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Sharing the load

We should move beyond outdated regulation and old prejudices, and accept the vital need for sprinklers to protect modern single-storey warehouses, says **Stewart Kidd**

IT TOOK the death of a firefighter in a supermarket blaze in 1996, several high-profile 'do-it-yourself' superstore fires and concerted efforts by several MPs before restrictions on the uncompartmented size of single-storey retail premises were introduced in the form of 'no greater than 2,000m^2 or sprinkler protection'. This recommended maximum limit for an unsprinklered compartment in a retail premises was included within Approved Document B (ADB), the guidance to the fire safety aspects of the Building Regulations in England and Wales, during an update in 2000.

In 2007, during the most recent review of ADB, there were numerous submissions to Communities and Local Government (CLG) proposing that similar restrictions on the recommended uncompartmented size of single-storey warehouses should be added to the guidance. The submissions suggested that the guidance should be revised so that unsprinklered warehouses are 'capped' at, variously, 2,000m^2 to 9,000m^2.

CLG accepted that there was an argument for an upper limit, but did not accept that there was a sufficiently robust argument for a restriction of 2,000m^2, in line with retail premises. As a result, 20,000m^2 (or 18m high) was imposed as the recommended maximum uncompartmented or unsprinklered size for single-storey warehouses.

To put the size of such a warehouse into perspective, around 2.8 Wembley Stadium playing surfaces would fit

into its footprint. It has to be said that there are few warehouses of this size, and general opinion is that few are ever likely to be built.

Discussions with CLG indicate that the reasons for its rejection of the proposals for a much smaller 'cap' relate principally to its view that there are 'no significant life safety issues with regard to warehouses' and that such measures would not be cost-effective. This argument, that fire regulations and fire precautions in buildings should be driven only where there is significant life loss, has been used for many years by CLG and its predecessors to explain their reluctance to introduce additional fire safety measures, as ADB only contains recommendations for life safety.

However, this argument can no longer be justified as the Building Regulations more generally now relate not just to life safety, but to site preparation, energy conservation, acoustic insulation and access to buildings, with various Approved Documents providing guidance on these issues. (Moreover, an enhanced version of ADB incorporating property protection and business resilience issues is now available from the Fire Protection Association).

In considering the matter that 'life safety is what really matters', it is perhaps useful to recall that the statutory functions of the fire and rescue service in England and Wales, as outlined in the Fire and Rescue Services Act 2004, include a duty to protect 'life and property in the event of fires'. Given all of which, it seems legitimate to question why CLG declines to consider wider, property-related interests in determining the extent of the fire protection of buildings.

Fires in warehouses

Data for fires in warehouses are remarkably hard to come by – due in part to the way in which national fire statistics are collated. There is no specific category for 'warehouses' – such fires are contained in much broader groupings and could, for example, be included in the 'Other industrial premises', 'Retail and vehicle trade premises' or 'Other premises' categories. In 2006, there was a total of four deaths and 458 injuries in 4,427 fires across these types of premises. FPA statistics for UK fires with damages exceeding £250,000 record 20 fires in warehouses (with a total cost of almost £19m) in the period June 2007 to May 2008.

Admittedly, there are relatively few very large fires (probably fewer than 100) in warehouses each year, and death and injury to occupants remains low. However, setting aside the partisan arguments from the sprinkler industry, the rationale for fitting sprinkler systems in large single-storey warehouses is very convincing and relates to the wider impact of such fires, in terms of:

- risks to firefighter safety
- impact on the environment
- impact on jobs and the economy
- comparisons with limits in other European Union member states (in some European countries, the threshold where sprinklers have to be installed varies from 800m^2 to 3,000m^2)

Firefighter safety

It is hard to see what more can be said with regard to the dangers of fighting fires in large single-storey buildings, particularly where the layout and contents are unknown to responding crews. It is generally accepted that sprinklers in fully protected buildings provide such a high probability of successful containment or extinguishment that it is most unlikely that firefighters responding to a fire in such a building would be exposed to significant risk from the fire or its products.

Environmental costs

There are now some widely accepted data on the impact of atmospheric carbon dioxide on global warming, and there can be few who doubt that fires are intensely polluting. Research by Dr Jim Marsden on carbon dioxide emissions from building fires (see *Fire Risk Management*, January 2009, p.21) and more recently the FM Global report, *The influence of risk factors on sustainable development* (Gritzo *et al*, 2009) confirms that fire protection can play a role in minimising this. A fire in any large structure must be seen as potentially a major contributor to airborne pollution, as well as having a significant impact on groundwater and land resulting from fire suppression and firefighting water run-off.

Economic costs

Despite acknowledging that fires cost the UK some £7.7bn, there still appears to be a reluctance by the Government to accept that the impact of fire on the economy is a subject

Relatively few large single-storey buildings in the UK have sprinklers

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Electrical machinery in modern warehouses is a potential source of ignition

worthy of consideration. The usual response to those who try to argue this point is that financial loss is a matter for the property owner and their insurers.

Insurers have always been concerned to mitigate the losses that might occur from fire and prove this tangibly, not only in their funding of fire safety initiatives but also by putting requirements for basic fire precautions into their policy wording. In most cases, such requirements relate to the need for fire safety management, the presence of portable fire extinguishers, and fire detection and alarm systems.

No insurer has a blanket requirement for automatic fire suppression systems, but all accept that where such systems are provided, benefits for insured and insurer can be significant. Not only will policy excesses be reduced, but premiums can be discounted by as much as 65%. In the case

Staff may not know what loads contain and the hazards that may arise


Erik de Graaf/Fotolia

of a large warehouse, over five years this may be enough to pay for the cost of the sprinkler system.

However, in reality, relatively few large single-storey buildings in the UK are sprinkler protected, and this omission may bear some responsibility for the current high level of property damage. Even though there has been a significant reduction in the number of fires, an increase has taken place in the cost of fires in non-domestic premises. Equally concerning is the number of deliberately set fires, which has begun to climb after the successes in arson reduction in the period 2000-2006.

The Association of British Insurers reports that the cost of fire damage in 2008 rose by 16% on 2007, to a record £1.3bn. In fact, the cost of fires has been rising consistently since 1994, when fire losses were put at £600m. So, at a time when the number of fires has been dropping dramatically, the cost of fires has more than doubled.

It is clear that policy-makers are aware of this situation, but continue to believe that the solution is solely a matter for the insurance industry. However, if the insurers responded collectively to restrict their losses, they would be in danger of breaching competition law. For example, should insurers decide to require that all warehouses larger than, say, 4,000m^2 must be sprinklered as a prerequisite for the purchase of insurance, this arrangement would rightly be referred to the courts.

Classification of occupancies

While the cost of property fires has the insurers worried, there are wider issues to be considered and a need for a reappraisal in the way we do things – in particular, the way in which building use/occupancy is classified.

Table D1 in Appendix D of ADB lists purpose groups. 'Shop and commercial' are listed in Group 4, while 'Industrial' is Group 6 and 'Storage and other non-residential' is Group 7A. However, while this way of depicting occupancy was appropriate 50 years ago, it no longer bears any resemblance to the way many of these buildings are constructed and used. How can a single grouping for retail premises be meaningful when that category includes both a one-room village shop and a multi-floor department store?

More importantly, given that the same premises can be used for Group 4, 6 and 7A – occupancies with no structural modifications – there is the possibility that changes of use can bypass the Building Regulations altogether. Many locations where speculative single-storey buildings were constructed as warehouses have since been modified to become factories and even retail premises in the form of factory outlets. There are premises, such as builders' merchants, where the same building serves as retail and warehouse – and even some which serve as retail, warehouse and industrial premises.

Even in very modern buildings, there can be confusion over the correct classification of use. The growth of online

retailing has introduced a new hybrid type of building: a storage occupancy used for the picking, packing and dispatch of consumer goods. Is this Group 5 or Group 7A – or a new Group altogether?

What is clear is that the number of people at risk in such buildings is much greater than the 'traditional' warehouse, where staff tend to be based in a separate, brick-built office extension. Not only are more employees at risk in these hybrid buildings, but the fire risk must be greater as a result of increased fuel loading (large amounts of combustible packaging), sources of ignition in the form of electrical machinery (conveyors, tugs, shrink wrappers, hydraulic pickers, etc) and frequent vehicle movements in and out of loading bays.

Modern practices

In 'pure' warehouse occupancies, new technology and working practices have created additional problems for the warehouse manager. With increasing use of third-party logistics, it is not difficult to see a situation where the on-site manager of a warehouse might have no idea what is stored in his building.

Consider this: a Polish registered truck with a mixed load picked up in Germany and Belgium arrives at a warehouse in England at 4am. The palletised load is unloaded and stacked in various bays dictated by the warehouse computer, splitting up the load to maximise use of empty space. Only the computer knows what is on the pallets and where they are. By noon the following day, the computer will arrange for a load or part load to be removed from the warehouse, loaded on another truck and transported to its final destination. The warehouse staff will probably not know what goods the pallets contain, or whether the locations where they are stored will create a hazard by bringing together items which can react to each other.

Given this degree of automation, has anyone considered how the responsible person's duties can be carried out in respect of fire risk assessments and the control of dangerous substances under Articles 12, 16, 19 and 20 of the Regulatory Reform (Fire Safety) Order 2005 in England and Wales?

Considering the issues of fire spread, environmental protection and firefighter safety, it is clear that installing an automatic sprinkler system is one of the most effective methods of protecting a warehouse, its staff and contents. So, surely it is now time to review the way in which the construction of large single-storey buildings is regulated. We should move beyond old, irrational prejudices and accept that, certainly as far as large warehouses are concerned, sprinklers are a panacea ■

Stewart Kidd is secretary general of the British Automatic Fire Sprinkler Association

This article does not necessarily represent the current position of BAFSA or its Council