Buncefield response

Buncefield – Reflections from a regulator

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I got involved in the Health and Safety Executive's investigation into the causes of the Buncefield explosion when I provided holiday cover for the Principal Inspector leading the technical aspects of the work.

I knew that the part I had played in the investigation was a small one, but it was some years later that I found out just how small. I wanted to give the senior leadership of an Australian regulator I was working for at the time an idea of the resources needed to investigate a major incident of this scale, so I made a freedom of information request to the HSE to get the numbers.

I was one of 62 inspectors who, between us, spent almost thirty thousand person-days finding out what happened and obtaining evidence for subsequent prosecutions. Most of the inspectors spent months on the case; some worked on it for years. I was only there for a few weeks.

When I first arrived at the site, months after the explosion, the extent of the damage to the site and its surrounds was shocking. Nearby trees were stripped of branches, adjacent buildings had their external facades ripped away to reveal crumpled support structures. The devastation resembled a war zone.

During a casual chat with a predictive risk assessor who worked for what was then called the Health and Safety Laboratory, I mentioned that it was lucky no-one had been killed. He nonchalantly dismissed such an alarmist view by pointing out that the explosion could only have happened in the early hours of a winter's morning, so the zoning of the area as light industrial meant that it was unlikely anyone would be present in the event of an explosion.

Figure 2 – Damaged building near the Buncefield storage depot

My role in the investigation was to provide technical and operational oversight of the examination of the electrical and control systems used to manage the flow and storage of product in the tanks.

The site had originally been operated by a single organisation, so the control systems were designed accordingly. Over the years, sections of the process and equipment had been sold to different organisations, which meant the control loops sometime had sensors owned by one company, logic solvers by another, and the intervening cables by a third.

If it wasn't hard enough trying to trace cables and signals

FOI Request for Information on the Buncefield Explosion Investigation.

HID – to end of May 08

	No.	Days spent 05/07	Days Spent 07/08	Days Spent 08/09	Total Days
No. of Inspectors (inc HSE Technical Specialists	62	28,123.09	591.04	114.70	28,828.83
No. of Admin	7	568.32	41.52	5.00	614.84
No. HSE Managers	2	191.00	161.00	25.00	377.00
				Grand Total	**29,820.67**

*** The investigation has been very complex. We are confident that these are the best figures we can obtain at this stage.**

Figure 1 – HSE Freedom of Information Response July 2008

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Figure 3 – The post-apocalyptic landscape we were trying to obtain evidence in

through a post-apocalyptic landscape, by this time, every duty holder involved had engaged lawyers to wage an intense liability-avoidance war.

Usually, safety regulators don't get involved in such squabbles, but the financial stakes were so high on this occasion, that one of the combatants persuaded HSE's investigation team to try to prevent the opposition from getting advanced notice of the direction of the enquiry. They asked for it to be conducted in a way that didn't reveal exactly what circuits and equipment we were looking at. This led to the farcical situation of the investigators conducting tests using coded statements rather than plain speech. So instead of saying, 'I'm checking the continuity of cable X leading to switch Y' over the radio, we had to write each testing step down individually, and refer to them by number. "The result of step 4.2 is positive."

I suspect that we were the first people to have fully traced these safety-critical loops in a decade or more.

I have strong recollections of conversations with the operators of the site who were engaged as liaisons assisting the ongoing investigation and recovery operations. The incident had clearly been devastating for them. They recounted a tale of constant resource-cutting and efficiency drives prior to the explosion that had led to fewer and fewer of them working on the site. One of them had a sense of guilt that maybe there was something they could have done to prevent the explosion.

I don't know what the owners of the site had saved over the years, but I bet it was a lot less than they lost in the explosion.

The failure of a level switch to stop the flow of petroleum into a storage tank proved to be a key factor in the subsequent formation and detonation of a petroleum vapour cloud. The owner of the tank at the heart of the explosion had not ensured that a handle had been padlocked into place to allow the unit to function properly.

One day, I inspected one such switch on a surviving tank operated by the same company. It had no padlock in place. Nearby, separated by a chain link fence, were some other tanks, operated by a different company. Each of their level switches had the necessary padlock. I have yet to encounter a more graphic physical demonstration of the effectiveness of safety culture in preventing major incidents.

About the author

Wayne Vernon was a Principal Specialist Inspector with the UK's Health and Safety Executive at the time of the investigation of the Buncefield Explosion *(pictured)*. He subsequently went on to establish New Zealand's onshore major hazards regime.

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