

## Overfilling Tanks – What Happened?

**September 2006**



*Photograph courtesy of Royal Chiltern Air Support Unit*

On Sunday December 11, 2005, gasoline (petrol) was being pumped into a storage tank at the Buncefield Oil Storage Depot in Hertfordshire, England. At about 1:30 AM a stock check of the tanks showed nothing abnormal. From about 3 AM, the level gauge in one of the tanks recorded no change in reading, even though flow was continuing at a rate of about 550 cu. meters/hour (2400 US gallons/minute). Calculations show that the tank would have been full at about 5:20 AM, and that it would then overflow. Pumping continued and the excess gasoline overflowed from the top of the tank and cascaded down the sides, forming a liquid pool and a cloud of flammable gasoline vapor. At about 6:00 AM the cloud ignited and the first explosion occurred, followed by additional explosions and a fire which engulfed 20 storage tanks. Fortunately there were no fatalities, but 43 people were

injured. 2000 people were evacuated, there was significant damage to property in the area, and a major highway was closed. The fires burned for several days, destroying most of the site and releasing large clouds of black smoke which impacted the environment over a large area.



*Photo  
courtesy of  
Royal  
Chiltern  
Air  
Support  
Unit*



*Photo courtesy of  
Hertfordshire  
Constabulary*

### Did you know?

- Overfilling of process vessels has been one of the causes of a number of serious incidents in the oil and chemical industries in recent years – for example, the explosion at an oil refinery in Texas City, Texas in March 2005.
- The tank involved in this incident had an independent high level alarm and interlock, but it did not work – the cause of the failure is still under investigation.
- A spill of flammable material such as gasoline can form a dense flammable vapor cloud which can grow and spread at ground level until it finds an ignition source, which can cause the cloud to explode.

### What can you do?

- When you transfer material, make sure that you know where it is going.
- When you are pumping into a tank, if the level or weight indicator in that tank does not increase as you would expect, stop the transfer and find out what is happening.
- Make sure that all safety alarms and interlocks are tested at the frequency recommended by the plant process safety management procedures.
- If you have alarms and interlocks which are not regularly tested, ask if they are safety critical and should be on a regular testing program.
- Read the reports about this incident at <http://www.buncefieldinvestigation.gov.uk>

***If you are pumping material, be sure you know where it is going!***