



FUELLING The Debate

By Rupert Gilbey.
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One year on from the major incident at Buncefield fuel depot in the United Kingdom and the Hertfordshire Fire and Rescue Service has issued a full and frank review of the multi-agency response.



“**T**here are many positive components of the Buncefield response to be shared. As always with major incidents, there are also additional lessons to be considered with the benefit of hindsight,” says Roy Wilsher, Chief Fire Officer of Hertfordshire Fire and Rescue Service (HFRS). His brigade’s report documented the multi-agency response to the massive explosions and fire which took place at the Hemel Hempstead fuel depot on December 11, 2005.

Keen to stress that the overall response – which involved ‘an unprecedented response’ from 32 fire services and four industrial brigades, plus numerous other organisations – was ‘very successful’, the report draws attention to the many ‘positives’. For example, there were no fatalities and a low number of injuries; most of the fuel tanks engulfed by fire were extinguished within 36 hours of the foam attacks starting; the main fire was put out within 60 hours; and significant work was undertaken to minimise the environmental impact, with millions of litres of contaminated water contained on site. The response, says Wilsher, “showed tremendous commitment, professionalism and skills”.

However, with Buncefield amounting to ‘a national logistical challenge never before faced by the UK fire service’, there are also major learning points. In its full and frank report, HFRS provides a step-by-step analysis of how events unfolded and scrutinises the response to this complex, protracted incident.

Based on a review of debriefs, analysis of data and a national survey of fire services, the

report not only provides an insight into what worked well, but also highlights problems and concerns relating to the management of resources and personnel. It sets out 30 recommendations covering issues such as incident command, fire ground and functional sectors, appliances and equipment, and safety and welfare.

Incident command

The report examines the multi-agency command systems set up both at the incident scene, where an HFRS control unit and sector commands were established, and away from the fire ground. These systems were initiated according to the well-rehearsed procedures developed by Hertfordshire Resilience Forum.

Although command systems generally worked well, the report says that some non-blue-light organisations ‘had either devolved limited power to those at the scene or not provided their personnel at the scene with all the relevant information in order to give the best advice’. There were times when multi-agency agreements made at silver and bronze command level were overturned at a higher level.

In addition, the speed of response following a request for information or a decision varied greatly among responder organisations, particularly in the early dynamic stages of the incident. “It was felt that some organisations arrived at decisions by committee processes, rather than by command,” highlighted the report.

Many of the problems with forward control at the incident scene stem from the

sheer scale of the incident and the fact that huge numbers of personnel from different fire services and nationally mobilised teams were operating on the site.

For example, there were occasions when actions were taken by individuals and crews that were not cleared with the chain of command, although these were instances that warranted urgent action and were carried out in a professional manner. There were also disagreements – one instance saw personnel committed inside a bund against the advice of Hertfordshire officers.

As the report makes clear, the incident required dynamic planning on a large scale, with decisions often made under pressure. For example, the incident, functional and sector commanders did not always appreciate the enormity of individual tasks and the complexity of the whole, especially in getting supplies of foam and water to the large foam monitors, and in getting other equipment in place.

With personnel largely unfamiliar with the Buncefield site, there was some confusion on the fire ground. A simple site plan was not provided to personnel until early on December 13. According to the report, it should have been distributed at a much earlier stage.

Another issue was that, as the incident progressed, command sectors were altered to meet changing needs. ‘During changeover periods, there was particular difficulty in informing all crews of all alterations. Following a period of rest, officers returning to the incident were usually allocated to a different role and different sector, so some previously gained knowledge was lost.’

However, the report stresses that there were many examples of good action planning – for example, in withdrawing personnel from extremely dangerous situations at critical moments for safety, such as when the integrity of a tank was called into question, and then recommitting crews at appropriate times.

Inner cordon management

Of major concern was the lack of an inner cordon at the site to control resources and maintain safety. As the report states, 'there is no evidence that procedures for inner cordon management were employed while the bulk of fire fighting was taking place. Personnel from supporting fire services and industry did not appear to support the principles of cordon control.'

As one fire officer stated in the early stages, there was little access to management and anyone who wanted to turn up, could. In fact, the report says poor personal discipline resulted in some personnel entering the risk area without permission and undertaking tasks outside any agreed action plan. Furthermore, a series of site withdrawals were required during the incident, yet no formal head counts were carried out. Instead, evacuations were on a 'the area is clear' policy.

Among a series of recommendations relating to incident command issues, the report emphasises that all local authority fire services should work to the current edition of the Fire Service Manual on incident command, and that other responders should be aware of the incident command system and be able to integrate their working practices to ensure a safe system of work. It also calls for structured inner cordon procedures to be implemented and maintained at major incidents; and says a national system is needed to maintain an accurate record of all fire responders at the scene.

The review also found little evidence of a safety officer being appointed on site, particularly during the fire fighting stage – a measure recommended in the Fire Service Manual. It says that a series of safety officers to survey operational sectors, identify hazards and advise sector commanders would have been 'advantageous'.

Managing resources

When it comes to the management of equipment and resources during the incident, a key recommendation of the report is that local resilience forums should develop a single coordination centre for the acquisition and distribution of all generic resources for all agencies during major incidents. This stems from the difficulties experienced in obtaining appropriate resources and getting them to the incident scene.

For example, the report says the lead-in times to establish supply chains and to order bulk consumables was often longer than what was ideal to keep the fire response operating at full potential. 'There was frustration that resources (such as diesel and antifreeze) were not available in the timeframes that personnel were used to at smaller incidents.'

Another concern was that there was a lack of broad awareness among commanding officers and crews about what specific tasks

had been allocated to whom, leading to some duplication of tasks, particularly with the ordering of supplies.

The movement of equipment and fire fighting personnel around the site also brought its fair share of problems. 'During the early stages, resources became confused as vehicles and equipment built up without adequate tracking or parking systems. The simple basics of reception, logging and key control of vehicles would have assisted,' says the report. It recommends that a strategic holding area with adequate facilities is established for incidents requiring national deployment. Vehicles should be mobilised from that area to the rendezvous point close to the incident and then committed to forward deployment.

In addition, the initial system of allocating specific crew/officers to relieve others did not operate well, with incoming personnel often unable to find the crew or officer they were due to relieve. Also, there was

Other Findings

The report also covers a range of other issues and recommendations, including:

- Local and national assessments of the likelihood of further incidents should be undertaken prior to the release of fire and rescue service resources under national mutual aid.
- Fire services should establish mutual aid arrangements with industrial brigades.
- Systems and procedures are needed to enable national deployment and extended working of fire service resources to be implemented and tested between the Fire and Rescue Service National Coordination Centre and others.
- Non-uniformed specialists were under utilised in areas where their wider skills could have assisted the response – for example, by providing administrative assistance to fire officers at multi-agency commands.
- Not all appliance crews deployed to the fire ground were given an overview of events that had occurred or the future action plan.
- There were no overload problems on the mobile phone network but there was congestion on the radio systems and poor reception at times. A more robust communications system should be developed, particularly for senior officers.
- Crews reported that their helmets caused significant discomfort when worn for long periods and also created difficulties in hearing commands. This led to helmets being removed at inappropriate times within risk areas. The report suggests that earpieces be introduced to enable communication while wearing a helmet.
- Considerable efforts were made to contain all fluids to prevent pollution of watercourses – for example, bunds were monitored to ensure there was no overtopping of foam or leaks.
- HFRS should introduce an effective recording system for all levels of command.
- Crews, particularly retained personnel, should be given advanced warning of redeployments for an extended period.
- There were no debriefs in the immediate aftermath of the incident – a national system is needed to enable 'hot debriefs' to take place, issues to be recorded, and any urgent issues to be resolved.

insufficient provision of cars and minibuses for crews to move around the site or to rest accommodation.

Some appliances became tied up at the incident, so their crews required alternative transport and they were advised to take another appliance. This had knock-on effects – for example, some appliances left the site with less than the full complement of equipment, and significant time was needed to reallocate or restock items; and other appliances were not returned to home stations, exacerbating the problems of ensuring county-wide fire cover.

Specialist equipment

The report also explores the supply and use of specialist equipment at the incident, in particular the high-volume pumping appliances deployed under the New Dimension programme and various fire fighting foam equipment. With the site's internal fire main and pump houses destroyed in the blast, crews used one accessible water supply in the southwest corner of the site and an offsite balancing tank nearly 2km away. In their first significant national deployment, the high-volume pumps were used to supply water to the site. Some 13 fire services provided crews for the pumps and the Fire Service College released its high-volume pump instructors to assist.

Based on this experience, Hertfordshire recommends that:

- A team of high-volume pump national operational and tactical advisers should be trained and equipped to be deployed anywhere in the UK. This could be extended to cover all national New Dimension resources.
- The New Dimension programme should consider the provision and supply of special ramps to enable vehicles to drive over large-capacity hose.
- Offsite water supplies and their access should be considered when preplanning for foreseeable incidents at facilities such as Buncefield.

A broad range of foam production and application equipment, which arrived from around the country, was used to fight the fuel tank fires. Some 786,000 litres of foam concentrate was used, with foam monitors operated by fire crews and personnel from

Buncefield fuel depot on December 11, 2005.

industrial brigades.

The report highlights some issues relating to the use of foam. For example, there was unfamiliarity with the range of foam equipment at the scene so, as one fire officer noted, 'specialist foam equipment and training of relief crews on the job was a little fraught'. Some of the foam was delivered in relatively small containers, rather than bulk containers.

As another officer noted, 'getting foam concentrate from a 25-litre container into a 1,000-litre container would take almost an hour; clearly the small containers were not useful at all'. In addition, there were often no common couplings to enable the foam to be moved from tankers to fire service pumps and foam systems. 'This required a great deal of practical fire fighting skills and innovation to make up adapters to decant foam from differing vessels,' says the report, which calls for further consideration of the various problems faced.

There were further problems with the application of the foam. 'On occasions during the incident, application could have been carried out more efficiently. The balance between cooling and maintaining the foam blanket was not clearly understood by all personnel,' explains the report. Even with industry and international experts assisting, it was difficult to calculate the total amount of foam required, it adds.

Safety and welfare

The report also illustrates the difficulties in providing welfare arrangements for large numbers of fire fighters during a major incident. It says welfare was considered early on and adequate provision for refreshments put in place with the help of the voluntary sector, although there were initial problems getting adequate refreshments to frontline crews. In the light of this, Hertfordshire recommends that the provision of toilets, washing facilities and rest areas should be a component of multi-agency response plans.



Similarly, health and safety issues were at the forefront of all decision-making, with safe systems of work deployed throughout. The report says that 37 accidents were recorded over the 26 days that the fire service was on the site. Sixteen of these were back or leg pain caused by ill-footing boots, and 13 were from the effects of breathing in fumes. Given the significant debris spread across the site from the explosions, treacherous underfoot conditions, and the manual labour involved in running out, by hand, 5km of hose, it is perhaps surprising that the number of injuries was so low.

Hertfordshire's report provides a comprehensive insight into Buncefield and is sure to enable national and international learning on the response to major incidents. The success of the multi-agency response shows that, by and large, effective arrangements are in place for major incidents, yet the review clearly identifies the need to develop 'smarter ways of working', and to formalise some procedures and ensure they are better implemented at incidents.

Buncefield: Hertfordshire Fire and Rescue Service's Review of the Fire Response is available for £45 per copy, on tel: +44 (0)870 600 5522; e-mail: customer.services@tso.co.uk; website: www.tsoshop.co.uk.

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Roy Wilsher, the Chief Fire Officer of Hertfordshire Fire and Rescue Service, will be speaking about the Buncefield incident at FPA Australia's HazMat 2007, which will be held in Sydney on May 10-11. For further details on the conference, please refer to the ad on page 4 of this edition of the journal. ■