L.N. 54 of 2009

ENVIRONMENT PROTECTION ACT (CAP. 435)

Control of Volatile Organic Compound-VOC Emissions (Storage and Distribution of Petrol from Terminals to Service Stations) Regulations, 2009

BY virtue of the powers conferred by articles 3, 9 and 28 of the Environment Protection Act, the Prime Minister has made the following regulations:-

Citation.

1. The title of these regulations is the Control of Volatile Organic Compound-VOC Emissions (Storage and Distribution of Petrol from Terminals to Service Stations) Regulations, 2009.

Definitions and scope.

2. (1) For the purpose of these regulations and unless the context otherwise requires:-

"approved auditor" means an auditor which has been approved by the Competent Authorities and by the Malta Standards Authority, who holds a warrant to practice the profession of an engineer under the Engineering Profession Act or the equivalent professional qualification as provided under the Mutual Recognition of Qualifications Act, who has suitable training, sufficient knowledge and experience and capability as approved by the competent Authorities to certify that terminals, service stations and road tankers are compliant with the standards set by the relevant technical Schedules of these regulations, and who is duly registered with the joint competent authorities;

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"existing petrol storage installations, loading installations, service stations and mobile containers" means such installations, service stations and mobile containers which were granted development planning consent before the 30 June 2012;

"gantry" means any structure at a terminal at which petrol can be loaded on to a single road tanker at any one time;

"hydrocarbon capture efficiency" means the fraction of petrol vapour captured by the Stage II petrol vapour recovery system compared to the amount of petrol vapour that would

otherwise be emitted to the atmosphere in the absence of such a system and expressed as a percentage;

"intermediate storage of vapours" means the intermediate storage of vapours in a fixed roof tank at a terminal for later transfer to and recovery at another terminal. The transfer of vapours from one storage installation to another at a terminal shall not be considered as intermediate storage of vapour within the meaning of these regulations;

"loading installation" means any facility at a terminal at which petrol can be loaded onto mobile containers. Loading installations for road tankers shall comprise one or more 'gantries';

"mobile container" means any tank transported by road, rail or waterways used for the transfer of petrol from one terminal to another or from terminal to a service station;

"new petrol storage installations, loading installations, service stations and mobile containers" means such installations, service stations and mobile containers which were granted development planning consent after the 30 June 2012;

"petrol" means any petroleum derivative, with or without additives, having a Reid Vapour Pressure (RVP) of 27.6 kilopascals or more, which is intended for use as a fuel for motor vehicles with the exception of liquefied petroleum gas (LPG);

"Stage II petrol vapour recovery system" means equipment aimed at recovering the petrol vapour displaced from the fuel tank of a motor vehicle during refilling at a service station and which transfers petrol to an underground storage tank at the service station or back to the petrol dispenser for resale;

"storage installation" means any stationary tank at a terminal used for the storage of petrol;

"target reference value" means the guideline given for the overall assessment of the adequacy of technical measures in the Schedules and is not a limit value against which the performance of individual installations, terminals and service stations will be measured;

"terminal" means any facility which is used for the storage and loading of petrol onto road tankers, rail tankers, or vessels, including all storage installations on the site of the facility;

"the competent authority" means the Environment Protection Directorate within the Malta Environment and Planning Authority;

"throughput" means the largest total annual quantity of petrol loaded from a storage installation at a terminal or from a mobile containers into a service station during the three preceding years;

"vapour recovery unit" means equipment for the recovery of petrol from vapours including any buffer systems at a terminal;

"vapour" means any gaseous compound which evaporates from petrol;

"vapour/petrol ratio" means the ratio between the volume at atmospheric pressure of petrol vapour passing through the Stage II petrol vapour recovery system and the volume of petrol dispensed;

"vessel" means an inland waterway vessel as defined in Chapter 1 of Council Directive 82/714/EEC of 04th October, 1982 laying down technical requirements for inland waterway vessels.

(2) These regulations transpose European Parliament and Council Directive 94/63/EC of 20 December 1994 on the control of volatile organic compound (VOC) emissions resulting from the storage of petrol and its distribution from terminals to service stations.

(3) These regulations apply to the operations, installations, vehicles and vessels used for storage, loading and transport of petrol from one terminal to another or from a terminal to a service station.

Requirements for terminals.

3. (1) The operator shall communicate to the Competent Authority the information listed in Schedule I, part A.

(2) Terminals shall not be allowed to store, load and unload petrol in Malta, unless they are in possession of a permit from the Competent Authority.

(3) The Competent Authority shall not grant a permit to store, load and unload petrol unless an approved auditor certifies that:-

(a) the storage installations at these terminals operate in accordance with the technical provisions of Schedule IV, in order to reduce the total annual loss of petrol from the storage installations of the terminal to below the target reference value of 0.01% mass by mass (m/m) of the throughput.

(b) loading and unloading equipment at terminals is designed and operated according to the technical provisions of Schedule V, in order to reduce the total annual loss of petrol resulting from loading and unloading of mobile containers at terminals to below the target reference value of 0.005% mass by mass (m/m) of the throughput.

(c) all road tanker loading gantries at the terminal meet the technical provisions of Schedule VIII.

(3) In order to calculate the mass of petrol lost from the storage installation at the terminal the procedure outlined by Schedule II part C shall be used.

(4) In order to calculate the mass of petrol lost from the loading and unloading of mobile containers at the terminal the procedure outlined by the relevant parts of Schedule II part B shall be used and wherever relevant reference shall be made to Schedule III.

(5) Sub-regulations (3)(b) and (c) are not applicable to existing terminals with a throughput less than 10,000 tons per year.

(6) Mobile containers shall not be loaded with petrol at any terminal unless the containers have been registered with the Competent Authority.

(7) The operator is required to monitor continuously the mean concentration of vapours in the exhaust from the vapour recovery unit according to the method established by the following standard MSA EN 12619:2000.

(8) The concentration of VOCs (corrected for dilution during treatment) in the exhaust from the vapour recovery unit shall not exceed the hourly average of 35 g/Nm^3.

Requirements for mobile containers.

4. (1) All the mobile containers handling petrol, including those retrofitted for bottom loading in accordance with Schedule VIII, shall be registered with the Competent Authority.

(2) The Competent Authority shall refuse to register mobile containers unless an approved auditor certifies that the mobile container is:

(a) compliant with the technical provisions of Schedule VII; and

(b) vapour tight and that the mobile container's vacuum or pressure valves are vapour tight.

(3) If after unloading of petrol the mobile container is subsequently used for products other than petrol, in so far as vapour recovery or intermediate storage of vapours is not possible, ventilation may, after consultation with and permission from the Malta Environment and Planning Authority, be allowed in a geographical area where emissions are unlikely to contribute significantly to environmental or health problems.

(4) The provisions of sub-regulation (1) shall not apply to losses of vapours resulting from measuring options using dipsticks in relation to:

(a) existing mobile containers; and

(b) new mobile containers which came into operation from 31 December 1995 to the 31 December 1999;

Requirements for service stations.

5. (1) The operator shall communicate to the Competent Authority the information listed in Schedule I, part B.

(2) Service stations shall not load petrol into their storage installations unless they have been registered with the Competent Authority.

(3) The Competent Authority shall refuse to register:

(a) all service stations unless an approved auditor

certifies that loading and storage equipment at the service station is designed and operated in accordance with the technical provisions of Schedule VI, part A.

This provision is designed to reduce the total annual loss of petrol resulting from loading into storage installations at service stations to below the target reference value of 0.01% of the throughput mass by mass (m/m).

(b) all service stations unless an approved auditor certifies that the service station is compliant with the technical provisions of Schedule VI part B.

(4) The provisions of sub-regulation 3(b) shall apply to:

(a) 'new' service stations if their throughput exceeds 500 m^3 per annum;

(b) 'new' service stations irrespective of their throughput if they are situated under living quarters or in working areas;

(c) 'existing' service stations if they have a throughput exceeding 500m^3 and if they undergo a major refurbishment after the 30 June 2012.

(d) 'existing' service stations having a throughput exceeding 3000 m^3 by the 31 December 2020.

(5) In order to calculate the mass of petrol lost from the storage installation at the service station the procedure outlined by Schedule II, part A shall be used.

(6) Mobile containers shall not be allowed to unload petrol into the storage installations at any service station unless they have been registered with the Competent Authority.

(7) The provisions of sub-regulations (1), (3) and (5) are not applicable to service stations with a throughput less than 100 m^3/year.

Responsibility for enforcement.

6. The Malta Environment and Planning Authority shall be responsible for the enforcement of these regulations.

Offences under these regulations.

7. Any person shall be guilty of an offence under these regulations if:-

(a) he fails to comply with any order lawfully given in terms of any provision of these regulations; or

(b) he contravenes any restriction, prohibition or requirement imposed by or under these regulations; or

(c) he conspires, attempts, aids, or abets, any other person by whatever means, including advertising, counselling or procurement to contravene the provisions of these regulations or to fail to comply with any such provisions, including any order lawfully given in terms of any of the provision of these regulations, or to contravene any restriction, prohibition or requirement imposed by or under the said regulations.

Penalties.

8. Any person who commits an offence against these regulations shall, on conviction, be liable:-

(a) on a first conviction to a fine (*multa*) of not less than one thousand two hundred euro (€1,200) but not exceeding two thousand three hundred euro (€2,300);

(b) on a second or subsequent convictions, to a fine (*multa*) of not less than two thousand three hundred euro (€2,300), but not exceeding eleven thousand six hundred euro (€11,600) or to imprisonment for a term not exceeding two years, or to both such fine and imprisonment:

Provided that whenever any person is found guilty of committing an offence under these regulations by means of a vehicle, the owner of the said vehicle, where applicable, is held liable in the same manner and degree:

Provided further that the court shall order any person who has been found guilty of committing an offence against these regulations to pay for the expenses incurred by the public entities and, or other persons acting on their behalf involved in the implementation of these regulations and restitution of the environment as a result of the said offence, the revocation of any permit issued by the Competent Authority and the confiscation of the *corpus delicti*.

VERŻJONI ELETTRONIKA

Applicability of the Criminal Code.

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9. (1) The provisions of article 23 and subarticle (1) of article 30 of the Criminal Code shall, *mutatis mutandis*, apply to proceedings, in respect of offences against these regulations, so that the disqualification from holding or obtain a licence, permit or authority shall in no case be for less than one year.

(2) Notwithstanding the provisions of article 370 of the Criminal Code, proceedings for an offence against these regulations shall be taken before the Court of Magistrates (Malta) or the Court of Magistrates (Gozo), as the case may be, and shall be in accordance with the provisions of the Criminal Code regulating the procedure before the said courts as courts of criminal judicature.

(3) Notwithstanding the provisions of the Criminal Code, the Attorney General shall always have a right of appeal to the Court of Criminal Appeal from any judgement given by the Court of Magistrates (Malta) or the Court of Magistrates (Gozo) in respect of proceedings for any offence against these regulations.

Repeals L.N. 214 of 2001.

10. The Control of Volatile Organic Compound Emissions (Storage and Distribution of Petrol from Terminals to Service Stations) Regulations, 2001 are hereby repealed.

SCHEDULE I

CALCULATION OF THE LOSS OF PETROL

A. **Annual fugitive emissions from the storage of petrol at terminals and from the loading and unloading of mobile containers at terminals**

The operator shall communicate to the Competent Authority the estimates of:

i) the mass of petrol lost from the storage installations at terminals;

ii) the mass of petrol lost from the loading and unloading of mobile containers at terminals;

and

iii) the throughput of the terminal.

In addition:

1. These estimates shall be certified by an approved auditor.

2. The procedure used for the estimation of losses mentioned in 1) above shall be that outlined in the relevant section of Schedule II.

3. Estimates of the throughput shall be backed up by the invoices for the purchasing of petrol during the three preceding years.

VERŻJONI ELETTRONIKA

B. **Annual fugitive emissions from the loading of petrol into storage installations at service stations.**

The operator shall communicate to the Competent Authority the estimates of:

i) the mass of petrol lost from loading into storage installations at service stations;

and

ii) the throughput of the service stations.

In addition:

1. These estimates shall be certified by an approved auditor.

2. The procedure used for the estimation of losses mentioned in 1) above shall be that outlined in the relevant section of Schedule II.

3. Estimates of the throughput shall be backed up by the invoices for the purchasing of petrol during the three preceding years.

SCHEDULE II

PROCEDURE TO CALCULATE PETROL LOSSES

A. Calculation of the Mass of petrol lost from the loading of petrol into the storage installations at service stations.

$$\textbf{Mass of petrol lost (kg)} = EF_{Fill} \times VOL_{Load} \times TVP$$

Where:

EF_{Fill} = Emission Factor from table 1, depending on filling mode.

VOL_{Load} = Volume of product loaded annually (in m^3).

TVP = True Vapour Pressure of product at loading temperature (in kPa).

Table 1 NMVOC Emission Factors for Loading Mobile Containers

Filling Mode	**Emission Factor EF_{Fill}**
stage 1b in operation without vapour balancing	2.44×10^{-2}
stage 1b in operation with vapour balancing	1.11×10^{-3}

B. Calculation of the Mass of petrol lost from loading operations at terminals.

1. Uncontrolled Emissions

Mass emitted (kg) = EF_{Load} × VOL_{Load} × TVP

Where:
EF_{Load} = Emission Factor from table 2, depending on loading mode.

VOL_{Load} = Volume of product loaded annually (in m^3).

TVP = True Vapour Pressure of product at loading temperature (in kPa).

Table 2 NMVOC Emission Factors for Loading Mobile Containers

Loading Mode	**Emission Factor EF_{Load}**
Road Tanker, Bottom Loading No Vapour Balancing during Previous Off-Loading	8.60×10^{-3}
Road Tanker, Top Loading No Vapour Balancing during Previous Off-Loading	9.40×10^{-3}
Road Tanker, Bottom or Top Loading Vapour Balancing during Previous Off-Loading	2.28×10^{-2}
Rail Tanker	1.08×10^{-2}
Marine tanker – typical cargo tank condition	6.10×10^{-3}
Barge – typical cargo tank condition	1.17×10^{-2}

2. Emissions Controlled with a Vapour Recovery Unit (VRU)

(a) VRU Fitted with a continuous emissions monitor

Mass emitted (kg) = $1.00\times10^{3} \times MEAS_{CONC} \times VOL_{LOAD} \times (1 - 0.01TVP)$

Where:
$MEAS_{CONC}$ = Measured VRU vent concentration (in g/m^3).

VOL_{Load} = Volume of product loaded annually (in m^3).

TVP = True Vapour Pressure of product at loading temperature (in kPa).

(b) VRU of known efficiency

Mass emitted (kg) = Uncontrolled emissions $\times [1 - (EFF \times Time_{ON} \times 1\times10^{-4})$

Where:
Uncontrolled emissions is calculated as shown in B part 1.

EFF = Average percentage efficiency of the VRU over the reporting period.

$Time_{ON}$ = Percentage of the time that the emissions reduction equipment is operational when required during the reporting period.

C. Calculation of the Mass of petrol lost from storage installations at terminals.

Mass Emitted (kg) = Standing Loss + Working Loss

1. Standing Loss and Working Loss from a fixed roof storage tank

Standing Loss (kg) = $48.5 \times D^{1.73} \times H^{0.51} \times C$

Where:
D = the diameter of the tank in metres.

H = vertical height of the tank in metres.

C = a coefficient which depends on the colour, according to table 3 below.

Table 3 Coefficients for different tank colours

Tank Colour	**Coefficient C**
White	1.00
Aluminium	1.20
Black	1.83
Other	1.6

Working loss (kg) = $0.878 \times VOL$

Where:
VOL = volume of petrol dispensed annually in metres cubed (m^3).

2. Standing Loss and Working Loss from a floating roof storage tank

Standing Loss (kg) = $9.35 \times C_J \times V^n \times D$

Where:
C_J = a coefficient for the floating roof tank depending on the nature of the seal, according to table 3 below.

V = annual average wind speed at the site in km/h. If unknown this value can be taken to be equal to 16 km/h (the annual average wind speed for the Maltese Islands).

n = wind coefficient related to the type of seal, according to table 4 below.

D = tank diameter in metres.

Table 4 Coefficient for the different floating tank seals (see page Schedule II)

Type of Seal	C_J	n
Mechanical-shoe primary seals		
primary only	0.52	1.53
With shoe mounted secondary seal	0.48	1.17
With rim-mounted secondary seal	0.13	0.97
Liquid-mounted resilient filled seal		
primary only	0.55	1.03
With weather shield	0.45	0.93
With rim-mounted secondary seal	0.51	0.43
Vapour-mounted resilient filled seal		
primary only	0.42	2.10
With weather shield	0.37	2.00
With rim-mounted secondary seal	0.09	2.23

Working Loss (kg) = $5.13 \times VOL \times (M \times D^{-1})$

Where:
VOL = volume of petrol dispensed annually in metres cubed (m^3).

M = clingage coefficient:
M = 0.0015 for light rust;
M = 0.0075 for dense rust;
M = 0.15 for gunite lining;

D = tank diameter in metres.

3. Standing Loss and Working Loss for a tank fitted with an internal floating deck.

Standing Loss (kg) = $2.85 \times [(0.518S + 2.15P)D^2 + (3.28F + 4.57A)D + 134\ B]$

Where:
D = diameter of the reservoir in metres.

F = a coefficient for the seal of the floating deck
F = 6.3 for a vapour-mounted resilient seal;
F = 2.9 for a liquid-mounted resilient seal;
F = 2.4 for a vapour-mounted resilient seal with a rim-mounted secondary seal;
F = 1.5 for a liquid-mounted resilient seal with a rim-mounted secondary seal;

S = a coefficient related to the structure of the internal deck, according to table 4 below;

P = internal deck permeation coefficient, according to table 4 below;

A and B = coefficients related to the configuration of the tank, according to table 5 below;

Table 5 Tank and Deck coefficients

Type of Tank and Deck	S	A	B	P
Tank with pipe columns				
Deck welded or bolted in its entirety	0.800	1.000	1.000	0.000
other type of deck	1.000	1.000	1.000	0.340
Tank without pipe columns				
Deck welded or bolted in its entirety	0.274	0.567	0.784	0.000
other type of deck	0.474	0.587	0.784	0.340

Working Loss (kg) = $5.13 \times R \times VOL \times (M \times D^{-1})$

Where:
R = coefficient related to the tank configuration.
R = 1 for a tank without pipe columns;
R = 1 if the tank has pipe columns and D < 40m;
R = 1.1 if the tank has pipe columns and 40m ≤ D < 70m;
R = 1.2 if the tank has pipe columns and D ≥ 70m;

VOL = volume of petrol dispensed annually in metres cubed (m^3).

M = clingage coefficient:
M = 0.0015 for light rust;
M = 0.0075 for dense rust;
M = 0.15 for gunite lining;

D = tank diameter in metres.

Wherever required the TVP for petrol can be calculated from:

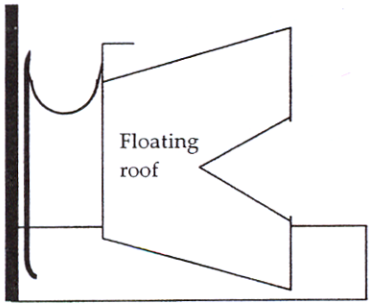
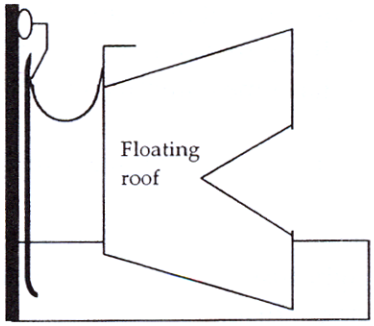
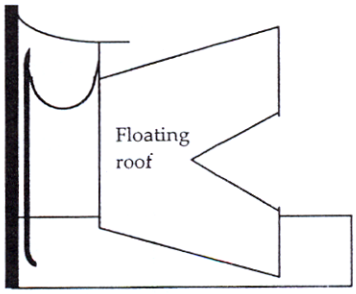
TVP = RVP × 10 EXP $\{[(7.047\times10^{-6} \times RVP) + 1.32\times10^{-2}] \times T + [(2.311\times10^{-4}\times RVP) - 5.236\times10^{-1}]\}$

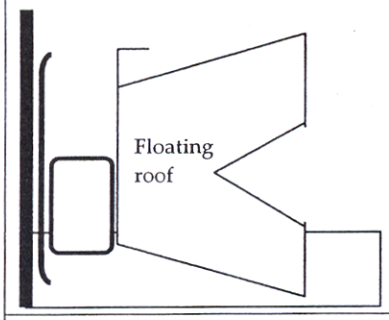
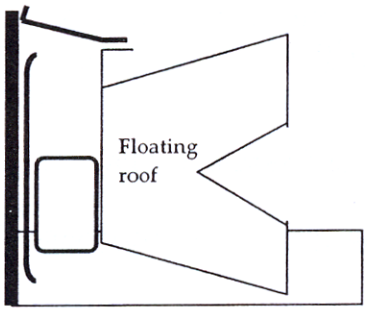
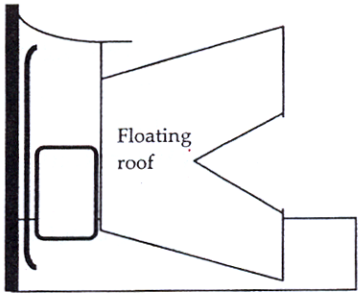
Where:
RVP = Reid Vapour Pressure (in kPa)

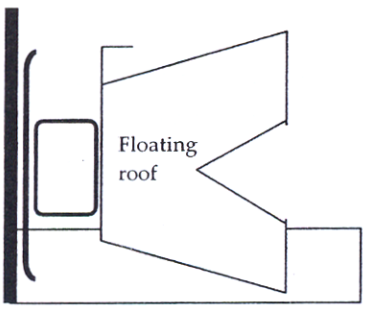
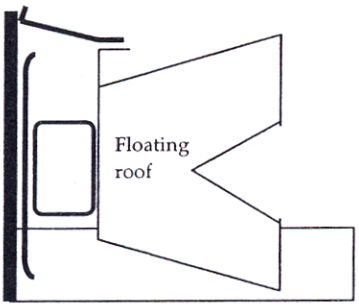
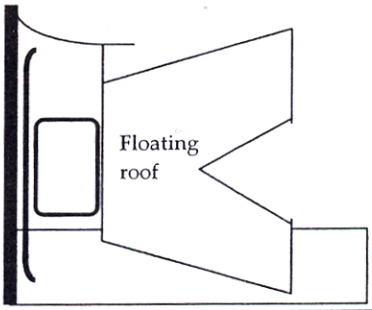
T = product loading temperature (in degrees Centigrade)

SCHEDULE III

THE DIFFERENT TYPES OF SEALS

1. Mechanical-shoe primary seals:		
		
primary seal only	with shoe mounted secondary seal	with rim-mounted secondary seal

2. Bottom of the resilient filled seal in contact with the Liquid Phase:		
		
primary seal only	with weather shield	with rim-mounted secondary seal

3. Bottom of the resilient filled seal in contact with the Vapour Phase:		
		
primary seal only	with weather shield	with rim-mounted secondary seal

SCHEDULE IV

REQUIREMENTS FOR STORAGE INSTALLATIONS AT TERMINALS

1. The external wall and roof of tanks above ground shall be painted in a colour with a total radiant heat reflectance of 70 % or more. These operations may be programmed so as to be carried out as part of the usual maintenance cycles of the tanks within a period of three years. The competent authority may grant a derogation from this provision where required for the protection of special landscape areas which have been designated by national authority. This provision shall not apply to tanks linked to a vapour recovery unit which conforms to the requirements set out in Schedule V, point 2.

2. Tanks with external floating roofs shall be equipped with a primary seal to cover the annular space between the tank wall and the outer periphery of the floating roof and with a secondary seal fitted above the primary seal. The seals should be designed to achieve an overall containment of vapours of 95 % or more as compared to a comparable fixed-roof tank with no vapour-containment controls (that is a fixed-roof tank with only vacuum/pressure relief valve).

3. All new storage installations at terminals, where vapour recovery is required according to regulation 3 (see Schedule V) shall be either:

(a) fixed-roof tanks connected to the vapour recovery unit in conformity with the requirements of Schedule V; or

(b) designed with a floating roof, either external or internal, equipped with primary and secondary seals to meet the performance requirements set down in point 2.

4. Existing fixed-roof tanks shall either:

(a) be connected to a vapour recovery unit in conformity with the requirements of Schedule V;

or

(b) have an internal floating roof with a primary seal which should be designed to achieve an overall containment of vapours of 90 % or more in relation to a comparable fixed-roof tank with no vapour controls.

5. The requirements for vapour-containment controls mentioned under points 3 and 4 do not apply to fixed-roof tanks at terminals, where intermediate storage of vapours is permitted according to Schedule V, point 1.

SCHEDULE V

REQUIREMENTS FOR LOADING AND UNLOADING INSTALLATIONS AT TERMINALS

1. Displacement vapours from the mobile container being loaded shall be returned through a vapour-tight connection line to a vapour recovery unit for regeneration at the terminal.

This provision does not apply to top-loading tankers as long as that loading system is permitted.

At terminals which load petrol onto vessels, a vapour incineration unit may be substituted for a vapour recovery unit if vapour recovery is unsafe or technically impossible because of the volume of return vapour. The requirements concerning atmospheric emissions from the vapour recovery unit shall also apply to the vapour incineration unit. At terminals with a throughput of less than 25000 tonnes/year, intermediate storage of vapours may be substituted for immediate vapour recovery at the terminal.

2. Measurements of the mean concentration of vapours in the exhaust from the vapour recovery unit shall be made over the course of one full working day (seven hours minimum) of normal throughput. The overall measurement error due to the equipment used, the calibration gas and the procedure used shall not exceed 10 % of the measured value. The equipment used shall be capable of measuring concentrations at least as low as $3 g/Nm^3$. The precision shall be at least 95 % of the measured value.

3. The competent authority shall ensure that the connection lines and pipe installations are checked regularly for leaks.

4. The competent authority shall ensure that loading operations are shut down at the gantry in the case of a leak of vapour. Equipment for such shutdown operations shall be installed at the gantry.

5. Where top-loading of mobile containers is permissible, the outlet of the loading arm shall be kept near the bottom of the mobile container, in order to avoid splash loading.

SCHEDULE VI

A. REQUIREMENTS FOR LOADING AND STORAGE INSTALLATIONS AT SERVICE STATIONS AND TERMINALS WHERE THE INTERMEDIATE STORAGE OF VAPOURS IS CARRIED OUT

Vapours displaced by the delivery of petrol into storage installations at service stations and in fixed-roof tanks used for the intermediate storage of vapours shall be returned through a vapour-tight connection line to the mobile container delivering the petrol. Loading operations may not take place unless the arrangements are in place and properly functioning.

B. ADDITIONAL REQUIREMENTS FOR SERVICE STATIONS

1. Service Stations shall be equipped with a Stage II Petrol Vapour Recovery system.

2. The efficiency of the Stage II petrol vapour recovery system shall not be less than 85%.

3. For petrol vapour recovery systems where the petrol vapour is transferred to an underground storage tank at the service station, the vapour/petrol ratio shall be equal to or greater than (≥)0.95 but less or equal to (≤) 1.05.

4. The operator shall ensure that the hydrocarbon capture efficiency of the Stage II Petrol Vapour Recovery is tested at least once annually by an approved third party.

5. If the operator opts to install an automated monitoring system, the operator shall make sure that the hydrocarbon capture efficiency of the Stage II Petrol Vapour Recovery system is tested at least once every three years.

6. The automated monitoring system in 5 above shall;

   (a) automatically detect faults; in the proper functioning of the Stage II petrol vapour recovery system and in the automatic monitoring system itself;

   and

   (b) indicate faults to the service station operator and automatically stop the flow of petrol from the faulty dispenser if the fault is not rectified within 7 days.

SCHEDULE VII

REQUIREMENTS FOR MOBILE CONTAINERS

1. The mobile container must retain residual vapours after the petrol is unloaded;

2. The mobile container should be capable of accepting and retaining the return vapours when supplying petrol to service stations and terminals;

3. Excluding releases through pressure valves, the vapours mentioned in paragraphs 1 and 2 should be retained in the mobile container until reloading takes place at a terminal.

SCHEDULE VIII

SPECIFICATIONS FOR BOTTOM-LOADING VAPOUR COLLECTORS AND OVERFILL PROTECTION OF EUROPEAN ROAD TANKERS

1. Couplings

1.1. The liquid coupler on the loading arm shall be a female coupler which shall mate with a 4-inch API (101.6 mm) male adapter located on the vehicle as defined by:

- API Recommended Practice 1004 Seventh Edition, November 1988.

Bottom loading and vapour recovery for MC-306 tank motor vehicles (Section 2.1.1.1 - Type of adapter used for bottom loading)

1.2. The vapour-collection coupler on the loading-gantry vapour-collection hose shall be a cam-and groove female coupler which shall mate with a 4-inch (101.6 mm) cam-and-groove male adapter located on the vehicle as defined by:

- API Recommended Practice 1004 Seventh Edition November 1988.

Bottom loading and vapour recovery for MC-306 tank motor vehicles (Section 4.1.1.2 – Vapour recovery adapter)

2. Loading conditions

2.1. The normal liquid-loading rate shall be 2,300 litres per minute (maximum 2 500 litres per minute) per loading arm.

2.2. When the terminal is operating at peak demand, its loading gantry vapour collection system, including the vapour recovery unit, is allowed to generate a maximum counter pressure of 55 millibar on the vehicle side of the vapour-collection adapter.

2.3. All approved bottom-loading vehicles will carry an identification plate which specified the maximum permitted number of loading arms which may be operated simultaneously whilst ensuring that no vapours are released via the compartment P and V valves, when the maximum plant back pressure is 55 millibar as specified in 2.2.

3. Connection of vehicle earth/overfill detection

The loading gantry shall be equipped with an overfill-detection control unit which, when connected to the vehicle, shall provide a fail-safe permission signal to enable loading, providing no compartment overfill sensors detect a high level.

3.1. The vehicle shall be connected to the control unit on the gantry via a 10-pin industry-standard electrical connector. The male connector shall be mounted on the

vehicle and the female connector shall be attached to a flying lead connected to the gantry-mounted control unit.
3.2. The high-level detectors on the vehicle shall either 2-wire thermistor sensors, 2-wire optical sensors, 5-wire optical sensors or a compatible equivalent, provided the system is fail-safe. (NB: thermistors shall have a negative temperature coefficient.)

3.3. The gantry control unit shall be suitable for both 2-wire and 5-wire vehicle systems.

3.4. The vehicle shall be bonded to the gantry via the common return wire of the overfill sensors, which shall be connected to pin 10 on the male connector via the vehicle chassis. Pin 10 on the female connector shall connected to the control-unit enclosure which shall connected to the gantry earth.

3.5. All approved bottom-loading vehicles shall carry an identification plate (see 2.3) which specifies the type of overfill-detection sensors installed (i. e. 2-wire or 5-wire).

4. Location of the connections

4.1. The design of the liquid-loading and vapour collection facilities on the loading gantry shall be based on the following vehicle-connection envelope.

4.1.1. The height of the centre line of the liquid adapters shall be: maximum 1.4 metres (unladen); minimum 0.5 metre (laden), the preferred height being 0.7 to 1.0 metres).

4.1.2. The horizontal spacing of the adapters shall be not less than 0.25 metres (preferred minimum spacing is 0.3 metres).

4.1.3. All liquid adapters shall be located within an envelope not exceeding 2.5 metres in length.

4.1.4. The vapour-collection adapter should be located preferably to the right of the liquid adapters and at a height not exceeding 1.5 metres (unlade) and not less than 0.5 metres (laden).

4.2. The earth/overfill connector shall be located to the right of the liquid and vapour-collection adapters and at a height not exceeding 1.5 metres (unladen) and not less than 0.5 metre (laden).

4.3. The above connections shall be located on one side of the vehicle only.

5. Safety interlocks

5.1. Earth/Overfill detection Loading shall not be permitted unless a permissive signal is provided by the combined earth/overfill control unit.

In the event of an overfill condition or a loss of vehicle earth, the control unit on the gantry shall close the gantry-loading control valve.

5.2. Vapour-collection detection Loading shall not be permitted unless the vapour-collection hose has been connected to the vehicle and there is a free passage for the displaced vapours to flow from the vehicle into the plant vapour-collection system.