



## Explosives aspects of port emergency plans

### Docks Information Sheet No 3 (Revised)

#### Introduction

This information sheet is one of a series prepared by HSE's Docks National Interest Group. It supplements the general guidance on emergency arrangements in the Approved Code of Practice and Guide to the Dangerous Substances in Harbour Areas Regulations 1987 (DSHAR); see 'Further information'. It is aimed at harbour authorities who have to prepare emergency plans covering the handling of explosives at places licensed under DSHAR. However, it may also assist berth operators, the emergency services and others who could be involved with such emergencies.

#### Types of explosive

Explosives are allocated to Class 1 under the United Nations classification scheme for dangerous goods. Class 1 is subdivided into six divisions:

- Division 1.1 - substances and articles which have a mass explosion hazard;
- Division 1.2 - substances and articles which have a projection hazard but not a mass explosion hazard;
- Division 1.3 - substances and articles which have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard;
- Division 1.4 - substances and articles which present no significant hazard;
- Division 1.5 - very insensitive substances which have a mass explosion hazard. For emergency planning purposes they should be treated as Division 1.1 explosives; and
- Division 1.6 - extremely insensitive articles which do not have a mass explosion hazard.

At the time of this information sheet going to print, no explosives have been classified as Division 1.6 in the UK. Should a need to handle explosives of Division 1.6 arise, further advice should be sought from HSE.

#### Explosives incidents

The emergency plan should cover all foreseeable incidents identified from the risk assessment required by the Management of Health and Safety at Work Regulations 1992. Incidents involving explosives are likely to fall into one of two categories:

- those where the explosives initiate without warning, eg when a load is dropped from a considerable height; or

- those where the explosives initiate after becoming involved in another event, such as an adjacent fire.

#### Emergency arrangements

If an explosion occurs without warning, there is little that can be done to prevent injuries. The emergency plan needs to concentrate on the safe rescue of casualties, the evacuation of the uninjured and on any action which will prevent the incident spreading to other explosives, dangerous goods or property. The sudden nature of such incidents underlines the importance of only handling explosives at the places designated in the explosives licence, keeping to the limits specified and minimising the number of people involved.

If explosives are not imminently threatened by another event, it may be possible to prevent them becoming involved, eg by spraying them with water. However, if they are threatened, or have already become involved, the action required will depend on the types and quantities of explosives present. You must obtain this information before explosives are allowed into the harbour or harbour area. If there is any doubt about the type of explosives they should be treated as Division 1.1.

#### Division 1.1 and 1.5 explosives

The main hazard from Division 1.1 and 1.5 explosives is an explosion affecting virtually the entire load almost instantaneously. The resulting blast will shatter anything close by and severely damage buildings in the surrounding area. The flash and firebrands thrown out may start secondary fires. Apart from those at most risk close to the explosion, people will generally be better off in the open and not in buildings or under structures which might collapse on them.

With these types of explosives, rapid evacuation is the primary course of action. The relevant schedule to the explosives licence can be used as a guide to the minimum evacuation distance offering protection. Based on the maximum quantity of explosives liable to be present, everyone should be evacuated to at least the distance shown in the column headed 'Distance to other explosives or persons in the open'. Remember that this distance is the **absolute minimum**.

If time allows, evacuation should continue to as far away as practicable or to the safeguarding distance SD2 given in the schedule. Buildings need to be cleared of people to at least the distance shown in the column headed 'Distance to a passenger vessel' and, if possible, the safeguarding distance SD2. As projectiles are a possibility, assembly points should be on the far sides of buildings to shield people from any explosion. However, the assembly point should not be immediately outside a building because of the risk of flying glass and other debris.

## Division 1.2 explosives

The main hazard from Division 1.2 explosives is missiles; some fast, some lobbed and including firebrands, possibly whole or part sub-munitions, packaging etc. Some may explode on impact. The fragment throw will not necessarily depend on the quantity of explosives involved. There could be secondary fires.

Incidents involving Division 1.2 explosives are characterised by sporadic explosions of individual articles over a prolonged period, possibly several hours. The best protection from this type of explosive is shelter, but it is essential that people stay well clear of windows. People in the open should be evacuated as far as possible, at least 400 m and more if possible. As a guide, the limit of fragment throw may be 1250 m from 5 tonnes (net explosives quantity) and 2000 m from 16 tonnes.

## Division 1.3 and 1.6 explosives

The main hazard from Division 1.3 and 1.6 explosives is intense radiant heat. The explosives are liable to burst into flames, probably violently, without warning. There could be flying firebrands, as well as flame jetting. The best protection is a combination of distance and shelter. If it is not possible to evacuate people to the distance shown in the column headed 'Distance to other explosives or persons in the open' for Division 1.3 explosives in the relevant licence schedule, they should be advised to seek shelter behind buildings wherever possible.

## Division 1.4 explosives

Division 1.4 explosives, if initiated, give rise to a serious, but localised fire. The normal emergency procedures for fires should be adequate for this type of incident.

## Evacuation

Emergency plans need to specify when and how evacuation is organised. They should consider any particularly vulnerable populations nearby, such as schools, hospitals and accommodation for the elderly and infirm. Staged evacuation may be necessary, but where this is likely to be slow or impracticable, alternative measures may be needed. For instance, if a hospital cannot be evacuated, it may be necessary to issue advice to close all curtains and blinds, and to move patients away from windows.

## Access

It is essential to maintain adequate means of escape and access for emergency services whenever explosives are present. While the most likely site of an incident is a licensed berth, an accident could occur to a vehicle, train or vessel going to or from the berth. The emergency plan needs to cover all such foreseeable incidents.

## Emergency information

If an incident occurs the emergency plan must be implemented quickly and the emergency services informed of all hazards without delay. The berth operator needs to notify the master of an explosives ship of the emergency arrangements at the berth as soon as is practicable after the ship has berthed. The master must be given written details of the signals to be used in an emergency and how to call the emergency services. Arrangements may be needed to cope with language difficulties.

The berth operator needs to ensure that information is immediately available to the emergency services on the type, quantity and location of all explosives at a berth. Similar information should also be available on any other dangerous goods present.

## Further information

Additional advice and information on the explosives aspects of this guidance may be obtained from HSE's Explosives Inspectorate, St Anne's House, Stanley Precinct, Bootle L20 3RA, telephone 0151 951 4741.

Further information on the other aspects of the emergency plans required by DSHAR is given in *Dangerous Substances in Harbour Areas. Dangerous Substances in Harbour Areas Regulations 1987. Approved Code of Practice COP18* HSE Books 1987 ISBN 0 11 883857 1 and *Guide to the Dangerous Substances in Harbour Areas Regulations 1987* HSR27 HSE Books 1988 ISBN 0 11 883991 8.

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This leaflet contains notes on good practice which are not compulsory but which you may find helpful in considering what you need to do.

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