FIRE SERVICES EXAMINATIONS BOARD

STUDY NOTE

EXAMINATION	LEADING FIREFIGHTERS EXAMINATION
PAPER	OPERATIONS
SUBJECT	FIREFIGHTING & RESCUE INCIDENTS
ITEM	ASBESTOS
STUDY NOTE No.	1105

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.

ASBESTOS

1. Introduction

Asbestos involved in fire can pose a significant risk to firefighters unless some basic procedures are followed.

PART 1 - HAZARDS BY ASBESTOS

1. Asbestos

Asbestos is a fibrous mineral that occurs in many parts of the world. The three main types of asbestos produced commercially are:

Chrysotile - white asbestos - UN 2590 EAC 2X
Crocidolite - blue asbestos - UN 2212 EAC 2X
Amosite - brown asbestos - UN 2212 EAC 2X

Asbestos fibre is mechanically strong and highly resistant to heat and chemical attack and because of its fibrous nature, it can be woven into fabrics and used as reinforcement for cement and plastics. It is the very fine fibres, invisible to the naked eye, which are dangerous when inhaled, and processes which produce very small airborne fibres are, in general, the most hazardous. These fibres pose no threat to health when left intact in undamaged material containing asbestos, which should be either left alone and managed, sealed or enclosed, or removed if deteriorating.

2. Asbestos Related Diseases

The principal diseases known to be caused by exposure to asbestos are asbestosis, lung cancer and malignant mesothelioma.

(a) Asbestosis, fibrosis or scarring of the lung in which the tissue becomes less elastic making breathing progressively more difficult. It is irreversible and may progress even after cessation of exposure to asbestos. Asbestosis is an industrial disease arising from high levels of exposure to airborne dust and there is no risk of contracting this disease from normal levels of environmental exposure to asbestos.

(b) Lung cancer, an increased incidence of lung cancer has been found amongst people who have worked with asbestos. The increase in risk depends on the degree of exposure and is very much greater for smokers than non-smokers. All three types of commonly used asbestos fibre can cause lung cancer, but crocidolite and amosite are thought to be more dangerous than chrysotile.

(c) Mesothelioma, a cancer of the inner lining of the chest or of the abdominal wall. The incidence in the general population is very low. The overwhelming majority of cases are attributable to occupational or more rarely, paraoccupational (those living in the same house as an asbestos worker) exposure to asbestos.

Fire brigades when dealing with incidents where asbestos fibres are likely to become airborne should always take precautions.

3. Asbestos in Railway Rolling Stock

Blue asbestos (crocidolite) has been used in the past for thermal and acoustic insulation in the construction of passenger rolling stock and locomotives. In addition, brown asbestos (amosite) has been used in a few instances as a pipe or tank insulant and small quantities of white asbestos (chrysotile) have been used in items such as brake pads, heat insulation panels, exhaust manifolds and gaskets. British Rail have advised that since the late 1960s, when the use of sprayed asbestos for sound and thermal insulation of rolling stock was discontinued, all asbestos in rolling stock (except asbestos cement sheet and tape wrappings) has been the subject of a planned removal programme.

In the event of an incident involving British Rail rolling stock, it will be possible to establish whether a coach contains blue asbestos by contacting the Railway Control Office and notifying them of the coach number, which will be found painted at the waist of one end on each side of the vehicle. This number will be checked against a central register of coaches containing blue asbestos in order to ascertain whether blue asbestos is present.

4. Asbestos in Buildings

Asbestos has been widely used in construction materials for buildings for many years as well as for pipe and boiler lagging. Although its use in new building materials has been much reduced, a significant tonnage is still used, mainly white asbestos in the manufacture of asbestos cement. Asbestos fibres in asbestos cement will only be released through damage or deterioration with age. Asbestos cement is relatively resistant to light abrasion and impact, but dust will be generated when it is being worked or if the material fractures under exposure to heat in a fire. In the latter case, this dust is likely to rise with the convection current creating a potential airborne risk.

5. Precautionary Measures

The Incident Commander should ensure that a restricted zone is set up around the incident and that personnel entering the fire/smoke plume area are protected by positive pressure breathing apparatus and a chemical protection suit if fibrous asbestos products are, or are thought, to be involved.

At incidents involving asbestos, care must be taken to ensure that dust concentrations are kept to minimum. Cutting or drilling asbestos should be avoided, unless this work is absolutely essential for the purpose of completing the task being undertaken. Such work will give rise to dust, the level of which will depend, for example, upon the amount of cutting involved, whether hand or powered tools are employed, whether the work is dampened and whether the work takes place in the open air or a confined space. Contamination from asbestos can be reduced by the use of hand tools instead of powered tools and by wetting or thoroughly dampening the material before commencing operations.

Once dust particles have been allowed to become airborne, it is not possible to control the concentration of respirable fibres by use of water spray although this does help to reduce the airborne fibres. Insulation boards can be coated with a sealant to suppress the amount of dust, however, since both boards and sealing agents will vary, it would be prudent to treat such material with caution.

Although the main danger from asbestos is through the respiration of fibres, firefighters should avoid eating, drinking or smoking near an incident involving airborne asbestos fibres.

Exposure to airborne dust concentrations should be at a minimum and specialist local Environmental Health Departments should be consulted if there is a probability of a prolonged incident.

6. Decontamination and Cleaning of Clothing and Equipment

In the event of protective clothing and/or equipment becoming contaminated with asbestos, decontamination procedures should be undertaken. If firefighting kit becomes contaminated with asbestos, it should initially be cleaned using a vacuum cleaner with a high efficiency filter, such as a Type H cleaner, and then packed in a suitable container, such as a special plastic bag which dissolves in hot water, to prevent the escape of any residual dust.

Contaminated clothing must be sent for cleaning before re-issue, and the cleaner advised of the reasons for cleaning and the fact that the clothing has been decontaminated by use of a suitable vacuum cleaner. Such clothing should be sent to cleaners who are aware of the risk to health from asbestos and who are able to observe the relevant precautions. Contaminated clothing should not be taken home. Where chemical protection suits are used, these can be decontaminated using portable showers or wiped down manually.

Any asbestos dust remaining on the skin should be immediately washed off. In the case of hair becoming contaminated with asbestos, it should be washed several times to ensure that it is thoroughly cleansed.

7. Disposal of Asbestos

Any waste containing asbestos is classed as a controlled waste and must be taken to a site licensed for disposal.

It would be advisable for brigades to maintain a list of licensed sites within their locality, so that appropriate precautionary measures could be put into effect without delay, should fire brigade assistance be required at such a licensed site.

8. Conclusion

Brigades are reminded that the wearing of positive pressure breathing apparatus should normally be the appropriate means of protecting firefighters from asbestos fibres, and that the provision of specialist respiratory equipment, appropriate for asbestos fibres, is a matter for each fire authority. In addition, brigades are advised to consult their local Environmental Health Department for information and to use the Section 1(i)(d) inspection procedure in order to identify asbestos risks in their area.

PART 2 - TYPICAL OPERATIONAL PROCEDURES

1. Command and Control

(a) Early assessment of involvement of asbestos should be undertaken.

(b) An early "asbestos involved" message will provide support.

(c) The number of personnel exposed to asbestos must be kept to a minimum.

(d) Plan work methods that do not create unnecessary dust.

(e) Avoid the use of power tools with asbestos.

(f) Avoid unnecessary breaking and disturbance of asbestos.

(g) Keep asbestos material wet whenever reasonably practicable.

(h) Smoking, drinking or eating must not be allowed until simple washing facilities are provided and used.

(i) All personnel should be made aware of any hazard.

2. Typical Mobilising Procedure on Receipt of "Asbestos Involved" Message

(a) Send:

(i) Special appliance containing - BA, chemical protection suits and decontamination equipment (including special hot water soluble plastic bags or containers).

(ii) Support pump.

(iii) Decontamination Officer and/or Hazmat Officer.

(b) Inform:

Health and Safety Officer (for further advice and/or sampling).

Note: For small incidents, elements of the above attendance may not be required and the Officer-in-Charge may restrict the attendance.

3. Levels of Protection

(a) Out of doors

(i) If contamination with asbestos debris is likely, then BA and chemical protection suits are required.

(ii) If personnel are within fire/smoke plume then BA and chemical protection suits are required.

(iii) A restricted zone should be set up for contamination control and the protection of personnel.

(b) Interior of Building

Working with disturbance of asbestos materials such as firefighting, damping down, turning over and fire investigation, poses a significant risk and BA and chemical protection suits are required.

4. Re-committing BA Wearers

Any decision to re-commit BA wearers should not be taken lightly and the procedures to replace expired sets MUST be carried out under strict supervision to avoid the contaminant spreading to the new BA set or the personnel assisting with the changeover of the expired set.

5. Decontamination

Asbestos debris/slurry will contaminate firefighting kit and brigade equipment, which will require decontamination.

(a) All personnel who are required to wear BA and chemical protection suits must undergo decontamination.

(b) Personnel requiring decontamination MUST proceed directly to the DIRTY ZONE.

(c) Arrangements must be made to maintain respiratory protection whilst awaiting decontamination.

(d) Wet and dry decontamination carried out on PPE and other equipment in accordance with brigade policy.

(e) PPE and clothing should be double bagged in soluble bags.

(f) Personnel to have a shower (either on site or on return to station).

(g) All waste containing asbestos to be double bagged in plastic bags. If distinguishable, avoid mixing asbestos waste with other waste.

(h) Decontamination operators should wear chemical protection suits and BA that can be decontaminated using portable shower units.

References

Dear Chief Fire Officer Letter 11/1992 & 2/1993
Dear Firemaster Letter 7/1992