

An LPB toolbox talk

Improving process safety by sharing experience



Bunding – should be simple and reliable

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Introduction

- Bunds have been used for years to protect against the effects of losses from storage tanks.
- They can limit the loss of flammable liquids, or prevent environmentally sensitive materials from damaging the environment.
- The benefit of bunds is that they are simple and reliable, or are they? The following examples have been drawn from several incidents.

Cracks in the base or wall of the bund

- Cracks may develop in the concrete base or wall of a bund.
- Small cracks can be a concern if ground water contamination is to be avoided.
- Expansion joint materials may be missing or unsuitable for the liquid being stored.



Bund not designed for hydrostatic pressure

- If the material being stored in a tank is changed to one with a higher density, it will be important to ensure that the bunds will still be able to contain the hydrostatic head.



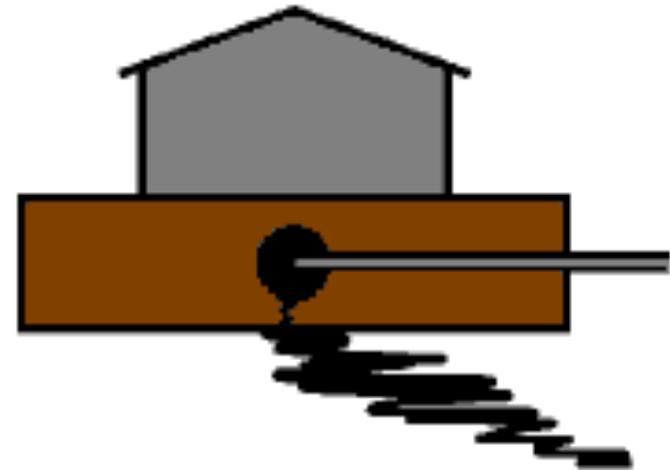
Bund not designed to contain tank capacity

- Bunds should be designed according to local rules but with a capacity of at least 110% of the capacity of the largest tank within the bund.



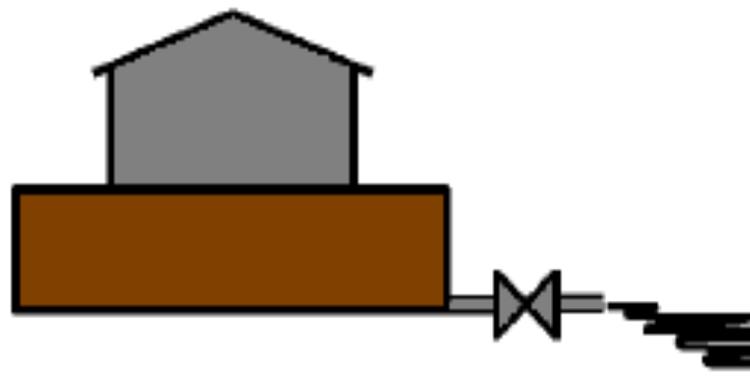
Bund not sealed after new pipe installed

- This is one of the most common errors and has contributed to a number of serious fires.
- It is important that all modifications are completed to the original specification.



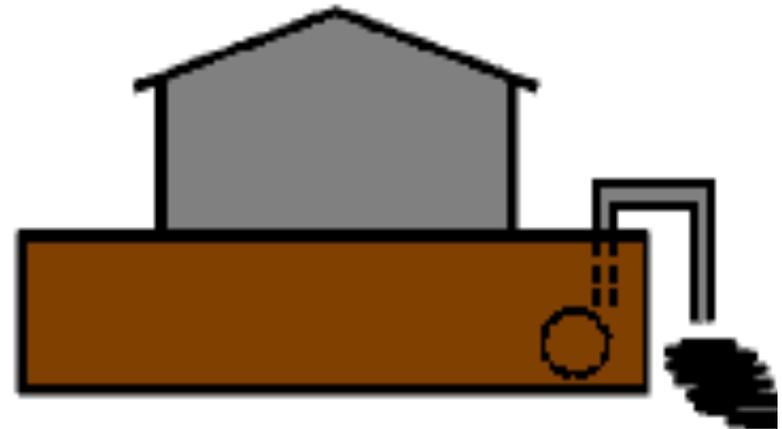
Bund drain left open

- The collection of rainwater within the bunded area can be a problem and drains are necessary.
- However, the common error of leaving the drain open completely negates the value of the bund.



Pump installed to empty bund

- Due to the problem with rainwater build-up, pumps can be installed to empty the rainwater.
- In one case, this was found to be equipped with an autostart facility, negating the purpose of the bund.



Bund damaged by freezing conditions

- Bunds, particularly those made of brick or cement overlain by a concrete coating, can be damaged if water penetrates the coating and freezes.
- Repeated freezing and thawing can damage the bund to such an extent that it loses its integrity.
- Regular draining or pumping is required, together with a regular and thorough survey of the wall, both inside and out.



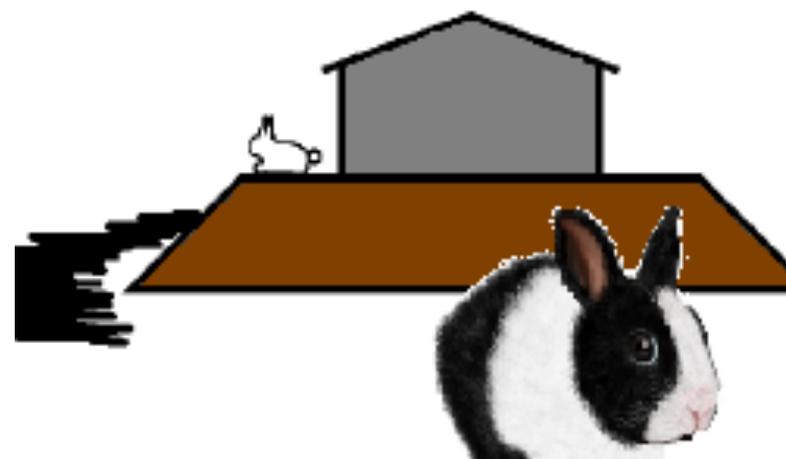
Firewater spray fills bund

- When firewater sprays are activated, they can cause water build-up within the bund.
- If the stock tank is at a very low level, the buoyancy forces on the tank can be very high.
- There have been cases where the tank has started to float, leading to pipework damage and leakage.



Attack by rabbits!

- In one example, rabbits were found to have burrowed into earth bunds causing them to lose integrity!



Disclaimer

- Whilst the Institution of Chemical Engineers has made every effort to ensure the accuracy of the information contained in this training presentation, it remains the responsibility of those responsible for the operations to ensure that the regulations and guidance issued by the authorities are consulted, that an appropriate risk assessment is carried out and that appropriate procedures are stipulated and followed.