



Evolution of Measurements

Long ago the idea of a universal measuring system did not exist. Prior to the 19th century, many countries had a measuring system for nearly every profession. In fact, in 1795, France alone recorded more than 700 systems of measurement. Systems relating to length were based on the measurement of body parts - particularly those of rulers. For example, in the 12th century, it was decreed by King Henry I that the distance from the tip of his nose to the tips of his fingers be the standard length of a yard. The foot was determined by measuring the length of King Charlemagne's actual foot while King Edgar designated the width of his thumb as an inch. With the existence of numerous systems of measurements among countries, which measurement superseded the other when it came to trade and commerce? Which unit of measurement was to be converted? How could the traders determine that the business conducted was fair and honest?

In an attempt to bring order to the chaos caused by the difference in measurements and measuring systems, the French developed an invariable measure that would not be based on national vanity but rather one that could be compared to a natural phenomenon and be used by all foreign nations. The meter was introduced in 1791 and was defined as the length equal to 1/10,000,000 of $\frac{1}{4}$ of the terrestrial meridian. It introduced the idea of a unit which, in its determination, was neither subjective nor related to a particular nation. The kilogram was determined in a similar fashion, being equal to the mass of a cubic decimetre of water at a given

temperature. In 1795, the decimal metric system was introduced and by 1799 the first standards of the meter and kilogram were manufactured and were "dedicated to all men for all times". Being universal and because of its simplicity, the decimal metric system spread outside of France to countries like the Netherlands and Spain eventually making its way to Latin America just after 1860.

The challenge that the metric system faced was that all countries which adopted the system became dependent on France whenever exact copies of the meter and kilogram standards were required. This subordination, together with the lack of uniformity in creating copies, was jeopardizing the desire to have a universal standard of measurement.

To overcome this difficulty, the Bureau International des Poids et Mesures (International Bureau of Weights and Measures – BIPM) was founded on 20th May, 1875 at the signing of the meter convention by 17 nations. While the initial mission of the BIPM was to set up the metric system throughout the world by constructing and maintaining new prototypes of the meter and kilogram, today, their mandate has evolved into providing a single coherent system of measurement throughout the world, traceable to the international system of units (SI) – formerly the metric system. Problem solved, right?



Evolution of Measurements (Cont'd)

Not so fast. The definitions of the SI base units have changed over the years to meet the requirements of users who demand greater precision. As such, in 1960, the international prototype meter – a bar made of platinum and iridium – was redefined as 1,650,763.73 times the wavelengths of orange radiation from krypton-86 atom in a vacuum. By 1983, advances in technology allowed for heightened precision in the realization of the meter. It was once again redefined as the distance travelled by light in a vacuum in $1/299,792,458$ of a second.

The kilogram is about to see its biggest change ever. For over 100 years, all masses around the world have been dependent on a small mass of polished cylinder of platinum and iridium kept in a triple locked vault. Scientist have revealed that either the international prototype kilogram has been losing mass or its witnesses (that are supposed to be EXACT copies) have been gaining mass. Either way, this has caused much inconvenience already where precision of measurements are concerned. In November of this year, it is expected that a resolution will be drafted to redefine the kilogram based on Planck's constant – a value from quantum mechanics – with the official redefinition to take effect on May 20th 2019 – World Metrology Day 2019.

Unlike the early systems of measurement, the SI has a more scientific origin. And it would seem that all international measurement differences have been nicely ironed out, right? Not quite. In 1983, an Air Canada plane ran out of fuel in the middle of a flight because the flight crew assumed the amount of fuel indicated on their gauges was gallons when it was actually liters. Thankfully, only two persons received minor injuries. A bit more costly was an incident in 1999 when the US\$125,000,000 Mars Orbiter was lost in space because the NASA team used metric units while a contractor assumed that the value was imperial units.

The Metrology Act of the Laws of Belize states that the legal units of measurements of Belize is the SI units, but that the British Imperial System may also be used until it is decided that it shall no longer be accepted. Hence, there may come a day when we'll be asking for 1 kilo of sugar instead of 1lb and instead of referring to the distance from Belize City to Belmopan as being 52 miles, it will be approximately 83.5 kilometers.



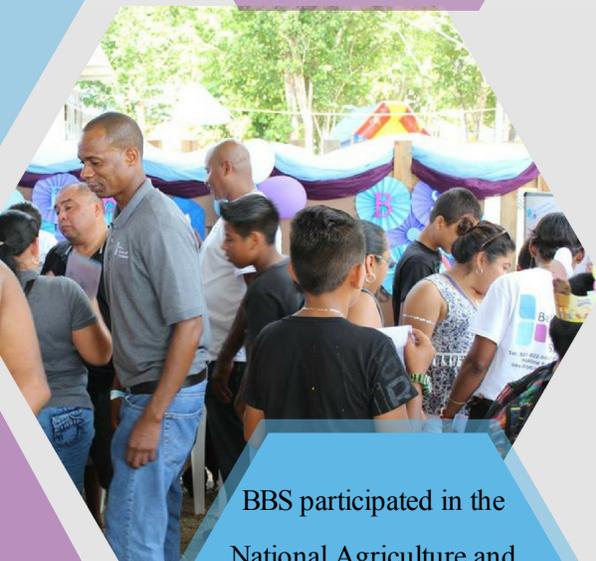
Successful Re-certification to ISO 9001: 2015 - Quality Management Systems (QMS)

The Belize Bureau of Standards was certified to ISO 9001: 2008 in January of 2016 and recently transitioned to the 9001: 2015 revised version of the standard. Having successfully completed the audit in November of 2017, the BBS is now certified to the 2015 version of the standard.

BBS along with the Citrus Growers Association (CGA) and the Belize Agricultural Health Authority (BAHA) on the 7th June, appeared on both The Open Your Eyes Morning Show and The Morning Show on Love Television in commemoration of World Accreditation Day 2018.



The OYE Morning Show Appearance from (left to right): CEO of CGA - Dr. Henry Anderson, Deputy Director of Food Safety Services, BAHA - Dr. Natalie Gibson and Director of BBS, Mr. José Trejo.



BBS participated in the National Agriculture and Trade Show held on the 28th - 29th April 2018, under the theme, "Let's Get Growing."



World Accreditation Day

Accreditation" Delivering a Safer World in the Food

World Accreditation Day is celebrated annually on June 9th. The organizations responsible for coordinating accreditation activities on a global scale, are the International Laboratory Accreditation Cooperation (ILAC) and the International Accreditation Forum (IAF). They are also the people behind the annual world accreditation day celebrations. For Belize, the Bureau of Standards serves as the National Accreditation Focal Point (NAFP) with responsibility to coordinate national accreditation efforts and address accreditation issues. This year's theme "Accreditation: Delivering a Safer World" focused on the expectation of safer products, safer transport, safer food, and safety in all aspects of our lives which is universally shared.

- ~We expect the food we eat to be free from contaminants.
- ~We expect the products that we buy to be safe for use.
- ~We expect that the air we breathe to be safe from harmful pollutants.
- ~We expect that large scale infrastructure to be safe to use.
- ~We expect that our daily sources of energy should be accessible without risk of injury or harm.

So what role does accreditation play in meeting these expectations? Products and services are evaluated against a standard code of practice by Conformity Assessment Bodies (CABs) involved in certification, testing and inspection services in order to ensure that the above expectations are met. CABs check and certify that products and services are safe to use and fit for purpose. Getting certified is a way of ensuring that products or services are packing the power of standards and are therefore in conformance with accepted requirements. While certification is not compulsory, many choose to engage an independent expert to verify the procedures and processes that they have in place. But what processes exist for making sure that independent experts, really are just that? The answer lies in accreditation, where CABs are themselves assessed and approved to provide inspection, testing or certification services against recognized standards to ensure their impartiality. Note that in this instance you are not only saying that you have certification but rather an accredited certification. Therefore, tested products and services can be accepted everywhere with equal confidence. Accreditation provides a way to assess and control risks in business operations along with products and services placed on the market. In this way, regulators, purchasers and employees can have confidence that accreditation makes your world a safer place, every minute, every hour, and every day meeting our expectations.



On 16th May 2018, the BBS celebrated World Metrology Day under the theme, "Constant Evolution of the International System of Units." To commemorate this day, BBS hosted an Open Day Event with booth displays from the Ministry of Works, Ministry of Energy and the Belize Natural Energy.

BBS celebrated World Metrology Day and World Accreditation Day 2018



In observance of World Accreditation Day, BBS hosted a Seminar on 11th June 2018 at the Best Western Biltmore Plaza in Belize City under the theme, "Accreditation: Delivering a Safer World." The seminar focused on the importance of accreditation to the food sector in Belize with emphasis on how accreditation can support businesses and/or processes in providing safer food.



**PECB Certified ISO 9001: 2015
Lead Auditor Training**

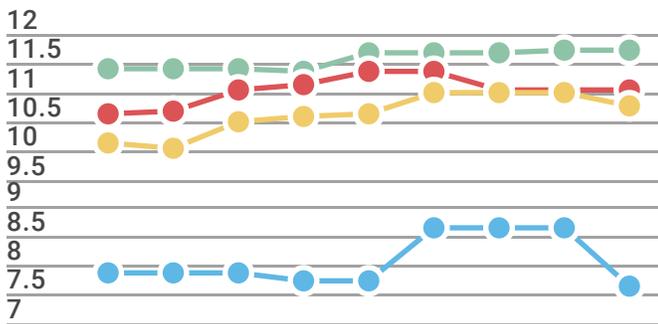


The Belize Bureau of Standards in collaboration with the Quality System Solutions and Initiatives (QSSI), in April of 2018, hosted a five days Lead Auditor Training on ISO 9001: 2015 - Quality Management Systems. During this training participants acquired the necessary knowledge, skills and competencies to proficiently plan and execute internal and external audits in compliance with the ISO 9001: 2015 standard. This training had participation from both the public and private sectors all of whom sat a PECB issued examination to become certified Lead Auditors.

The BBS extends its gratitude to the participating companies and agencies, and congratulates all successful participants. The BBS especially want to congratulate two of its participating officers, Ms. Demi Guerra - Standards Inspector and Mr. Salim Hoy - Standards Officer who have now joined the pool of certified Lead Auditors in the Department.



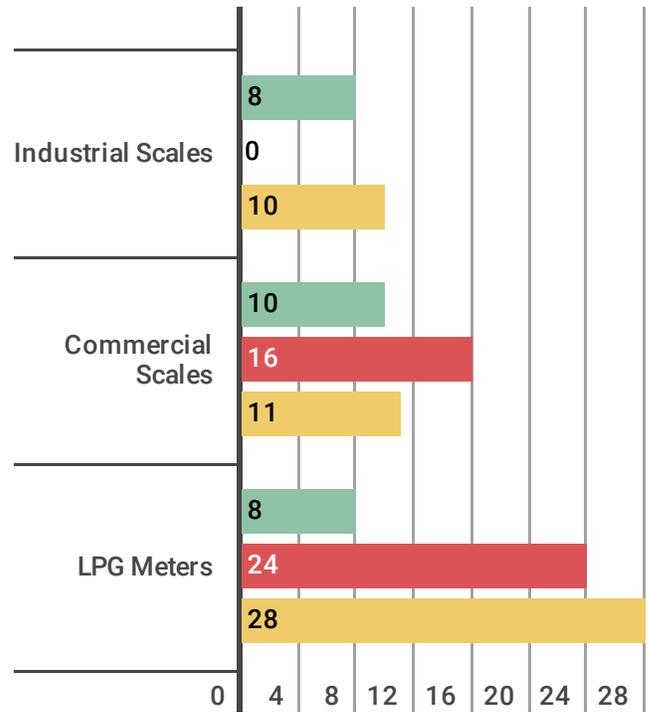
**Changes in the Controlled Prices of Fuel -
April to March 2018**



● Premium Gasoline ● Regular Gasoline
● Diesel ● Kerosene

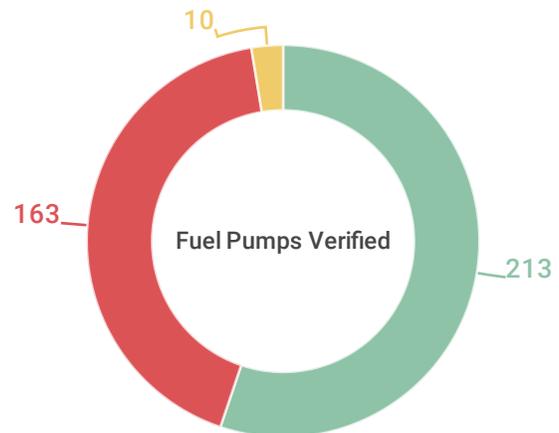


**Verification Exercises - April to June
2018**



● April ● May ● June

Verification of Fuel Pumps - April to June 2018



● April ● May ● June

