FIRE SAFETY GUIDE TO POTATO STORES

This document is designed to assist NFU Mutual customers in managing fire risks associated with potato farming

NFU Mutual
RISK MANAGEMENT SERVICES

INTRODUCTION

Each year there are many fires in potato stores with causes including, but not limited to: electrical faults, heating systems, hot works, arson and also the use of sprouting suppression systems. These have arisen where using methanol based carrying materials, which introduce a flammable material within potato stores, or injection of thermofogging (hot fog) sprout suppressants.

The potential for serious fires within potato stores can be reduced by implementing a Fire Risk Management Programme to both minimise inception hazards and help reduce the spread and growth of a fire.

The following guide is aimed at providing information on fire safety for storage of potatoes.

FIRE RISK ASSESSMENT

A fire risk assessment is to be undertaken to identify and evaluate the potential for a serious fire at your premises. Responsibility for the fire risk assessment rests with occupiers and owners of business premises, and should include: the construction of the premises, working practices within, fire inception hazards, likely fire spread potential and the suitability and standard of fire protections, including: your fire alarm, fire doors, emergency lighting, escape signage and fire extinguishing appliances. The risk assessment to be carried out by a suitably competent person and any necessary control measures carried out to reduce the risk and effects of fire.

We recommend the local Fire & Rescue Service are invited to visit the location to assess water sources and familiarise themselves with the layout and the location of the premises.

COMBUSTIBLE COMPOSITE INSULATED PANELS/LININGS

Combustible composite insulated panels, combustible lining boards and/or sprayed linings within potato stores increases the fire risk. Therefore, any new potato stores to be constructed of non-combustible (mineral wool) panels or those approved by the Loss Prevention Certification Board (LPCB) achieving LPS 1181: Part 1 EXT A30 for external envelopes and LPS 1181: Part 2 INT-2 for internal areas, as a minimum standard.

Where combustible composite insulated panels, combustible lining boards or sprayed linings are present, these must be managed in line with the following guidance:

1. Where possible the fire risk within existing stores to be reduced by replacing panels/linings as above.
2. Where composite panels are present, all panels to be inspected at least weekly and damaged panels or facings replaced or repaired. Fixings or joints to be in good condition and tightly secured. A written log of inspections and remedial action to be maintained.

Further guidance can be found in the Fire Safety Guide for Combustible composite Panels.

HOT WORK

Welding, cutting or grinding equipment, blow lamps, blow torches or similar equipment is not to be used on or within the stores. Where the use of such equipment within the building is unavoidable, it is not to be completed within 2 metres of combustible composite insulated panels, combustible lining boards and/or sprayed linings, unless they are protected by non-combustible fire blankets, drapes or screens and subject to a strict 'Permit to Work' system, unless undertaken by own staff in accordance with documented safe hot working procedures/policy.

Further guidance can be found in the Fire Safety Guide for Hot Work.

ELECTRICAL INSTALLATION

Electrical installations present a potential inception risk and appropriate control measures are necessary embracing the following;

Electrical testing of the fixed installation in accordance with the current edition of **BS7671 Requirements for Electrical Installations. IET Wiring Regulations** by a member of National Inspection Council for Electrical Installation Contractors (NIC EIC), who is regulated for commercial installations. The frequency of electrical inspection of the premises needs to be every 3 years, in accordance with the recommendations of BS 7671 or Electricity at Work Regulations, or more frequently if advised by your electrician and any remedial action to be corrected without delay.

Thermographic imaging, using heat-sensitive camera equipment, is increasingly undertaken to identify any "hot spots" and provide early warning of potential problems. This is particularly beneficial for detecting certain electrical faults, overheating motors, pumps, extraction etc., and should supplement the formal electrical inspection programme.

Electrical wiring or switch panels, and controls directly attached to, located within or passing through, combustible composite insulated panels, combustible lining boards and/or sprayed linings to be inspected annually with IET certification, or be subject to at least annual thermographic inspection to detect hidden hot spots with any corrective action taken as necessary.

Portable Appliance Testing of all portable apparatus connected to a fixed installation to be completed in accordance with the **Code of Practice for In-Service Inspection and Testing of Electrical Equipment** published by the Institute of Engineering and Technology. Whilst this is recommended at intervals between three and four years, depending on the risk, annual testing would be usual.

Evaporators on refrigeration systems to be fitted with additional automatic thermostatic cut-offs, pre-set at no more than 20 degrees centigrade above normal ambient temperature and subject to annual calibration checks or as stipulated by the manufacturer.

Consider fitting a direct low pressure application, fixed fire suppression system to electrical and/or switch cabinets. Any such system to comply with **LPS1666: Requirements and test procedures for the LPCB approval of direct low pressure (DLP) application fixed fire suppression systems** and upon activation isolate the power supply and activate the fire or environmental alarm system via a relay switch. Further guidance on LPS1666 can be found at https://www.redbooklive.com/download/pdf/LPS1666-Issue-Direct-Low-Pressure-Application-Fire-Suppression-System-Standard.pdf

Further guidance on electrical safety can be found in the Fire Safety Guide for Electrical Installations.

AUTOMATIC FIRE ALARMS

A common feature of why many fires in potato stores have the tendency to develop into a substantial loss, is due to the facility being unattended for much of the time.

This means any faults or issues that could give rise to a fire not being detected quickly after ignition, with the potential for rapid growth.

Consider installation of, or upgrading existing system, to an automatic fire alarm system conforming to **BS5839: Fire Detection and Alarm Systems for Buildings: Part 1: Code of Practice for Design installation, commissioning and maintenance of systems in non-domestic premises**, specifically designed to provide early warning fire detection. The fire alarm system should also give a warning remotely to nominated staff, by use of remote signalling or preferably to an approved alarm receiving centre in accordance with **BS5979: Remote centres receiving signals from fire and security systems. Code of practice or BS EN 50518: Monitoring and Alarm Receiving Centre** preferably by dual path signaling.

A programme of testing, servicing, checking and maintenance in accordance with the installer's recommendations to be in place and documented.

PORTABLE FIRE EXTINGUISHERS

Appropriate portable fire extinguishers to be located on emergency escape routes and at least one environmentally appropriate fire extinguishing appliance to be provided in each control room, with regular inspection and maintenance undertaken by an approved supplier and recorded.

Ensure staff are adequately trained and know where the fire extinguishers are located.

LIGHTING

1. Ideally high temperature electrical light fittings e.g. halogen lamps and fluorescent tube lighting to be replaced with low voltage lighting e.g. LED lighting.
2. Any high temperature electrical light fittings in use not to be fitted directly onto combustible composite insulated panels, combustible lining boards and/or sprayed linings.
3. Damaged lighting equipment, including fluorescent tubes to be immediately replaced.
4. Impact protection covers/guards to be fitted to any lighting equipment vulnerable to impact related damage e.g. fork-lift or reach trucks operating in proximity.

CIPC THERMOFOGGING

Approval for Isopropyl-N-(3-chlorophenyl) Carbamate (CIPC) was withdrawn on 8 January 2020 with the EU having withdrawn authorisation for CIPC based products and requiring existing stocks to be used up by 8 October 2020, with alternative methods to be used after that date. Authorised alternatives at present include Ethanol, Spearmint oil and Maleic Hydrazide (MH).

If CIPC is used, the potato store to be flushed where possible within 6-8 hours of CIPC settling.

THERMOFOGGING CONTROL MEASURES

1. Only approved contractors to be used to undertake thermofogging. The contractor to ensure they have Public Liability insurance with an adequate indemnity limit to reflect the potential exposure, but of at least £5 million.
2. Application machinery to be used and operated in accordance with the manufacturer's instructions and serviced annually (or as recommended by the manufacturer) by a competent person.
3. Thermofogging access vents not to pass through combustible lining boards and/or sprayed linings.
4. Where thermofogging access vents pass through combustible composite insulated panels, the vents to be inspected to ensure no core material is exposed which could allow the hot fogging agent to enter the core.
5. To be used and stored in accordance with relevant Material Safety Data Sheets (MSDS).
6. Wait 24-48 hours after treatment before entering treated area.

ETHYLENE GAS CYLINDERS

Ethylene may be used to inhibit sprout elongation. The most common form of ethylene application is via a mobile ethylene restrain generator although the use of ethylene cylinders to inject stores with ethylene gas can also be used. Ethylene is a flammable gas and the following guidance to be followed should ethylene cylinders be used within the store:

1. Only experienced and properly instructed persons to handle gases under pressure. Regularly inspect pressure relief device(s) in gas installations ensuring the complete gas system is regularly checked for leaks before use and only use manufacturers specified equipment;
2. Leave valve protection caps in place until the container has been secured against either a wall, structure or placed in a container stand and is ready for use. The cylinder to be inspected prior to use and any difficulty operating the cylinder valve to result in cessation of use. Never attempt to repair or modify container valves or

safety relief devices. Damaged valves or defects to be reported immediately to the supplier. Keep container valve outlets clean and free from contaminants particularly oil and water;

3. Whilst concentration levels within the stores to be maintained at levels unlikely to become an explosion risk in normal circumstances, assess the risk of potentially explosive atmospheres and the need for explosion-proof equipment in accordance with the Dangerous Substances and Explosive Atmosphere Regulations (DSEAR). Following the assessment any identified control measures to be implemented;
4. Keep away from ignition sources and take precautionary measures against static discharge. Consider the use of only non-sparking tools and ensure equipment is adequately earthed;
5. Protect cylinders from physical damage - do not drag, roll, slide or drop. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders, securing cylinders as instructed;
6. Replace valve outlet caps or plugs and container caps where supplied, as soon as container is disconnected from equipment. Close container valve after use and when empty, even if still connected to equipment. Never attempt to transfer gases from one cylinder/container to another;
7. Never use direct flame or electrical heating devices to raise the pressure of a container. Do not remove or deface labels provided by the supplier for the identification of the cylinder contents. Open valve slowly to avoid pressure shock;
8. When storing spare cylinders, containers not to be stored in conditions likely to encourage corrosion. Container valve guards or caps to be in place;
9. Containers to be stored in the vertical position and properly secured to prevent toppling;
10. Cylinders in the open air to be stored upright and protected by placing within a lockable cage, or compound at least 1.8 meters in height. The floor is to be level, loadbearing and unlikely to flood. Protection to be provided from direct sunlight by a light, open sided weather covering of non-combustible construction (tarpaulins not to be used);
11. Cylinder cage to be located away from all property boundaries, public access routes, fire escapes, buildings and motor vehicle movement. Where practical this distance should be at least 5 metres;
12. Stored cylinders to be periodically checked for general condition and leakage. Keep container below 50°C in a well-ventilated place and in a location free from fire risk and away from sources of heat and ignition. The cage/compound and adjacent areas to be kept clear of combustible materials, such as pallets and vegetation;
13. Segregate from oxidant gases and other oxidants in store. All electrical equipment in the storage areas to be compatible with the risk of a potentially explosive atmosphere.

MOBILE ETHYLENE RESTRAIN GENERATORS

1. Only proprietary ethylene restrain generators to be used. Ensure that generator machinery is used and operated in accordance with manufacturer's instructions and serviced annually (or as recommended by the manufacturer) by a competent person.
2. If possible, the generator to be permanently fixed and set close or abutting to a non-combustible wall or partition. Where this is not practicable, the generator to be set within a clear designated floor area and a clear space of 2m from any combustible materials maintained at all times.
3. A barrier to prevent accidental impact from fork-lift trucks to be erected around the generator.
4. Ensure that only proprietary ethylene solvent fuel, as specified by the manufacturer, is used. Filling and decanting of ethylene solvent to be restricted to a designated competent person, carried out strictly to the manufacturer's instructions and using an anti-spark or plastic filling funnel connection. A spill kit to be available to contain the spread of any spilt ethylene solvent and any spent cloths/rags used to clean spills removed to a metal lidded bin at least 7 metres (but wherever possible 10 metres) from the site buildings or other combustible items/materials. Stock of ethylene solvent fuel to be kept in separate designated non-combustible flammables store.
5. The generator to have an automatic thermostatic safety device fitted designed to switch off operation in case of overheating or emergency and the mains electricity supply cable should include a suitably rated Residual Current Device to cut off the supply in case of emergency or power surge.
6. If operated for more than 24 hours, the generator to be subject to regular inspections to ensure its continued safe operation.

HEATING

Heating to be by a fixed indirect heating system, such as a gas or oil-fired installation with ducted warm air and the products of combustion vented to the open via a flue. Such installations should be serviced annually by a competent engineer. Hot flues to not pass through combustible composite insulated panels, combustible lining boards and/or spray linings. Where this is unavoidable, insulated sleeving or dual skin flues to be used with a minimum fire resistance of 60 minutes. Any gaps between the sleeve and the panel to be filled with non-combustible material, however non-approved silicone mastics and expanded foam sealants must not be used.

Temporary portable heating appliances within the stores using LPG or paraffin as a fuel source, such as for seed potatoes, are not be used.

HOUSEKEEPING

1. Ensure formal housekeeping procedures are in place and implement a dust control and cleaning programme in relation to ducts, building framework and cavities where dust and other combustible materials may accumulate.
2. Ensure plant and equipment is inspected, serviced and maintained in accordance with the manufacturer's recommendations. Any essential maintenance works and servicing to be undertaken by an approved engineer with a strict permit to work system with enhanced controls in regard to any 'hot works' as stated above.
3. Conduct battery charging in an area of non-combustible construction or outside the buildings. Where this is not possible, do not undertake charging within 3 metres of combustible panels unless they are protected by non-combustible materials such as steel checker plate or mineral board adhered between the panel and the charger and extending at least 1 metre around the chargers.
4. External storage of combustible or waste materials to be at least 7 metres (but wherever possible 10 metres) of the fabric of the building, preferably within fenced or enclosed areas.
5. Cut back vegetation growing in the immediate vicinity on a regular basis.
6. Smoking to be permitted only in a dedicated area, preferably at least 7m (but wherever possible 10m) detached from the buildings or combustible/flammable materials and to be provided with ash trays and fire extinguishers with suitable notices prominently displayed restricting smoking elsewhere.

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