

# FIRE SERVICES EXAMINATIONS BOARD

## STUDY NOTE

EXAMINATION	STATION OFFICERS' EXAMINATION
PAPER	HUMAN RESOURCE MANAGEMENT
SUBJECT	HEALTH, SAFETY AND WELFARE
ITEM	ACCIDENT CAUSATION AND PREVENTION
STUDY NOTE No.	3315

### *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.*

## ACCIDENT CAUSATION AND PREVENTION

### 1. Learning from Experience

Accidents and their repercussions (sickness of personnel, early retirement, civil litigation and damage to property and equipment) have serious implications for operational efficiency. They place enormous burdens on brigade budgets and take up valuable resources which could be better used to provide a better fire service.

### 2. Health and Safety Executive Definitions

For the purposes of this study note:

'**Accident**' includes any undesired circumstances which give rise to ill-health or injury, damage to property, plant, products or the environment, production losses or increased liabilities.

'**Incident**' includes all undesired circumstances and 'near-hits' which could cause accidents.

These collectively can be referred to as **safety critical events** and include the following:

- (a) Injuries and cases of ill-health (including monitoring of sickness records);
- (b) Other losses such as damage to property;
- (c) Incidents, including those with the potential to cause injury, ill-health or loss;
- (d) Hazards; and
- (e) Weakness or omissions in performance standards.

### 3. Conducting Investigations

In conducting an investigation following an accident, the key sources of information will normally be gathered:

- (a) At the scene;
- (b) From the person or persons involved;
- (c) From any witnesses whether at the scene or not; and
- (d) From any expert witnesses the brigade may need to consult.

The scene:

The scene of the accident should be left undisturbed as far as possible, until any investigation has been completed. Any item of material evidence involved at the scene should be examined carefully, photographed where possible and should subsequently be retained until it is no longer required.

#### 4. Accident Investigation

Investigation of safety critical events provides an opportunity for brigades to:

- (a) Monitor its health and safety performance;
- (b) Identify management and systems failures;
- (c) Revise, if necessary, its risk assessment process; and
- (d) Improve its health and safety performance.

In addition, investigation will enable a brigade:

- (a) To report certain accidents and dangerous occurrences to the Health and Safety Executive (HSE) as required by the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR);
- (b) To comply with the Social Security (Claims and Payments) Regulations 1979, which requires the preservation of data about injured persons to enable claims for industrial disability to be processed; and
- (c) To provide information which brigades are requested to furnish to HM Chief Inspector of Fire Services, as appropriate, although this is not a statutory requirement.

Investigations should be carried out by suitably trained personnel as soon as practicable after the event, because over time, conditions change and people's memories fade.

The key element to an effective investigation is accurate reporting. This can be encouraged by:

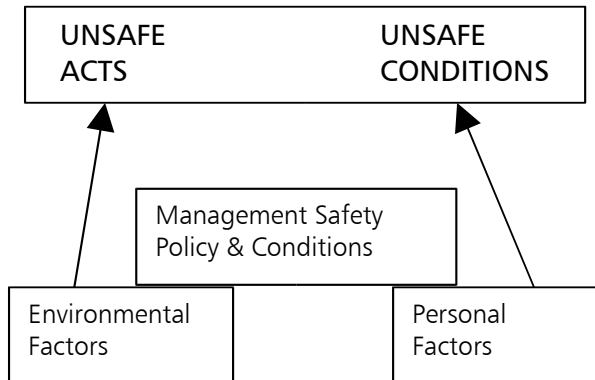
- (a) Training which clarifies the objectives and reason for identifying such events;
- (b) A culture which emphasizes an observant and responsible approach; and
- (c) Open, honest communication in a just environment, rather than a tendency merely to allocate blame.

Not all events need to be investigated to the same extent or depth. Greatest effort should concentrate on events where there has been serious injury, ill-health, or loss as well as those which had the potential to cause serious injury or loss. Investigations should:

- (a) Identify reasons for sub-standard performance;
- (b) Identify underlying failures in health and safety management systems;
- (c) Identify any lessons to be learnt;
- (d) Identify actions to prevent recurrences; and
- (e) Satisfy legal and reporting requirements.

It is important that managers should routinely analyse accident data in conjunction with information from personnel, finance, occupational health and welfare departments in order to provide a holistic view of performance.

### Basic or Root Causes



Most accident prevention programmes are involved in the identification of unsafe acts and/or conditions. Whilst this is important for short-term prevention, a long term plan must include the identification and correction of the basic causes, these can be grouped into three main categories.

- (a) Management Policy and decisions.
- (b) Personal factors.
- (c) Environmental factors.

## 5. Management, Policy and Decisions

Underlying root causes may be identified as a lack of management control.

Control is one of the four essential management functions:

Plan, Organise, Lead and Control.

The successful manager/supervisor knows the standards and plans and organises to meet these standards, leads people to attain the standards and monitors the performance of those involved. Without the management control, the sequence that triggers factors that will cause an accident to occur and lead to loss will more easily begin.

## 6. Personal Factors

Accidents can occur due to an individual's inadequate motivation, ability, knowledge, training, supervision, communication procedures, physical and mental state, etc, etc.

Because these factors are so interrelated, thoughts should be directed to the effects that a change in any one factor would have on the others. For example, the effect that training, placement, equipment, etc would have on employee selection, and vice-versa.

## 7. Environmental Factors

Accidents can also occur due to environmental hazards such as noise, temperature, humidity, lighting, dust, gases (the nature of the surroundings).

## 8. Multiple Causation

It is very rare for an accident to arise from a single cause, more frequently there is a combination of factors all of which must be present simultaneously. Accidents, therefore, are more likely to be the result of a combination of physical circumstances which could and should have been recognized and controlled.

Unsafe conditions can be engineered out of the working system and unsafe acts can be influenced by training, instruction or supervision. These hazards, however, are not in themselves the sole cause of an accident, they are an indicator of some other deficiency.

## 9. Accident Prevention

Accidents are caused by an unsafe act and/or unsafe conditions. Accidents can cause injury.

The process of accident prevention should be considered in terms of principles, strategy and techniques. The main elements of each are outlined below:

### (a) Accident Prevention Strategy – (Planning)

The HSE have published guidance outlining a strategy for successful accident prevention.

This guidance advises that a successful strategy will involve the following stages, which may be better recalled by using the mnemonic IEDIM:

- (i) **Identify** the hazards involved in the work activity. These may arise from people, equipment, materials or environment (PEME).
- (ii) **Evaluate** the risk involved in the work activity. This will help determine the priority for risk reduction measures. Simple evaluations which help focus on the likelihood of an injury occurring and the severity of resulting injury could be used.
- (iii) **Develop** a safe approach to the work which, as a first choice, *eliminates* the hazard (and thus the risk). Where this is not possible, then engineering measures which *reduce* the risk should be considered followed by measures which *isolate* the hazard from contact. *Control* systems and procedures can then be considered with the use of *personal protection* and a well *disciplined* approach coming last in the hierarchy of choice (ERICPD).
- (iv) **Implementing** the risk elimination or reduction measure(s) is the next step. This will undoubtedly involve the provision of information, instruction and training with varying degrees of supervision to ensure application and check on success of the measure(s).
- (v) **Measure** how well the protective measures achieve their objective. This can be achieved by the use of audits, spot checks, sampling, inspections, statistical checks and informal safety tours can assist.

(b) Accident Prevention Techniques – (Practical Methods)

The application of risk reduction, or preventive measures, will require varying levels of skill and practice depending upon the size and nature of the risk. The provision of effective:

- (i) training in good work practice;
- (ii) performance measuring techniques;
- (iii) development of safe systems of work;
- (iv) risk estimation and analysis systems; and
- (v) hazard identification systems

are all important tools in the development of high health and safety standards.

## 10. Accident Costs

The losses which may result from accidents may be broadly categorized into three areas:

- (a) Human           eg     Pain and suffering, illness, domestic problems etc.
- (b) Economic       eg     Time lost, administration costs, management time, overtime, damage to property, plant etc.
- (c) Legal            eg     Prosecution, fines, bad publicity etc.

Each of these three areas of loss involves some moral or financial cost and provides good reasons for the prevention of accidents.

Some of the economic losses may be covered by insurance policies, eg liability insurance may provide for any compensation payable to injured persons. However, the premium paid for such insurance policies does impose an economic cost on the insured, and the premium will increase as the amount of paid compensation increases. Other consequential losses may arise, with some economic and moral impact, in the form of legal actions, bad publicity etc.

The resources required to enable health and safety needs to be considered should not, therefore, be viewed as an extra cost being imposed on brigades but as a positive opportunity to reduce negative expenditure and resource needs that would be required if no action was taken to prevent accidents from occurring.

## 11. Management Information

An analysis of the total costs incurred through accidents would provide a brigade and its senior management with:

- (a) A good indication of the effectiveness of its health and safety policy; and
- (b) Information which will need to be taken into account when setting budgets.

## References

Health and Safety Executive guidance document HS(G) 65  
Fire Services Examinations Board