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Guidelines for Weighbridge Control Systems

Legal Metrology Branch

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Guidelines for Weighbridge Control Systems

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Preface

In November 1999, the National Measurement Institute (NMI) (then the National Standards Commission) published leaflet L29 “Guidelines for Automated Weighbridge Systems”, providing guidelines on metrological functions controlled automatically or by a semi-automated system and the driver.

In July 2011, NMI published “NMI M 7 – Pattern Approval Specifications for Point of Sales Systems” which relates to devices that manipulate and enhance data received from an approved measuring instrument. Point of sale systems can be interfaced with weighbridges to determine and provide measurement information for the transaction.

Point of sale systems approved under NMI M 7 are not permitted to control a function of a measuring instrument, modify the measurement indications on the measuring instrument primary indicator, store calibration or other measurement data for use by the measuring instrument.

This document provides guidance on the specifications for a weighbridge control system that interfaces with an approved weighbridge in use for trade and controls the operation of the weighbridge.

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Explanation of Terms

For explanations of other terms see [General Information for Test Procedures](#). For other terms relating to weighbridges, refer to [NMI R 76 Non-automatic Weighing Instruments. Part 1: Metrological and Technical Requirements — Tests](#). For other terms relating to point of sale systems, refer to [NMI M 7 Pattern Approval Specifications for Point of Sale Systems](#).

Weighbridge

A non-automatic weighing instrument with a capacity of 3 t or more, which has one or more platforms by the use of which the measuring instrument is capable of determining the mass of a vehicle or livestock.

Approved Weighbridge

A weighbridge which has been pattern approved under the *National Measurement Act 1960 (Cth)* (the *Act*), and whose Certificate of Approval:

- is currently in force under that provision; or
- has expired or been cancelled (but not withdrawn) under the *Act* and was in force when the instrument was manufactured.

Weighbridge Control System

A system interfaced with a weighbridge to automatically or semi-automatically control the weighbridge operations.

Unattended Weighbridge

An approved weighbridge which is not interfaced with a weighbridge control system where the driver of the vehicle is the weighbridge operator.

Automated Weighbridge

An approved weighbridge interfaced with a weighbridge control system to automatically control the weighbridge operations.

Semi-automated Weighbridge

An approved weighbridge interfaced with a weighbridge control system which controls certain aspects of the weighbridge operations in conjunction with limited input from the driver of the vehicle.

Automated Public Weighbridge

A weighbridge licensed by NMI for public weighing without a public weighbridge operator being present during the weighing.

Weighbridge Controller

A person who makes a weighbridge available for trade use and authorises a person(s) to be a weighbridge operator. For a public weighbridge, this includes the public weighbridge licensee.

Weighbridge Operator

A person authorised by the weighbridge controller to complete weighbridge operations. In the case of automated weighbridges the weighbridge operator is the person making the weighbridge available for use (weighbridge controller).

Weighbridge Operations

The functions required to determine a weighbridge measurement including:

- ensuring the weighbridge is correctly on zero before conducting a weighing;
- the ability to adjust the weighbridge indication to zero as required;
- ensuring the vehicle or livestock being weighed is within the confines of the weighbridge platform(s) during the weighing process;
- providing the measurement result to the driver visually or as a document at the time of weighing; and
- ensuring the weighbridge platform and pit are free of water, mud and debris.

1. Scope

This document provides guidance on the minimum metrological specifications for a weighbridge control system which controls metrological functions of a weighbridge and/or facilitates correct operation of the weighbridge automatically or semi-automatically.

This document is not intended to provide options or methodologies for each metrological specification but to provide criteria for a system.

These guidelines apply to a weighbridge control system interfaced with a pattern approved weighbridge used as an automated or semi-automated weighbridge.

Most of this document provides specifications that correspond directly to a requirement in the *National Measurement Act 1960* (Cth) (NMA) or the *National Trade Measurement Regulations 2009* (Cth) (NTMR). Accordingly, these requirements are marked as mandatory.

In some cases, this document provides a specification that does not directly reflect a requirement in the legislation and are considered good management practice which are marked as guidance.

2. Specifications for Weighbridge Control Systems

2.1 Automated and Semi-automated Weighbridges – Public and Non-Public Weighbridges

2.1.1 Vehicle Control (Mandatory)

A measurement result will not be provided if the weighbridge platform(s) are not clear of any vehicular/pedestrian traffic or obstructions immediately prior to the vehicle entering the weighbridge.

This supports the requirements of s18GD NMA – inaccurate use of measuring instrument.

2.1.2 Zero Control (Mandatory)

A measurement result will not be provided if the weighbridge platform(s) are not correctly on zero immediately prior to the vehicle entering the weighbridge.

This supports the requirements of s18GD NMA – inaccurate use of measuring instruments.

2.1.3 Zero-setting (Mandatory)

Where a weighbridge platform is not correctly set to zero when the platform is clear, there shall be a means of re-setting the indication to zero, either automatically or by the driver, prior to a vehicle entering the weighbridge.

This supports the requirements of:

- s18GD NMA – inaccurate use of measuring instruments; and
- Reg 3.24 NTMR – weight recorded by public weighbridge without load to be kept accurately at zero.

2.1.4 Vehicle Position (Mandatory)

A measurement result will not be provided unless the vehicle is correctly positioned on the weighbridge platform(s).

This supports the requirements of:

- s18GD NMA – inaccurate use of measuring instruments; and
- Reg 3.3 NTMR – visibility on weighbridge.

2.1.5 Weighbridge Control (Mandatory)

A weighbridge control system is not permitted to control the operation of the weighbridge primary indicator other than for zero setting, or to store any calibration or other measurement data for use by the weighbridge itself.

This specification is mandatory because it distinguishes between the functions of a weighbridge, which must be of an approved pattern, and the functions of a weighbridge control system.

2.1.6 Cleaning Procedure (Guidance)

A programmable cleaning procedure alert be provided by the weighbridge control system. This alert can be reset by the weighbridge controller after cleaning or a weighbridge inspection.

This specification provides guidance on complying with the regulatory requirement that a public weighbridge licensee must ensure that each platform of a public weighbridge is kept clean.

2.1.7 Software (Guidance)

Software used to acquire measurement data should not be conducive to fraudulent modification.

This specification provides guidance on complying with the regulatory requirement that public weighbridge licensees and operators must not permit or assist fraudulent conduct.

2.1.8 Excluded Measurements (Mandatory)

Automated and semi-automated weighbridges may not be used to determine the weight of vehicles by the end-and-end method unless approved in writing by the Secretary.

This supports the requirements of Reg 3.11 NTMR - use of weighbridge to determine end-and-end measurement.

2.2 Automated and Semi-automated Weighbridges – Non-Public Weighbridges

2.2.1 Measurement Result (Mandatory)

Any reading or information displayed by the measuring instrument, is readily visible or a written statement of the measurement is provided.

This supports the requirements of:

- s18KA and s18KB NMA – requirements if purchaser present or not present when measurement made.
- Reg 3.3 NTMR - visibility on weighbridge.

2.2.2 Printed Record Details (Guidance)

Printed records shall include the following information and comply with the requirements for transaction records detailed in NMI M 7:

- Unique transaction identifier;
- Location of the measurement;
- Identity of the controller of the weighbridge;
- Measurement date and time;
- Vehicle identity;
- Gross mass (if applicable);
- Tare mass (if applicable);
- Net mass (if applicable); and
- Axle mass (if applicable);

This specification provides guidance on complying with the legislative requirement of s18KA and s18KB NMA for a written statement of the measurement.

2.2.3 Stored Tares (Guidance)

Tare weights determined by the operation of the weighbridge can be stored by the control system for future use. Any stored tares manually entered into the system can only be used when uploaded into the system by the weighbridge controller, and where identified as a preset tare (PT). Stored tares are only accessible by a unique access system provided to the weighbridge controller.

This specification provides guidance on complying with the approval requirements for the weighbridge and NMI M 7 in relation to tare and preset tare.

There is a risk in using stored tares for determining a net measurement as the accuracy of the tare used has not been confirmed and may have changed since previously determined. Such practice may result in a shortfall offence being committed.

2.2.4 Axle Measurement (Mandatory)

Axle measurement for vehicles may only be conducted on automated weighbridges where:

- the weighbridge is a multi-platform weighbridge;
- each axle/axle group sits wholly on a single platform during measurement and/or means are provided to calculate the weight of axles/axle groups from controlled movement of the vehicle between different platforms: and
- the measurement may not take place with any part of the vehicle located on a dead space or approach to the weighbridge.

This supports the requirements of:

- s18GD NMA – inaccurate use of measuring instruments; and
- Reg 3.4 NTMR – approach to weighbridge.

2.3 Automated and Semi-automated Weighbridges – Public Weighbridges

2.3.1 Measurement Tickets (Mandatory)

The weighbridge control system (operator) shall provide suitable means to comply with the requirements of Reg 3.43 NTMR. The minimum requirement is that measurement tickets must include an image of the vehicle(s) on the weighbridge at the time of weighing.

This supports the requirements of Reg 3.43 NTMR – measurement tickets—certain requirements to be met by operator.

2.3.2 Public Weighbridge Ticket (Mandatory)

A public weighbridge ticket must be issued to the driver at the time of weighing. This requirement does not prohibit driver access to a visual display, however where a printed ticket cannot be produced, the visual measurement indication shall be inhibited.

On completion of the weighing a 'copy' public weighbridge ticket must be produced

Tickets must contain the minimum information required for the public weighbridge ticket type used (direct measurement or axle measurement ticket) whilst also complying with any requirements of NMI M 7. Tickets must be numbered and issued in numerical order.

This supports the requirements of Reg 3.27 NTMR – measurement tickets—requirements of public weighbridge licensee.

2.3.3 Axle Measurement (Mandatory)

Axle measurement for vehicles may only be conducted on automated and semi-automated public weighbridges where:

- the weighbridge is a multi-platform weighbridge;

- each axle/axle group sits wholly on a single platform during measurement and/or means are provided to calculate the weight of axles/axle groups from controlled movement of the vehicle between different platforms:
- the measurement may not take place with any part of the vehicle located on a dead space or approach to the weighbridge; and
- a 'copy' public weighbridge axle measurement ticket (of the approved format) is provided to the driver that correctly identifies the weight of each axle/axle group.

This supports the requirements of:

- Reg 3.4 NTMR – approach to weighbridge; and
- Reg 3.62 NTMR – additional licence conditions—public weighbridges.

2.3.4 Measurement Software (Mandatory)

The weighbridge control system must ensure that certain measurement ticket requirements are complied with, namely:

- net weight tickets may only be produced where tare and gross measurements take place within 24 hours of each other for the same vehicle/combination.
- where a vehicle returns for the second measurement more than 24 hours after the first measurement but within 72 hours of the first measurement, two separate tickets (gross only and tare only) can be provided.
- where a vehicle returns for a second measurement more than 72 hours after the first measurement, a ticket cannot be issued.

Note: The requirements above are regulatory requirements for the operator of a public weighbridge, and these would be mandatory for software in the absence of an operator on site.

This supports the requirements of Reg 3.43 NTMR – measurement tickets—certain requirements to be met by operator.

2.3.5 Ticket Retention (Mandatory)

Means must be provided to either print out 'original' measurement tickets for retention, or the public weighbridge ticket information must be securely retained electronically within the system, backed up, for a minimum of three years after the initial issue of the ticket, with the facility to print a further 'copy' ticket where required/permitted. The device must prevent alteration or deletion of the retained ticket information, once issued.

This supports the requirements of Reg 3.53 NTMR – operator must not allow another person to delete or alter electronic record included in the measurement ticket.

2.3.6 Weighbridge Errors (Mandatory)

Means must be provided to enable the user of the automated or semi-automated public weighbridge to contact the licensee in the event of any fault.

This supports the requirements of Reg 3.45 NTMR – operator must not use public weighbridge for public weighing in certain circumstances.

2.3.7 Instructions (Mandatory)

Clear instructions must be provided to enable the public to use the weighbridge correctly.

This supports the requirements of Reg 3.56 NTMR – operator must not permit or assist person to engage in fraudulent conduct.

2.3.8 Fraud Prevention/Correct Measurement (Mandatory)

Means must be provided to ensure that no fraud is facilitated in the weighing of vehicles on the public weighbridge and to verify that the driver and all passengers are out of the vehicle and off the platform(s) of the weighbridge during the measurement process (other than when determining the axle weights of the vehicle).

This supports the requirements of:

- Reg 3.56 NTMR – operator must not permit or assist person to engage in fraudulent conduct;
- Reg 3.57 NTMR – operator must notify Secretary of fraudulent conduct related to measurement using weighbridge; and
- Reg 3.58 NTMR – operator must not engage in certain conduct related to false representation.

2.3.9 Weighbridge Checks (Guidance)

The weighbridge control system shall include weighbridge regular (e.g. daily) checks to confirm the working operation of parts, such as cameras.