

Lecture W16

Explosion during the Destruction of Cartridged Perchlorate-based Emulsion

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Detonation of cartridged emulsion during destruction

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Background

- AEL manufacture a range of cartridged emulsion products in a range of sizes and formulations.
- Cartridged or bulk emulsion waste arise during manufacture.
- Waste is destroyed by open burning at a burning ground in 250kg piles.
- 2 Explosions have occurred at the burning ground 10 years ago when burning larger piles.
- The burning ground was licensed for 3000kg

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What happened ?

- 3000kg cartridged emulsion in 25kg packaging was packed out on the burning ground for destruction.
- Approximately 20 minutes after the burning ground was lit, an explosion occurred that destroyed the entire 3000kg waste.
- There were no casualties or injuries as a result of the incident.
- Windows were broken up to 5 km from the burning ground in the direction of the wind.

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Why did it happen?

- 10 meter spacing and quantity on the waste piles was not maintained.
- Partly burnt waste from a previous burn was not removed.
- Rapid burning occurred due to the wind conditions and the amount of diesel that was applied in a small area.
- Sympathetic detonation distances of burning emulsion are much greater than for cold emulsion and these distances are affected by cartridge clips. These distances are more than double the standard sympathetic detonation distances.

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What did we learn?

- The quantity of waste in a single pile needs to be reduced to 100kg.
- Cartridged product needs to be removed from its packaging.
- Frequent auditing of waste destruction processes are necessary.

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