



ASIA PACIFIC LEGAL METROLOGY FORUM

22nd APLMF meeting, Hawaii, USA

New Zealand Economy Report 2014-2015

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New international requirements to obtain a verified gross weight of a shipping container

The International Maritime Organisation (IMO) has amended the document 'Safety of Life at Sea 1974' (SOLAS), which may have impact on an economy's legal metrology infrastructure. The SOLAS provides the minimum safety standards in construction, equipment and operation for merchant shipping.

Maritime NZ is the New Zealand organisation responsible for ensuring the requirements of the SOLAS are complied with and introduced appropriately. The amendments have introduced a new requirement that all packed shipping containers must have a 'verified gross weight statement' provided to the 'Master of the Port' prior to being loaded onto a vessel.

The new requirements will provide a fair commercial platform for all exporters and strengthen the health and safety protection for the vessel, road vehicles transporting containers and port workers.

The requirement was introduced following a number of high profile disasters such as:

The **MSC Napoli**, which ran aground in January 2007. Investigations found that a crack in the hull was the result of excess loading on the structure of the ship. Containers exceeding their stated capacity caused the structure to crack and forced the captain to run the vessel aground in order to save the ship.

Financial cost to rectify **MSC Napoli** was US\$185 million.



The investigation to determine why the stack of containers collapsed on the **Ital Florida**, while at sea, revealed heavier containers had been stacked at the top of the stack. This was due to incorrect weight declarations provided to the port officials.



In 2013 the shipping vessel '**Mol Comfort**' sank with 4500 packed containers on board off the coast of Yemen. Suspected cause was overloaded containers causing stress on vessels hull.

The sinking of the **MOL Comfort** bore a financial cost of US\$523million.



The new SOLAS requirements come into force on the 1st July 2016 and they provide two options for determining the 'verified gross weight statement', these are:

Method One

- weighing the packed container using calibrated and certified equipment; or

Method Two

- weighing all packages and cargo items, including the mass of pallets, dunnage and other securing material to be packed in the container and adding the tare mass of the container to the sum of the single masses, using a certified method approved by the competent authority of the state in which packing of the container was completed.

The verified weight must be signed by a person authorised to do so by the shipper. It must also be submitted to the Port, sufficiently in advance of loading, to be used in the stowage plan. Where an accurate verified weight is not provided, the port master or representative will be obliged to refuse to load the container.

Trading Standards has been working with Maritime NZ since January 2015 on how to best introduce these new requirements with minimum compliance costs to businesses and regulators.

A consultation document has been circulated to industry providing three options for their introduction:

1. Adopt the internationally recognised weights and measures requirements enforced by Trading Standards, which include weighing instruments being trade approved and verified.
2. Maritime NZ to develop a parallel certification system which would run in parallel to the current Trading Standards system
3. Industry to self-certify the weighing instruments to a standard they deem acceptable.

Trading Standards preferred option is to adopt the existing weights and measures system. In addition to the common weighing instruments currently available for determining container weights, such as weighbridges and an 'on-board weighing system directly installed in forklift mechanism', Trading Standards has experienced an increase in innovative instruments being submitted for approval testing. These include:

1. Lifting Jacks - <http://www.bison-jacks.com/>



2. Load Shackles – loadcells acting as the pin of a shackle



Improving the accuracy of New Zealand's milk collection instruments

Trading Standards were approached by Fonterra Co-operative Group (Fonterra), who is New Zealand's largest milk processing company. During peak season, Fonterra collects 90 million litres of milk per day, processes on average 15 billion litres of milk per annum in New Zealand and 22 billion worldwide.

Trading Standards were requested by Fonterra for assistance on a project to reduce the standard deviation from their milk measuring systems. Any improvement in accuracy would significantly reduce total variation in measurement across its operations and also result in a range of productivity gains such as improved forecasting for processing plants and global markets.

Fonterra has a fleet of 600 milk tankers for milk collection. Each tanker is equipped with a PD340 trade approved flow meters to measure the collected milk.



There were nine 2000 L and nine 400 L working standards of volume located throughout New Zealand that were used for verifying the flow meters. Each measure

was constructed differently and the tolerance range applied was +/- 2L and +/- 0.4L respectively.

Following an extensive consultation period with Fonterra management the following was agreed and introduced.

- To design and develop a new indicator/controller unit and this was consequently approved by the National Measurement Institute, Australia. The SMART solutions control/indicator unit is user interactive to facilitate additional functions related to milk collection and records other useful measurement data. The measured data can be read in 0.1 L scale interval for the calibration and testing purposes.



- A new 2600 L and a 400 L volume measures were manufactured for each of the 33 processing sites located in New Zealand. The measures were identical to reduce variation. The larger measure was increased from 2000L to 2600L to take into account an increase in flow rate so that when calibrating the flowmeter, the maximum flowrate could be maintained for 1 minute, which is in line with international best practise.



- Following the manufacture, all measures were verified volumetrically so they could be put into use for calibrating the milk flow metering systems.

The next stage to reducing the standard deviation is to move from volumetric verification of the working volume standards, which provides a tolerance, to gravimetric verification that would provide a precise actual value. The gravimetric method allows the volume to be determined by weighing the volume measure on a weighing instrument against standard weights of known mass and density.

By changing from verifying the measures volumetrically using tolerances to gravimetrically where an actual value can be provided, it will minimise variations and results and improve the standard deviation value. Once established the flow meters for milk collection should provide increased confidence in measurements for both the dairy farmer and processing plant.

Once the system is set up and established in New Zealand, it is intended to be replicated in their other milk collection sites across the world, which includes Australia, China and Brazil.

Determining density for carbonated liquids

Following on from last year's economy report, developing a testing procedure for determining the density of a carbonated liquid continues to progress. New Zealand has engaged a scientific metrologist from the Measurement Standards Laboratory to research and develop a two tier approach for density determination.

1. A high level accurate method that can be used in the laboratory to determine density for enforcement purposes and to confirm the second tier method.
2. A second tier method for determining density which is:
 - a. suitable for use by economies with emerging infrastructures and smaller manufacturers (micro-breweries),
 - b. a straightforward procedure that can be used by small to medium manufacturers,
 - c. low cost,
 - d. reliable and repeatable.

As the bubbles within a carbonated drink are an integral part of the product and consumed, these will have to be included in any density calculation. Part of the research will involve determining the difference in densities between carbonated drinks with bubbles and carbonated drink that has been de-foamed using an agent like Octonol-1.

The OIML G14 document already provides a method for determining the density of a carbonated beverage that involves marking a line on the actual fill level of the bottle neck, replacing the carbonated liquid with distilled water, which then allows the density to be calculated. This method is suitable for containers that are non-deformable and transparent. It is therefore not suitable for dark bottles as the meniscus is not clear, plastic bottles which are not rigid and cans. The scientific metrologist has also concerns with the level of uncertainty introduced by the procedure, as it can be very subjective for the operator to accurately mark a line at the correct point.

Once complete, the procedure will then be submitted to OIML TC6 for consideration for adoption into the G14 document. An article will also be drafted for the OIML Bulletin.



Figure 4: Marking of Level

Excess fluid in chicken meat

Trading Standards received a consumer complaint regarding short weight uncooked pre-packaged poultry. Following the initial complaint Trading Standards conducted a sampling project to ascertain the level of compliance across the poultry industry.

The results indicated that a number of packaged poultry were short weight which represent a breach of the legislation. Findings revealed that some whole chickens contained up to 8% fluid and chicken cuts, such as breasts, contained up to 12% fluid at the point of sale. The findings also indicated the issue to be industry wide.

The primary cause of these underweight packages would appear to be fluid which has excreted from the poultry following packaging. Many of the packages contained a 'soaker pad' which is an absorbent pad that soaked up the excess fluid and increased the weight of the packaging.

Trading Standards is of the opinion that that the stated net weight of the poultry meat or flesh excludes any packaging or fluid that may have excreted from the meat following packing. The Weights and Measures Act 1987 is clear that the package is to be equal to the stated quantity at the time of sale not at the point of packaging.

Trading Standards is working with the Poultry Association to address this issue.



Trading Standards achieves ISO 9001 accreditation

Trading Standards attained ISO 9001 accreditation for all its areas of responsibility, which includes Trade Measurement, Product Safety, Fuel Quality Monitoring, Auctioneers Register, and Motor Vehicle Traders Register. In the Trade Measurement area, this involved documenting all processes and procedures relating to the accreditation system and enforcement activities. Achieving ISO 9001 complements the existing ISO 17025 accreditation in the laboratories.

Trading Standards used the accreditation body TELARC to complete the 1st and 2nd stage audits. Introducing this Quality Management System (QMS) into Trading Standards provides increased confidence in Officers' abilities and a platform for continuous improvement in the effectiveness and efficiency of Trading Standards' performance.

The QMS and Procedures, which includes all working documents, are available on Officers IPAD for use when out in the field. Introducing this system will provide consistent service delivery across all Trading Standards' three offices and introduces a level of accountability for our Officers.

Using a displacement bath for testing the volume of ice cream

At the 21st APLMF meeting, Trading Standards announced a project to develop a guidance document for industry and for legal metrology officials for determining the volume of ice cream using the displacement method. New Zealand exports 9,000 tonnes of ice cream each year and it is estimated New Zealanders consumer 23 Litres of ice cream and related products per annum.

Trading Standards utilised test procedures and equipment provided by Australia and USA during development. The prototype displacement bath is suitable for products with a height of XXml and diameter



Features of the bath include:

- A spout rising from the bottom to a sharply bent neck, which provides a quick cut off as the product under test becomes fully submerged;
- An internal cage with solid sides, grated bottom and a weighted lid, which drops below the water line, stops water ripples and keeps the product under test fully submerged; and
- Robust stainless steel construction, which when placed in the freezer before being used, allows the temperature of the vessel to be maintained for a longer period.

A draft test procedure has been developed and it will be peer reviewed internally before being sent for industry consultation.

Once this small displacement bath is complete, work will commence on the development of a larger displacement bath suitable for determining ice cream tub volumes of up to 2 Litres.

The final outcome of this project is to produce a guidance document for industry and legal metrology officials, which will detail the procedures for determining ice-cream volume and include a schematic drawing of the test equipment, so it can be reproduced.

An initial sampling project using this displacement bath has highlighted two New Zealand based ice cream manufacturers whose packing system is not in control.

A quick video has been produced to demonstrate the basic test procedure.

Metrological Society of Australasia biennial conference held in New Zealand

New Zealand hosted the Australasian Measurement Conference for the first time. The Metrology Society of Australasia (MSA) is an association of professional metrologists, engineers, scientists, technicians and measurement experts throughout Australia and New Zealand. The Society holds a biennial conference, along with other events to promote the professional development of its members and to promote the practice and interests of good measurement practice.

The society was formed in 1993 and supports its members through an internationally recognised conference every two years. The conference was held in New Zealand for the first time and took place in Queenstown on the 14th – 16th October 2015. The slogan for this year's conference was "Good Measurement – Great Business" and was to showcase how good measurement underpins great business.

This conference was a good opportunity to raise the profile of New Zealand's legal metrology system and allow an open forum for industry and metrologists to network.

Trading Standards personnel formed part of the conference committee who were tasked with organising the event and also presented two case studies and chaired a forum on "New Zealand's Place in the International Measurement System". The conference provided a mix of sixty case studies, presentations and workshops which showcased research, innovation, and success in the world of calibration and measurement.

The conference was seen as a great success. 120 delegates attended and were from a range of industries and businesses that use physical measurements, calibration and testing laboratories, national measurement institutes, accreditation services, and government organisations. Subject matters included: Measurement infrastructure, Temperature, Pressure, Electrical, Medical, Light and Lab Managers forums.

New Zealand assists in the Development of a Harmonised Quantity Mark for ASEAN

Trading Standards were asked to facilitate an ASEAN workshop on ‘Harmonised Quantity Mark System for Prepackage products’ at the 23rd meeting of ACCSQ-WG3 in Manila, Philippines.

The Association of South East Asian Nations (ASEAN) is in the process of developing a ‘Quantity Mark’ system. The intention is to harmonise and improve the legal metrology controls in manufacturing within the ASEAN region. The meeting was attended by nine ASEAN economies and to enhance the productiveness of the meeting, New Zealand sponsored an expert from South Africa to assist with facilitation. The South African facilitator is the current Secretariat for OIML Technical Committee that is tasked with the development of the ‘Guidance Document for the Certification of Prepackages’ (GCOP). The facilitator was also instrumental in introducing a ‘Quantity Mark’ system into South Africa.

This was the third ASEAN workshop focused on developing a ‘Quantity Mark System’ and the outcomes of this meeting would be used to develop a recommendation to be submitted for approval. The information collected during the workshop was intended to directly inform the proposal.

The morning session of the workshop involved a summary presentation of the previous two workshops and a detailed explanation of the South African Quantity Mark System along with outlining the principles of the GCOP.

The afternoon sessions consisted of group workshops. The delegates were split into four groups, with each group having the opportunity to comment on each of the following eight questions:

	Question / topic
Question 1	Impact on business and national/regional trade. Possible trade barrier or business competitive edge.
Question 2	Costing principles for the administration of a regional/national quantity mark system – Should businesses pay to apply for a quantity mark on their products; cost recovery model for the conformity assessment.
Question 3	Mechanism on handling infringement, enforcement and appeals.
Question 4	Resource requirements in relation to the varying schemes identified in GCOP.
Question 5	Testing or accepting products that have different quantity marks.
Question 6	One system or mutual recognition. ASEAN set the standard that everyone works to.
Question 7	Promotion and outreach for the quantity mark scheme.
Question 8	Recognition of Quantity Mark.

The facilitators provided the ASEAN Secretariat with a full electronic summary of the workshop findings. Feedback from the convenor and many of the participants was positive with the following message being received:

“The Workshop on Harmonised Quantity Mark System for Pre-packaged Products held on 25 May 2015 (Mon) in the Philippines was facilitated with great success! Thanks to the 4 experts and

facilitators of Kevin, Phil, Jaco and Samson. All the participants and ASEAN Secretariat found the Workshop to be useful and informative.”



National Regulatory Compliance Qualifications

As part of the Government’s work to improve regulatory institutions and practices, New Zealand is developing and implementing a government wide regulatory compliance qualification. This is the first time a whole-of-government approach to such qualifications has been developed.

This qualification framework is one of the many actions agreed to by Government (refer <https://www.beehive.govt.nz/release/government-drive-lift-regulatory-quality>) arising from the New Zealand’s Productivity Commission review ([Regulatory Institutions and Practices](#) June 2014)

These qualifications will be available to all regulators (local and central government) and are intended to provide the following benefits:

1. Improved capability, by providing organisations with a structure around which to build a coherent programme of training (if one is not presently in place)
2. The ability for organisations to recognise staff progress within their existing training and development frameworks with a formal qualification
3. Consistency across the regulatory system, promoting trust amongst regulatory workers and higher service standards
4. Professionalisation of the regulatory workforce as a result of a common qualification framework and compliance language, and an increase in the sharing of regulatory best practice
5. The ability to monitor and steward regulatory capability at an individual agency level and at a regulatory system level (across multiple agencies).

The Ministry of Business, Innovation and Employment will play a leading role in driving this initiative, as it aligns with the Ministry’s objective of achieving excellence in regulatory systems, design and delivery. The initiative contributes to this goal by facilitating learning and cooperation across both central and local government. Development of the framework and how it will be implemented across agencies will be developed and consulted on over the next 2-3 months.