



# Industrial mills risk review

In his column this month, **Adair Lewis** analyses data relating to large-loss fires in industrial mills

**T**HE WORD 'mill' nearly always conjures up heritage connotations. From the old windmills of medieval times to the steam-powered mills of the Industrial Revolution, mills are associated with historic structures of a specific style. It is therefore somewhat surprising that the RISCAuthority large loss statistics still record fires in mills as accounting for 26.8% of all industrial processing losses, with an average loss of £13,453,559 per fire. This compares with an average loss in the order of £2 million for industrial processing fires as a whole.

Mills are clearly still big business, although they are no longer so dominant on the skyline. Thankfully in terms of numbers, mill fires account for just 0.6% of all large loss fires – but when one occurs, it is big! This is perhaps not surprising when it is realised that many of these incidents involve paper mills, some of which also undertake paper recycling. The waste processing industry has in the last couple of years been identified as a source of major losses for insurers and several initiatives are now in progress to address this issue. As the value of the paper itself is relatively modest, more than 54% of losses in mill fires are attributed to business interruption.

Although there is an element of arson (23.5% of all fires), the majority (58.8%) are recorded as being of accidental origin, which is largely comparable with industrial processing fires as a whole. The fire and rescue service reported an impedance in only one of the 18 major mill fires featured in this study, with a reported presence of acetylene cylinders on site. In view of the very large quantities of paper at many of the fire scenes, it is satisfying that inadequate water supplies have not been reported as a problem.

## Fire hazards

There are a number of fire hazards associated with mills, including:

- sparks produced as a result of the 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 by friction from poorly maintained machinery
- static electrical charges accumulating from poor bonding and earthing of conductors
- explosions occurring as a result of the release of flammable liquids and gases from compressed gas cylinders in poorly ventilated areas
- the formation of dust in the atmosphere in sufficient concentrations to form an explosive atmosphere
- electrical fire hazards from poorly maintained electrical equipment and installations
- deliberate fire raising
- combustible materials, waste (including waste oil), and idle pallets stored outside

## Addressing the problems

It is important to ensure that measures identified in the fire risk assessment (and DSEAR assessment, where appropriate) are implemented effectively by competent persons.

At the time of the risk assessment, give careful consideration to the likelihood of deliberate fire setting and the implementation of suitable measures to maintain the security of the premises and minimise the vulnerability of stocks of combustible materials stored outside the premises, especially during hours of darkness.

Review the fire risk assessment whenever there are significant changes to the number of staff, layout of the premises or scale of external storage.

Aim to eliminate hot work wherever possible, but if it cannot be avoided, then eliminate the use of acetylene by using other forms of welding and cutting, if practicable. Control the work by using a hot work permit system. Where the use of acetylene cannot be eliminated, minimise the number of acetylene cylinders held on site.

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

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

Industrial Manufacturing – Mill fires account for 0.6% of all large-loss fires and 3.8% of all Industrial Processing fires.

Causation	Accidental	Deliberate	Unknown
Industrial Processing	59.1%	15.0%	25.8%
Industrial Manufacturing – Mill	58.8%	23.5%	17.6%

Time of fire	Midnight - 6am	6am - Midday	Midday - 6pm	6pm - Midnight
Industrial Processing	27.3%	18.0%	25.9%	28.7%
Industrial Manufacturing – Mill	31.3%	25.0%	31.3%	12.5%

Impedances	Access	Acetylene	Inadequate Water Supply	Resources
Industrial Processing	38.8%	33.8%	16.3%	11.3%
Industrial Manufacturing – Mill	0.0%	66.7%	0.0%	33.3%

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

1 Industrial Manufacturing – Mill fires of 18 had one impedance.

In addition, minimise the storage of combustible materials outside the premises. Small quantities of combustible waste should be stored in 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 in accordance with the *FPA Design Guide for the Fire Protection of Buildings: Essential Principles*, in order to maintain the designed fire rating of the structural elements concerned.

Make sure you locate overhead heaters to provide at least a 2m clearance from combustible materials. Heaters should not be positioned in such a way that they direct hot air towards nearby composite panel walls, whether these form internal or external elements of the structure.

Electrical installations should be 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. Arrange for portable electrical equipment to be inspected and tested at least in accordance with HS(G) 107 and/or the IET Code of Practice for in-service inspection and testing of electrical equipment. A risk assessment should be used to determine the actual programme of inspection and testing.

The building should be protected by an automatic fire detection and alarm system that is designed to take into account the need for property protection and is installed by an organisation certificated by an independent, UKAS-accredited third party certification body. The installation should be to a recognised category of installation, in accordance with BS 5839-1, as determined by a risk assessment and in consultation with the insurer. Monitor the system either on site or

by means of an off-site alarm receiving centre, certificated by an independent UKAS-accredited third party certification body and operating in accordance with a Category II facility, as defined in BS 5979.

Give serious consideration to installing 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, incorporating BS EN 12845.

A suitable number of appropriate portable fire extinguishers that are immediately accessible in the case of fire should be provided – fire extinguishers should be provided even where a sprinkler system is installed. Designated staff need to be trained in their use.

In large buildings, consider 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.

Water supplies must be adequate for the sprinkler installation and for firefighting purposes. Make arrangements to retain firefighting water in the event of an incident and ensure that any hydrants on site are prominently signed, regularly maintained and kept clear of obstructions. Appropriate hazardous material warning signs must be prominently displayed at the entrance to the site and on each building.

Ensure that access to all parts of the site is readily available to the fire and rescue service on its arrival.

An effective emergency plan must be in place to ensure the resilience of the business. 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).*