

Loss prevention standards

Engine Powered Mobile Plant

Engine powered mobile equipment is essential to the day-to-day operations of a wide range of industries. But the fire risks posed by **internal combustion engines shouldn't be** overlooked – and neither should the impact of theft, arson and malicious damage.



Engine Powered Mobile Plant



Introduction

In various industries from construction to manufacturing, diesel-powered mobile plant is essential to day-to-day operations like moving and processing items – for example, forklift trucks, loaders, 360-degree telehandlers, shovels, diggers, trolleys and shredders.

Because these pieces of equipment have internal combustion engines, they're sources of ignition and pose a significant fire risk. The risk becomes even greater when you combine it with other factors, such as combustible fuels, lubricants and materials, dust and dirt, and constant daily use.

That's why it's essential to include all mobile plant in fire risk assessments. By understanding the risks, it's then possible to put measures in place to limit damage to property and equipment, injury to plant operatives, and the impact on the business.



Using this Guide

- The information in this guide relates to equipment and its engine chambers – it doesn't cover the different types of mobile plant, or what each piece of equipment does or is used for. For example, if the plant is a mobile shredder used in a waste handling site, this guide would not cover the processing risks posed by the shredder. However, automatic fixed fire suppression would also be required for the processing environment.
- 'Mobile plant' is used to refer to any independently powered piece of equipment (not fixed electrical mains supply), regardless of whether it physically moves or is stationary. This means equipment that's located in one place all the time but is independently powered and has the capacity to move is still considered 'mobile'.

Risk Assessment

Every business has a responsibility to comply with the [Regulatory Reform \(Fire Safety\) Order 2005](#). Its main focus is to protect lives, but this should be considered the minimum standard when carrying out a risk assessment – it's also important to consider property values and the impact of business interruption.

A risk assessment should:

- Review security and fire protection arrangements, to determine whether they are adequate and if additional protections are needed
- Include when and where the mobile plant is in use, and when it's inoperable or idle
- Record the results and review the process periodically, making sure it's fit for purpose

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Controlling Hazards – Management Procedures

All employees should be made aware of the fire risks posed by mobile plant equipment. This includes when it's idle as well as in use, and how to react in the event of a fire.

For sites carrying out any fire-related activities, such as burning matter, heating items with fire or any other activity in which fire is a trivial or substantial part of the process, **mobile plant shouldn't be used to handle or process materials in the vicinity of a fire**, because it creates a higher potential for an uncontrolled fire.

Housekeeping

- At the end of each shift, the mobile plant should be cleaned of all debris and any oil or fuel accumulations. Ideally air or water jet cleaning should be used, where appropriate, for:
 - The engine compartment
 - The wheel arches
 - The exhaust areas
 - Anywhere that material can accumulate
- At least once every month the equipment should be cleaned using steam or a high-pressure water hose in the engine, brake, fuel and oil tank compartments. Please note this is dependent on the working environment and in some cases, the frequency of cleaning should be increased.

Mobile plant not in use

When not in use, mobile plant should be:

- Left outside of any buildings
- Kept at least 15m away from any other item, equipment, mobile plant, buildings or yard storage

The location of the equipment needs to be balanced between the inherent fire risk of the mobile plant itself, and the security or malicious damage risks from leaving it in a more vulnerable position.

It's also important to note that many fires associated with mobile equipment start when it's been idle, and smouldering fires can go undetected for some time before growing. As a precaution, you can reduce this risk by undertaking routine inspections on the equipment, even when they are not in regular use.

Fire watch

The plant should be observed by a competent individual for at least 30 minutes after use. If the nature of the site **means there's a greater risk of fire, this time period should be increased.** The person completing the fire watch should be trained to use fire extinguishers and hose reels and know where the fire extinguishing equipment is located. Failure to have a trained individual performing this role not only increases the risk of a fire becoming a live issue, but also increases the risk of a failure to extinguish the same, increasing damage to plant equipment and the site, but most importantly, a risk to their own life.

Maintenance

Mobile plant maintenance should always be carried out:

- In an area with low combustible loading (ideally a predominantly sterile environment)
- At least 15m away from any main structures or assets
- In accordance with the manufacturer's recommendations

Emergency response plans

All emergency response plans should consider fires on, or associated with, mobile plant. Saving lives should always be the primary concern, but proper training, fire extinguishing equipment, and a joined-up emergency response plan will provide protection for the property and business too.

Appropriate fire extinguishers and hoses should be provided around the site, close to the mobile plant – and in the case of portable fire extinguishers, within the cab of the mobile plant, readily accessible to the operator. Training (and retraining) should be provided for drivers in areas where mobile plant is used.

In an emergency, the following should be considered where it is safe to do so:

- Driving or moving the mobile plant to a safer position, e.g. outside to a sterile area
- Manually shutting down the engine, rather than waiting for any automatic interlocks
- Using appropriate fire extinguishers, and where possible hose streams, to suppress any fire

Controlling Hazards – Physical and Fire Protection

Protecting mobile plant

Does one or more of the following apply, the:

- Exposure or value of the mobile equipment is large, i.e. around £100,000 or more?
- Use of the equipment is hazardous, e.g. waste processing or handling?
- Risks posed by an equipment fire are large, e.g. **the mobile plant may be worth less than £100,000, but it's used or housed in a building with a value or business importance greater than £100,000?**

If yes, it's important to make sure that all hot zones (and potential hot zones) within the equipment have a pre-engineered, automatically and manually actuated fire suppression system installed. This system should:

- Be appropriately certified and Factory Mutual (FM) Global Approved
- Have the correct type of piping, fixings, fittings, and location of nozzles and cylinders
- Include automatic interlocks to shut down the engine, providing extra protection for operators to safely evacuate the mobile plant, and helping to minimise damage to the mobile plant and surrounding buildings and equipment
- Be installed, tested and commissioned by a competent person
- Be **serviced, maintained and used in line with the manufacturer's recommendations**
- Be formally inspected and maintained every 6 months, with records kept

It's also important to ask:

- How could the system be damaged, compromised or impaired when the mobile plant is repaired?
- How many discharge nozzles are required - risk areas which will determine this include:
 - The bellypan
 - Hydraulic compartments
 - Turbochargers
 - Left engine
 - Right engine
 - Exhaust manifolds
 - Wiring looms

LOSS PREVENTION STANDARDS

- Heat and fuel sources
- Is the stored volume of extinguishing agent(s) correct for the number of discharge nozzles?
- Based on the nature of the mobile plant and its use, is there a reignition risk? If so, a twin-agent wet chemical and dry chemical system may be required. If not, a dry chemical system may be appropriate

Factory Mutual (FM)

FM approval ensures standards are met whilst providing assurance of manufacturing, design and installation quality.

Free access to the FM approval standard is available at:

- [FM Approval Standard: 5970 – Heavy Duty Mobile Equipment Protection Systems](#)

FM approved fire suppression systems are available from:

- [Amerex Fire International Ltd](#)
- [Ardent Ltd](#)

Protecting buildings

For buildings where the use, construction, value or nature of the business pose a higher risk, automatic fixed fire suppression or automatic sprinklers should be provided. This is in addition to any local or spot protection systems within the mobile plant itself.

Controlling Hazards – Security Measures

Mobile plant can be at an increased risk of theft and may be stolen to order. It can also be stolen to be used as part of other crimes, such as ram-raids. **The location of the mobile plant when it's not in use can increase the theft risk** and may also make it an attractive target for malicious damage and arsonists.

A formal security risk assessment should always be completed, covering the following:

- What equipment is there, and how attractive is it to thieves?
- Is there any history of theft, malicious damage or arson in the local area?
- Is the mobile plant located within a secure site or compound, or out in the open? In a rural or built-up area?
- What key management system is in place, e.g. removing ignition keys?
- Are there security measures to meet the risks – for example, lights, alarms, fencing or guarding?
- Do the fire protection measures balance with the security risk?

Checklist

A generic Engine Powered Mobile Plant Checklist is presented in Appendix 1 which can be tailored to your own organisation.



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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.*

*Calls may be recorded and/or monitored for our joint protection.

Appendix 1 – Engine Powered Mobile Plant Checklist



| | |
|-----------------------------------|--|
| Location | |
| Date | |
| Completed by (name and signature) | |

| | Engine Powered Mobile Plant Checklist | Y/N | Comments |
|----|--|-----|----------|
| 1. | <p>Have all items of mobile plant been identified and recorded on a formal register? Don't forget 'mobile' plant which may be kept in one place, and include:</p> <ul style="list-style-type: none"> • The manufacturer • The model • The value • If it's owned or leased | | |
| 2. | <p>Has a competent person completed a fire risk assessment, including this equipment?</p> <ul style="list-style-type: none"> • Is it up to date? • Does it take into account different times of day/year, and the changing uses of the mobile plant? • Does it consider the mobile plant when in operation and when idle? | | |
| 3. | <p>Has a competent person completed a security risk assessment, including this equipment?</p> <ul style="list-style-type: none"> • Is it up to date? • Does it take into account different times of day/year, and the changing uses of the mobile plant? • Does it consider the mobile plant when in operation and when idle? | | |
| 4. | <p>Are risk assessments updated when new equipment is brought in, even if the equipment is temporary?</p> | | |

LOSS PREVENTION STANDARDS

| | Engine Powered Mobile Plant Checklist Contd. | Y/N | Comments |
|-----|---|-----|----------|
| 5. | Are all employees aware and trained on the fire and security hazards associated with mobile plant? | | |
| 6. | As part of day-to-day operations, are there any 'burning activities'? If yes, is the mobile plant prohibited from being within 15m of these activities? | | |
| 7. | Is there a formal and secure key management system? <i>Keys shouldn't be left in mobile plant when not in use.</i> | | |
| 8. | Is all mobile plant cleaned (by air or water jet) at the end of each shift and is this formally recorded? Does cleaning cover: <ul style="list-style-type: none"> • The engine compartment? • Wheel arches? • Exhaust areas? • Anywhere that material can accumulate? | | |
| 9. | Are there regular inspections of mobile plant and equipment, e.g. pre-shift? | | |
| 10. | Is all mobile plant deep-cleaned (by steam or high-pressure jet wash) at least monthly? Is this formally recorded? | | |
| 11. | Is the mobile plant observed by a trained, competent individual for at least 30 minutes at the end of each shift, or when it's idle (like a hot work fire watch) ? | | |
| 12. | When not in use, is all mobile plant left outside of buildings? If it doesn't hugely increase the security, arson or malicious damage risk, is there a 15m clear separation distance between the mobile plant and any: <ul style="list-style-type: none"> • Buildings or structures? • Yard storage? • Other mobile equipment? | | |

| | Engine Powered Mobile Plant Checklist Contd. | Y/N | Comments |
|-----|--|-----|----------|
| 13. | Is mobile equipment maintenance carried out in a largely sterile area, physically detached from any main site activities? | | |
| 14. | Is the mobile plant inspected and maintained in line with the manufacturer's recommendations? | | |
| 15. | Are all operators formally trained to use the mobile plant also trained on: <ul style="list-style-type: none"> • What to do in an emergency? • How to shut down the engine and equipment in an emergency? • Moving the mobile plant to a safer location? • Using portable fire extinguishers and hose streams to tackle a mobile plant fire? | | |
| 16. | Are items of mobile plant protected with an automatically and manually actuated FM Approved fire suppression system? Is this interlocked to shut down the engine before the extinguishing agent is released? | | |
| 17. | Are any fire suppression systems inspected, tested and maintained in line with the manufacturer's recommendations? | | |
| 18. | Are automatic fixed fire suppression or automatic sprinkler systems provided within any buildings? Can these appropriately protect the activities or processes associated with mobile plant? | | |
| 19. | Additional comments: | | |

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