

Fundamental safety management failings formed the basis of Britain's most costly industrial disaster, a new publication reveals

# Root causes revealed for Buncefield explosion

**T**he report into the explosion and five day fire at the Buncefield Oil Storage Depot in December 2005 tells for the first time the full story of the Health and Safety Executive (HSE) and Environment Agency's (EA) investigation.

Drawing on previously unpublished material held back until the criminal prosecution was completed and the appeals processes exhausted, *'The Buncefield explosion: Why did it happen?'* identifies several failings including:

- Systems for managing the filling of industrial tanks of petrol were both deficient and not fully implemented
- An increase in the volume of fuel passing through the site put unsustainable pressure on those responsible for managing its receipt and storage, a task they lacked information about and struggled to monitor. The pressure was made worse by a lack of necessary engineering support and other expertise
- A culture developed where keeping operations going was more important than safe processes, which did not get the attention, resources or priority status they required
- Inadequate arrangements for containment of fuel and fire water to protect the environment.

Gordon MacDonald, the chairman of the COMAH Competent Authority (CA) strategic management group which published the report, says:

'Companies that work in a high hazardous industry need to have strong safety systems in place, underpinned by the right safety culture. Buncefield is a stark reminder of the potential result of a poor attitude towards safety. With estimated total costs exceeding £1 billion (£1.17 billion), this remains

Britain's most financially costly industrial disaster.'

In July 2010, five companies were fined a total of £9.5million for their part in the catastrophe.

The 36-page report highlights a number of process safety management principles, the importance of which were underlined by the failings at Buncefield:

- There should be a clear understanding of major accident risks and the safety critical equipment and systems designed to control them.
- There should be systems and a culture in place to detect signals of failure in safety critical equipment and to respond to them quickly and effectively.
- Time and resources for process safety should be made available.

Once all the above are in place, there should be effective auditing systems in place which test the quality of management systems and ensure that these systems are actually being used on the ground.

At the core of managing a major hazard business should be clear and positive process safety leadership with board-level involvement and competence to ensure that major hazard risks are being properly managed.

The Buncefield explosion was further evidence that the major hazard industries had still not taken on board vital lessons.

A lot of improvements have been made since the event and there continues to be a programme into the future to complete the more complex and longer term improvements. Since the incident the CA and the industry have been working through a staged process to improve safety and environmental controls at fuel storage sites based on the lessons from the incident.

The industry's response to the adoption of new standards for the assessment of safety integrity levels (SILs) for overfill protection systems has been positive. Today, most sites are in the SIL 1 or 2 categories and many have planned or already implemented automatic shutdown systems. Both represent a significant improvement in the standard of overfill protection.

Many operators have also made good progress improving secondary and tertiary containment measures, including lining of bunds, improving bund fire resistance and revising firewater management plans. The CA's work to agree operator improvement plans to implement Buncefield recommendations is reaching its final stages. The CA will monitor progress during its planned inspection programme through 2011-12.

What remains are the more complex improvements that require either plant and processes to be taken out of use, or which require longer term planning, for instance significant civil engineering work. This has to be managed carefully to avoid disruption to strategic fuel supplies.

The CA has a comprehensive programme to monitor progress against the programme agreed with the industry. The CA will take enforcement action where it considers a site is not effectively complying with the law. So far this has not been necessary.

The Process Safety Leadership Group (PSLG), formed in September 2007 to provide an effective framework for interaction between industry, trade unions and the CA.

PSLG's final report for 'Safety and environmental standards for fuel storage sites', was published on 11

December 2009 – <http://www.hse.gov.uk/comah/buncefield/response.htm>.

The PSLG, built on the work of the Buncefield Standards Task Group (BSTG), set up in 2006 to translate the lessons learned from the incident into effective and practical guidance that the industry could implement quickly. PSLG expanded the membership to include the Chemical Industries Association and also took on the task of progressing the implementation of the Buncefield Major Incident Investigation Board (MIIB) recommendations. PSLG also saw a need to raise the profile of process safety leadership throughout the petrochemical and chemical industries in response to criticisms by both the Baker Panel (Texas City) and MIIB that leadership in this area was lacking and a contributory factor to these events.

The types of managerial failings revealed during the Buncefield investigation were often found at other major incidents. The report on the gas explosion at Longford, Australia, identified factors associated with the incident which were also present at Buncefield. For example:

- poor communications at shift handover;
- lack of engineering expertise on site; and
- failure to implement management of change processes.

The Baker report emphasised that process safety protection systems should not rely on operator response to alarms and that overfill protection should be independent of normal operational monitoring. That lesson again must be drawn from the Buncefield incident. ●

**For more information:**  
<http://www.hse.gov.uk/comah/investigation-reports.htm>