



OPERATING STANDARD 10

ROAD TANKER - OVERFILL PROTECTION STANDARD

OS 10

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1. PREFACE

This operating standard aims to facilitate the highest possible safety standards in the petroleum industry by establishing specifications for the performance and operation of equipment. The specific equipment covered by this Operating Standard (OS) is:

- The setting of Road Tanker - Overfill Protection System probes that load at SLP participating petroleum fuel terminals and depots.

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OPERATING STANDARD FOR Road Tanker - Overfill Protection

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2. Purpose

The purpose of this procedure is to describe the standard for the settings of the Overfill Protection System probes for the prevention of overfill on Bulk Road Tank Vehicles (tankers) and the frequency of testing functionality and verification.

This standard applies to:

- All holders of a current Safe Load Program identification card (ID Card) or Safe Load Program Driver Passport, when visiting or working at a participating Safe Load Program Terminal.

3. Scope

3.1 This standard covers:

- 3.1.1 The standard for the setting of Overfill Protection System probes on Road Tankers that load at petroleum fuel terminals and depots.

3.2 This standard does not cover:

- 3.2.1 The task and steps involved in the testing of the probes.
- 3.2.2 Any engineering standards for equipment in use.

3.3 Applies to:

- 3.3.1 SLP Accredited Inspection Locations.
- 3.3.2 Road Tankers fitted with an Overfill Protection System.

4. Definitions and Acronyms

Term/Acronym	Definition
ADGC7	Australian Code for the Transport of Dangerous Goods by Road and Rail
SLP	Safe Load Program for road tanker and driver accreditation
SLP Joint Venture	A BP, Caltex, Shell partnership which owns and manages SLP
AIL	SLP Accredited Inspection Location
OG-7	SLP Operating Guidelines for Pass-2-Load Inspections
Pass-2-Load (P2L)	6 monthly vehicle inspection by AILs for compliance to OG-7
Product	Bulk liquid petroleum products
Overfill Protection System (OPS)	An electronic system incorporated in road tanker barrels which will prevent the overfilling of tanker compartments when connected to compatible loading facility equipment.
OPS Probe	A device, integral to the OPS and located in the top of each tanker compartment, which will initiate the shutdown of loading on liquid contact.
Gross Capacity (GC)	The total volume capacity of a tanker compartment to hold product.
Safe Fill Level (SFL)	The maximum level of liquid that can be safely loaded in a tanker compartment as per ADGC7.
Liquid level	Level of product in the tanker compartment
Minimum Ullage	The difference between the Gross Capacity and the SFL in a tanker compartment as per ADGC7.
Surge Setting (SS)	The probe setting allowance for liquid surge above the SFL of the compartment. It is set to avoid premature ESD initiation during normal loading operations due to surges and level fluctuation while filling.
ESD	Emergency Shutdown

5. Roles and Responsibilities

Role	Responsibilities
SLP - AIL	<ul style="list-style-type: none"> Ensure that Road Tankers comply with the standard. Provide the required documentation and evidence to ensure compliance with this standard.
Road Tanker Owners / Operators	<ul style="list-style-type: none"> Ensure that Road Tankers comply with the standard. Ensure OPS probes settings are verified and have the required documented evidence.

6. General Precautions

- 6.1.1 Employees and contractors will comply with all Australian Workplace Health & Safety requirements, directives and provisions in taking all “reasonable” care to protect themselves and others.

7. Procedure

7.1 Who

- 7.1.1 All AILs that conduct P2L inspections of road tankers that load at SLP Joint Venture, and SLP participating facilities, must comply with this standard.
- 7.1.2 All road tanker owners / operators with vehicles that load at SLP Joint Venture, and SLP participating facilities, must comply with this standard.

7.2 Verification of Probe Setting

- 7.2.1 A full verification of the probe setting must be conducted:
- 7.2.2 At a frequency no more than thirty months, aligned with AS 2809.2 requirements for regular testing and maintenance of road tank vehicles for flammable liquids; and
- 7.2.3 When a Tanker Truck has had maintenance completed on the barrel and the probe setting have been affected; and
- 7.2.4 After an “overflow trip” during loading when it is identified that the probe height settings are incorrect; and
- 7.2.5 When the setting of the probes is questionable or suspect; and
- 7.2.6 When a carrier presents a new tanker barrel for an P2L inspection; and
- 7.2.7 At the request of the tanker operator/carrier.

7.3 Function test

A full function test of the Overflow Protection System must be conducted at a frequency of no less than 6 months (covered under the SLP P2L inspection guidelines (OG-7)).

7.4 Evidence

Evidence of verification and full function testing conducted by an AIL / tanker manufacturer must be provided by the AIL / tanker manufacturer to the tanker operator / carrier on completion.

8. Ullage & Probe Setting Guidelines

The ullage and probe requirements are as follows –

8.1 Ullage Coefficient of Expansion

As a rule, petrol is taken to have a coefficient of expansion 95×10^{-5} ; therefore the ADGC states 3% Ullage.

Tanker Truck Loading Rack Design assumptions

- Assumption is that the **maximum** compartment loading flow rate on any loading arm is 2400 litres/minute.
- The valve (ESD) closure time is less than 4 seconds to close tight shut at the full flow rate.
- After an Emergency Shut Down (ESD) is initiated when the OPS is activated, a maximum of 160 litres of product could be loaded into the compartment prior to valve closing fully. (2400/60X4 = 160 Litres).

8.2 Gross Capacity

The size of the compartment as provided by the manufacturer and noted in the strapping tables calibration sheet and marked on the dip stick. Also noted as the gross volume for a compartment expressed in litres.

8.3 Safe Fill Level

The Safe Fill Level of the compartment is the **lesser of:**

- **97% of the Gross Capacity**
- **The Gross Capacity of the compartment minus 230 Litres**

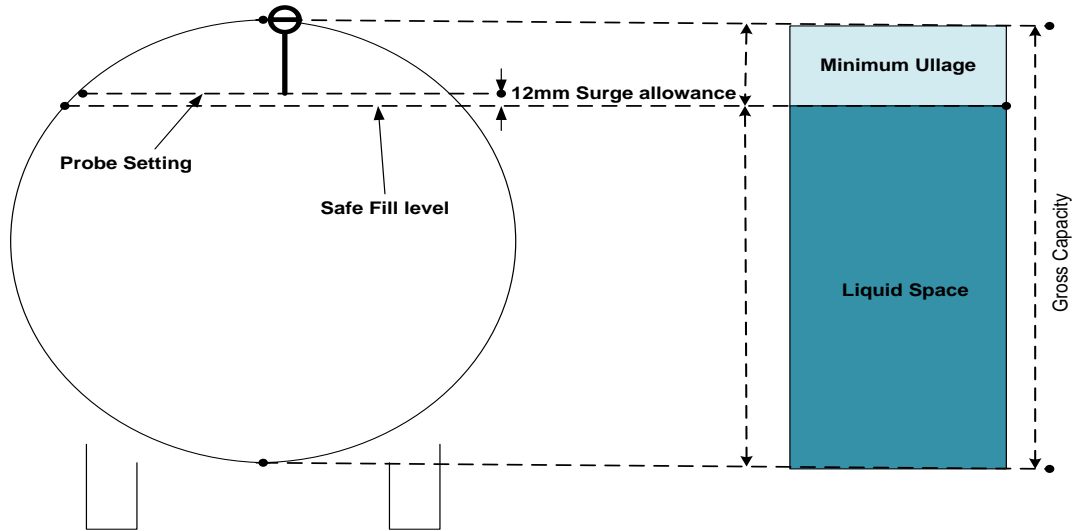
8.4 Surge Allowance

This is the space between the Safe Fill Level of a compartment, and the probe trip point. It is provided to avoid premature probe initiation during normal loading operations due to liquid surges and level fluctuation. **The maximum Surge Allowance is 12mm, but no less than 10mm.**

8.5 Probe Setting

The probe setting is the Safe Fill Level plus the Surge Allowance.

8.6 Probe Setting Drawing



8.7 Probe Setting Table

Maximum Flow Rate	Time to close valve	Minimum ullage required
2400 litres/minute	4 seconds	$(2400/60) \times 4 = 160$ litres
Gross Capacity (litres)	As provided by the tanker manufacturer	
Safe Fill Level (litres) Lesser of	<ul style="list-style-type: none"> • 97% of Gross Capacity, or • Gross Capacity minus 230 Litres 	
Minimum Ullage (litres)	Gross Capacity minus Safe Fill Level	
Probe Setting (litres)	Safe Fill Level plus 12mm	

9. Supporting Documents and References

AS2809.1 <ul style="list-style-type: none"> • 1.5.42 • 1.5.39(a) & (b) 	<ul style="list-style-type: none"> • This refers to Ullage as per ADGC • More than 8600 Litres is regarded a Large Compartment, Less is a Small Compartment
AS2809.2 - 3.5.1	Refers to maintenance intervals for testing of hatches, vents and valves
ADGC 7th Edition 10.3.1.1 (b)	Ullage = 3% for dangerous goods having a coefficient of expansion greater than 90×10^{-5} but less than 135×10^{-5} per degree Celsius
SLP-OG7.V2	Operating Guidelines for Pass-2-load Inspections