



Factories risk review

Large loss fire data on modern factories come under scrutiny, as **Adair Lewis** draws out specific risks and suggests ways of addressing them

THE IMAGE of grubby buildings belching smoke, set in an industrial landscape populated by Lowry-style matchstick men is now far from the reality of modern factories. Most modern factories are smart, clean environments – some scrupulously so – and the change in character has brought with it a corresponding change in the fire hazards present.

A welcome difference from most other industrial and commercial sectors is the (relatively) low occurrence of arson, with those being deliberately lit accounting for just 10% of all fires. An interesting feature of the statistics for fires in factories is that there appears to be a relatively uniform spread of fires during the various times of the day. The variation is from 20% in the afternoon to 29% in the morning, which seems to contradict the often cited theory that accidental fires increase during the work period as staff become tired.

One of the biggest problems experienced by the fire and rescue services at factory fires relates to access to the site. Over a third of their difficulties relate to access, which highlights the need to provide adequate parking space for staff and deliveries, and to maintain clear, unobstructed access and turning areas at all times for the emergency services.

The presence of acetylene cylinders has also been problematic, but it is hoped that the new fire service operational procedures and greater awareness among factory managers of the need to minimise the occurrence of this hazard will reduce these incidents.

Problems with inadequate water supplies and resources may well be associated with large factory fires, reflecting the incompatibility of fire compartmentation with day-to-day operational requirements in many factory-based businesses.

The property losses associated with the large fires in this survey make for sad reading: while factory fires

account for just 2.8% of all industrial processing fires, they account for 16.8% of the total loss. Each of the factory fires in this survey cost, on average, very nearly £2 million.

Fire hazards

In addition to the potential ignition sources present in most businesses, there are a number of additional hazards associated with industrial factories, including:

- sparks produced as a result of welding and cutting of metal using oxyacetylene, oxygen/propane, electric arc welding and other hot work processes
- cylinders of acetylene stored on the premises
- heating used during fabrication processes using ovens and furnaces
- heating produced by friction from poorly maintained machinery and from processes such as drilling, boring and countersinking
- static electrical charges from movement during processes accumulating as a result of poor bonding and earthing of conductors
- explosions occurring as a result of the release of flammable liquids and gases from compressed gas cylinders
- the formation of dust clouds in the atmosphere in sufficient concentration to form an explosive atmosphere
- electrical fire hazards from poorly maintained electrical equipment and installations, and the excessive use of extension leads
- deliberate fire raising
- breaches of the fire compartmentation of the building
- combustible materials, waste (including waste oil) and idle pallets stored outside
- inadequate water supplies for firefighting purposes

Sector Main Category: Industrial Processing**Sub Category: Industrial Manufacturing – Factory**

Industrial Processing fires account for 31.3% of all large-loss fires.

Industrial Manufacturing – Factory fires account for 2.8% of all large-loss fires and 16.7% of all Industrial Processing fires.

Causation	Accidental	Deliberate	Unknown
Industrial Processing	59.1%	15.0%	25.8%
Industrial Manufacturing – Factory	66.3%	10.0%	23.8%

Time of fire	Midnight - 6am	6am - Midday	Midday - 6pm	6pm - Midnight
Industrial Processing	27.3%	18.0%	25.9%	28.7%
Industrial Manufacturing – Factory	24.0%	29.3%	20.0%	26.7%

Impedances	Access	Acetylene	Inadequate Water Supply	Resources
Industrial Processing	38.8%	33.8%	16.3%	11.3%
Industrial Manufacturing – Factory	36.4%	18.2%	27.3%	18.2%

42 Industrial Processing fires out of 479 had impedances, 8 of these had more than one impedance.

6 Industrial Manufacturing – Factory fires out of 80 had impedances, 0 of these had more than one impedance.

Addressing the problems

Review the fire risk assessment whenever there are significant changes to the number of staff, the layout of the premises or the processes being carried out. Ensure that measures identified in the fire risk assessment – and the Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) assessment where appropriate – are implemented effectively by competent persons.

Identify appropriate hazard zones in the DSEAR assessment (where undertaken) and train staff in the implications of these in the context of the materials being handled and operations being carried out. Where flammable liquids are in use, refer to RISCAuthority Recommendations RC55, 56 and 57.

Wherever possible, eliminate hot work and minimise the number of acetylene cylinders on the site. Control hot work by use of a hot work permit system in accordance with RISCAuthority Recommendations RC7.

Where it is necessary for processes to operate unattended, carry out a fire risk assessment to ensure compliance with RISCAuthority Recommendations RC42.

Minimise the spread of fire by ensuring effective fire compartmentation between manufacturing areas and those used for other purposes, particularly for storing packaging materials.

The storage of combustible materials outside the premises should be minimised. Wherever practicable, combustible waste should be stored in enclosed metal skips or bins sited at least 10m clear of all buildings and 2m away from boundary walls or fences.

Following any work that requires breaching the fire compartmentation, ensure that suitable fire stopping is undertaken to maintain the designed fire rating of the structural elements concerned.

Site overhead heaters so as to provide at least 2m clearance from combustible materials. Heaters should not be positioned so as to direct hot air towards nearby

composite panel walls, whether these form internal or external elements of the structure.

Ensure that electrical installations are designed, installed and periodically tested by a competent electrician in accordance with the current edition of BS 7671 (the IET Wiring Regulations). Inspections should be carried out on a risk assessed basis as recommended in the Periodic Inspection Report.

Where 24-hour shift working is not in operation, monitor the automatic fire detection and alarm system either on-site or via an off-site alarm receiving centre.

When a new facility is at the design stage, give serious consideration to the installation of an automatic fire suppression system, such as water sprinklers. Sprinkler systems should be designed, installed, commissioned and maintained in accordance with the LPC Sprinkler Rules.

Provide a suitable number of appropriate portable fire extinguishers, which should be provided even where a sprinkler system is installed.

In large buildings, give consideration to the installation of smoke venting systems to prevent smoke logging, for both life safety and property protection purposes. This may be a requirement of the fire and rescue service.

Liaise with the fire and rescue service to ensure that water supplies are adequate for the sprinkler installation and for firefighting purposes. Make arrangements to retain firefighting water in the event of an incident.

To ensure the resilience of the business, have an effective emergency plan in place. One way of approaching this is to complete the ROBUST business continuity and incident management planning software, which is available free from <https://robust.riscauthority.co.uk/> ■

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These statistics are based on information supplied by loss adjusters to the FPA on a voluntary basis and not all insurers conducting business in the UK contribute to this dataset. They represent only sums paid out where the total loss is in excess of £100k and are deficient of losses under £100K, deductibles, underinsurance, uninsured, self-insured and captively insured components, which may be significant. In a year, total losses captured typically account for 50% of the ABI declared annual fire loss figure – which is similarly deficient of the same components (except the £100k threshold).