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# Design Guidelines for the Construction of Fixed Bulk Distillate Installations Underground in Coal Mines

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MDG 7



NSW DEPARTMENT OF  
**PRIMARY INDUSTRIES**

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New South Wales  
Department of Mineral Resources

**DESIGN GUIDELINES FOR THE CONSTRUCTION OF  
FIXED BULK DISTILLATE INSTALLATIONS UNDERGROUND IN COAL MINES  
(SUPPLY FROM SURFACE BY PIPELINE)**

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1. **SCOPE**

Clause 21 and Clause 35 of the Coal Mines Regulation (Transport - Underground Mines) Regulation 1984 requires that all containers used for storing diesel fuel underground be of a type approved for that purpose by an Inspector of Mechanical Engineering.

The following guidelines are intended to help designers of bulk distillate installations, where supply is by pipeline, by indicating those parameters which will be considered in an approval assessment.

It is not the intention of the guidelines to restrict innovative design. Where a design requires deviation from the guidelines, advice should be sought from Inspectors of Mechanical Engineering, Coal Mining Inspectorate and Engineering, Department of Mineral Resources.

PLEASE NOTE That these guidelines do not in any way negate the requirements of the Coal Mines Regulation Act, 1982.

2. **CONSTRUCTION**

2.1 The maximum total amount of distillate permitted underground at any time is not to exceed the total consumption at the mine (with normal operation) over seven days. The stores register should be checked to ensure that this amount is not exceeded when storage tanks are installed.

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- 2.2 There shall be visual means to check the level of the fuel in the storage tank without the need of a dip stick.
- 2.3 The storage tank shall be capable of holding twice the amount intended to be stored so that no over flow occurs should a second batch be despatched in error. (e.g. for 2,000 L storage a 4000 L tank shall be used.) If more than one tank is used there shall be no valves in the connected lines between the tanks.
- 2.4 The storage tank be located within a bund which can hold full tank capacity (e.g. 4,000 L) and which will remain leak proof even if subjected to ground movement.
- 2.5 The storage tank shall not be replenished until the level has dropped to a maximum of 15% of the fuel to be stored (e.g. 15% of 2,000 L is 300 L).
- 2.6 The maximum capacity of the batch tank on the surface shall be not more than 85% of the fuel to be stored (e.g. 85% of 2,000 L is 1,700 L).
- 2.7 All tanks (surface and UNDERGROUND) shall be clearly marked to identify their contents and capacities.
- 2.8 Tanks shall be mounted so that all external surfaces are available for inspection.
- 2.9 Construction of all tanks (surface and UNDERGROUND) shall comply with AS1692-1983 "Tanks for Flammable and Combustible Liquids".
- 2.10 To prevent the feed line becoming pressurised it shall have no valves at its lower end and a 50% flow restrictions orifice on or near the surface. The feed line shall be galvanised steel and clearly marked to identify its contents.
- 2.11 To prevent the storage tank from becoming pressurised it shall be fitted with a vent large enough to handle the inflow.
- 2.12 Before fuel is fed from the surface, it must first be transferred to a batch tank connected via a 3-way valve, this shall be kept open except when fuel is being transferred to the batch tank.
- 2.13 A shut-off valve shall be installed between the surface bulk and the 3-way valve. A drain-off valve shall installed between the shut-off valve and the 3-way valve, this valve shall be kept open except when fuel is being transferred to the batch tank.

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- 2.14 The dispensing system from the UNDERGROUND storage tank shall be equipped with protection so that the dispensing pump is only powered during decanting. It must be possible to accidentally empty the underground storage tank in the event of a punctured decanting hose or a malfunction in the decanting nozzle.
- 2.15 An automatic smoke or heat triggered fire fighting system shall be installed in the underground fuel storage area.
- 2.16 The underground storage tank must be located in a garage to the satisfaction of the Inspector of Mechanical Engineering.
- 2.17 A door shall be provided from the garage to the return, which will open automatically in the event of an alarm signalled by the equipment required under.

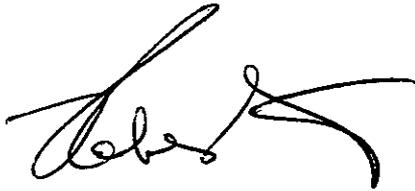
3 OPERATING CONDITIONS

- 3.1 Not more than 3 persons shall be authorised to operated the system.
- 3.2 The 3-way valve shall be locked when not in use and the key in a secure location (e.g. lamp cabin).
- 3.3 Operating instructions shall be clearly displayed near the underground storage tank and near the 3-way valve. An example of such Operating Instructions for Transferring Distillate to Underground Storage Tank is as follows:
  - (a) Go underground and check quantity of fuel in storage tank. When quantity of fuel storage falls below 300 L, another 1,700 L may be transferred from the surface bulk tank.
  - (b) On the way back to the surface inspect the feed line to ensure it is not damaged.
  - (c) Pick up key for lock 3-way valve from lamp cabin and proceed to surface tank site.
  - (d) Close drain off valve, unlock 3-way and turn lever through 90° then open stop valve to allow flow from the 30,000 L tank to the 1,700 L batch tank.
  - (e) On completion of transfer shut of stop valve on 30,000 L tank, turn 3-way valve back to lock position and lock. This will allow the fuel to flow

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down to the UNDERGROUND storage tank. Open drain  
off tank.

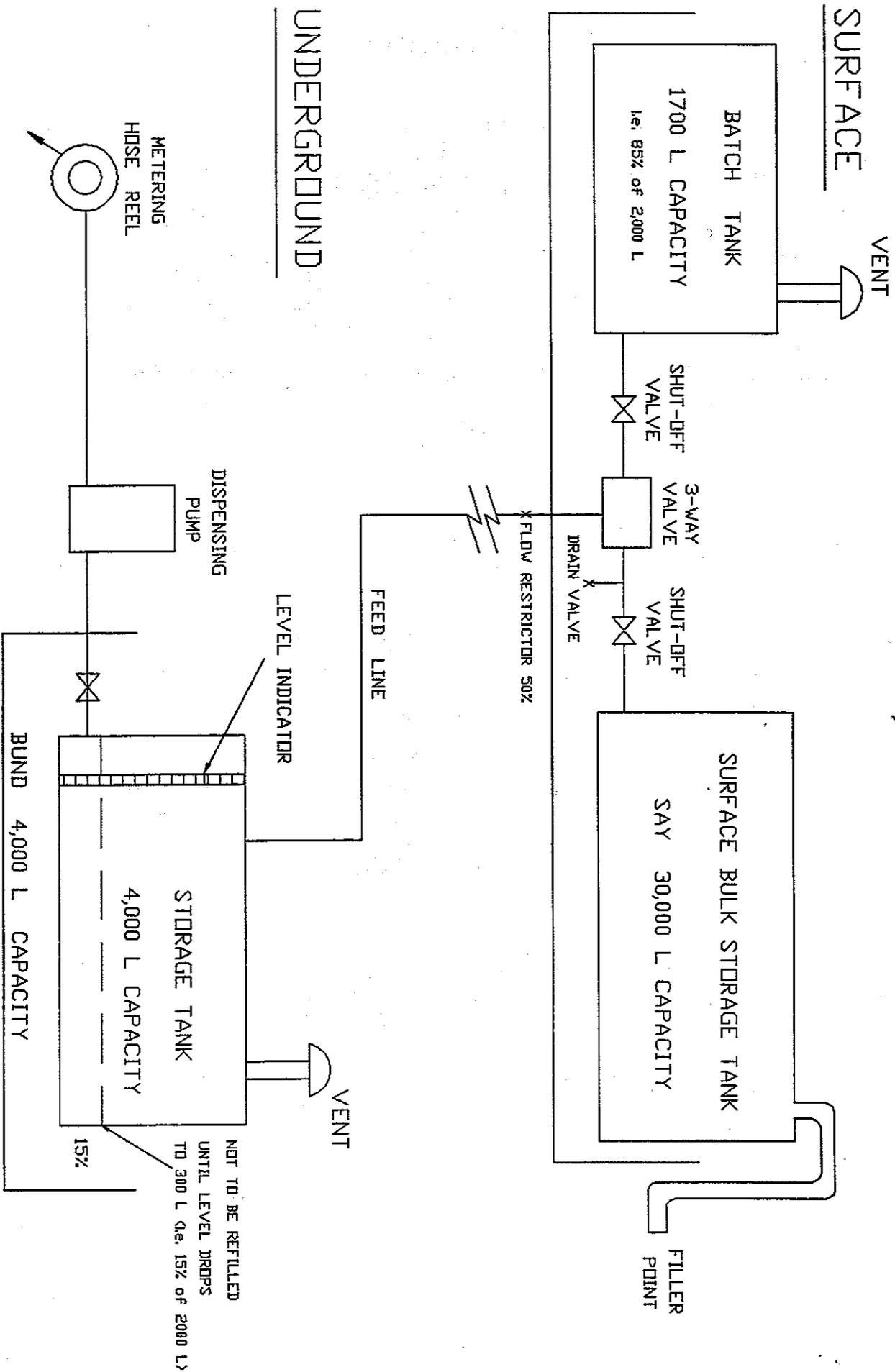
- (f) Check underground storage tank to ensure transfer  
has taken place correctly.
- (g) Return key to lamp cabin. Record transfer of fuel  
in book kept at the lamp cabin and sign.



L. J. ROBERTS  
Senior Inspector of Mechanical Engineering  
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# EXAMPLE OF A BULK DISTALLATE INSTALLATION

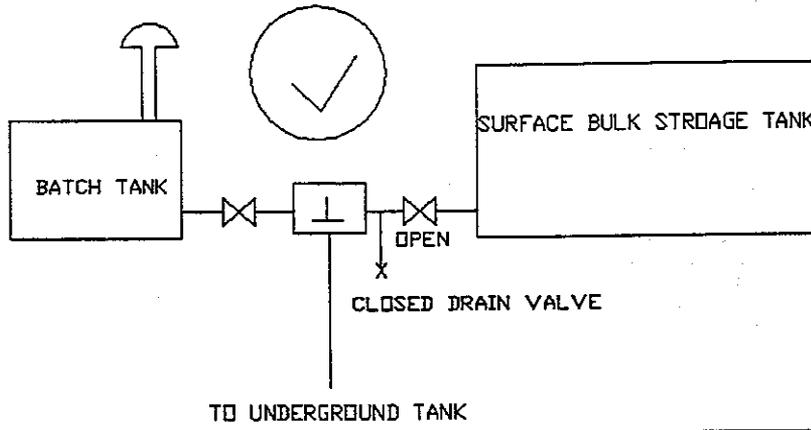
FIGURES ARE FOR A 2,000 L SYSTEM



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# VALVE POSITIONS

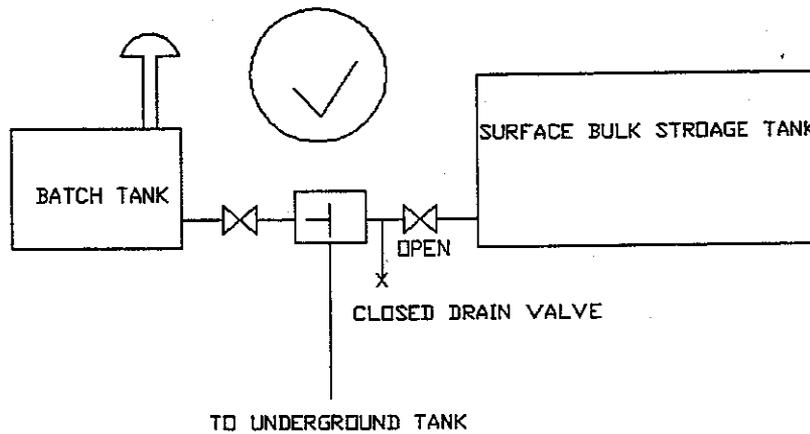
(a) During Transfer to Batch Tank



(b) During Transfer to Underground Tank

Valves Remain In This Position after Transfer

3-way Valve to be Locked-Up In this Position Until Next Transfer



(c) Provison Shall be Made to Prevent the 3-way Valve from Reaching this Point

