Back in 2005, there was a dangerous accident that occurred at the Buncefield Oil Depot, which was the largest fire in Europe since World War II. This fire was caused by an overfill of an outdoor storage tank, causing a release of a flammable vapor that was ignited. The overfill safety system for Tank 912 in bund A failed to operate and shut off the supply of petrol to the tank. The petrol would not easily explode, but when a large amount escaped and transitioned to vapor state, it reached a concentration that would support combustion. At 6:01 am on Sunday 11 December 2005, the first of a series of explosions took place. The fire burned for 5 days, destroying much of the depot. Luckily, there were no fatalities from the explosion, but it brought a focus to overfill prevention on a global scale. It was found that a combination of electro-mechanical servo gauges and a failure of the high-level switch combined to allow the overfill event.

When API 2350 was released, it was based on the events of the Buncefield Oil Depot overfill back in 2005. Both API and the MIIB (Major Incident Investigation Board) released new revisions and reports respectively to their standards after reflecting on what went wrong at Buncefield. API RP 2350 was released in 2012 and helped establish good practices. The Buncefield final report was released in 2008 and helped lay out recommended practices for primary, secondary and tertiary containment of a potential overfill situation. These recommended practices covered a wide range of overfill prevention areas from having systematic assessments of SIL requirements to creating a culture where high performance and leadership are expected. The Buncefield reports and API 2350 cover very similar topics relating to overfill prevention.

### Summary Comparison of Recommendations

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Moreover, the Buncefield Standards Task Group submitted its final report of safety and environmental standards for fuel storage sites. In this standard, action levels and response times were recommended based on different tank levels similar to API 2350. These levels correspond to each other and identify where alarm locations should be. As indicated below.

**Action Levels and Responses**

**Buncefield Report**

**Overfill**
- Enough time must be allowed at the level of Tank Rated Capacity (a theoretical tank level) to respond to the final warning (LAHH – level alarm high high), and still prevent loss of containment/damage.

**Tank Rated**
- LAHH should be set at or below Tank Rated Capacity to allow adequate time to terminate transfer by alternative means before loss of containment/damage occurs. LAHH is an independent alarm driven by a separate level sensor etc.
- Ideally, and where necessary, LAHH should have a trip action to automatically terminate filling operation.
- LAH (Level alarm high) is derived from the ATG (automatic tank gauging), part of the process control system. This is first-stage overfilling protection and should be set to warn when normal fill level has been exceeded. It should NOT be used to control filling.

**Normal Fill Level**
- Defined as maximum level to which the tank will be intentionally filled under routine process control.

**API RP 2350**

**CH** (Critical High)
- Required action: Spill management emergency response

**AOPS** (Automated Overfill Prevention System)
- Required action: AOPS activation
- Alarm/alert: Initiates shutdown; alarm optional

**HH** (High High)
- Required action: Alarm and shutdown
- Alarm/alert: Alarm required for tank categories 2 (Semi-attended) and 3 (Unattended); Instrumentation optional for category 1 (Fully attended)

**MW** (Maximum Working Level)
- Required action: None, information only
- Alarm/alert: Alert optional

**(Minimum Working Level)**


Magnetrol® offers a readiness kit for compliance with API 2350. This kit can help compliance with the Buncefield report recommendations with the help of our level control technologies. For more information regarding how Magnetrol can help you comply with the recommended practices of the Buncefield report or API 2350, please visit www.api2350.magnetrol.com.