Title

Terms and Conditions for the Approval of Liquid Meters Used to Measure Liquefied Natural Gas.

1.0 Definitions

In this document,

**Act** – means the *Weights and Measures Act* (Loi)

**Liquefied Natural Gas** – means commercial grade natural gas, consisting of predominantly methane, which has been liquefied through refrigeration. Commonly known as LNG. (*gaz naturel liquéfié*)

**Metering Installation** – means a metering assembly and all equipment necessary for the operation of the metering assembly and includes the piping, pump, valves and reservoir. (*installation de mesurage*)

**Meter** – means a device intended to measure continuously and display the quantity of the liquid passing through it. It includes at minimum a measuring transducer, a register (calculator) and an indicating device. (*compteur*)

**Minimum Measured Quantity** – means the smallest quantity of liquid for which the measurement is metrologically acceptable for that system or element (MMQ). (*quantité minimale mesurée*)

**Regulations** – means the *Weights and Measures Regulations*. (Règlement)

1.1 All other words and expressions used in these terms and conditions have the same meaning as in the Regulations.

2.0 Scope

These terms and conditions apply to liquid meters and metering installations intended to measure liquefied natural gas.
3.0 Approval of Liquefied Natural Gas Metering Systems

3.1 In accordance with subsection 3(2) of the Act, types of liquefied natural gas metering systems may be approved on a temporary basis, if:

(a) an application is submitted which includes evidence that the device type has been tested and found to meet the requirements of the terms and conditions set out in this document; and

(b) an example of the device type has been evaluated in the field prior to trade use and found to be in compliance with the terms and conditions set out in this document and the applicable sections of the Regulations.

3.2 Liquefied natural gas metering systems will not be approved on a temporary basis once metrological requirements have been established and suitable means to conduct evaluations developed. At the discretion of Measurement Canada, types of liquefied natural gas metering systems approved in accordance with subsection 4(1) prior to the establishment of requirements and means to evaluate the devices may be granted full approval or may be required to be submitted for further evaluation.

4.0 Minimum Measured Quantity

4.1 The approval applicant shall state a minimum measured quantity applicable to a device type submitted for approval evaluation. The value of the minimum measured quantity shall not exceed 20 kg for metering systems intended to refuel road vehicles.

5.0 Delivery Hose

5.1 If the delivery hose of a liquefied natural gas metering system is not designed to remain filled between deliveries, the system must employ some means to automatically account for the volume of product required to fill the delivery hose prior to starting a delivery. The electronic register (calculator) may:

(a) reset to a value below zero, equal to the volume of the hose, prior to commencing the delivery or filling the hose;

(b) reset to zero before the delivery commences, but after the hose has been filled;

(c) suppress the advancement of the indication until the delivery hose is charged and start the delivery transaction at zero at that time; or

(d) use another method not mentioned here, but deemed acceptable by Measurement Canada.
6.0 Units of Measure

6.1 Liquefied natural gas metering systems must indicate in units of mass, as prescribed in Schedule I of the Weights and Measures Act. Any printed record of transactions shall also be in terms of units of mass.

7.0 Recirculation Circuits

7.1 To accommodate the cooling of the meter and associated components prior to commencing a delivery, metering systems may include a recirculation circuit downstream of the meter to permit product to be recirculated back to storage. Such recirculation circuits must be designed to prevent the passage of liquid while a delivery is being made and be equipped with suitable means to indicate when there is product flowing through the circuit.

8.0 Limit of Error

8.1 For the purposes of pattern approval evaluation, the Limit of Error (LOE) for initial or subsequent verifications and applicable to liquefied natural gas metering systems is ± 1.5% of the measured quantity.

9.0 Minimum Limit of Error

9.1 For evaluation and inspection purposes, the LOE in section 9 is applicable to any known test quantity greater than or equal to two times the MMQ.

9.2 For quantities less than or equal to twice the value of the MMQ, the LOE is the LOE applicable to a quantity equal to two times the MMQ.

10.0 Repeatability Limit of Error

10.1 For three consecutive tests, each with a quantity equal to or greater than five times the MMQ and conducted at any single rate of flow or at any rate of flow of the same pattern that falls between the rated maximum and the rated minimum, the spread of the results shall not exceed two-fifths of the applicable limit of error.

11.0 Vapour Elimination

11.1 A metering installation shall be equipped with an effective means, automatic in operation, to prevent the measurement of vapour or air that may result in measurement errors exceeding the applicable LOE.
12.0 Vapour Return Lines

12.1 During any metered delivery of liquefied natural gas from a supplier’s tank to a receiving container, there shall be no vapour return line from the receiving container to the supplier’s tank.

12.2 To accommodate the delivery of liquefied natural gas, the pressure in the receiving tank may be relieved prior to commencing a delivery. This may be done through the use of a separate vapour return line which must be removed before the delivery is initiated. Alternatively, the pressure may be relieved via the delivery hose and the recirculation circuit.

12.3 The relief of pressure from the receiving tank prior to the commencement of a delivery is not deemed to be part of the delivery transaction.

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