

# FIRE SERVICES EXAMINATIONS BOARD

## STUDY NOTE

EXAMINATION

STATION OFFICERS' EXAMINATION

PAPER

FIRE SAFETY, EDUCATION AND ENFORCEMENT

SUBJECT

FIRE SAFETY RISK ASSESSMENT

ITEM

PRINCIPLES OF FIRE SAFETY RISK ASSESSMENT

STUDY NOTE No.

3210

### *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.*

## PRINCIPLES OF FIRE SAFETY RISK ASSESSMENT

### 1. Introduction

Risk Assessment is nothing more than a careful examination of what could cause harm to people.

Carrying out a risk assessment enables judgements to be made as to whether enough precautions have been made, or if more of them are required to be done to prevent harm.

In the context of Fire Safety Risk Assessment, the process is about a careful examination of the harm that could be caused to people if a fire was to occur.

The process includes the identification of fire hazards, assessing the risk of those hazards, taking action to eliminate or reduce that risk and securing the safe passage of people from the scene of the fire.

### 2. Fire Safety Risk Assessment

Risk assessment is widely used in the health and safety arena and takes many forms.

The one described in this study note has been designed for general use, taking into account the advice in Section 6, but it has no statutory force.

The guidance provided follows normal practice in considering the life risks, the hazards and the precautions available to mitigate the hazards. It permits an assessment as to whether an acceptable level of safety has been achieved, or if there is a need for improvements.

Other models are available which follow similar principles, however this model is the one that will be used for the purposes of the examination.

### 3. Introduction to the Guidance

The guidance provided in this study note does not attempt to set new standards for fire safety; existing standards and codes of practice etc. would form part of the reference material of the fire officer undertaking a fire safety risk assessment.

In order to provide general-purpose guidance it is accepted that some buildings will present more complex or difficult problems for assessment and that in such cases this guidance would only serve as the first stage of any assessment.

It is not intended to provide fire authorities with a means of determining the frequency of inspections necessary for different risk categories of premises. However the findings of the risk assessment are likely to be one factor in determining the frequency of inspections.

#### 4. Method

The study note relates to eight worksheets and a summary sheet. Each worksheet must be used in every assessment, and one summary sheet completed for each assessed premise.

Worksheet 1 examines the life risk in the premises;

Worksheets 2 and 3 consider the possible fire hazards; and

Worksheets 4 to 8 consider what fire precautions, if any, have been provided.

#### 5. Hazards and Precautions

In evaluating the hazards and precautions, reference is made in the worksheets to current "benchmark" guidance against which the assessment is to be made.

As this "benchmark" guidance is not repeated on the worksheets, it is essential that the candidates are familiar with it.

(a) As regards Hazards:

- (i) Those which are no greater than the "benchmark" are acceptable and pose no concern.
- (ii) Those that are greater than the "benchmark", but can be reduced by housekeeping are also not a serious concern and just require reminders about the importance of housekeeping.
- (iii) Those that require compensation will not be acceptable unless all five-precaution worksheets (4-8) are to the "benchmark" standard or above.
- (iv) Those that are of an unacceptable level (Sub-standard hazards) will require further action and possibly a more detailed assessment.

(b) As regards Precautions:

- (i) Excellent precautions are those which are above the "benchmark" standard and may serve to mitigate some hazards or particular life risk problems;
- (ii) Those which are at the "benchmark", should be what are normally present;
- (iii) Those which are below the "benchmark", but can be brought up to the "benchmark" standard by housekeeping are not a serious concern and just require reminders about importance of housekeeping;
- (iv) Those that are at an unacceptable level (Sub-standard precautions) will require remedial work, possibly a more detailed assessment, and maybe even enforcement action.

Where life risk issues are identified these may be adequately covered if all precautions are excellent or to the "benchmark" level.

Compensatory factors include fixed installations and fire suppression systems designed for inherent risk.

## 6. Hospitals and Residential Care Premises

It should be noted that this guidance is not suitable for either hospitals or residential care premises.

## 7. Worksheet 1- Life Risk

Before considering hazards and precautions it is important to establish the level of life risk within the building, and in particular to identify any unusual problems.

There would, therefore be a need to *ASSESS* the occupancy and identify if there are any life risk problems. In particular:

### (a) Sleeping Risk

For example:

- Hotels;
- Boarding houses;
- Houses in multiple occupation;
- Shared residential accommodation;
- Prisons and other residential institutions.

### (b) Mobility Risk

Where high proportions of the occupants are disabled, have their mobility impaired, have learning difficulties, are elderly, or are very young.

As there will be some disabled people in every building this is only relevant when the percentage with mobility impairment is greater than that in the normal population.

For example:

- Day centres for the elderly;
- Nurseries; and
- Prisons.

(c) Familiarity Risk

Where a high proportion of the occupants are neither staff nor long-term residents.

For example:

- Shops;
- Hotels; and
- Cinemas.

(d) Numbers Risk

Where there are likely to be large numbers of people assembled during the normal use of the building (using above 60 people as a "benchmark").

For example:

- Ice rinks;
- Schools; and
- Shopping centres.

Where the premises are likely to be used for different activities, leading to different levels of life risk then it may be necessary to undertake separate risk assessments.

This will be particularly the case where premises might be subject to licence applications for specific events.

**RECORD** the findings on the summary sheet of any risks, which have been identified for:

- Sleeping;
- Mobility;
- Familiarity;
- Numbers.

## 8. Worksheet 2 - Ignition Sources

For there to be a fire there must be an ignition source and a fuel. The first hazard to be assessed is therefore the ignition sources within the building.

There will therefore be a need to *ASSESS* the hazard posed by ignition sources. In particular:

- Cooking equipment;
- Electrical hazards;
- Naked flames;
- Space heating appliances;
- Process risk;
- Machinery;
- Outside contractors (hot work);
- Wilful fire raising;
- Vandalism; and
- Smoking materials.

Where the premises are subject to a variety of different uses then it might be necessary to carry out more than one risk assessment.

Assessment should be against the standards set out in the reference documents that serve as a "benchmark".

**RECORD** findings on the summary sheet of the level of hazard as follows:

- Benchmark - Acceptable or minimum standard;
- Below benchmark - Can be reduced to acceptable by housekeeping measures;
- Compensation - Requires compensation;
- Sub-Standard - Is unacceptable even with mitigation

## 9. Worksheet 3 - Combustible Materials

The second hazard to be assessed is the level of combustible materials, which might serve as fuel either within the building or as part of the building structure.

There will therefore be a need to *ASSESS* the hazard posed by combustible materials. This should cover both the combustible materials within the building and any combustible materials used in the construction of the building. In particular:

(a) Contents:

- Flammable materials (in storage or in use);
- Highly flammable materials (especially liquids);
- Bulk storage of goods;
- Fabrics;
- Furnishings;
- Furniture; and
- Waste.

(b) Building Structure:

- Combustible sandwich panels;
- Combustible over cladding; and
- Fibreboard and combustible wall linings.

Where the premises are subject to a variety of different uses then it might be necessary to carry out more than one risk assessment.

Assessment should be against the standards set out in the reference documents that serve as a "benchmark".

*RECORD* findings on the summary sheet of the level of hazard:

- Benchmark - Acceptable or minimum standard;
- Below benchmark - Can be reduced to acceptable by housekeeping measures;
- Compensation - Requires compensation;
- Sub-Standard - Is unacceptable even with mitigation.

## 10. Worksheet 4 - Prevention and Management

Turning to the precautions, the first to be considered is the prevention of fire and the fire safety management of the building.

There will therefore be a need to *ASSESS* the fire prevention and fire safety management measures. In particular:

- Fire safety management methods;
- Fire safety training (both means of escape and first aid firefighting);
- Fire drills;
- Fire emergency plan;
- Housekeeping standards;
- Nominated responsible person;
- Record keeping;
- Security;
- Wilful fire raising prevention measures;
- Previous history of fires and contraventions etc;
- Self-assessment of fire risk;
- Periodic review/ fire audits / continuing risk assessment;
- Maintenance and recording of fire safety features (detection, alarm, extinguishers, lighting etc);
- Hot work procedures (permit to work); and
- First aid firefighting equipment.

Where the premises are subject to a variety of different uses then it might be necessary to carry out more than one risk assessment.

Assessment should be against the standards set out in the reference documents that serve as a "benchmark".

*RECORD* findings on the summary sheet of the level of precautions:

- Excellent - Above benchmark standard;
- Benchmark - Acceptable or minimum standard;
- Below benchmark - Below benchmark standard due to bad housekeeping;
- Sub-Standard - Unacceptably below benchmark standard.

## 11. Worksheet 5 - Communications

If ignition occurs the first priority is to detect the fire and to initiate an alarm. If this is successful then the occupants can begin to escape and the fire brigade can respond to the alarm.

It is also possible that some of the structural fire precautions may be dependent upon the successful detection of the fire (eg fire shutters).

There will therefore be a need to *ASSESS* the means of communication in the event of fire. In particular:

- Manual fire detection (ie reliant upon the actions of the occupiers);
- Automatic fire detection;
- Fire alarm system;
- Links to the fire brigade;
- Fire safety signs (directional and warning); and
- Fire action notices (what to do in the event of fire).

Assessment should be against the standards set out in the reference documents that serve as a "benchmark".

*RECORD* findings on the summary sheet of the level of precautions:

- Excellent - Above benchmark standard;
- Benchmark - Acceptable or minimum standard;
- Below benchmark - Below benchmark standard due to bad housekeeping;
- Sub-standard - Unacceptably below benchmark standard.

## 12. Worksheet 6 - Structural Precautions

Whether detection is successful or not the structural precautions should help to control the spread of the fire. If they are successful they buy time for people to escape.

There will therefore be a need to *ASSESS* the structural fire precautions. In particular:

- Fire resistance and non-combustibility;
- Separation and compartmentation;
- Concealed spaces (cavities);
- Protection of openings and fire stopping;
- Distance of sides of buildings from boundaries;
- Requirements for special purpose groups (shared residential accommodation, single storey commercial buildings and shops); and
- Provision of sprinkler and other automatic suppression systems.

Assessment should be against the requirements of the relevant Building Standards in force at the time of the building's erection, alteration, or change of use. These should be regarded as the "benchmark" standards.

All buildings should have received a completion certificate showing compliance with these Standards in force at the time of their construction or at the time of the last change of use.

If the building being assessed has a completion certificate, and has not been changed/alterd since that date, the presumption should be that the "benchmark" standard has been met, or possibly exceeded.

Candidates should be aware that buildings might have been subject to relaxation granted by the local authority. Relaxation may or may not be granted with additional conditions setting other fire safety requirements (for example automatic detection). In the case of relaxation the local fire authority will have been consulted and a check should be made of their records.

If the building does not have a completion certificate or if there is evidence that it has been altered since the certificate was issued, then this may indicate an unacceptable level of provision.

It has to be remembered that there is no obligation on a building owner to upgrade a building to comply with the most recent relevant Building Standards, provided there has been no change of use.

If the assessment reveals that the means of escape would be prejudiced by bad housekeeping, (eg holes in compartment walls, missing fire doors etc) this should be noted.

**RECORD** findings on the summary sheet of the level of precautions:

- Excellent - Above benchmark standard;
- Benchmark - Acceptable or minimum standard;
- Below benchmark - Below benchmark standard due to bad housekeeping;
- Sub-Standard - Unacceptably below benchmark standard.

### 13. **Worksheet 7 - Means of Escape**

Once the occupants have been given warning of the existence of a fire they can attempt to escape.

There will therefore be a need to *ASSESS* the means of escape. In particular:

- Exits;
- Escape routes;
- Travel distances;
- Design for horizontal escape;
- Design for vertical escape;
- Doors across escape routes;
- Internal fire spread;
- Galleries;
- Places of special fire risk;
- Mechanical ventilation systems; and
- Emergency lighting.

Special care should be taken with auditoria and air supported structures.

Assessment should be against the requirements of the relevant Standards in force at the time of the building's erection, alteration, or change of use, and these should be regarded as the "benchmark" standards.

All buildings should have received a completion certificate showing compliance with the relevant Standards in force at the time of their construction or at the time of the last change of use.

The relevant standards are those that are necessary for compliance with the appropriate Building Standards and other guides and codes of practice relating to means of escape.

If the building being assessed has a completion certificate, and has not had a change of use or has been altered since that date, the presumption should be that the "benchmark" standard has been met, or possibly exceeded.

If the building does not have a completion certificate or if there is evidence that it has been altered since the certificate was issued, then this may indicate an unacceptable level of provision.

Candidates should be aware that buildings might have been subject to relaxation granted by the local authority. Relaxation may or may not be granted with additional conditions setting other fire safety requirements (for example automatic detection). In the case of relaxation the local fire authority will have been consulted and a check should be made of their records.

It has to be remembered that there may not be an obligation on a building owner to upgrade a building to comply with the most recent requirements of the Standards, provided there has been no change of use.

If the assessment reveals that bad housekeeping prejudices the means of escape, (eg broken ironmongery, defective emergency lighting etc) this should be noted.

*RECORD* findings on the summary sheet of the level of precautions:

- Excellent - Above benchmark standard;
- Benchmark - Acceptable or minimum standard;
- Below benchmark - Below benchmark standard due to bad housekeeping;
- Sub-Standard - Unacceptably below benchmark standard.

## 14. Worksheet 8 - Operational Facilities for Brigade Firefighting

Once the alarm has been given to the fire brigade they can play a major role in the safety of life within the building.

There will therefore be a need to *ASSESS* the facilities for firefighting. In particular:

- Access for fire appliances;
- Water supply (mains supply, open water supply, etc);
- Remote rural areas;
- Height of building (dry/wet rising mains, firefighting lifts, firefighting stairs and bridge-heads, etc);
- Expected time of arrival of the fire brigade; and
- Accessibility for ladders.

The assessment should include a check with the fire authority records to establish if a particular firefighting strategy has been agreed and what this might require.

This will be particularly significant in historic buildings, but may also effect other buildings with particular risks or occupancies.

Assessment should be against the standards set out in the reference documents that serve as a "benchmark".

*RECORD* findings on the summary sheet of the level of precautions:

- Excellent - Above benchmark standard;
- Benchmark - Acceptable or minimum standard;
- Below benchmark - Below benchmark standard due to bad housekeeping;
- Sub-Standard - Unacceptably below benchmark standard.

## 15. General

Shown, as Appendix A is a typical summary sheet that could be used to summarise a Fire Safety Risk Assessment.

## References

A Guide to Fire Safety Risk Assessment

## APPENDIX A

### A Guide to Fire Safety Risk Assessment - Worked Example of Summary Sheet

**Building:** FACTORY  
**Owner/Occupier:** BRONCO ELECTRONICS LTD  
**Location:** UNIT 30, SEA CRESCENT  
 ANYTOWN, RQ9 3LS  
**Assessor:** STATION OFFICER C BLUE  
**Brigade Reference:** EC13961

**Signature:** Charles Blue  
**Date of Assessment:** 7/2/2000

Notes	Record finding	
<b>Worksheet 1 : Life Risk</b> <i>The building has a workforce of 93 persons on the day shift with 65 persons on the night shift. High occupancy numbers required for production purposes</i>	Sleeping	
	Mobility	
	Familiarity	
	Numbers	✓
<b>Worksheet 2: Ignition Sources</b> <i>Outdated propane heaters used in winter, with gas supplied overhead heaters also being used. Electric heating used in the manufacturing process.</i>	Benchmark	
	Below benchmark	✓
	Compensation	
	Sub-standard	
<b>Worksheet 3 : Combustible Materials</b> <i>Solvents in use but stored in Highly Flammable store outside. Only the required quantities are brought into the building for processing purposes. Automatic smoke detection and ventilation systems installed.</i>	Benchmark	✓
	Below benchmark	
	Compensation	✓
	Sub-standard	
<b>Worksheet 4: Prevention and Management</b> <i>The fire safety logbook was not up to date with no record of training or maintenance of fire safety equipment. Housekeeping of a poor standard.</i>	Excellent	
	Benchmark	
	Below benchmark	
	Sub-standard	✓
<b>Worksheet 5 : Communications</b> <i>Existing fire alarm and automatic detection system was not being maintained and inappropriate to the building use. Fire exit signs in poor condition with only one fire action notice visible in the building.</i>	Excellent	
	Benchmark	
	Below benchmark	
	Sub-standard	✓
<b>Worksheet 6 : Structural Precautions</b> <i>Several holes made in walls to provide access for pipework. Some walls had been removed to facilitate the manufacturing process. No Completion certificate was available.</i>	Excellent	
	Benchmark	
	Below benchmark	
	Sub-standard	✓
<b>Worksheet 7: Means of Escape</b> <i>Means of escape was to the required standard at the time of construction in approximately 1990, however there is clear evidence of alterations and the means of escape require upgrading.</i>	Excellent	
	Benchmark	
	Below benchmark	
	Sub-standard	✓
<b>Worksheet 8 : Operational Facilities for Brigade Firefighting</b> <i>The building consists of ground floor only with access for the fire brigade at the front, rear and one side. Water supplies and pressure are good. The factory is located in a Retained Station area.</i>	Excellent	
	Benchmark	✓
	Below benchmark	
	Sub-standard	

**Excellent:** comfortably exceeds "benchmark" standards and therefore of no concern; may mitigate some hazards marked for compensation.

**Benchmark:** meets minimum standard, no concern.

**Below benchmark:** no serious concern, just reminders about importance of housekeeping.

**Compensation:** no concern, if all precautions are excellent or to "benchmark" standard.

**Sub-standard:** serious concern and remedial/enforcement action required.

Further details and descriptions can be recorded on the reverse of this form.