6/10B/67
2 May 2006

Australian Government

National Measurement Institute

12 Lyonpark Road, North Ryde NSW 2113

Cancellation

Certificate of Approval No 6/10B/67

Issued by the Chief Metrologist under Regulation 60
of the
National Measurement Regulations 1999

This is to certify that the approval for use for trade granted in respect of the

PEBCO Model PEB-363 Hopper Weighing Instrument

submitted by PEBCO Australia
148 Greenhill Road
Parkside SA 5063

has been cancelled in respect of new instruments as from 1 July 2006.

Signed by a person authorised by the Chief Metrologist to exercise his powers under Regulation 60 of the National Measurement Regulations 1999.

National Standards Commission

Certificate of Approval

No 6/10B/67

Issued under Regulation 63
of the
National Measurement Regulations 1999

This is to certify that an approval for use for trade has been granted in respect of the

PEBCO Model PEB-363 Hopper Weighing Instrument

submitted by PEBCO Australia
148 Greenhill Road
Parkside SA 5063.

NOTE: This Certificate relates to the suitability of the pattern of the instrument for use for trade only in respect of its metrological characteristics. This Certificate does not constitute or imply any guarantee of compliance by the manufacturer or any other person with any requirements regarding safety.

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CONDITIONS OF APPROVAL

This approval becomes subject to review on 1 March 2005, and then every 5 years thereafter.

Instruments purporting to comply with this approval shall be marked NSC No 6/10B/67 and only by persons authorised by the submittor.

It is the submittor's responsibility to ensure that all instruments marked with this approval number are constructed as described in the documentation lodged with the Commission and with the relevant Certificate of Approval and Technical Schedule. Failure to comply with this Condition may attract penalties under Section 19B of the National Measurement Act and may result in cancellation or withdrawal of the approval, in accordance with the Commission's Document 106.

The Commission reserves the right to examine any instrument or component of an instrument purporting to comply with this approval.

Auxiliary devices used with this instrument shall comply with the requirements of General Supplementary Certificate No S1/0/A.

DESCRIPTIVE ADVICE

Pattern: approved 8 February 2000

- A PEBCO model PEB-363 hopper weighing instrument.

Variant: approved 8 February 2000

1. The instrument used in a system for the sequential filling of rail wagons.

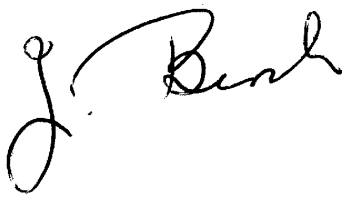
Technical Schedule No 6/10B/67 describes the pattern and variant 1.

FILING ADVICE

The documentation for this approval comprises:

Certificate of Approval No 6/10B/67 dated 22 March 2000
Technical Schedule No 6/10B/67 dated 22 March 2000 (incl.Test Procedure)
Figures 1 to 4 dated 22 March 2000

Signed and sealed by a person authorised under Regulation 63 of the National Measurement Regulations 1999 to exercise the powers and functions of the Commission under this Regulation.



TECHNICAL SCHEDULE No 6/10B/67

Pattern: PEBCO Model PEB-363 Hopper Weighing Instrument.

Submittor: PEBCO Australia
148 Greenhill Road
Parkside SA 5063.

1. Description of the Pattern

A PEBCO model PEB-363 hopper weighing instrument (Figure 1) of 70 000 kg maximum capacity and approved for use with a verification scale interval of 50 kg.

1.1 Basework

The model PEB-363 weighing instrument has the weigh bin fully supported by four load cells.

1.2 Load Cells

Four Mettler Toledo model 0760 load cells of 45000 kg maximum capacity are used and are mounted as shown in Figure 2. The load cells are also described in the documentation of NSC approval No S252A.

1.3 Indicator

A Mettler Toledo model Jaguar digital indicator is used. The indicator is described in the documentation of NSC approval No S339.

1.4 Markings

Instruments shall carry the following markings:

Manufacturer's mark, or name written in full	PEBCO Australia
Indication of accuracy class	(III)
Maximum capacity	Max …… kg *
Minimum capacity	Min …… kg *
Verification scale interval	e = …… kg *
Serial number of the instrument	.....
Pattern approval mark for the instrument	NSC No 6/10B/67
Pattern approval mark for the load cells	NSC No S...
Pattern approval mark for the indicator	NSC No S...

* These markings shall also be shown near the display of the result if they are not already located there.

1.5 Verification/Certification Provision

Provision is made for the application of a verification/certification mark.

In addition suitable provision must be made for the application of suitable verified masses to the instrument as required for verification and certification purposes. It may be necessary for such masses to be incorporated within the design of the instrument.

1.6 Sealing Provision

Provision is made for the calibration adjustments to be sealed by means of the sealing screws provided on the rear of the indicator.

2. Description of Variant 1

The instrument used in a system for the sequential filling of rail wagons.

2.1 The System

In addition to the equipment described with the pattern, the train wagon filling system comprises:

a) An Allen Bradley model PLC 5/20 programmable logic controller, connected to the indicator of the pattern;

b) A computer operator interface using custom software designed and programmed by FGR Automation, Pittsburgh USA. The software incorporates the operator interface as well as containing the databases for storing the train information, loading details and final generation of the manifest for billing purposes;

c) Photo sensors used to detect the position of the wagons to lower and raise the telescopic chutes into the wagons for loading purposes;

d) Hydraulic cylinders and associated equipment used for raising and lowering verified masses (for the purpose of checking and verifying the instrument two sets of verified masses, each totalling 7000 kg, are provided), opening and closing gates on the surge bin and weigh-bin and extending and retracting the telescopic chutes;

e) An interface with the rail system operator’s computer system for the transfer of train and wagon details and for transferring the completed train manifest for billing purposes; and

f) An interface with the facility operator’s computer system for transfer of the completed manifest.

Figure 3 shows a block diagram of the major components in the system and how they are linked.

2.2 Operator Interface/Billing System

The operator interface is a custom designed Windows NT-based software package to control the wagon loading and generate the train manifest.

Prior to loading a train the operator loads the details of the train into the system from the rail operator's computer system. The software then creates a database for the train and determines the target weight to be loaded into each wagon. Based on this target weight the software sets the set-points for the Programmable Logic Controller (PLC) for the sequenced closing of the surge bin gates to provide the required amount of material for each wagon.

Once a wagon has been filled and the weight of material supplied has been determined, the PLC transfers this to the billing system for inclusion in the manifest.

The operator interface is also used for editing train details, for entering loading set-points, selecting variables and for the annunciation of alarms generated by the PLC.

At the completion of train loading the completed manifest is printed and is available to be transferred to the facility operator's management system as well as the rail operator's management system.

Data displayed on the screen is not used for trade purposes and the computer cannot be used to alter programming within the PLC. The printout is the indication in use for trade. Figure 4 shows a typical printout.

2.3 Programmable Logic Controller (PLC)

The PLC is used for the following:

a) To interface with the Mettler Toledo model Jaguar indicator for transfer of weight information.

b) To interface with the computer running the FGR computer operator interface and billing software.

c) To control the sequenced opening and closing of surge bin gates to provided the required amount of material as determined by the FGR computer operator interface software.

d) To control the automatic loading of each wagon by raising and lowering the chutes and opening and closing the weigh bin gates at positions as determined by photo sensors located at track level.

2.4 Weighing and Loading Operation

a) The train details are transferred to the control system database which sets the amount of material required for each wagon.

b) The material required for the first wagon is prepared by opening the 4 surge bin gates to allow product to enter the weigh bin. The surge bin gates close sequentially as the target weight approaches in order to get close to the required amount of material.

c) Once the target weight is reached and all surge bin gates are closed the system records the weight of material in the weigh-bin as indicated by the Mettler Toledo model Jaguar indicator. The recording of the weight value is dependent on receipt of a ‘no-motion’ signal from the Jaguar indicator, the function of which is determined by the stability detection parameters of the indicator (see additional test in test procedure).

d) Once the required material is available in the weigh bin the train can commence moving through the loading facility at a constant speed.

e) Once the photo sensors of the system sense that the wagon is under the telescopic chutes, signals are given to lower the chutes into the wagon and commence filling the wagon by emptying the weigh bin.

f) When the end of the wagon is sensed, filling is stopped and the chutes are raised.

g) The system then records the weight of any material remaining in the weigh-bin as indicated by the Jaguar indicator indicator (see additional test in Test Procedure).

h) The amount loaded into the wagon (the difference between the initial ‘full’ weight and the remaining weight) is then stored in the manifest.

i) As the train continues to move the weigh bin is filled with material for the second wagon (the target weight is derived from the database) which will be loaded once the wagon comes into position under the chutes. This procedure repeats for each wagon until all wagons are filled.

j) Once the complete train is loaded the completed manifest file is printed and transferred to the facility operator’s and rail operator’s computer systems.

TEST PROCEDURE

Instruments should be tested in conjunction with any tests specified in the approval documentation for the indicator used, and in accordance with any relevant tests specified in the Inspector's Handbook.

Maximum Permissible Errors at Verification/Certification

The maximum permissible errors for increasing and decreasing loads on initial verification/certification for loads, *m*, expressed in verification scale intervals, *e*, are:

±0.5e for loads $0 \leq m \leq 500$;
±1.0e for loads $500 < m \leq 2000$; and
±1.5e for loads $2\,000 < m \leq 10\,000$.

Additional Test (Variant 1)

Note: Although the instrument loads wagons sequentially in an automatic manner, the test procedure used is the same as that for a non-automatic weighing instrument, with the following addition.

Stability of Equilibrium

Adequate provision must be made for stable equilibrium of the weighing system to be achieved before capturing of a weight reading. For this instrument the stability detection features of the Mettler Toledo model Jaguar indicator are used to control the 'no-motion' signal of the indicator, which determines when a weight reading is captured.

The required parameters for the 'no-motion' signal to correctly indicate stable equilibrium may vary between installations depending on factors such as the hopper capacity, verification scale interval and material being weighed.

It is important that a conservative approach is taken, and that parameters are set result in a longer settling time where there is any doubt that stability has clearly been reached.

The following procedure is based on the requirements of clause 4.4.5 of NSC Document 100, *Pattern Approval Specifications for Non-automatic Weighing Instruments for Trade Use*, and may be used to determine that stable equilibrium has been achieved prior to the capturing of weight readings.

1. Allow the weigh-bin to fill with material.
2. Record the reading which is captured when the no-motion signal appears on the indicator.

3. Observe the indication of the instrument for a period of 5 seconds (if necessary stop the automatic sequence to prevent additional loading or unloading).
4. Stable equilibrium is considered to have been achieved (at the time at which the reading is captured) when, over the 5 second period, no more than two adjacent values are indicated, one of which is the value captured at point 2 above.
5. Allow the weigh-bin to empty of material
6. Repeat steps 2 to 5 above with the empty weigh-bin.

FIGURE 6/10B/67 - 1

PEBCO Model PEB-363 Hopper Weighing Instrument

FIGURE 6/10B/67 - 2

Showing Load Cell Mounting

FIGURE 6/10B/67 - 3

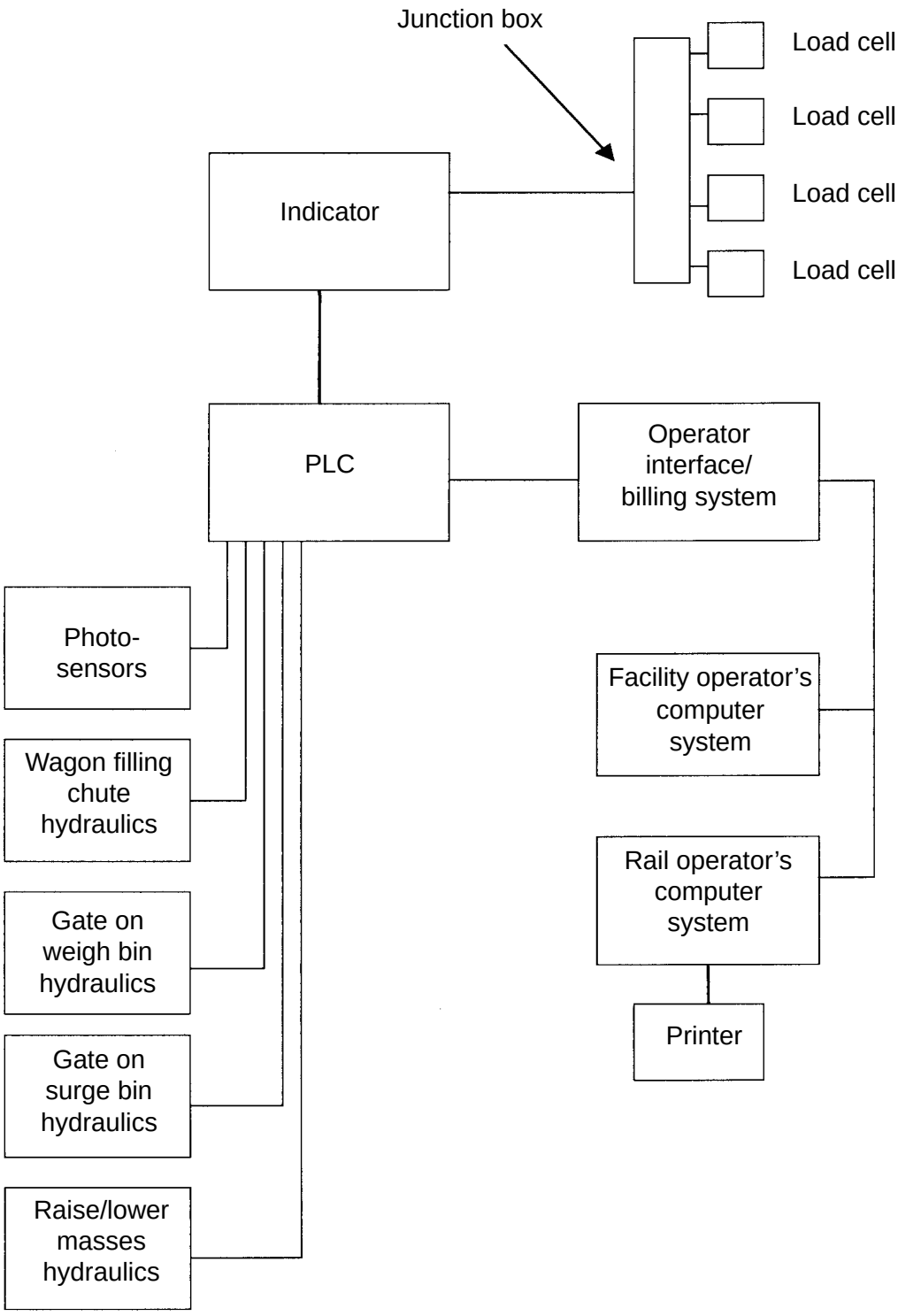


Diagram of Major Components

FIGURE 6/10B/67 - 4

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                    ____________________________________
TRAIN ID:       279D          ORIGIN DATE:      15/01/2000

                          SEQUENCE    WAGON                  CANCELLED
CONNOTE 1:      NJ90004   From:  1    1st:   vfmq 42150     From:
                          To:    25   Last:  vfmq 42258     To:
CONNOTE 1:                From:       1st:                  From:
                          To:         Last:                 To:
CONNOTE 1:                From:       1st:                  From:
                          To:         Last:                 To:

OPERATOR SN:    031066        LOADER ID:        551

TRAIN SHEET CORRECT:          YES

START DATE:     15/01/2000    START TIME:       16:30

SCALE ZERO:     YES           DIRECTION:

                    ____________________________________
SEQ. NO         WAGON NETT WEIGHTS    Fault/Error Message
1                 66.15 Tonnes
2                 64.15 Tonnes
3                 63.90 Tonnes
4                 64.10 Tonnes
5                 64.10 Tonnes
.
. . .
.
20                59.80 Tonnes
21                64.40 Tonnes
22                64.45 Tonnes
23                64.45 Tonnes
24                64.60 Tonnes
25                64.05 Tonnes

TOTAL TRAIN NETT WEIGHT:                                  1589.20 TONNES
TOTAL TRAIN GROSS WEIGHT (not to be used for trade):      1976.54 TONNES
FINISH DATE:    15/01/2000    FINISH TIME:      20:05
                    ____________________________________
WAGONS NOT LOADED
TOTAL NUMBER OF WAGONS NOT LOADED
                    ____________________________________
OVERLOADED / UNDERLOADED WAGONS TO ADJUST

TOTAL NUMBER OF OVER/UNDER WAGONS TO ADJUST               0
```

Typical Manifest Printout