

CBI

EXPLOSIVES INDUSTRY GROUP

RISK ASSESSMENT FOR EXPLOSIVES including FIREWORKS.

A Practical approach to Risk Assessment which is relevant to small companies including wholesale and retail organizations involved in the storage, distribution and supply of explosives including fireworks.



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Section 1 Foreword.

This guide has been produced by a joint working party of the Explosives Industry Group of the Confederation of British Industry and the Health and Safety Executive.

Advice is given on a practical approach to risk assessment for small companies involved in the storage and supply of explosives including fireworks. Medium and larger companies involved in the manufacture, testing, storage, and disposal of explosives generally have developed risk assessment processes designed to meet their particular needs and may seek further advice from other sources.

Risk assessment is the basis of all health and safety legislation which requires 'reasonably practicable' precautions to secure the health and safety of persons likely to be affected by the work activity. Regulation 3 of 'The Management of Health and Safety at Work Regulations 1999 places a specific requirement on employers and the self-employed to make a suitable and sufficient assessment of these risks.

All employers are required to assess the risks associated with their various work processes and workplaces in order to establish a safe place of work for both employees and those likely to be affected by the work activities, including visitors, contractors, customers and the general public.

Whilst every effort has been made to cover appropriate legislation, regulations and good practice when this guide went to print, neither the CBI nor its servants or agents can accept responsibility for, or liabilities incurred directly or indirectly as a result of, any errors or omissions in this Guide. Those involved in the explosives industry are responsible for taking their own legal and other advice as they see fit. Readers are strongly advised to check whether there is any change in legislation or regulation since the publication of this Guide.

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Section 2 About this Guide.

The Aim

To provide guidance on basic risk assessment principles to small companies involved in the storage and supply of explosives including fireworks.

The Approach Taken.

The guide follows the basic 5 steps approach to risk assessment relating to the identification of the hazards in the workplace, the associated risks, what actions may be necessary to control the risks and how assessments may be documented.

The Use.

A small number of worked examples are provided within the annexes of this guide to demonstrate the risk assessment process, these are typical of the range of activities carried out by small companies within the explosives industry. The examples may assist individuals in developing a format suitable for their particular activities and arrangements. The mitigations that are built into the examples may also assist the reader in the controls that may be applied and how they impact on the assessment.

From a legal point of view it is the responsibility of the company to ensure that the relevant activities of their business are fully covered by suitable and sufficient risk assessment.

What Information is provided?

General information and worked examples of risk assessment are provided for various activities involving explosives and fireworks. Information is also included on best practice and potential pit falls in carrying out a risk assessment.

Further information is also provided to direct those carrying out risk assessments to other sources of information which may assist them.

Limitations.

The examples of risk assessments included in this guide provided are not intended to be adopted as standard, that is copied and a company name added - this would not meet your legal responsibilities nor would it be effective in protecting people. Every business is different. The examples given are designed to cover the areas which may be considered during the risk assessment process.

There are sectors of the explosive industry where the risk assessments are often very specialised and require a multilevel of assessment because of the complex consideration which are required to be made. These assessments largely relate to

the theatrical effects and special effects used in the entertainment industry. It is not proposed re is an expected format or content b

Section 3 *A Practical Approach to Risk Assessment.*

3.1 *An Introduction to Risk Assessment.*

Risk assessment is a much-abused concept. Assessing the risks is not the same as doing a risk assessment. Assessing the risks is a serious task, and although in any operation, for instance a firework display, many factors may remain constant, there are always site-specific factors that must be addressed. Risk assessment is not an exercise in photocopying the last assessment but must consider the variable factors which create change and how this may impact.

This guide is intended to help smaller companies within the explosives industry to gain some understanding of the risk assessment process. The main purpose of risk assessment is to enable the employer/self-employed to identify the risks created by the work activity and then decide whether the existing working arrangements are adequate, or whether further action may be necessary and what the action priority should be.

In the explosives industry the most obvious potential risks are fires or explosions from the explosives themselves, and traditionally have received the most attention. Other hazards and risks to health may also need to be considered such as manual handling and exposure to smoke as these may not be so well controlled. It is important to ensure that all significant risks including unfamiliar risks are identified, prioritised and properly controlled.

A number of worked examples have been provided which help explain and lead you through the process of carrying out a suitable and sufficient risk assessment. The examples provided are designed to cover a wide range of potential hazards and risks, in most real life situations only a small number of these may be relevant however the examples show the range of considerations which may need to be made.

There are a number of common pitfalls associated with risk assessment and these are discussed further in this guide.

There are many different formats of risk assessment, they may all be equally valid provided that their purpose is clear and they address all the relevant points. Finding a format which suits your needs is entirely a matter of personal or corporate choice.

3.2 *What is a Risk Assessment?*

A risk assessment is an estimation of the likelihood and degree of harm to people from the work activity and the effectiveness of the means of controlling that harm. The three main terms used are defined below :-

'Hazard' means a physical situation with the potential to cause harm i.e. human injury, damage to property, damage to the environment or some combination of these.

'Risk' is the chance however great or small that someone will potentially be harmed by a particular hazard being realized. This will depend on the likelihood of a specified undesired event occurring within a specified period of time or in specified circumstances and the potential severity or consequences.

'Likelihood' is the probability or chance of a hazard being realised.

3.3 Why is a Risk Assessment Required?

There are legal duties placed on every employer to assess: -

- the risks to the health and safety of his employees to which they are exposed whilst they are at work; and
- the risks to the health and safety of persons not in his employment arising out of or connection with the conduct by him of his undertaking.

Similar requirements are placed on the self-employed in respect of their own health and safety and that of others they might affect by their work.

There are a number of pieces of legislation which require or have an implied requirement to carry out a suitable and sufficient risk assessment, the main pieces of legislation are identified in Annex 1 of this guide.

3.4 A Suitable and Sufficient Risk Assessment?

A suitable and sufficient risk assessment is one which is able to demonstrate that all the significant hazards have been identified, with a view to reducing risks to the lowest level which is reasonably practicable. With this in mind, each assessment should:

- identify the activity, scope the activity out to identify start and finish;
- address all aspects of the work activity; including loading, unloading, moving of material in and moving material out, lifting and stacking unpacking, repacking and possible inadvertent deviations from laid-down procedures; emergency shut downs; plant/equipment clean down; maintenance operations; effects of interruptions/breaks; identify the hazards (e.g. by using a Hazard Checklist);

- take account of existing preventative or protective measures;
- identify the significant risks arising out of the work activity. These constitute risks which are likely to arise (i.e. are reasonably foreseeable) and which could reasonably be expected to result in serious harm or affect people (from such things as substances, equipment, work processes, work organisation).

Risk assessments vary in nature from simple qualitative at one end through to fully quantitative, this guide focuses on the simple qualitative. The depth of any assessment will depend upon a number of factors including; the potential severity of the hazards, the complexity of the activity, whether the activity is well established or new.

3.5 The Risk Assessment Process:

Introduction

General guidance is provided in the HSE leaflet 'Five Steps to Risk Assessment' and the approach presented in this guide follows this approach. concentrates on assessing the risks from the fire and explosion hazards associated with explosives handling and storage.

The person carrying out these risk assessments will need to be competent, that is to have had sufficient training, knowledge and experience to be able to carry out a suitable and sufficient assessment.

This section is broken down into the five steps or stages and some discussion is provided as to what is required for each step or stage. Also included with each step are a few indicators of what may be regarded as best practice and what are the common pit falls. These tables are not exhaustive and are given as a guide.

As more and more risk assessments are carried out there is a greater awareness gained, however there are a number of pitfalls which those carrying out risk assessments should be aware of.

There are many formats available for the documentation used in the risk assessment process as the annexes to this guide will show. The majority of these have been generated in house to suit the needs of the organisations however it is important to structure the documentation used to ensure that the relevant sections are covered. The Five Step approach should provide a guide to the sections that are required on the documentation. The documentation should be user friendly, easy to complete and easy to follow.

The tables provided below identify the best practices and pitfalls of risk assessment against the HSE model of Five Steps to Risk Assessment.

| General Considerations which may be used when carrying out Risk Assessments | |
|--|---|
| Best Practice | <p>Identifying who is the most appropriate person to carry out the assessment;</p> <p>Provide adequate time to carry out the assessment;</p> <p>Keep assessments as simple as possible without losing the important detail;</p> <p>Identifying the variable factors which change from location to location or task to task;</p> |
| Common Pitfalls | <p>Basing assessments on how individuals think the task is done rather than how it actually is;</p> <p>Providing too much information within the assessment so it becomes over complicated;</p> <p>Believing that the risk assessment process is merely a paperwork exercise.</p> |

Step 1 – Identify the Hazards

The identification of hazards is the first step in the risk assessment process. A hazard is anything that can cause harm to people, for example falling objects, falling from height, a fire or an explosion, substances containing chemicals which have the potential to damage health such as may be found in paints, inks and adhesives.

To identify all the hazards for a given process or activity in a workplace, consideration needs to be given to which hazards may arise from the workplace itself and from the task being carried out there. To ensure that all hazards are correctly identified it is necessary to know how and where the task is being carried out - observe the task.

Hazard checklists can be useful both in demonstrating the variety of hazards and to ensure that consideration is given to all the main potential sources of hazard. Manufacturers' instructions or safety data sheets may also assist in identifying hazards.

Consider the circumstances under which the task will be done to ensure that all hazards have been identified, for example the opportunity of operators being distracted, jolted or becoming fatigued. Consider also how one situation may impact on another in process at the time and vice versa. Concentrate on significant hazards that could result in serious injury and ignore the trivial hazards. Consider the harm

that could be done if no precautions were in place – any existing precautions are taken into account later in the risk assessment process.

For each identified hazard it will then be necessary to estimate the effect, e.g. for the accidental initiation of the explosives, will the explosives burn gently, vigorously (fireball effects), or violently (detonate)?

It should be noted that the 'design effects' of the explosive do not necessarily relate to the effects which might be realised in an accident situation. For example high explosives can burn rather than detonate, conversely pyrotechnics and propellants can detonate, under certain circumstances.

| Step 1 | Identifying the Hazards |
|------------------------|---|
| Best Practice | <p>Having a clear understanding of what the process is ;</p> <p>Ensuring that assessments take account of changing legislation;</p> <p>Assume that ‘it can happen’ and work from there;</p> <p>Talk to people doing the job – unwritten knowledge;</p> |
| Common Pitfalls | <p>Underestimating explosive hazards for stores – assuming that the licence is the assessment;</p> <p>Omitting non explosive hazards e.g. electrical fires;</p> <p>Misunderstanding the meaning of the word hazard – the hazard is the means not the consequence;</p> <p>Failing to understand what the maximum credible event might be – mass explosion <i>rather than a fire</i>;</p> |

It is important therefore that the effects of quantity of material present, the nature of the plant and in particular any confinement, conditions of handling (temperature), impurities and so forth are all considered. Self-confinement for example is particularly important. Black powder burns relatively gently when spread out in a thin layer, and yet when heaped-up, burns violently.

If any doubts exist about the way in which a particular substance, article or assembly will behave, then it will be necessary either to use remote handling facilities or to perform tests to establish how it will react in a variety of situations.

Step 2 – Decide Who Might be Harmed and How

Having identified all the potential hazards, it is then necessary to determine which of these are significant in terms of having the ability to cause harm to persons in the vicinity. This should include all people who enter the workplace, even on an occasional basis, such as visitors, contractors and service engineers.

| Step 2 | Identify Who Might be Harmed |
|-------------------------------|---|
| <p>Best Practice</p> | <p>Properly identifying who is involved in the task;</p> <p>Identifying peripheral persons e.g. members of the public, other road users, pedestrians etc;</p> <p>Assess the hazard in relation to property, equipment etc;</p> <p>System in place to feed back information to those persons most affected by the assessment ,</p> |
| <p>Common Pitfalls</p> | <p>Not considering the ways in which people may be harmed;</p> <p>Not considering properly the interactions between activities and the potential for escalation e.g. a fire during unloading could spread to contents of store;</p> <p>Underestimating the range and numbers of people potentially affected;</p> |

Consideration should be given to vulnerable groups of people such as young persons, old persons, pregnant or nursing mothers, disabled persons or the public. In some instances it may be necessary to carry out a specific risk assessment e.g. for pregnant women.

Step 3 – Evaluate the Risks and Assess the Precautions

The next and probably the most difficult step, is to judge which of the identified potential hazards could be foreseeable, or could reasonably be expected, to occur in the particular handling or manufacturing situation/s. If any doubt exists then a conservative approach should be adopted.

Having identified the risks which could be foreseeable or could reasonably be expected to occur, the first consideration should be to remove as many of these as practicable. A simple example of this would be the replacement of flammable and toxic cleaning agent by a water based detergent.

| Step 3 | Evaluate the Risks |
|------------------------|--|
| Best Practice | <p>Taking immediate action where risks are identified;</p> <p>Identify where generic assessments are appropriate;</p> <p>Consider a tiered system to look at different levels of risk;</p> <p>Ensuring back up systems are identified</p> |
| Common Pitfalls | <p>Failing to properly understand the risk;</p> <p>Providing an unrealistic assessment of human capabilities e.g. over dependence on person seeing that something is wrong and reacting to it;</p> <p>Assuming existing controls are 100% reliable e.g. fenced area to prevent access but fence has hole in it;</p> <p>Not making sufficient allowance for young or inexperienced employees;</p> <p>Not being open minded – questioning whether risk are adequately controlled rather than assuming they are;</p> |

Next it will be necessary to prioritise the identified risks in order of importance. A simple approach to both risk estimation and prioritisation of risks is given by the following risk matrix scheme, this is an example of one of many in use at present.

In practice, at one end of the spectrum will be small undertakings presenting few or simple hazards, and a suitable and sufficient assessment can be straightforward using judgement, requiring no specialist skills or complicated techniques. An example of this is the storage of finished explosives, packaged ready-to-transport in accordance with the UN scheme for the Transport of Dangerous Goods. Providing that the storage conditions are in accordance with the relevant statutory provisions and the licence, then the risk assessment record for the explosives risk will primarily refer to the explosives licence and the compliance with relevant requirements of MSER and its Approved Code of Practice. At the other extreme, for example a complex automated explosives manufacturing process, the risk assessment may need to be developed so far as to produce the basis for a complete safety case or report incorporating such techniques as Quantitative Risk Assessment (QRA). In general though, QRA's will rarely be necessary. QRA's may be required as part of a justification for deviations from normally accepted precautions.

Having identified the risks created by the work activity, the employer/self employed should then assess whether existing control measures are adequate, or whether further action is necessary and on what priority basis. The identified control measures should be prioritised according to provision of the greatest benefit.

The first consideration should be elimination of the hazards and risks, then towards combating the risks at source, rather than by mitigation measures. Where this is unsuccessful in that it results in an unacceptably high residual risk, then it may be necessary to move from an 'hands-on' operation to a 'remote' operation. The measures adopted should try to take advantage of technological and technical progress. A simple example of this might be to change from a hands-on roman candle filling operation to an automated press - which has operator protection (via polycarbonate fire/explosion resistant screening).

Step 4 – Record the Findings and Implement Them

Reg.3 (6) of the 'Management of Health and Safety at Work Regulations 1999' also requires that where an employer has five or more employees he shall record –

- the significant findings of the assessment; and
- any group of his employees identified by the assessment as being at risk.

The record itself should be retrievable in writing or on computer, and may refer to and rely on other documents and records describing process operation instructions, procedures and safeguards. Such a record should provide a clear audit trail of judgements made to prioritise the control of risks via an action plan, and provide a visible justification to others of the health and safety arrangements. Also at any future time the record should be sufficiently detailed to allow a determination of the validity of the last assessment and to understand the full basis of the assessment and how the conclusions were reached.

| Step 4 | Record the Findings |
|----------------------|---|
| Best Practice | <p>Looking at appropriate documentation e.g. training records;</p> <p>Discuss findings, this may give unwritten knowledge;</p> <p>Use a numbering system to provide ease of referencing;</p> <p>Level of recording should be proportionate to level of risk</p> |

| | |
|--------------------------------|---|
| <p>Common Pitfalls.</p> | <p>Failing to record findings – assessment done in head;</p> <p>Failing to record all aspects of assessment e.g. items which were considered but discounted;</p> <p>Not properly defining precautions i.e. wear gloves but no indication of type;</p> <p>Recording findings in a form which cannot be understood at a later date;</p> |
|--------------------------------|---|

The significant findings should include :-

- the significant hazards/risks identified in the assessment; which are those which might pose serious risk to workers or others who might be affected by the work activity if they are not properly controlled.
- the existing control measures in place and the extent they control risks. This need not replicate details of measures more fully described elsewhere in such things as works manuals, but could refer to them.
- the population which might be affected by these significant risks or hazards, including groups of employees who are especially at risk.

It is also useful to provide details of the assessment itself; this facilitates subsequent inspection by an inspector or safety representative, or to review the assessment.

Where actions are identified as a result of the risk assessment process these should be documented on the assessment and the actions should be assigned to an individual and include an anticipated completion date for the action. Actions should be tracked to completion as the assessment may not be regarded as complete until all the actions have been completed.

There are requirements on employers to provide information to their employees.

Regulations 10 and 11(1) (c) of The Management of Health and Safety at Work Regulations 1999 require every employer to provide his employees with comprehensive and relevant information on the risks to their health and safety identified by their assessments and any assessments by others on site;

- the preventative and protective measures;
- procedures to be followed in the event of serious and imminent danger (such as fire alarms, gas leaks, bomb threats);

- the identity of the nominated competent persons who will implement the procedures for emergency evacuation of the premises.

This information should be in a form which can be easily understood by the employees.

Step 5 – Review the Assessments and Update If Necessary

Regulation 3(3) of the Management of Health and Safety at Work Regulations 1999 requires that any assessment shall be reviewed periodically by the employer or the self-employed who made it or if either there is reason to suspect that the assessment is no longer valid, or if there has been a significant change in matters to which it relates; and to make any amendments necessary.

Straight forward type assessments and generic assessments should be reviewed at least every three years, more complex assessments should be reviewed more frequently and in relation to the level of hazard and risk e.g. a high hazard process risk assessment may be reviewed annually whereas a less hazardous activity may be reviewed bi annually.

| Step 5 | Review the Assessment |
|------------------------|---|
| Best Practice | <p>Closing out any actions which have been identified;</p> <p>Choosing realistic review dates for the assessment;</p> <p>Ensure that the review includes lessons learnt;</p> <p>Keep up to date with legislative requirements;</p> |
| Common Pitfalls | <p>Not acting on significant changes which may prompt a review e.g change in the range of materials stored;</p> <p>Not tracking when assessments are due for review;</p> <p>Reviewing assessments from a desk rather than looking at the task.</p> |

In addition to the above; accidents, incidents or near misses should prompt a review of the relevant risk assessments.

Section 4 – Terminology.

There is a significant amount of terminology that is used or is associated with risk assessment and the list below contains some of the the more common terms.

| | |
|-------------------------------|---|
| ALARP | As Low As Reasonably Practicable. ALARP decisions require an assessment of the risk that might be avoided in terms of:- <ul style="list-style-type: none">➤ an assessment of the sacrifice (in money, time and trouble) in taking further measures to avoid that risk;➤ the benefits derived from those further measures; and a comparison of the two relative to the baseline risk. |
| Competent Person | Persons who are competent to carry out a particular task, by virtue of their knowledge, experience, training and personal qualities. |
| Hazard | Something with the potential to cause harm (this can include articles, substances, plant or machines, methods of work, the working environment and other aspects of the work organization). |
| Likelihood | The probability or chance of a hazard being realised. |
| Reasonably Practicable | The balance between the risk and the sacrifice involved in the measures needed for averting the risk (money, time, trouble). |
| Risk | The chance, great or small that someone will potentially be harmed by a particular hazard being realized. The extent of the risk will depend on: <ul style="list-style-type: none">➤ the likelihood of that harm occurring;➤ the potential severity of that harm, i.e. of any resultant injury or adverse health effect; and➤ the population which might be affected by the hazard, i.e. the number of people who might be exposed. |
| Severity | An assessment of the credible accident that could be caused by a specified hazard. |

***Suitable and
Sufficient***

Fit for purpose and meeting all legal requirements. A suitable and sufficient risk assessment will reflect what it is reasonable to expect an employer to know about the hazards in the workplace.

Section 5 – Relevant Legislation.

This section of the guide provides a brief overview of the key health and safety legislative requirements that have a direct or implied requirement to carry out a risk assessment.

Health and Safety at Work etc Act 1974

Under Section 2(1) and 2(2) of HASWA employers are required to ensure so far as is reasonably practicable, the health and safety of their employees. To judge what is, or is not reasonably practicable can involve a process of risk assessment.

Management of Health and Safety at Work Regulations 1999 (MHSWR)

A key requirement of these regulations is for an employer to make a suitable and sufficient assessment of the risks to the health and safety of employees and other persons arising from the employer's undertaking in order to identify the measures the employer needs to take to comply with health and safety legislation. Similar duties are placed on the self-employed. These regulations lay down a set of principles to be followed in identifying the appropriate preventive and protective measures to control the risks identified by the risk assessment. These principles are reflected in the requirements of many of the sets of regulations dealing with specific hazards and risks described below. Hazards, whether or not covered by other regulations, will fall in any case under MHSWR. There is an approved code of practice and guidance for these regulations.

Regulations 10 and 11(1) (c) of The Management of Health and Safety at Work Regulations 1999 require every employer to provide his employees with comprehensive and relevant information on the risks to their health and safety identified by their assessments and any assessments by others on site;

- the preventative and protective measures;
- procedures to be followed in the event of serious and imminent danger (such as fire alarms, gas leaks, bomb threats);
- the identity of the nominated competent persons who will implement the procedures for emergency evacuation of the premises.

This information should be in a form which can be easily understood by the employees.

Manufacture and Storage of Explosives Regulations 2005 (MSER)

These regulations came into force in 2005 and replaced most of the Explosives Act 1875 and 1923 and subsidiary legislation. There is an Approved Code of Practice and Guidance, and paragraphs 31 to 55 of that document specifically refer to risk assessment, as follows:

Paragraphs 31 to 35 are guidance on general principles and cite the risk assessment requirements of Regulation 3 of the Management of Health and Safety at Work Regulations 1999 and Regulation 5 of the Dangerous Substances and Explosives Atmospheres Regulations 2002. They also advise that the risk assessment must be taken before any new work activity involving dangerous substances begins. The regulation follows the “five steps” approach to risk assessment and stress the importance of consulting and involving safety representatives in the process of drawing up a risk assessment.

Paragraphs 36 to 44 are guidance and give advice on matters that need to be considered under each of the “five steps” headings. Under the heading of recording the results of the risk assessment, it is advised that newsagents consider paperboys and girls as employees.

Paragraphs 45 to 55 are part of the Approved Code of Practice, and stipulate hazards that need to be considered for various explosives activities (storage of fireworks and other pyrotechnic articles – paragraph 45, storing high explosives – paragraphs 46 and 47, firework fusing – paragraph 48, manufacture of explosives – paragraphs 49 – 54 inclusive, and higher risk operations – paragraph 55).

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Live Action FX Ltd.

Defence Science and Technology Laboratory (Dstl)

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Local Government Regulations (formerly LACORS).

SELEX, Sensors and Airborne Systems Ltd.

AWE plc.

Institute of Explosives Engineers.

TNT Fireworks (UK) Ltd.

DAVAS Ltd.

Appendix 1 Risk Assessment Example for a Firework Retail Outlet.

This example of a risk assessment is based around a shop which has been set up specifically for the sale of fireworks to the general public during the peak period of the season, the run up to November and the run up to New Year. The shop holds a local authority license to store a limited quantity of materials in a store room which is located beneath the shop. Customer requirements are collected from the store room taken up to the sales area as required and are then sold to the public.

In this particular example the contents have been expanded to demonstrate a number of scenarios which may exist

Whilst the store room may hold limited quantities of materials, stocks are replenished from a larger store/facility which is located some miles from the retail outlet. These replenishment stocks are brought to the shop by a van which is driven by an employee. The assessment identifies the appropriate legislation relating to the transport of dangerous goods.

In this example the assessment is carried out by the shop manager in association with the employees and covers the full range of activities from loading the van at the main facility, transporting to the shop, unloading, storage, retail sale and returning stocks to the main facility.

The assessment is reviewed annually in order to keep it up to date and reflect any legislative changes regarding transport, packaging or classifications, the range of fireworks may also change, this may include both quantity and hazard type e

The purpose of the assessment is to ensure that the risks have been properly identified and are sufficiently mitigated by the control measures that have been put in place and to ensure that best practice is applied The approach taken is a simple assessment of determining if the risk is considered high, medium or low. This type of assessment is common and relatively simple.

The assessment is posted in the storage area of the shop and held on file at the main facility.

This type of assessment may be of interest to persons operating dedicated retail outlets for fireworks and is subject to local authority inspections.

Risk Assessment Example – Firework Retail Outlet.

| Activity | Identified Hazards. | Persons Affected . | Consequences. | Control Measures in Place. | Residual Risk. |
|---|---|--|--|---|----------------|
| General Operation of Retail Firework Shop | Fireworks being sold to or acquired by persons under the age of 18. | Business and potentially members of the public | Possible legal action and loss of licence. Potential for misuse leading to injury. | All products on open display in the sales area are dummy products. Staff are trained in the sale of fireworks and will ask for identification. Intercompany spot checks are carried out as are checks by trading standards. Signage is in place. | Medium. |
| | Electrical fire within the premises. | Employees and members of the public. | Possible major injury to employees and or members of the public. | All electrical appliance outlets throughout the sales area are blanked off, all other electrical appliances e.g. oil filled radiators are wired directly. | Low |
| | Fire within shop during out of hours – possible cause is arson. | Emergency services responding to incident. | Possible major injury. | All products on open display in the sales area are dummy products, no live fireworks are permitted to be stored in the sales area.. All live fireworks are stored in lockable flame proof cabinets and are only moved to the sales area when required. | Low |
| | Fire within shop caused by malicious attack. | Employees and members of the public. | Major injury possible to one or more persons. | All products on open display in the sales area are dummy products, no live fireworks are permitted to be stored in the sales area. Smoking is not permitted. Smoking is not permitted in the whole of the shop area. Fire extinguishers are available and shop staff are trained in their use. All live fireworks are stored in lockable flame proof cabinets and are only moved to the sales area when required. | Low |
| | Fire within the premises spreading from sales area to store room. | Employees and members of the public. | Major injury possible. | All products on open display in the sales area are dummy products, no live fireworks are permitted to be stored in the sales area. Smoking is not permitted. Smoking is not permitted in the whole of the shop area. Fire extinguishers are available and shop staff are trained in their use. All live fireworks are stored in lockable flame proof cabinets and are only moved to the sales area when required. | Low |
| | Personal injury e.g. slips trips and falls. | Employees and drivers. | Minor to Major injury possible to an individual. . | All employees are provided with safety footwear. Dedicated loading area which is flat and free from loose or uneven surfaces. There are handling aids to assist in loading e.g. belt | Low |

| | | | | | |
|--|--|--|--|---|--------|
| Vehicle loading at base. | | | | conveyor, sack trucks etc. | |
| | Ignition of fireworks through impact e.g. dropping of box or boxes. | Employees and drivers. | Major injury possible to one or more persons. | All fireworks are packaged in UN approved boxes. All employees are trained in manual handling. Throwing of boxes is not permitted. All spillages are cleaned up immediately. | Low |
| | Ignition of fireworks through friction – sliding of boxes across rough surfaces. | Employees and drivers. | Major injury possible to one or more persons. | All fireworks are packaged in UN approved boxes. All employees are trained in manual handling. Throwing and sliding of boxes is not permitted. All spillages are cleaned up immediately. | Low |
| | Water ingress into carton. | Employees, drivers and business. | Possible product damage and or malfunction. | Boxes are kept dry at all time and away from damp or wet surfaces. Loading suspended during periods of heavy rain. | Low |
| Transport to the shop / retail outlet. | Personnel injury caused by road traffic accident. | Employees, drivers or members of the public | Possible major injury or fatality to driver and or employee or to member of the public. | Where possible main roads are used for transporting fireworks to shop. Drivers are ADR trained and hold full licence.. Vehicle is fully serviced and roadworthy. All materials are in UN approved packaging | Medium |
| | Ignition caused by impact – box or stack falling over. | Employees. drivers or members of the public. | Possible major injury to employee. Possible projectile hazard to members of the public | All boxes are stacked in a safe and secure manner and load is kept level during transport where possible. Stack height and separation arrangements in place. | Medium |
| | Friction / impact ignition caused by spillage of powder. | Employees, drivers or members of the public. | Possible major injury to employee/s. Possible projectile hazard to members of the public. | All boxes are stacked in a safe and secure manner and load is kept level during transport where possible to prevent movement during transit.. Stack height and separation arrangements in place. Vehicle is swept clean prior to loading. | Medium |
| Delivery into the shop. | Personal injury to employees and others from crossing in front of vehicle. | Employees and or pedestrians. | Possible major injury or fatality to employee/s. Possible projectile hazards to members of the public. | When reversing an assistant is used to guide vehicle to ensure minimal risk of collision or personal injury to members of the public. Vehicle parked close to shop with easy and clear access where possible. Kerbs to be avoided. | Low |
| | Personal injury through slips trips and fall. | Drivers and employees. | Possible minor to major injury to employee. | Employees trained in manual handling. Single box handled at any one time. Manual handling equipment is available. | Low |
| | Poor supervision of shop leading to overloading and | Shop owner. | Possible enforcement action by authorities. | Retail outlet side of the shop is closed during deliveries of new stock, load quantity is checked prior to delivery to ensure that there is sufficient | Low |

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|--|--|--|---|--|---------|
| | breach of licence. | | | licence available and physical space. | |
| | Ignition of fireworks caused by falling or dropping of box. | Drivers and employee. Members of the public. | Possible major injury to employee/s and to members of the public. | All fireworks are packaged in UN approved boxes. All employees are trained in manual handling. Employees handle single boxes and where appropriate use handling equipment. | Medium |
| | Ignition of fireworks through friction | Drivers and employee. Members of the public. | Possible major injury to employee/s and to members of the public. | All fireworks are packaged in UN approved boxes. All employees are trained in manual handling. Employees handle single boxes and where appropriate use handling equipment | Low |
| | Theft from vehicle while being unloaded – possible abuse of product. | Drivers and employee. Members of the public. | Possible major injury to employee/s and to members of the public. Business risk. | Vehicle is parked close to shop so as not to cause obstruction, there is an attendant with the vehicle at all times until unloading is complete. Goods taken from vehicle to delivery point, no stacking of goods on pavement or in doorway outside store or shop. | Low. |
| | Ignition of fireworks communicates to material in vehicle. | Drivers and employees. Members of the public. | Possible major injury or fatality to employee/s. Possible projectile hazards to members of the public. | Vehicle parked out of line of sight of access to the store located beneath the retail outlet. This is to prevent communication between the store and the loaded vehicle. | Low |
| Dispensing of fireworks into storage cabinets within the store room. | Ignition caused by dropping box or product from box. | Drivers and employees. | Possible major injuries or fatality to employee/s. | No throwing of boxes at any time or dragging of boxes across uneven surfaces. All spillages to be cleared up immediately. Store room swept prior to deliveries. Fireworks to be stored in original packaging until ready to move to cabinets. | Medium |
| | Personal injury. | Employees. | Minor injury. | All personnel are trained in manual handling. Only one box handled at any one time. | Medium. |
| | Product ignition through friction. | Employee | Possible major injury | All fireworks are packaged in UN approved boxes. All employees are trained in manual handling. Employees handle single boxes and where appropriate use handling equipment | Low |
| | Water ingress into carton or product | Business risk through product write off. | Possible major injury through product malfunction. | Boxes are kept dry at all time and away from damp or wet surfaces. Loading suspended during periods of heavy rain. | Low |
| | Personal injury – cuts and abrasions. | Employees. | Possible minor injury. | Care to be taken when opening boxes with knives or scissors, where possible use safety cutters. | Low |
| | Ignition spreading from external | Employees. | Possible major injury. | One carton to be loaded at any one time. Only one cabinet in use at any one time. | Low |

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|---|---|--------------------------------------|--|--|--------|
| | sources to fireworks in cabinet. | | | Cabinets are flame proof. | |
| Sale of fireworks in shop area to the general public. | Fire caused by smoking or smoking mats. | Employees and member of the public | Possible major injury. | No smoking is permitted on the premises. Signage is in place in all public areas | Medium |
| | Fire spreading through the sales area from external sources. | Employees and members of the public. | Possible major injury. | Fire extinguishers available in the event of a small fire. All live fireworks are kept in either the store room or in locked fire resistant cabinets in the sales areas. | Low |
| | Fire caused by spillages or dropping of individual fireworks. | Employees and members of the public. | Possible major injury. | All spillages are cleared up immediately and placed in a flame proof container. Fireworks are suitably packaged before hand over to the public. Surplus or waste packaging stored separately . | Low |
| Collecting stock from the premises. | Personal injury while moving around vehicle. | Employees and to the general public | Potential major injury. | When reversing an assistant is used to guide vehicle to ensure minimal risk of collision or personal injury to members of the public. Vehicle parked close to shop with easy and clear access where possible. Kerbs to be avoided. | Medium |
| | Personal injury through handling or slips and trips. | Employees. | Possible major injury. | Employees trained in manual handling. Single box handled at any one time. Manual handling equipment is available. | Low |
| | Theft of stock from the premises during loading. Possible abuse of product. | Business risk. Members of the public | Possible impact on the business. Possible major injury through abuse of product/s. | Vehicle is parked close to shop so as not to cause obstruction, there is an attendant with the vehicle at all times until unloading is complete. Goods taken from store to vehicle, no stacking of goods on pavement or within doorways. | Low |
| | Ignition of fireworks through impact. | Employees and to the general public | Possible major injuries to a number of persons. | All fireworks are packaged in UN approved boxes. All employees are trained in manual handling. Employees handle single boxes and where appropriate use handling equipment. | Low |
| | Ignition of fireworks through friction | Employees and to the general public | Possible major injuries to a number of persons. | Boxes are handled carefully, no dragging of boxes across the floor. Employees trained in manual handling. All spillages cleared up immediately. | Low |
| | Water ingress into carton and product. | Business risk. | Possible product failure to function or malfunction leading to personal injury. | Boxes are kept dry at all time and away from damp or wet surfaces. Loading suspended during periods of heavy rain. | Low |

| | | | | | |
|---------------------------------|--|---|---|--|--------|
| | Theft from vehicle whilst being loaded or unloaded. | Employees, general public and the business. | Possible product misuse leading to personal injury or impact on business. | Unloading is a two man operation to ensure that the vehicle is never left unattended. Goods taken from store to vehicle , no stacking of goods on pavement or outside store entrance. | Medium |
| Return Transport to main store. | Personal injury caused by road traffic accident. | Employees, driver or members of the general public. | Possible major injury. | Boxes are handled singly. All fireworks are packaged in UN approved boxes | Low |
| | Ignition of fireworks from impact or from falling boxes during transit.. | Employees and driver | Possible major injury. | Employees trained in manual handling. Stack height and separation arrangements in place. | Low |
| | Ignition of fireworks through friction - sliding of boxes during transit.. | Employees and driver. | Possible major injury. | Employees trained in manual handling. Stack height and separation arrangements in place. | Low |
| | Ignition of spillages of powder through friction or impact. | Employees / driver | Possible major injury. | Employees trained in manual handling. Stack height and separation arrangements in place. | Low |
| Unloading at base or main store | Personal injury to employee through slip, trip and fall. | Employees. | Possible major injury. | Area for unloading is flat and clear with no uneven surfaces. Employees trained in manual handling | Low |
| | Ignition of fireworks caused by dropping of box. | Employees. | Possible burns resulting in major injury. | Boxes are handled rather thrown during unloading operations. Employees are trained in manual handling. Boxes are handled singly. All fireworks are packaged in UN approved boxes | Low |
| | Ignition of fireworks through friction e.g. from dragging of boxes. | Employees. | Possible burns resulting in major injury. | Boxes are handled correctly rather than dragged during unloading operations. Employees are trained in manual handling. Boxes are handled singly. All fireworks are packaged in UN approved boxes. | Low |
| | Water ingress into carton or box. | Employees / business. | Product damage and loss of stock. | Boxes are kept dry at all time and away from damp or wet surfaces. Loading suspended during periods of heavy rain. | Low |
| | Storage of live fireworks in unlicensed area. | Employees / business. | Breach of licence with potential loss of licence. | Fireworks removed straight from vehicle and placed directly into licensed store. | Low |
| Date of Assess'nt | Date | | Assessment Carried out by | Name. | |

| | | | | |
|--|---|--|--|--|
| Date of Assess'nt Review. | | | | |
| Assessment Notes | Low Risk | No further action required, low risk , proceed. | | |
| | Medium Risk | Safe to proceed but monitor controls. | | |
| | High Risk. | Action required to reduce risk before commencing. | | |
| Conclusions of Risk Assessment. | <p>There were no high risk areas identified and therefore no processes which required immediate review.</p> <p>There were a number of processes which were identified as medium risk most of which require the employees to follow the instructions provided and not to take short cuts or be lax in the required checks. For example sale to persons under 18 relies on the sales person requesting and checking ID.</p> | | | |

Annex 2 Risk Assessment Example for a Local Authority Registered Premise or Licensed Store.

This example relates to the operation of a licensed explosives store authorised by the local authority and is subject to visits by local authority inspectors. Typical examples of these types of store may be defined storage areas within buildings, brick built buildings, steel proprietary stores or small ISO containers. These stores may be located close to the point of use such as a retail premises and therefore accessed on a fairly regular basis by a number of people or alternately may be located some distance away from their point of use and materials are transferred between the store and point of sale or use.

These types of stores may be used for the storage of a variety of explosives or explosive articles. For best practice these stores should not be used for the storage of any other materials including packaging materials.

This example of a risk assessment was carried out by the person responsible for the licensed store in conjunction with a member of staff responsible for accessing the store and removing materials from it.

The assessment is a simple qualitative assessment based on the 5 steps to risk assessment and a copy of the completed assessment is posted in the store. The assessment is subject to a bi annual review unless a significant change occurs such as a change in the balance of materials held within the store e.g. an increase in the quantity of hazard type 3.

The assessment has identified a number of areas where individuals may be assigned responsibilities e.g. training of staff in how to correctly stack/store boxes containing fireworks. This may be carried out by responsible individuals and the risk assessment documents that all staff have been trained. This type of approach is useful in ensuring that the requirements of local authorities are met and should the store be inspected a risk assessment would be required.

The risk assessment may need to be reviewed if the store is inspected and serious deficiencies are found during the inspection indicating that the identified controls are not implemented or are inadequate.

Risk Assessment Example of Local Authority Registered Premises or Licensed Store.

Location of Store – Peak Industrial Estate.

Date of Assessment July 2011

| What are the Hazards? | Who might be Harmed and How? | What are You already Doing? | What further Action is Necessary? | Who is Responsible for the Action | Action to be Complete by When? | Completed |
|--|---|---|---|-----------------------------------|--------------------------------|-----------|
| Accidental ignition of the explosives during loading and unloading at the store. | Store staff and delivery drivers. Members of the public in the immediate vicinity. | No sources of ignition or smoking materials allowed in the store or in the immediate vicinity of the store. | Train staff in the store rules, correct stacking techniques, for example stable stacks of boxes, maximum stack height, gangways between stacks. | GW. | Sept 11 | ✓ |
| | | We have confirmed that the delivery driver has had training in how to minimise hazards during delivery. | Provide system of stock rotation. | GW. | Sept 11 | ✓ |
| | | Vehicle is parked a safe distance away from the front of the store. | Advise wholesaler of suitable delivery times for best access. | GW. | July 11 | ✓ |
| | | Manual handling equipment is provided to minimise risk of dropping boxes of explosives. | Train all staff in the use of the manual handling equipment. | FD. | Sept 11 | ✓ |
| | | | Compile and post notice about what to do in an emergency. | FD. | Sept 11 | ✓ |
| Accidental ignition of the explosives during storage. | Store Staff, visitors and members of the public in the immediate vicinity of the | No sources of ignition or smoking materials allowed in the store or in the immediate vicinity of the store. | All other combustible materials are cleared out of the store prior to use. | FD. | July 11 | ✓ |
| | | | Put up signage stating that this is a no smoking area. | FD. | July 11 | ✓ |

| | | | | | | |
|--|--------|---|--|-----|----------|---|
| | store. | | Prohibit use of mobile phones within the store and the immediate vicinity of the store. | GW. | July 11. | ✓ |
| | | Limit quantities of explosives stored to that allowed by the registration. | Post notice in the store stating the maximum quantities of materials allowed within the store. | GW. | July 11 | ✓ |
| | | Ensure that when the store is not occupied the doors are secured to prevent unauthorised entry. | Train all store staff in security and provide key holder arrangements | GW. | Sept 11 | ✓ |
| | | Prohibit opening and decanting of boxes of explosives within the stores. | Provide notices stating good working practices for the store for example what to do about spillage or disposal of damaged items. | GW. | Sept 11 | ✓ |

Annex 3 Basic Risk Assessment – Small Retail Premises.

This is an example of a risk assessment which may be suitable for a small to medium sized retail premises selling fireworks on a seasonal basis and where fireworks may be stored on the premises in a store room or small container immediately adjoining the premises. Typical premises which may be covered by this approach are news agents and corner shops and possibly garden centres etc.

Deliveries are made to the shop at agreed times to minimise the exposure of members of the public since the boxes containing explosives need to be moved through the shop to access the store room at the rear. For larger premises access may be directly to the rear of the premises.

The assessment is carried out by the shop owner or shop manager and the completed assessment is posted in the store room. The assessment is a simple quantitative assessment which follows the 5 steps to risk assessment approach.

The assessment has identified a number of areas where individuals may be assigned responsibilities e.g. training of staff in how to correctly stack/store boxes containing fireworks. This may be carried out by the shop owner or manager and the risk assessment documents that all staff have been trained.

The assessment will be reviewed on a bi annual basis unless there is a significant change e.g. differences in pack classifications and sizes, relay out of the shop.

This example may also provide some information for retail premises selling shot gun cartridges.

Risk Assessment Example for a Small Retail Premises.

Company Name : Your Local Newsagent

Date of Assessment – June 2011

| What are the Hazards. | Who might be harmed and How. | What controls are already in place. | What further action may be carried out to reduce the risk. | Who is responsible for the Action | Action to be complete by When | Completed |
|---|---|--|---|-----------------------------------|--|-----------|
| Accidental ignition of fireworks during delivery to the shop. | Shop staff while stacking delivery in the stock room. | No sources of ignition or smoking materials allowed in the stock room. | Train all staff in correct stacking techniques e.g. stable stacks of boxes, not too many layers in a stack. | LK. | Sept 11 | ✓ |
| | Delivery driver carrying boxes to the shop from delivery vehicle. | We have confirmed that the delivery driver had received training in how to minimise hazards during delivery. | As above. | LK | Sept 11 | ✓ |
| | Public present in the shop. | All deliveries of fireworks are taken directly to the stock room so that retail area is avoided. | Advise firework wholesaler of "direct delivery to stock room " requirement. | FM. | August 11 (before first delivery takes place.) | ✓ |
| | Newspaper delivery staff present in the shop. | As above. | Schedule deliveries to avoid times when newspaper delivery staff are present. | FM | August 11 (before first delivery takes place.) | ✓ |
| Accidental ignition of fireworks during storage. | Shop staff. | No sources of ignition or smoking materials allowed in the stock room. | Lighter refills currently stored in the stock room to be removed and stored elsewhere. | FM. | July 11 | ✓ |

| | | | | | | | | |
|--|---|--|--|---|---------|--|---------|---|
| | | Limit the quantity of fireworks stored to our registration limit less the quantity we keep in the retail area. | Put up notice in stock room stating the maximum quantities allowed in the stock room and in the retail area. | LK. | July 09 | ✓ | | |
| Accidental ignition of fireworks during retail sale. | Shop staff | Following advice given in the wholesaler's leaflet "Selling Fireworks Safely" | Train staff on safe procedures given in "Selling Fireworks Safely". | LK. | July 11 | ✓ | | |
| | Public in the shop | | Erect "No smoking" signs in the retail area. | FM. | July 11 | ✓ | | |
| | Public in immediate vicinity outside the shop | All fireworks sold to customers to be in carrier bags and no other goods to be | Order and provide suitable carrier bags. | SD. | July 11 | ✓ | | |
| | | | Be prepared to limit number of customers in retail area at busy times. | Work out a safe maximum number of customers for the retail area. | FM. | July 11 | ✓ | |
| | | | All stock of fireworks in retail area kept in a closed cabinet – only opened to remove fireworks when sold to customers. | Ensure clear route to the door of retail shop at all times. | All | Oct 11 and throughout the firework selling season. | ✓ | |
| | | | | Check cabinet is large enough to take new packs of fireworks for this season. | LK | | July 11 | ✓ |

Annex 4 Risk Assessment Example for the Bulk Storage of Fireworks in ISO Containers.

The use of ISO container of various sizes for the shipping and transport of fireworks is well known and well used however these containers are being used increasingly for the storage and dispensing of fireworks to retail outlets.

The following example of a risk assessment relates to the primarily to the use of 40' ISO containers for the storage of fireworks although this assessment methodology is equally applicable to risk assessments relating to ISO containers of other sizes. The contents of this example have been expanded out in order to demonstrate a number of scenarios which may need to be considered as part of the risk assessment and what controls may be applicable to control the risk.

The operator of the site, the licence holder, has a number of ISO containers located on a fenced licensed site. The site is located some distance from a main road and is accessed via a narrow country lane. The site is located on the edge of a small industrial estate which is also serviced by the same narrow country lane. The industrial estate is partially screened from a river flowing along its edge by a line of trees. On the far side of the river is a housing estate. There are therefore a variety of hazards to be considered within the risk assessment.

There are a total of 12 40' ISO containers on the site and they are arranged in 2 lines of 6 and each line is faced back to back with the other line. The site is bounded by a fence and there is only one access gate.

The fireworks are brought to the site in a variety of vehicles ranging from a small van through to a tractor and trailer unit capable of transporting a 40' ISO container. The contents of the vehicles are either unloaded by hand for the smaller vehicles or using a diesel fork lift truck borrowed from an adjoining factory unit. The fuel for the diesel truck is stored at the rear of the adjoining factory unit close to the fence. Access around the ISO containers is not suitable for large vehicles but may be used by smaller vehicles.

The fireworks stored at this site are largely Hazard Type 4 (80%) with some Hazard Type 3 (20%). It is considered likely that this split may change in the future with an increase in the quantities of Hazard Type 3 fireworks.

The site is only occupied during deliveries to or despatches from the containers. The industrial site employs a local security company to carry out security checks during out of hours periods. There is an agreement for security cover during peak business times.

The risk assessment has been carried out by the licence holder/site operator in accordance with the five step approach. The assessment is sub divided into what are regarded as the main activities relating to the site i.e. access and egress to the site, the loading and unloading of the vehicle to and from the storage containers and the security of the stores.

The example shows a semi quantitative approach although a simpler approach may equally be used. In this case a matrix is used and figures are given for unmitigated and mitigated risk. The makeup of the risk rating is provided to demonstrate the effects of the mitigation. The risk assessment is documented as shown and a copy is held by the licence holder. The assessment will be reviewed periodically or when a significant change occurs.

| Assessment – Bulk Storage of Fireworks in an ISO Container. | | | | Assessment Number XXXX | Assessment Carried Out by | Assessment Date cc/dd/ee |
|---|--|--|---|---------------------------|--|-----------------------------|
| Activity | What are the Hazards | Who may be Affected. | Consequences. | Risk Level | Control Measures in Place | Residual Risk |
| Vehicle accessing and leaving the site. | Impact with other vehicles accessing or leaving the industrial site. | Drivers of each vehicle. Passengers in the cabs of vehicles | Potential serious injury to one or more drivers. Potential fire as a result of collision damage. | 4 x 3 = 12 MEDIUM | All drivers are fully trained and ADR certificated. There is a 10MPH speed limit on the access lane which allows for single file traffic only. Access to main road is via main access to industrial estate. | 4 x 1 = 4 LOW |
| | Impact with pedestrians | Pedestrians. | Major injury possibly fatal to pedestrian. | 5 x 3 = 15 MEDIUM. | There is a 10MPH speed limit on the access lane which allows for single file traffic only. There is no pedestrian access to the site but separate pedestrian access to the industrial site. | 4 x 1 =4 LOW |
| | Vehicle fire caused by electrical fault. | Driver and passengers. | Possible major injury and damage. Potential fire spread to units in industrial park. | 4 x 3 = 12 MEDIUM. | Vehicles maintained to current VOSA requirements. Fire extinguisher fitted to vehicle. Separate vehicle parking away from containers. | 3 x 2 = 6 LOW |
| Unloading of vehicle. | Ignition caused by dropping of box/boxes from vehicle | Employees, | Possible major injury to employee. | 4 x 3 = 12 MEDIUM. | All employees trained in manual handling. All materials are packaged in UN approved packaging. Material handling equipment available – sack truck. Single person in vehicle to minimise tripping risk. | 3 x 2 = 6 LOW |
| | Ignition caused by stack falling over. | Employees. | Possible major injury to employee. | 4 x 3 = 15 MEDIUM. | Vehicles are loaded in such a way as to prevent unnecessary movement or sliding of goods. Stack heights of materials restricted to 4 boxes. All materials are packaged in UN approved packaging. | 3 x 1 = 3 LOW |
| | Communication of ignition to rest of load. | Employees, | Possible major injuries to employees. | 4 x 3 = 12 MEDIUM. | Single boxes handled at any one time to minimise likelihood of spread. No smoking rules apply. | 4 x 1 = 4 LOW |
| | Communication of the ignition to other ISO containers. | Employees, and members of the public. | Possible major injuries to employees and members of public | 4 x 3 = 12 MEDIUM. | Vehicle parked away from front of container, out of line of sight between vehicle and containers. Containers are positioned in such a way that there is no direct line of sight between individual containers. Doors to containers are kept shut when not in use. | 4 x 1 = 4 LOW |
| | Ignition caused by operator dropping box during transfer. | Employees. | Possible major injury to employee | 4 x 3 = 15 | All employees trained in manual handling. All materials are packaged in UN approved packaging. Material handling equipment available – sack truck. No smoking rules apply. | 3 x 2 =6 |

| | | | | | | |
|---|--|---|--|---------------------------------|---|--------------------------------|
| | | | | MEDIUM. | | LOW |
| Loading and unloading of materials to and from ISO container. | Ignition caused by dropping of box/boxes near or within the container. | Employees. | Possible major injury or fatality. | 5 x 3 = 15 MEDIUM. | All employees trained in manual handling. All materials are packaged in UN approved packaging. Material handling equipment available – sack truck. Single person in vehicle to minimise tripping. | 5 x 2 = 10 MEDIUM |
| | Ignition caused by stack falling over in container. | Employees, | Possible major injury or fatality. | 5 x 3 = 15 MEDIUM. | All employees trained in manual handling. All materials are packaged in UN approved packaging. Single person in container to minimise tripping. No boxes are to be thrown to speed up unloading or loading. All boxes are stacked in a sensible and safe manner and to a realistic height. | 5 x 1 = 5 LOW. |
| | Ignition within container communicates to materials within the container. | Employees, pedestrians or member of the public. | Possible major injury or fatality. | 5 x 3 = 15 MEDIUM. | All employees trained in manual handling. All materials are packaged in UN approved packaging. Material handling equipment available – sacktruck. Single person in container to minimise tripping. No smoking rules apply. | 5 x 1 = 5 LOW |
| | Ignition from within container communicates to other containers. | Employees, pedestrians or member of the public. | Possible major injuries or fatality | 5 x 3 = 15 MEDIUM. | No boxes are to be thrown to speed up unloading or loading. All boxes are stacked in a sensible and safe manner and to a realistic height. Doors on containers not in use are kept closed. Containers are located in such a way that there is no line of sight between doors. | 5 x 1 = 5 LOW |
| Dispensing of materials into and between the ISO containers. | Ignition caused by dropping box or product from box. Potential for fire spread to other containers | Drivers and Employees. | Possible major injuries or fatality | 5 x 3 = 15 MEDIUM. | Product groups and hazard types separated into individual ISO containers. Boxes are not opened within the ISO container, dispensing takes place remotely from the container. Loads are consolidated in a dedicated areaway from ISO containers containing bulk materials. | 5 x 2 = 10 MEDIUM |
| | Ignition or personal injury from falling box. Potential for fire spread to other containers. | Employees, pedestrians or member of the public. | Possible major injuries or fatality | 5 x 3 = 15 MEDIUM. | No throwing of boxes at any time. All boxes are stacked in a sensible and safe manner and also at a sensible height. Stack height controlled at 4 boxes. Single person works within any one ISO container. All container doors are closed when not in use. There is no line of sight between container doors. | 5 x 1 = 5 LOW. |
| Ignition caused by external heat or flame. | Fire caused by smoking or smoking materials. | Employees. | Possible major injuries from explosion caused by confinement of fireworks in ISO container | 4 x 2 = 8 MEDIUM. | No smoking is permitted on site, smoking materials must be left within vehicles. No smoking notices posted across the site. Vegetation around the storage containers is minimised and kept under control, waste is removed for external disposal. | 4 x 1 = 4 LOW |

| | | | | | | |
|-----------------------------------|--|--|---|--------------------------|--|-------------------------|
| | Fire caused by spillages / waste packaging materials disposed of by burning. | Employees. | Possible major injuries from explosion caused by confinement of fireworks in ISO container | 4 x 2 = 8 MEDIUM. | All spillages are cleaned up immediately and placed in a flame proof container. Waste packaging materials are stored separately. Designate area established where waste is stored and disposed of. | 4 x 1 = 4 LOW |
| Loading of a variety of vehicles. | Ignition caused by dropping box or product from a box. | Employees, vehicle drivers | Possible major injuries or fatality. | 5 x 3 = 15 MEDIUM | Single vehicles are loaded at any one time. Loads are consolidated in one area prior to loading. System in place for timed collections and deliveries to and from the site. Employees trained in manual handling. | 5 x 2 = 10 MEDIUM |
| | Vehicles containing incompatible materials e.g. chemicals. | Employees and vehicle drivers. | Possible ignition or chemical reaction leading to injury. | 3 x 2 = 6 LOW | Collection vehicles are required to be empty when coming on site . Any suspect materials are removed. Where possible dedicated vehicles are used. | 2 x 1 = 2 LOW |
| External factors. | Fire spread caused by fire in adjoining industrial area. | Fire Fighters, Police or member of the public. | Possible major injuries from explosion caused by confinement of fireworks in ISO container. | 4 x 3 = 12 MEDIUM. | Security presence on industrial estate providing early warning of risk. Site is maintained in clean and tidy state with surplus / waste packaging stored away from containers. Metal containers maintained in good state of repair. Emergency arrangements in place when site is occupied. | 3 x 2 = 6 LOW |
| | Fire caused by act of vandalism. | Fire Fighters, the police and members of the public. | Possible major injuries from explosion caused by confinement of fireworks in ISO container | 4 x 2 =8 MEDIUM | There is a security presence on the main industrial site The containers are stored on a licenced site which is fenced off and accessed through a lockable gate. Containers are secured by close hasped padlocks. Warning signs are posted. Extra security patrols arranged during peak activity. | 4 x 1 =4 LOW |
| | Break in and Theft from containers. | Police Officers. Thieves. | Possible acts of vandalism including firing off products or setting fire to containers. | 3x2 =6 MEDIUM | There is a security presence on the main industrial site The containers are stored on a licenced site which is fenced off and accessed through a lockable gate. Containers are secured by close hasped padlocks. Warning signs are posted. Extra security patrols arranged during peak activity. | 3x1 =3 LOW |
| | Likelihood | 1 No injury or damage | | | | |
| | | 2 Minor Injury or damage | | | | |
| | | 3 RIDDOR 3day injury | | | | |
| | | 4 Major injury. | | | | |

| | | | | | |
|--|---|--------------------|---------------------------------------|---|--|
| Assessment Notes. | X | 5 | Fatality or major fire damage | | |
| | Severity = | 1 | Highly Unlikely | | |
| | | 2 | Unlikely | | |
| | | 3 | Likely | | |
| | | 4 | Very Likely | | |
| | | 5 | Certain. | | |
| | Risk Rating | High Risk | 16 – 25 | Action is required to reduce risk before commencing. | |
| | | Medium risk | 6 – 15 | Safe to proceed and monitor controls. | |
| Low risk | | 1 – 5 | No further action is required. | | |
| Conclusions of the assessment. | <p>There were no high risk activities identified which required immediate action.</p> <p>The majority of the medium risks have been mitigated by the control measures that have been put in place. The higher residual risks centre around the potential for an individual to drop a box containing fireworks. It is considered not possible to reduce the likelihood to highly unlikely.</p> | | | | |
| Review Date for the Assessment. | <p>This assessment must be reviewed within 2 Years or where an accident or significant change takes place e.g. an increase in the quantity of fireworks transported or stored or the hazard type being stored.</p> | | | | |

Appendix 5

Risk Assessment Example for a Major Firework Display.

The following example is that for a major fire work display which is to take place at a key London landmark. While this example is much more detailed than required under the terms of this guide it serves to provide information and examples of many of points which need to be considered when carrying out a risk assessment for a firework display.

Firework displays range from small local affairs such as private parties through to major events of tied in with other social events.

There is a colour coding used in this example is as follows:-

- Red - Action needs to be taken to reduce risk to ALARP before commencing.
- Yellow- While safe to proceed further action should be taken where possible to reduce the residual risk to ALARP.
- Green - No further action is necessary although further actions may be taken to reduce the residual risk to ALARP.

This type of assessment is a one off assessment and therefore a review date is not required.

Note: This Risk Assessment formed part of a much larger document detailing Frequency and Hazard values, fallout distances and areas, curtailment procedures and emergency actions. It is presented here as an illustrative example of a more complex semi-quantified Risk Assessment only.

RISK ASSESSMENT EXAMPLE for a MAJOR FIREWORK DISPLAY.

| EVENT New Years Eve - London Eye | | | | | | | | DATE 31.12.2008 | | |
|----------------------------------|---|----------------------|------------------------------|---------------|------------|---------------|---|-----------------|-------------|------------|
| | | | | Initial Risk. | | | Managed Risk. | | | |
| Item | Hazard and Effect | Site/date | Who is Affected | Hazard Index | Freq Index | Risk Product. | Mitigation of Risk | Hazard Index | Freq. Index | Resid Risk |
| 1 | Premature ignition of items on firing plate during unloading | Site during rigging. | Public | 10 | 2 | 20 | Ensure public are remote from unloading/transport route (via Barges and Marius boats). Keep items packaged until arrived at site. | 4 | 1 | 4 |
| 2 | Premature ignition of items on firing plate during unloading. | Site during rigging. | Operators and Staff. | 10 | 2 | 20 | Only pyrotechnists/riggers to handle materials. London Eye riggers to be supplied with appropriate FR PPE. | 10 | 1 | 10 |
| 3 | Mass explosion of entire holding in transport vehicle leading to onsite risk. | General | Operators, Staff and Public. | 10 | 3 | 30 | Stock remains in lidded transport boxes throughout. | 10 | 1 | 10 |
| 4 | Mass explosion of entire holding in storage leading to offsite fatalities. | General | Public. | 10 | 2 | 20 | Maintain safety distances to barrier for public. No access to site for public. Crew /staff to be issued with ID badges. | 6 | 1 | 6 |
| 5 | Unexpected violent event from ignition due to incorrect types. | General | Operators and Public | 10 | 2 | 20 | High standards of housekeeping, labelling of boxes, clear instructions, training and monitoring. | 6 | 1 | 6 |
| 6 | Ignition through poor handling of items/containers. | General | Operator. | 10 | 2 | 20 | Clear procedures, training and monitoring of operator. | 10 | 1 | 10 |
| 7 | Protestor attack leading to breach of safety on site. | General | Public. | 10 | 2 | 20 | Adequate security available on site. | 10 | 1 | 10 |
| 8 | Accidental ignition during loading or unloading. | General | Operators. | 10 | 1 | 10 | Minimise number of personnel in area and quantities of stock at any one time | 8 | 1 | 8 |
| 9 | Premature ignition from smoking/matches. | General | Operators. | 10 | 2 | 20 | All sources of ignition banned from immediate pyrotechnic working area.. | 1 | 1 | 1 |
| 10 | Ignition during transport of fireworks from vehicle to working area. | General | Operators. | 10 | 2 | 20 | All boxes to be kept closed. Procedures to prevent excessive quantity/unsafe transport - overloading | 8 | 1 | 8 |
| 11 | Ignition during fusing of piped match to firework body. | General | Operators. | 10 | 3 | 30 | Exposed firework to be kept to minimum. Igniters to be protected by sheath or similar. Majority of work completed offsite. | 6 | 1 | 6 |
| 12 | Ignition during the manipulation of blackmatch fuse. | General | Operator on barge. | 10 | 2 | 20 | Quantities exposed to operator kept to a minimum. | 6 | 1 | 6 |
| 13 | Ignition when adding delay fuse to existing firework. | General | | 10 | 2 | 20 | Quantities exposed to operator kept to a minimum. | 6 | 1 | 6 |
| 14 | Ignition during packing of fireworks for transport. | General | Operators. | 10 | 2 | 20 | Exposed quantity to be kept to a minimum. Approved packaging and packing specifications to be used. | 6 | 1 | 6 |
| 15 | Ignition during loading of vehicles. | Vehicle | Operators. | 8 | 2 | 16 | Operator trained in manual handling techniques and monitored. | 5 | 1 | 5 |
| 16 | Ignition caused by collapse of | Vehicle | Operators. | 8 | 2 | 16 | Operator trained in manual handling | 5 | 1 | 5 |

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| | stack of fireworks in vehicle. | | | | | | techniques and monitored. | | | |
| 17 | Premature ignition of fireworks while loading vehicle due to poor handling. | Vehicle | Operators. | 8 | 2 | 16 | Operator trained in manual handling techniques and monitored. | 5 | 1 | 5 |
| 18 | Premature ignition of igniter whilst in vehicle. | Vehicle | Operators. | 10 | 2 | 20 | All wires' shunted'. Transmission equipment prohibited from loading area. | 10 | 1 | 10 |
| 19 | Ignition during transport of fireworks. | Vehicle | Operator and Public. | 10 | 2 | 20 | All drivers trained to ADR standard and road awareness. | 10 | 1 | 10 |
| 20 | Premature ignition of pyrotechnics on firing plate during rigging. | London Eye during rigging. | Public. | 10 | 2 | 20 | Rigging can only take place when area is secured from public access. | 4 | 2 | 8 |
| 21 | Premature ignition of pyrotechnics on firing plate during rigging. | London Eye (LE) during rigging. | Operators and Staff. | 10 | 2 | 20 | Rigging only carried out by pyrotechnists or under supervision. FR PPE supplied to LE staff.. | 10 | 1 | 10 |
| 22 | Dropping of tools onto public walkway. | LE during rigging. | Public. | 8 | 2 | 16 | Rigging to take place only when the area is secured from public. | 1 | 2 | 2 |
| 23 | Dropping of tools onto public walkway. | LE during rigging. | Operators and Staff. | 8 | 2 | 16 | Rigging only carried out by pyrotechnists or under supervision. Tools secured where appropriate.. | 5 | 1 | 5 |
| 24 | Premature ignition from stray RF signal. | LE during rigging. | Public. | 10 | 2 | 20 | Rigging to take place only when the area is secured. | 1 | 2 | 2 |
| 25 | Premature ignition from stray RF signal. | LE during rigging. | Operators and Staff. | 10 | 2 | 20 | All wiring to be shunted prior to installation. | 10 | 1 | 10 |
| 26 | Premature ignition from lightning strike. | LE during rigging. | Public. | 10 | 2 | 20 | Rigging to take place only when the area is secured. | 1 | 2 | 2 |
| 27 | Premature ignition from hot sources. | LE during rigging. | Operators and Staff. | 10 | 2 | 20 | No heat sources(matches etc) to be present in pyrotechnic area.. | 10 | 1 | 10 |
| 28 | Premature ignition from lightning strike. | LE during rigging. | Public. | 10 | 2 | 20 | Rigging to take place only when the area is secured. | 1 | 2 | 2 |
| 29 | Premature ignition from lightning strike. | LE during rigging. | Operators and Staff. | 10 | 2 | 20 | Short wires to splitter box, wires shunted. No work to take place during thunderstorms. | 10 | 1 | 10 |
| 30 | Falling during rigging operations. | LE during rigging. | Operators and Staff. | 8 | 4 | 32 | Harnesses to be used for working at height and permit controlled. | 8 | 1 | 8 |
| 31 | Premature ignition from stray RF signal. | Public access to LE up to 31/12 | Public and Staff. | 10 | 2 | 20 | Short wires to splitter box, wires shunted. No connection to be made to firing panel. | 10 | 1 | 10 |
| 32 | Premature ignition from lightning strike. | Public access to LE up to 31/12 | Public and Staff. | 10 | 2 | 20 | Short wires to splitter box, wires shunted. No connection to be made to firing panel. | 10 | 1 | 10 |
| 33 | Dislodging of plate components. | Public access to LE up to 31/12 | Public and Staff. | 8 | 2 | 16 | Plate affixed by 2 independent fixings | 8 | 1 | 8 |
| 34 | Complete disruption of plate falling to ground. | Public access to LE up to 31/12 | Public and Staff. | 10 | 2 | 20 | Plate affixed by 2 independent fixings. | 10 | 1 | 10 |
| 35 | Dislodging of pyrotechnics. | Public access to LE | Public and Staff. | 6 | 2 | 12 | Each pyrotechnic article secured by at least 2 independent fixings. | 6 | 1 | 6 |

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| | | up to 31/12 | | | | | | | | |
| 36 | Water ingress leading to chemical induced initiation. | Public access to LE up to 31/12 | Public and Staff. | 10 | 2 | 20 | All pyrotechnic articles are waterproofed independently. | 10 | 1 | 10 |
| 37 | Premature ignition from firing current. | Connection of wiring. | Public and Staff. | 8 | 2 | 16 | Power source is dis connected. No access to the area for the public. | 8 | 1 | 8 |
| 38 | Falling from connecting position. | Connection of wiring. | Staff. | 8 | 4 | 32 | Fall arrest harnesses to be used when working at height, permit controlled. | 8 | 1 | 8 |
| 39 | Incorrect connection resulting in out of sequence firing. | Connection of wiring. | Staff, Public and Operators | 8 | 1 | 8 | All slaves/connectors are numbered individually. | 8 | 1 | 8 |
| 40 | Unauthorised public access. | Rigging on pier/access routes. | Public. | 8 | 2 | 16 | Walkways closed during rigging. | 8 | 1 | 8 |
| 41 | Unauthorised public access. | Rigging on pier/access routes. | Operators and Staff. | 8 | 2 | 16 | Non-pyrotechnician access restricted to one side of walkway. | 8 | 1 | 8 |
| 42 | Misalignment of devices leading to malfunction on firing. | Rigging on pier/access routes. | Staff, Public and Operators. | 8 | 2 | 16 | All pieces to be secured by 2 independent fixings. | 8 | 1 | 8 |
| 43 | Premature ignition during rigging. | Rigging on Bananas. | Public. | 8 | 2 | 16 | Rigging to take place when LE is closed. | 1 | 2 | 2 |
| 44 | Premature ignition during rigging. | Rigging on Bananas. | Operators and Staff. | 8 | 2 | 16 | Non essential personnel removed. | 5 | 2 | 10 |
| 45 | Fall/physical injury. | Rigging on Bananas. | Operators and Staff. | 8 | 2 | 16 | Hard hats and safety harnesses to be worn when working at height. | 8 | 1 | 8 |
| 46 | Premature ignition during rigging. | Rigging on Barge | Public. | 8 | 2 | 16 | Rigging to take place at a remote location. | 1 | 2 | 2 |
| 47 | Premature during rigging. | Rigging on Barge | Operators and Staff. | 8 | 2 | 16 | Non-essential personnel removed from area,. | 8 | 2 | 16 |
| 48 | Premature ignition from firing current. | During testing on 31/12 | Operators and Staff. | 8 | 2 | 16 | All non-pyrotechnicians cleared of immediate area. Firing current disconnected. | 6 | 1 | 6 |
| 49 | Premature ignition causing hot debris on pod. | During testing on 31/12 | Lighting Engineers. | 5 | 2 | 10 | Lighting engineers not in pod after initial rigging. | 1 | 2 | 2 |
| 50 | Premature ignition from firing current. | Testing on Barge | Operators and Staff. | 8 | 4 | 32 | All non-pyrotechnicians cleared from area, firing current disconnected. | 8 | 1 | 8 |
| 51 | Accidental ignition of during final rigging of pyrotechnics. | Final rigging 31/12 | LE Riggers and Operators | 8 | 2 | 16 | Hard hats and PPE worn. | 5 | 2 | 10 |
| 52 | Firing plate distortion/failure during rigging from excessive force. | Rigging General. | LE Riggers. | 5 | 4 | 20 | Firing plates made from box section metal to prevent distortion. | 5 | 2 | 10 |
| 53 | Ignition during transshipping of live pyrotechnics from working vehicles. | Rigging. | Operators and Public | 10 | 2 | 20 | Minimum quantities of pyrotechnics exposed at all times, Pyrotechnics to be packed in UN approved packaging. | 10 | 1 | 10 |
| 54 | Ignition caused by dropped box due to slippery conditions. | Rigging General. | Operators and Public. | 10 | 2 | 20 | Work area to be kept clean. | 10 | 1 | 10 |
| 55 | Ignition of ignite by high power RF signal. | Rigging General. | Operators and Public. | 10 | 2 | 20 | No sources of high power RF identified. | 6 | 1 | 6 |

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| 56 | Incorrect erection of mortars leading to potentially serious failure during firing. | Rigging on Barges and Marius Boats. | Operators and Public. | 8 | 4 | 32 | All operators under supervision of Group F trained staff. | 5 | 1 | 5 |
| 57 | Public entrance into firing/transport during rigging. | Rigging. | Public. | 10 | 2 | 20 | Firing area to be fenced and secure. | 6 | 1 | 6 |
| 58 | Public entrance into designated safety area prior to/during display. | Rigging. | Public. | 10 | 2 | 20 | Safety area to be marked with high visibility tape and stewarded.. | 6 | 1 | 6 |
| 59 | Dislodging of item due to previous firing. | During Display from London Eye. | Operators and Staff. | 8 | 2 | 16 | Each j pyrotechnic device secured by at least 2 independent fixings. | 8 | 1 | 8 |
| 60 | Mis-fire due to unpredicted trajectory. | During Display from London Eye | Operators and Staff. | 8 | 2 | 16 | All items tested prior to installation. | 8 | 1 | 8 |
| 61 | Mis-fire causing hot debris on Pod. | During Display from London Eye | Structure of Pod. | 5 | 4 | 20 | Materials have previously been tested against sample of Pod glass. Orientation of displayed fireworks prevents direct firing at glass. | 1 | 2 | 2 |
| 62 | Hot debris falling on ground surrounding London Eye. | During Display from London Eye | Public. | 6 | 4 | 24 | Personnel cleared from identified area(see wind speed flow chart). | 6 | 2 | 12 |
| 63 | Hot debris falling on ground surrounding London Eye. | During Display from London Eye | Operators and Staff. | 6 | 4 | 24 | Non-essential personnel cleared from identified area(se wind speed flow chart). | 6 | 1 | 6 |
| 64 | Hot debris falling on combustible debris/oils. | During Display from London Eye | Staff and lighting engineers. | 8 | 2 | 16 | All combustible material has been removed. | 8 | 1 | 8 |
| 65 | Hot debris falling on combustible debris/oils. | During Display from London Eye | Structure of the London Eye. | 6 | 4 | 24 | All combustible material has been removed. | 2 | 4 | 8 |
| 66 | Wind change in direction/strength prior to start of display. | Display. | Public. | 8 | 6 | 48 | If wind strength/direction threatens area outside safety area – procedure manual to modify/cancel display. | 6 | 2 | 12 |
| 67 | Fallout from wind change in direction/strength during display. | Display. | Public. | 8 | 6 | 48 | If wind strength/direction threatens area outside safety area – procedure manual to modify/cancel display | 6 | 2 | 12 |
| 68 | Disruption of adjacent mortars from failure of shell and subsequent firing towards audience. | Display on Barges | Operators and Public. | 10 | 4 | 40 | All racks to be strapped. All single mortars to be independently fixed to stable structures.6” shells to be protected by barricades. | 10 | 1 | 10 |
| 69 | Adverse fallout predicted prior to display. | Display. | Public. | 10 | 3 | 30 | Display curtailed to minimise fallout – see contingency plans. | 10 | 1 | 10 |
| 70 | Fallout during display as advised by marshals etc. | Display. | Public. | 10 | 3 | 30 | Displays stopped by radio. | 10 | 1 | 10 |
| 71 | Accident on site during display. | Display. | Operator. | 10 | 3 | 30 | First Aid available – communication to emergency services via event organisers. | 6 | 3 | 18 |
| 72 | Premature ignition of fireworks | Display. | Operator. | 10 | 3 | 30 | Material setup/protected to minimise | 10 | 1 | 10 |

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| | from misfire. | | | | | | misfires. | | | |
| 73 | Unauthorised persons entering site during firing. | Display. | Public. | 10 | 3 | 30 | Adequate security to access points by land. Exclusion zone maintained on water. In case of security breach display stopped by control via PLA. | 10 | 1 | 10 |
| 74 | Ingress of smoke and activation of smoke alarms in Pods. | Display. | Structure and emergency plan. | 2 | 3 | 6 | Switch off but monitor from ride control. | 2 | 3 | 6 |
| 75 | Smoke triggering County Hall smoke alarms. | Display. | Structure and Emergency plan. | 2 | 3 | 6 | Windows closed – monitor with London Fire Brigade. | 2 | 3 | 6 |
| 76 | Smoke triggering County Hall smoke alarms. | Display. | Structure and emergency plan. | 2 | 3 | 6 | Temporary shutdown of alarm system in liaison with London Fire Brigade. | 2 | 3 | 6 |
| 77 | Fire alarms triggered by smoke – no real event. | Display. | Public and County Hall occupants. | 2 | 3 | 6 | Warning to occupants, verification of event and adaption of emergency plan. | 2 | 3 | 6 |
| 78 | Fire alarms triggered by smoke – REAL event. | Display. | Public and County Hall occupants. | 10 | 3 | 30 | Verification of event by London Fire Brigade – normal evacuation plan. | 2 | 3 | 6 |
| 79 | Accident during clearing up. | After Display. | Operator. | 10 | 3 | 30 | No clear up of individual sites until 20 minutes after display. Sterile area maintained around London Eye. | 8 | 2 | 16 |
| 80 | Unauthorised access during clean up. | After Display. | Operator. | 10 | 3 | 30 | Marshals to remain on site until the site is completely clear. | 8 | 2 | 16 |
| 81 | 'Hangfire' reigniting. | During Breakdown. | Public | 10 | 2 | 20 | Public cleared from London Eye during breakdown and clean up. | 1 | 1 | 1 |
| 82 | 'Hangfire' reigniting. | During Breakdown. | Operators and Staff. | 10 | 2 | 20 | Minimum number of staff present – cooling off period prior to breakdown. Hard hats worn by staff under rigging. | 10 | 1 | 10 |
| 83 | Dropping of item/plate. | During Breakdown. | Public. | 10 | 2 | 20 | Public cleared from London Eye during breakdown. | 1 | 1 | 1 |
| 84 | Dropping of item/plate. | During Breakdown. | Operators and Staff. | 10 | 2 | 20 | Minimum number of staff present – hard hats to be worn beneath de-rigging area. | 10 | 1 | 10 |
| 85 | Live materials remaining for transport. | During Breakdown. | Public, Staff & Operators. | 10 | 2 | 20 | Igniters removed prior to transport. Re-packing of surplus in approved boxes. | 10 | 1 | 10 |