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THE MEASUREMENT AND PRODUCT
SAFETY SERVICE NEWSLETTER FOR
ACCREDITED PERSONS

MEASURE UP

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MINISTRY OF CONSUMER AFFAIRS
MANATŪ KAIHOKOHOKO

New Zealand Government



Editorial

Stephen O'Brien

A fair bit of water has flowed under the proverbial bridge since last year's measureUP.

During this period the MAPSS team line up has undergone some positive change. Lucy He (Petone), Simon Barratt (Petone) and Ben Aitken (Christchurch) have completed an intensive training programme to become the first MAPSS Officers to obtain the National Diploma in Public Sector Compliance Management (Weights and Measures) and as a result have become fully qualified Inspectors of Weights and Measures. Vladimir Koutsenko has also taken on a new role within the team and now has responsibility for the national Fuel Quality Monitoring Programme.

Over the coming year we will be looking at the way we deliver services to Accredited Persons and the public. As part of this process we will look at our metrology laboratories, their locations and the way they operate to ensure they continue to be effective and efficient. We are also trialling setting specific days aside each week for the verification of standards to enable our MAPSS Officers to spend more time in the marketplace undertaking surveillance, education and enforcement activities. Your MAPSS client manager will keep you informed of any changes in the days available for scheduling your standards for verification.

As a team we have a continuing commitment to quality improvement and the maintenance of a professional service in combination with an increased focus on operational efficiency in response to the current financial climate.

In this climate the importance of the role of MAPSS and Accredited Persons in supporting a marketplace that maintains consumer and trader confidence is emphasised. Creating a level playing field promotes confidence in market transactions and helps ensure that both traders and consumers are not being disadvantaged or ripped off.

With this role in mind, this edition of measureUP aims to deliver clarification on the requirements for secondary displays and tare functions on weighing instruments in cross counter situations. We also report on MAPSS work to reduce fuel vapour exposure during fuel dispenser testing, on how improvements in traceability can show savings and on MAPSS type approval functional review.

I hope you will find the latest issue of measureUP useful and informative.

Please contact Brian Waltham or myself if you have any feedback on what we have presented here or issues you would like to be addressed in future editions.

Hot fuel update

Further information in relation to 'hot fuel' will be notified through measureUP as it becomes available.

In the March 2008 issue of measureUP we ran an article on the issue of 'hot fuel', after a complaint from an independent service station retailer. The

complaint related to an industry term known as 'hot fuel', whereby a retailer can suffer losses due to the fact that when they take delivery of fuel from the road tankers, it is at a higher temperature than it ends up being once it has settled in their underground storage tanks (USTs).

As part of our investigation into this issue MAPSS conducted some temperature testing of service station USTs for regular and premium motor spirits and diesel.

MAPSS visited 42 retail sites throughout the country (winter and summer), from Whangarei to Wellington in the North Island and from Nelson to Invercargill in the South Island. MAPSS also requested fuel temperature information from the major oil company bulk storage, load-out facilities throughout the country.

The data obtained will enable us to get a better picture of what the effects, if any, New Zealand's winter and summer climate has on fuel at both terminal storage facilities and service station retail sites and if there is a need to investigate further or make recommendations in an attempt to reduce the effects of 'hot fuel'.

Once compiled the data obtained will be made available to the Motor Trade Association (MTA) and oil company representatives. MAPSS would like to take this opportunity to thank the service station retail sites that MAPSS visited and the oil company storage facilities for their willingness and cooperation in letting us carry out testing and providing us with the relevant information as requested.





MAPSS type approval function review

The MAPSS type approval function is currently under review. MAPSS has recently consulted with interested parties to get an indication of the service level that MAPSS need to provide for the weighing industry in the medium to long term in New Zealand.

The current MAPSS approvals regime can be defined in three parts:

- full type approvals
- overseas based approvals
- novel/unique approvals

MAPSS holds ISO 17025 signatory status (Accreditation) for its full type approvals function which gives the full type approvals regime the traceability to internationally recognised standards. Under the OIML Mutual Acceptance Arrangement (MAA) MAPSS are “Issuing Participants” for Non Automatic Weighing Instruments (NAWIs) under OIML R 76. This allows the certificates and test reports MAPSS issue to be recognised by “Utilising Participants” of a Declaration of Mutual Confidence (DoMC). However this status is on hold at present because there are few applications being submitted for full type approval, which limits the ability of approvals technical staff to keep up their currency and signatory status.

This review has been undertaken as part of an internal review within MAPSS in order to assess the current ‘state of play’ of the type approval function. Maintaining a viable type approvals service requires high levels of technical expertise, test equipment and facilities, all of which are resource hungry in terms of time and/or money.

The demands placed on our full type approval regime is not only driven by domestic expectations from business, industry and measuring system manufacturers within New Zealand, but also international expectations through our membership of OIML and our relationships with our international counterparts, (such as NMI Australia, NWML UK and PTB Germany, to name a few).

This review is focused on the full type approvals function, as this is where the biggest drain on resources in terms of time, money and technical expertise is found. The requirements in order to meet the needs of accepting overseas and performing novel/unique approvals are a lot less onerous and do not require the same degree of resources or technical expertise.

The broad aim of this review is to ensure that the MAPSS approvals regime continues to meet the needs and standards required by business, industry and measuring system manufacturers within New Zealand for the next ten years and beyond. And, in doing so, remains a viable and cost efficient service that is consistent with international ‘best practice’. In particular it is important to remain consistent with our Australian counterparts approvals regime, which in turn helps reduce technical barriers to trade (TBTs).

More specifically, the review aims to give New Zealand measuring system and component manufacturers a clear direction, so that they know where they can obtain full type approval testing which meets both the domestic and international requirements and expectations. This will enable them to know with certainty the level of service they can expect and the associated costs that will be incurred through using such a service. MAPSS are also trying to establish the likely workload full pattern approvals will generate in the short to medium term and whether this work will be component or full system testing.

Further information about the review will be notified through [measureUP](#) as it becomes available.



Automatic catch-weighing instruments:

Requirements for automatic catch-weighing instruments and becoming accredited to test.

These types of instruments are covered by the relevant OIML recommendations (OIML R51 - Automatic Catch-weighing Instruments). The following definitions can be found in OIML R51:

T.1 General definitions

T.1.1 Weighing instrument

Measuring instrument that serves to determine the mass of an amount of material by using the action of gravity on this material.

Note: *In this Recommendation “mass” (or “weight value”) is preferably used in the sense of “conventional mass” or “conventional value of the result of weighing in air” according to OIML R 111 and OIML D 28, whereas “weight” is preferably used for an embodiment (= material measure) of mass that is regulated in regard to its physical and metrological characteristics.*

The instrument may also be used to determine other quantities, magnitudes, parameters or characteristics related to mass.

According to its method of operation, a weighing instrument is classified as automatic or non-automatic.

T.1.2 Automatic weighing instrument

Instrument that weighs and follows a pre-determined program of automatic processes characteristic of the instrument.

T.1.3 Automatic catch-weighing instrument (catch-weigher)

Automatic weighing instrument that; weighs pre-assembled discrete loads or single loads of loose material.

T.1.3.1 Check-weigher

Catch-weigher that sub-divides pre-packages of different mass into two or more sub-groups according to the value of the difference between their mass and the nominal set point.

T.1.3.2 Weigh labeler

Catch-weigher that labels individual pre-assembled discrete loads (pre-packages) with the weight value.

T.1.3.3 Weigh-price labeler

Catch-weigher that calculates the price to pay on the basis of the indicated mass and the unit price and labels individual pre-assembled discrete loads (e.g. pre-packages with the weight value, unit price and price to pay). OIML R 51-1: 2006 (E)

T.1.3.4 Vehicle mounted instrument

Complete instrument that is firmly mounted on a vehicle, and that is designed for that special purpose.

***Note:** For example, a garbage weigher (waste collecting vehicle) that determines the quantity of loose material emptied from a container (supported by the load receptor) into the body of the vehicle.*

T.1.3.5 Vehicle incorporated instrument

Instrument where components of the vehicle, which are also components of the weighing instrument, i.e. parts of the vehicle (levers, joints and/or force transmission) are used for the instrument.

***Note:** For example, a front-end loader (front-end loading vehicle) that determines the quantity of loose material held in the bucket (load receptor).*

T.1.4 Loose material

Material which is not packaged during and/or after the weighing process. The material may be collected for weighing in the load receptor of the instrument (e.g. front-end loader) or in a separate container (garbage weigher).

T.1.5 Grading instrument

Instrument which assigns a weighing result to a predetermined range of mass to determine a tariff or toll. Examples: postal scales, garbage weighers.

Accuracy Classes

Instruments depending on their use are divided into two main categories designated by “X” or “Y”.

Category X

This category applies only to check-weighers that are used to check pre-packaged products that are subject to the requirements of OIML R87, “Quantity of product in packages”.

This category is further divided into four accuracy classes: **XI, XII, XIII and XIII.**

Category Y

This category applies to all other automatic catch-weighing instruments such as weigh-price labelers, postal and shipping scales, and instruments that weigh single loads of loose material.

This category is further divided into four accuracy classes: **Y(I), Y(II), Y(a), and Y(b).**

There are a number of these types of weighing instruments in use throughout the country. They can be found in industries such as food processing plants and freight companies etc. Wheel loader instruments can be found in fertilizer plants, quarries and landscape supply companies etc.

The Weights and Measures Act 1987

The Weights and Measures Act 1987 does not cover automatic weighing machines or any automatic volumetric liquid dispensing machines (Section 22 of the Act).

Although these types of instruments are exempt from approval and are not required to be stamped with the mark of verification, they are still expected to be accurate. Compliance is determined through product inspections using the Average Quantity System (AQS) as an inspection tool. Any non-compliance would fall under Section 16A, of the Act, – “*Offence to supply weight, measure or number not in accordance with stated quantity*”.

Accredited for this type of class

Accredited Persons wishing to extend their accreditation to include this class of instrument should contact their client manager. In the majority of instances the test procedures will be detailed in the Certificate of Approval for the particular instrument concerned. Or alternatively you can contact your nearest MAPSS Office to obtain a copy of the required test procedure format.

If you would like further clarification or additional information please contact

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Tare functions on weighing instruments in cross-counter situations

Recently MAPSS have had questions from some APs about tare functions on cross-counter scales and what the current requirements are. Following is some background relating to this issue.

Background

Before 1993 weighing systems used for trade that were used in cross-counter situations (with the purchaser present) had to have self-cancelling tares. This meant that when a weighing took place and a tare value was entered, then immediately after the weighing took place the tare would self-cancel and the indicator would return to zero.

Weighing systems used in pre-pack situations that had non-self-cancelling tares could only be used in situations where the customer was not present. This meant these could not be used in cross-counter situations. These machines were also required to have the back display (customer view) blanked out and have a statement saying “not to be used in the presence of the purchaser”.

Retained-tare systems were only approved for weighing systems that were not used in front of the purchaser and restricted for pre-packing use only.

In the early nineties, weighing equipment started being imported into the country that had retained tare facilities that were intended for cross-counter situations. This equipment met the requirements of OIML R76-1 edition 1992 (Revised OIML R76-1 edition 2006 E)

R76-1 provides technical requirements for the use and application of tare systems (paras 4.13.3 to 4.13.4). R76-1 does not prohibit retained tare systems in cross-counter situations as outlined in 4.13.3.2;



Semi-automatic tare device:

An instrument may be fitted with semi-automatic tare devices if:

- *The action of the tare devices does not permit a reduction of the value of the tare; and*
- *Their effect can only be cancelled when there is no load on the load receptor.*

In addition, the instrument shall comply with at least one of the following requirements:

- *the tare value is indicated permanently in a separate display*
- *the tare value is indicated with a sign “-” (minus), when there is no load on the load receptor, or*
- *the effect of the device is cancelled automatically and the indication returns to zero when unloading the load receptor after a stable net weighing result greater than zero has been indicated.*

Current policy

The requirement for weighing systems in cross-counter situations to have self-cancelling tares is no longer mandatory provided the equipment meets the requirements as outlined above in OIML R76-1 4.13.3.2 and the equipment complies with at least one of the last three bullet points outlined above.

This policy was approved on the 25th March 1993. Both Australia and Britain have adopted this stance by fully implementing OIML R76-1 on this issue.

IMPROVEMENTS IN TRACEABILITY CAN SHOW SAVINGS

The Measurement and Product Safety Service for the past 17 years has been operating an accreditation scheme, which allows third party accredited persons (APs) to inspect, test and verify/certify measuring instruments used for trade. As part of our ongoing continual improvement philosophy MAPSS was recently involved in providing some expertise and advice to one of our major accredited companies (APs) involved with providing calibration and servicing for the bulk fuel industry.

As part of the routine audit that was carried out for the AP, MAPSS identified several areas in the calibration and maintenance of the proving vessel that enabled the accuracy and uncertainty of the proving vessel to be improved. This resulted in an adjustment being made to the proving vessel that moved its actual volume closer to its stated base volume.

The flow-on effect of this adjustment has subsequently been passed on to one major bulk fuel industry installation which uses high flow metering systems in their custody and transfer processes. The result to the bulk fuel installation was an average 0.14% saving after adjusting the accuracy of their metering systems. The allowable tolerance for metering systems of the type involved is $\pm 0.5\%$ and before this adjustment was made the system was well within the allowable tolerances. The 0.14% saving has been found within the 0.5% tolerance.

The 0.14% reduction has resulted in conservative savings for this bulk fuel facility of approximately \$1,848,748 over a 12-month period.

MAPSS were able to improve the traceability of bulk fuel measurements and pass this onto New Zealand industry partly as a result of our liaisons and close contact with our international counterparts. These relationships were fostered through our membership of OIML and implementation of the relevant OIML Recommendations which are available as part of our participation and membership.



Pipe Prover for calibrating high flow fuel metering systems.

Secondary DISPLAYS

There are situations where secondary displays have been installed to enable traders, operators/users, or consumers to easily see the indicated weight statement when weighing is taking place.

Examples of this are weighbridge owners installing secondary displays so truck drivers and customers can view the weight indication without having to enter the weighbridge kiosk to view the primary display. Other examples can be found in retail situations, where secondary displays may be installed in order to give both the trader and customer clear views of the whole transaction taking place.

However, secondary displays are only to be used in **addition** to the approved primary indicator and are **not permitted** as the only means of showing the weight indication. The approved verified primary display must always be visible to both parties of a transaction.

When a secondary display is used in addition to an approved primary display then the secondary display must be in the same configuration and duplicate the same value as the approved primary display. The verification scale interval on the secondary display must comply with the requirements for the class of equipment approved under the Certificate of Approval and the maximum permissible error (MPE) specifications. It is also a requirement that when information is printed that this information is generated by the approved verified primary display only.

Secondary displays are not covered under Approvals Certificates unless they meet the requirements under OIML R76 and are submitted for approval before they are installed or used.

When carrying out verification/certification testing, secondary displays need to be checked in conjunction with the primary display by following the tests prescribed under the Weights and Measures Regulations 1999 and the conditions laid down in the Certificate of Approval for the weighing equipment.

Solution to fuel vapour exposure during driveway flowmeter (DFM) testing

MAPSS has finished modifications and testing on the 20-litre working standards used for testing DFMs.

The modifications were made because of rising concern overseas and within NZ over the potential health risks to inspectors who are testing DFMs caused by exposure to the A1 carcinogen benzene, and

other volatile organic compounds that are present in hydrocarbons.

MAPSS initially sought the opinion of an independent laboratory, Air Matters Ltd which is qualified to make assessments on work place exposure rates to hydrocarbons. As a result of some testing that Air Matters of NZ conducted for MAPSS in 2008 it was found inspectors were potentially exposed to high levels of various volatile organic compounds, particularly benzene.

MAPSS decided to see if the levels of exposure could be reduced to more acceptable levels by making modifications to the 20-litre working standard. The main aim was to reduce the amount of vapour that was coming into contact with the inspectors face and body while the measure was being filled.

The modifications included an expansion tower that fits into the opening of the measure allowing the delivery nozzle to have a positive seal. This enables

the vapour to be collected in the expansion tower and piped to ground level, away from the inspector's face. A secondary adaption was to put a large nitrile (rubber) 'doughnut' on the drain hose so that when product is being delivered back to the underground storage tank (UST) the pipe is sealed around the UST fill point.

Once the modifications were complete, MAPSS sought a second opinion from Air Matters Ltd and asked them to reassess the exposure rates to hydrocarbons while inspectors were undertaking DFM testing. This assessment was carried out in March 2009. The results and subsequent report showed significant reductions in the levels of the various organic compounds that inspectors were being exposed to. Benzene levels have been reduced from 1mg /m³ in 2008 to 0.15 mg/m³ in the latest test. All other organic compounds have been reduced; Xylene and Trimethyl Benzene are approximately half that previously measured with benzene, octane, and toluene being reduced by 75%.

MAPSS will provide a copy of the report to anyone interested, on request.

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