Safeguarding high-hazard facilities

How fire-risk assessments can save lives and money

High-hazard sites in the firing line

Fires can have a devastating impact on high-hazard industrial, manufacturing and commercial facilities.

For sites such as petrochemical and gas plants, airports, marine ports, manufacturing facilities and oil refineries, the presence of high fuel loads means the fire danger to property and people is at the extreme end of the scale.

If lightning strikes, or accidents occur during refuelling or the unloading of cargo, the consequences can be catastrophic when appropriate fire-suppression measures are not in place. The risk of fires in data centres – and subsequent shutdowns of the affected business – as a result of the heat produced from electrical equipment can also cause crippling downtime repercussions.

In the event of a serious fire, the fallout may result in a range of after-effects such as:

- **Property damage** – the need to rebuild infrastructure or replace high-cost equipment and items could threaten a business's future.
- **Business interruption** – long periods of downtime can ruin revenue streams and cause customer dissatisfaction due to delayed shipments and missed deadlines.
- **Environmental harm** – air pollution, water contamination and soil and forestation damage as a result of fires can cause reputational damage, or result in Environmental Protection Authority investigations.
- **Insurance cost blowouts** – after a significant fire, premium rises are common
- **Legal implications** – major industrial fires can cause legal disputes involving liability claims or regulatory fines.

Combatting some or all of these threats should be standard practice for big industrial plants or manufacturing facilities.

Crunching the numbers

The financial impost of fires on major industrial sites and businesses can be debilitating, with international research highlighting the risk.

$1.15 million – the mean average loss for a business per fire incident in the United Kingdom.

The Fire Protection Association (FPA) in the UK analysed 4782 major fires between January 2009 and December 2019 and put the losses per incident at £657,074, or about $1.15 million.

US$1.2 billion – the total estimated property damage to industrial and manufacturing properties in the United States each year.

This research was conducted by the National Fire Protection Association in the US.

In Australia, specific figures related to industrial fires are not available, but it is telling that one disaster – the 2019-20 bushfires – caused the loss of 34 lives and an estimated $100 billion in overall economic damage. While these fires were not restricted to industrial sites, they devastated many manufacturing plants and businesses.

For facility owners and managers, such figures underline the risk of complacency with regard to fire-prevention strategies. One of the best ways to safeguard properties is through rigorous and regular fire-risk assessments. Rather than seeing fire-prevention initiatives as a cost, they should be seen as a standard business practice that helps ensure that a business can keep running smoothly and safely.

The value of fire-risk assessments

Facility managers have a responsibility to look after their properties, people and the environment. This means they should be alert to fire risks, as well as overseeing the inspection, servicing and maintenance of fire-prevention equipment.

In some cases, high-hazard sites will be subject to specific National Construction Code of Australia rules, while voluntary fire-risk assessments are advisable for at-risk facilities. The advantages of such assessments include the following five factors

1. Evaluating and identifying a site's potential fire hazards and possible sources of ignition and fuel risks.
2. Minimising downtime from fire events.
3. Getting clarity on the performance of any existing fire-detection and fire-suppression systems.
4. Receiving advice on desired fire-safety training and education for internal fire wardens.
5. Saving lives and property through the prevention of major fires.

How they work

A fire-risk assessment involves a detailed review and evaluation of a building or a facility for fire risks, along with the provision of advice on how to either eliminate the risk or mitigate it.

Properly carried out by experienced fire-prevention specialists, these assessments can provide a clear picture of current fire threats and form the basis of an action plan for businesses as they seek to safeguard their assets.

The relatively small cost of such a test could potentially save hundreds of thousands of dollars, or even millions of dollars, if it helps prevent a fire. The truth is, however, that many businesses see fire-prevention measures as a cost impost only, rather than a normal part of best-practice business. The danger for businesses that fail to prepare for fire risks is that they are unlikely to ever recover from a serious fire event.

Specific factors to consider and check

Any fire-risk assessment should include checks of the following items or issues:

- Emergency exit routes and emergency lighting, sprinklers and fire doors
- Fire-detection and warning systems such as fire alarms and smoke detectors
- Equipment such as fire extinguishers, hose reels and water-supply infrastructure
- Emergency fire-evacuation plans
- Measures to protect vulnerable people such as the elderly, children and those with a disability. Facility owners and managers who take proactive steps to assess and prevent fire risks have the peace of mind of knowing that their people and properties are as a safe as they can possibly be if a fire breaks out.

An action plan – 7 steps to minimise fire risks

For high-hazard sites with significant fire risks, some or all of the following actions may be appropriate as businesses seek to protect their assets. These decisions should be made in consultation with qualified fire-prevention and fire-suppression experts.

1 Deploy modern lightning avoidance systems

As one of the biggest threats to petrochemical facilities and other fuel-heavy sites, lightning-avoidance systems have superseded traditional lightning rods. Such systems combine lightning protection, grounding and surge suppression to create an 'isolation zone' that impedes direct strikes to a site and minimises the impact of nearby strikes.

2 Train staff in fire-safety procedures

Training is crucial as part of an emergency plan to ensure that, in the event of a fire, staff know what to do and how to evacuate the site safely. External and internal training is typically suggested.

3 Use premium firefighting foams and powders

Synthetic and biodegradable protein firefighting foam concentrates can put out or contain a wide variety of fires, including petrochemical blazes that are often linked to gas and petroleum tanks.

Choosing the most appropriate types of foam – the two broad categories are aqueous film-forming foams (AFFFs) which contain fluorinated surfactants, and fluorine-free

foams – is essential for protecting fuel supplies given that such foams are often subject to strict management and containment rules.

For manufacturing sites, sophisticated dry-powder fire-fighting agents are extremely effective at inhibiting the chain reaction of combustion while coating the surface of the burning material. The coating separates the fuel from the oxygen supply and prevents re-flash.

4 Insist on quality hardware systems and equipment

When fighting hazardous chemical fires, the best fixed and mobile high-volume foam delivery systems are required. Such fire-suppression tools must be able to withstand a hostile and highly corrosive environment while also being easy to maintain. Firefighting foam is typically applied in two ways – non-aspirated, through water nozzles, sprinklers or deluge nozzles; and aspirated, through foam-making devices such as branchpipes, top pourers, foam cannons, foam sprinklers or high-expansion generators.

5 Take advantage of gaseous suppression techniques

Gaseous suppression is a highly effective form of fire control that starves a blaze of the air it needs to continue burning. This occurs through the use on inert gases. It is crucial that such products meet Australian and international standards.

6 Focus on protecting data-centre switchboards

Data centres, switchboard cabinets and telecommunications centres are the brains of modern enterprises because they store and protect sensitive information related to the business and its customers.

They are also highly susceptible to fire and smoke damage, and even a small fire can cause inestimable loss and shut down operations. Added risk may come in the form of collateral water damage caused by traditional fire-suppression systems such as sprinklers. Local area gas

systems are considered best practice, quickly putting out a fire without causing the long-term damage that water-based solutions can incur.

7 Partner with a reputable fire-suppression expert

There is no substitute for experience when it comes to preventing or suppressing major fires. Given the high stakes associated with possible accidents, downtime and maintenance costs at high-hazard industrial sites, it is important to seek the advice of fire-suppression experts to develop appropriate protection measures.

An experienced fire-suppression expert can factor in such risks and provide a comprehensive fire-safety plan. A defensive strategy could include measures such as an early-warning air-sampling detection system that can sense a fire in its early stages; alarms that emit a loud noise and also use flashing lights to attract attention; and a plan to limit fire acceleration or explosions as a result of hazardous gases, fuels and vapours.

The best partners offer support throughout the entire process from design and procurement through to commissioning and after-sales service, while also offering the best products and testing. Given that people's lives and high-value assets are at stake, there is no room for short cuts.

Why expert advice is the key to safety

Fire-safety decisions on industrial sites can mean the difference between life and death for employees, or survival for the business itself.

So, seeking the guidance of an experienced and professional fire-protection services provider is crucial. When choosing a provider, it is advisable to partner with consultants who:

- can point to years of fire-prevention experience on high-hazard sites
- supply products that meet international and Australian standards
- offer support throughout the entire fire-risk analysis and commissioning process

About Delta Fire

Delta Fire are Australia's leading specialist in the provision of high hazard fire protection and equipment. Our commercial and industrial fire protection product range includes almost every aspect of fire retardants and suppression from portable fire extinguishers to specialised fire safety solutions.

Clients include numerous airlines, fire and rescue organisations and Australia's top commercial and industrial organisations. Some blue-chip clients we work with are Virgin Blue, Qantas, Thiess Construction, Shell, Fremantle Ports, BP Petroleum, Neumann Petroleum, and Royal Vopak. We also provide fixed and mobile fire-fighting systems and suppression agents that provide around-theclock protection in high-hazard petrochemical environments.

As a national fire safety organisation with operations in Brisbane, Sydney and Melbourne and authorised distributors in South Australia and Perth we provide a consistently high level of service across Australia.

Delta Fire Australasia specialises in the design, installation and servicing of commercial and industrial fire-suppression systems. To find out more about the range of foam hanger protection solutions **contact Delta Fire.**

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