# Mobile Plant – Fire Risk Management

Engine powered mobile equipment is prevalent in many industries and sectors.

This Loss Prevention Standard provides guidance on managing the fire risks associated with engine powered equipment.

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# Mobile Plant – Fire Risk Management

## Introduction

Mobile plant equipment plays a critical role in many industries and sectors including construction, primary and secondary manufacturing, waste management and some wholesale and retail-based operations.

From mobile cranes, forklift trucks and loaders, to telehandlers, shovels, diggers, trommels and shredders, these machines are essential for moving and processing materials. However, their reliance on internal combustion engines makes them potential ignition sources and creates a significant fire risk.

The property damage risks can be amplified by combustible fuels, lubricants and materials, dust accumulation and the wear-and-tear associated with continuous use. Without focused fire risk management, these hazards can lead to severe consequences, including damage to property and equipment, disruption to business operations, and impacts to environmental, sustainability and governance (ESG) initiatives.

The document focuses on the main fire damage risks associated with mobile plant equipment. It does not discuss:

- Risk associated with hiring mobile plant.
- Security of mobile plant.
- Battery powered mobile plant.
- Specific operational risks associated with specialised mobile plant or their applications that may require bespoke fire protection solutions, e.g., mobile shredders or trommels risks at waste handling/recycling sites.
- Liability or motor risks.

**Note:** This document is focussed on property loss prevention in relation to the operation and use of mobile plant with an internal combustion engine. Mobile plant is defined in this document as:

- ✓ Any independently powered equipment capable of movement, that is not reliant on fixed electrical mains supply.
- ✓ Whether it is stationary or actively mobile in its use, it has the capability to move, i.e., it has wheels.

The presumption is that all regulatory requirements, fire and other risk assessments, and compliance with local authority having jurisdiction requirements which would include licencing, building permissions, regulations, codes, or standards, have or will be met.

## Understanding the Risks

Fire ignition hazards include, but are not limited to:

- **Overheating**. Engines can overheat due to inadequate or damaged cooling, oil leaks etc.
- **Exhaust Systems**. Exhaust systems can run hot and potentially ignite combustible materials in proximity.
- **Fuel Spills and Leaks**. Diesel, petrol and oil leaks can ignite upon contact with hot surfaces such as engines or exhaust systems.
- **Battery Fires**. Batteries can become damaged and susceptible to ignition, including when under charge.
- **Maintenance**. Poorly managed or inadequate maintenance can lead to components failing, e.g., oil filters, and leading to ignition. Rags and other combustible materials and agents can be left in engine bays and ignite.
- **Housekeeping and Inspection.** Inadequate or ineffective inspection and/or associated cleaning regimes can result in performance issues or in the worst case scenario fire, especially in 'hot zones'.
- **Location**. The equipment may be vulnerable to fire damage due to the working environment, e.g. grain stores with combustible materials on the floor areas.
- **Arson**. Plant left in the open or in lightly secured areas may be vulnerable to arson related damage.

## Risk Assessment

Before implementing any risk management controls, a risk assessment of the mobile plant, how it is used, the processes undertaken and the refueling process etc. should be completed to identify all potential fire exposures.

This risk assessment should consider:

- The potential for loss events, e.g., fire, smoke and firefighting water contamination, damage to other equipment or other assets through impact or accidental damage, etc.
- The importance, or business impact, should the equipment be lost or incur downtime.
- The financial value, or reinstatement cost of the equipment or damaged assets.
- The potential for wider damage, e.g., fire growth spread attributed to combustible materials or construction in proximity, susceptibility of wall and floor surfaces, stock and machinery to water or fluid damage.
- Previous losses or downtime.

This will help identify the critical or exposed equipment, infrastructure, services and processes to the organisation and their vulnerability to loss events.

Refer to Aviva Loss Prevention Standard **Material Damage Risk Assessment** for further guidance.

## Managing the Risks

**Important:** Some insurance policy wordings may contain conditions relating to storage and parking locations; housekeeping; post use cooling and fire watch periods; cleaning and drying of engine bays; smoking arrangements and maintenance. Refer to your policy, Plant Insurer or Broker for guidance.

**Note:** High risk trades referred to in this document are occupancies that feature extensive use of flammable/combustible materials, trade processes with significant ignition and /or explosion hazards. These include but are not limited to waste storage and/or handling; recycling; timber/lumber; mills; fuel depots; chemical plants, grain stores and farm stores etc.

Effective management procedures are essential to help mitigate the property damage risks associated with mobile plant equipment. These procedures should be clearly communicated to relevant workers and other persons, e.g., contractors, ensuring they understand the hazards posed by mobile plant equipment, both when in use and idle, and how to respond in the event of a fire.

For sites where trade activities expose mobile plant to the risk of ignition, e.g., open furnace, burning matter, heating items with fire, or other processes where fire is integral), the plant equipment should not be parked or used to handle or process materials within 15 metres of the hazardous activity.

### Idling, Parking and Storage

When not in use, mobile plant equipment should be parked/stored:

- At least 15 metres away from other mobile plant, equipment, buildings, yard storage or combustible materials.
- in a location that balances the inherent fire risks with security considerations, to reduce vulnerability to malicious damage or theft.

Fires can originate whilst mobile plant is stationary, parked or idling. As a result, routine inspections throughout the shift should be undertaken, even when equipment is not in active use, to help identify and address any potential issues early.

### Post Use Cooling and Fire Watch

After use, the mobile plant should be moved to a location as above and observed by a responsible individual for at least 30 minutes, or until the 'hot zones' have cooled to a temperature where they do not pose an ignition risk. This should be documented as part of a formal procedure/record.

Use thermographic cameras to monitor 'hot zones' during the cooling period, particularly for high fire risk trades.

Refer Aviva Loss Prevention Standard **Use of Thermographic Cameras - General Considerations** and **Use of Thermographic Cameras - Checklist** for further guidance.

**Important:** For high fire risk occupancies, this observation period should be extended until the hot zones are thoroughly cooled.

Fire watch personnel should:

- Understand the fire exposures of the mobile plant.
- Be trained in the use of fire extinguishers and hose reels.
  - ✓ Such devices should be provided in the vicinity of the parked mobile plant.
- Know the locations of all fire extinguishing equipment on-site.

Failure to provide adequately trained personnel for fire watch duties increases the risk of undetected fires escalating and endangering property and assets.

## Housekeeping

At the end of each shift, and once the mobile plant equipment has adequately cooled down (to help prevent damage and also to protect employees), it should be thoroughly cleaned to remove debris, dust, fly, oil or fuel accumulations. Cleaning should focus on:

- The engine compartment.
- Turbo chargers.
- Brake areas and wheel arches.
- Axles and wheel bearings.
- Fuel and oil tank compartments.
- Exhaust areas.
- The cab.
- Any other areas where combustible material can accumulate.
- Hot zones, e.g., areas where the mobile plant creates or accumulates heat that could cause an ignition source.

**Important:** At a minimum, and regardless of occupancy, an intensive steam or high-pressure water hose clean should be completed at least once every month to include all areas above. This frequency should be increased for working environments prone to heavy contamination such as the waste/recycling industry. The engine should also be dry before restarting it. The Original Equipment Manufacturer (OEM) should be able to provide guidance in this regard. All cleaning activities should be formally recorded, and the mobile plant be subject to routine self-inspections, to monitor ongoing compliance with cleaning rules.

**Note:** Guidance should be taken from the OEM on the most appropriate cleaning methods for the various areas of the plant. The use of high-pressure water hoses or steam cleaning may not be recommended within some engine compartments.

Refer Loss Prevention Standard **Housekeeping** for further guidance.

## Smoking

Smoking should be prohibited within the cab, and within 10m of any mobile plant. Cabs should be inspected routinely to monitor ongoing compliance with smoking rules.

## Maintenance and Ongoing Care

Mobile plant maintenance should always adhere to the following guidelines:

- Follow all OEM recommendations in respect of inspection and servicing. This extends to any automatic fire protection systems installed to the plant.
- Conduct maintenance sterile environments.
- Ensure maintenance activities occur at least 15m away from key structures or assets.

Refer Loss Prevention Standard **Maintenance Regimes** for further guidance.

## Automatic Fire Protection

Fire protection measures are critical for high-value or high-risk mobile plant equipment:

- Valued individually over £100,000, or
- Where the individual mobile plant is valued less than £100,000 but it exposes other insured assets that exceed this figure e.g. other mobile plant, storage, buildings etc.,
- Where used in high fire risk environments.

**Note:** When considering the value of the equipment, owners should include the business impact of the exposure and not just the financial value of the plant.

Automatically, and manually actuated, pre-engineered fire suppression systems should:

- Be an approved Factory Mutual (FM) Global Approved fire protection system that meets current standards for heavy-duty mobile equipment protection (e.g., FM Approval Standard S970).
- Include automatic interlocks to shut down engines during emergencies, minimising damage and facilitating safe evacuation of operators in the cab.
- Be installed, tested, and commissioned by competent professionals.
- Include discharge nozzles in the following risk areas:
  - ✓ Belly pan.
  - ✓ Hydraulic compartments.
  - ✓ Turbochargers.
  - ✓ Engines (left and right).
  - ✓ Exhaust manifolds.
  - ✓ Wiring looms.
  - ✓ Heat and fuel sources.

Fire protection systems should also be:

- Used in used in accordance with the Original Equipment Manufacturers (OEM) recommendations.
- Inspected, tested and maintained in accordance with the OEM recommendations.
- Systems should be serviced every six months in line with OEM recommendations, with records kept for review and audit purposes.

**Note:** Guidance on the suitability of pre-engineered Factory Mutual (FM) Global Approved fire protection systems should be sought from your Plant Insurer or Broker.

## Emergency Response Plans

Emergency response plans should extend to fires involving mobile plant and particular attention should be given to the locations such an event could occur, and what damage could be anticipated in those locations, e.g., within manufacturing buildings, storage areas etc.

Refer Aviva Loss Prevention Standard **Emergency Response Teams** for further guidance.

## Specialist Partner Solutions

Aviva Risk Management Solutions can offer access to a wide range of risk management products and services at preferential rates via our network of Specialist Partners.

For more information please visit: Aviva Risk Management Solutions – Specialist Partners

## Sources and Useful Links

- BS 5306-3: Fire extinguishing installations and equipment on premises - Commissioning and maintenance of portable fire extinguishers. Code of practice

**Note:** Whilst UK standards and legislation are referenced in this document, other international standards and legislation should be referenced where applicable.

## Additional Information

Relevant Loss Prevention Standards include:

- **Emergency Response Teams**
- **Hot Work Operations**
- **Maintenance Regimes**
- **Smoking and the Workplace**
- **Mobile Plant Theft from Construction Sites**

To find out more, please visit Aviva Risk Management Solutions **or speak to one of our advisors.**

## Email us at riskadvice@aviva.com or call 0345 366 6666.*

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