) 2018-08-07 (Complete test)	2018-09-10
8	Lanka Fuel Mart, No.76, main Street , Mawadipalli, karaitheve	Shanghai Cowell Machingary Company , China	COWELL-CWK 50C 1111,CWK50C2222 (One Product, One nozzle ,Two Displays, Two products, Two nozzles, Four displays Max: 50 *l*/min , Min: 5 *l*/min	2018-03-28	2018-05-14 2018-08-15 (Visual Inspection)	On site Approval 2018-08-13, 2nd part approved on 2018-09-10

Appendix 2

ANNUAL ACCOUNTS

2018

A2.1 Consolidated Fund

Table 23: Recurrent Expenditure - Consolidated Fund

Description	2017 Actual Expenditure Rs.	2018 Approved Estimate Rs.	2018 Revised Estimate Rs.	2018Actual Expenditure up to December Rs.
Personal Emoluments	99,487,338	110,000,000	109,921,000	104,421,142
Others	1,329,455	1,350,000	1,429,000	1,428,804
Total Recurrent Expenditure	**100,816,793**	**111,350,000**	**111,350,000**	**105,849,946**

Table 24: Capital Expenditure - Consolidated Fund

Object Code	Capital Expenditure	2017 Actual Expenditure Rs.	2018Approved Estimate Rs.	2018Revised Estimate Rs.	2018 Actual Expenditure to December Rs.
2102	Furniture and Office Equipment	1,607,084	-	-	-
2103	Machinery	19,971,099	25,000,000	25,000,000	0
2401	Knowledge Development	-	1,500,000	1,500,000	1,470,603
	TOTAL	**21,578,183**	**26,500,000**	**26,500,000**	**1,470,603**

Table 25: Summary of Expenditure - Consolidated Fund

Description	2017 Actual Expenditure Rs.	2018 Approved Estimate Rs.	2018 Revised Estimate Rs.	2018 Actual Expenditure to December Rs.
Recurrent Expenditure	100,816,793	111,350,000	111,350,000	105,849,946
Capital Expenditure	21,578,183	26,500,000	26,500,000	1,470,603
Total	**122,394,976**	**137,850,000**	**137,850,000**	**107,320,549**

A2.2 Income

Source	Revenue Rs.
Stamping Charges (Without Tax)	358,905,593.87
Calibration Fees	1,859,317.00
Pattern Approvals	398,000.00
Registration Charges	897,134.00
Invest Income	27,419,018.00
Training Fees	364,783.00
Other Income	452,507.00
Total	**392,055,968.87**

Table 26: Income of the MUSSD for 2018

1/3rd of the total income is remitted to the treasury according to the Measurement Units, Standards and Services act. The income of the department comprises the revenue collected from verification, calibration, and pattern approvals.

A2.3 Measurement Units, Standards and Services Fund

Summary of Expenditure

Table 27: Summary of expenditure of MUSSD fund in 2018

Description	2017 Actual Expenditure Rs.	2018 Approved Estimate Rs.	2018 Actual Expenditure to December Rs.
Recurrent Expenditure	53,329,498	82,328,315	68,670,422.00
Capital Expenditure	51,925,074	231,050,700	55,705,475.00
Total	**105,254,572**	**313,379,015**	**124,375,897.00**

Table 28: Statement of Expenditure of MUSSD fund for the Year as at 31.12.2018

Description of Expenditure		Value Rs.
1002	Payment of Overtime	1,621,644.00
1101	Travelling Expenses - Local	8,931,991.00
1102	Travelling Expenses - Foreign	2,996,553.00
1201	Purchased of Stationary	2,352,288.00
1202	Fuel and Lubricant	4,813,848.00
1203	Uniforms	60,000.00
1207	Other Supplies	269,398.00
1301	Repair of Vehicles, Plants, and Machinery	9,240,170.00
1303	Land and Building	1,525,865.00
1304	Others	30,490.00
1401	Transport Expenses	42,647.00
1402	Communication and Telephone	2,073,094.00
1403	Postage Charges	106,217.00
1404	Payments of Electricity Bill	9,865,062.00
1406	Municipal Tax	31,069.00
1407	Other Expenses	4,412,697.00
1408	Haring Charges	9,551,896.00
1409	Work Shop, Exhibition and Seminars	47,610.00
1507	Payment of Membership Fees	7,998,026.00
1905	Other Recurrent Expenses	2,699,857.00
2102	Purchasing of Furniture and Office Equipment	2,931,035.00
2103	Purchasing Machinery	50,275,754.00
2401	Knowledge Development and Organizational Development	2,498,686.00
	Total Expenditure	**124,375,897.00**

Winners of the Art Competition - World Metrology Day 2018

Topic: Medical Treatment Measurements

First Place

J.K.Yasasi Hansina
C/ Ananda Balika College
Colombo- 10
Grade 9

Second Place

S.T.Dilshan Samarathunga
Udamattha Mihindu Central College
Eahaliyagoda
Grade 9

Third Place

H.Dulmini Sadhalika
Viharamahadevi Balika Vidyalaya
Kribathgoda
Grade 7