

# FIRE SERVICES EXAMINATIONS BOARD

## STUDY NOTE

EXAMINATION	STATION OFFICERS' EXAMINATION
PAPER	OPERATIONS
SUBJECT	FIREFIGHTING AND RESCUE INCIDENTS
ITEM	STORED PESTICIDES INVOLVED IN FIRE
STUDY NOTE No.	3104

### *INTRODUCTION TO THE STUDY NOTE*

*This study note has been prepared as the basis of study in connection with the qualifying examinations for promotion.*

*Candidates will be expected to demonstrate knowledge of the information contained in the study note and understand how it should be applied:*

*The 'References' made at the end of the Study Note are included for information only and candidates will not be expected to study these as part of the bibliography.*

## STORED PESTICIDES INVOLVED IN FIRE

### 1. Introduction

Pesticides are designed to destroy or control harmful organisms, or to preserve plants or their crops. There are, in addition, a range of "Farm Chemicals", such as animal medicines, dairy hygiene products, fertilizers and food preservatives, commonly found in storage, which can be safely considered as suitable for being dealt with as pesticides, in the absence of other information.

Station Commanders should be aware of the location of pesticides stored in premises such as warehouses and farms in their area and the method of dealing with incidents involving them.

### 2. Storage

Pesticides are used as an essential part of efficient modern farming. Their use is partly seasonal with much larger stocks being encountered in farm stores in the spring and autumn.

The manufacturers of pesticides produce and store these chemicals on their premises, often with storage being remote from manufacture.

Pesticides may be found as solids (in the form of granules, grains and powders) and as liquids. Liquid pesticides may be either water based or formulated on flammable solvents.

They are normally stored, distributed and used in comparatively small containers typically from 1 litre up to 25-litre capacity in the case of drums, or in bags or in sacks up to 25Kg. Pesticides may also form bulk loads carried either by road or rail haulage.

Containers are marked with the name of the chemical and a considerable amount of other information. It should be noted that four-digit identification numbers might mark some containers. These markings do not indicate any form of action code, but only the approval identification and should not be confused with the substance identification number used with the HAZCHEM scheme.

A Code of Practice on the sale and supply of pesticides encourages farmers and warehouse keepers to display a standardised sign on buildings where pesticides or herbicides are stored. This will give firefighters warning upon arrival of a fire or other incident, and will help them take appropriate protective measures. The positioning of such a sign in a conspicuous place will supplement the information, which a farmer or warehouse keeper is able to give at the scene. The warning sign will be a yellow triangle, edged with black, and displaying an exclamation mark.

### 3. Hazards

In storage or in use, pesticides can be considered in the same light as all other potentially dangerous chemicals. The risk to firefighters when dealing with incidents involving pesticides is no greater just because they are pesticides. The risk, however, is generally very much greater to the environment.

Although they may be handled safely while in their containers and are seldom, if ever, the cause of fires, they can be potentially hazardous when spilt or heated or converted into vapour.

Under normal conditions the great majority are not hazardous in storage. Although many are based on flammable solvents, the flash points of the majority of the finished products are outside the statutory limits set for "highly flammable liquids".

Although earlier products often had low flash points in concentrated form, flash points in excess of 45°C are now more usual. A typical solvent content would be about 50% of the whole formulation.

The solvents may be either hydrocarbon or alcohol based, but in both cases emulsifying agents will ensure readily miscibility with water and so pesticides will not react adversely when in contact with water. (\*See Note on page 5).

There are many hundreds of pesticides and it must be assumed that in the presence of fire some will break down to some extent to produce toxic products of decomposition.

Further problems are that pesticides are biologically active and if flushed into drainage systems or watercourses by jets of water, they could cause serious damage and pollution. Some of those with flammable formulations could produce a risk to firefighters, particularly if the vapours can accumulate during a subdued fire.

### 4. Pre-Planning

It follows that in dealing with this risk, careful pre-planning is required.

Risk assessment visits are valuable in that all information likely to be of use during firefighting can be considered, risk assessed and formulated into an operational plan.

The pre-planning should include liaison with the Environment Agency (Scottish Environment Protection Agency) in respect of the impact that firefighting may have on water courses and drainage systems. The local Environmental Health Officer should always be made aware of any possible environmental health risk.

During risk assessment visits the opportunity should be taken to discuss fully with the owners of any warehouses in the area what action should be taken to minimise the effect of fire or any accident that might occur.

## 5. Operational Procedures

### (a) General

- (i) Although in large quantities pesticides do provide a fire risk, this is not the major hazard during firefighting operations. Every effort should be made to contain any pesticide, which may spill or be leaking, and any water used for firefighting. The importance of this containment cannot be over-stressed. The implications of any pollution can be very far-reaching, potentially involving risk to human, animal, fish and botanical life and can involve expenditure of enormous resources to combat the hazard produced after containment has failed.
- (ii) At all times fire brigades should concentrate their efforts on containing the chemicals and any water necessary for firefighting. Water fog or spray should be used in order to reduce the need for containment.
- (iii) Where effective control of an incident is not possible without the use of large quantities of water, and where containment may be at risk serious consideration should be given to allowing the chemicals and the storage building to burn under control whilst protecting surrounding risks.

In many cases this course of action may be extremely difficult to follow particularly where large clouds of products of combustion may be seen as a serious risk. However experience to date has indicated that in the conditions of a fire only limited risk exists from such a cloud although it is appreciated that it may be extremely difficult faced with such a circumstance, to take the desirable action of ensuring containment as a high priority.

- (iv) In making any decision, advice both from the user of the premises and from the water authority will be invaluable. Even where the decision is taken to allow a storage building to burn out, due consideration would need to be given to the containment of water used to protect adjacent property.
- (v) The firefighter will be adequately protected providing chemical protection suits and breathing apparatus are worn. No higher level of personal protection is necessary for agrochemicals.

- (vi) Once the immediate emergency of an incident is concluded it is important that containment and control of the fireground is maintained.

The Fire Brigade should remain on site until overall control can be properly handed over to the water and local authorities and it is important that this hand over is carried out formally by the brigade.

The debris and spillage left after the incident still presents a major hazard to the environment, and loss of control and containment would nullify the previous efforts of the brigade.

- (vii) Similarly the need for standard decontamination procedures should be considered if contamination of firefighters has occurred.

(b) Specific

- (i) When called to a warehouse containing pesticides, the officer-in-charge should make contact at once with the owner and/or manufacturer of the material for advice.
- (ii) Efforts should be made to prevent pesticides being flushed into the drainage system or watercourses.
- (iii) Chemical protection suits and breathing apparatus must be worn, and spilled pesticides should not come into contact with the skin. Any contamination must be washed off as soon as possible and medical advice obtained in accordance with the appropriate procedures laid down within the brigade for dealing with toxic hazard casualties.
- (iv) Any pesticide containers, which are not involved in the fire, should be removed. Pesticides can be more hazardous when simply heated on the fringe of a fire than when they are directly involved because of the production of toxic products of decomposition.
- (v) In salvage operations following a fire, it must again be emphasised that care should be taken not to allow polluted water to enter the drainage system. Manufacturers and owners will give advice and take the necessary measures in respect of decontamination of the affected premises. Precautions should not be relaxed until the premises are free from contamination.
- (vi) Special care should be exercised when decontaminating uniforms and fire equipment. As a precautionary measure breathing apparatus should be worn while this is being done. Clothing and equipment, which may still be contaminated, should be returned to the fire station in a suitable well-ventilated vehicle prior to it being decontaminated or disposed of.

Note: This study note applies to all pesticides, however CYMAG can be considered to present a greater risk. This chemical reacts with water and produces hydrogen cyanide gas. There are only a few main stores in the United Kingdom, where the chemical is kept under special storage conditions. The local brigade knows these stores. Otherwise storage is in very small quantities of boxes containing 8 x 2-kilogram tins. In any incident where this chemical is involved in isolation, the use of water should be avoided. Should extinction be necessary dry powder is the appropriate medium. In practice, however, this chemical is unlikely to be encountered in isolation in an incident and where it is involved within a larger incident positive pressure breathing apparatus and chemical protection suits give the appropriate personal protection.

## References

Technical Bulletin 1/1975  
Dear Chief Fire Officer Letter 3/1987  
Dear Chief Fire Officer Letter 3/1985  
Dear Firemaster Letter 3/1987  
Dear Firemaster Letter 2/1985