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Guide to the NEBOSH International Certificate in Fire Safety and Risk Management

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Guide to the NEBOSH International Certificate in Fire Safety and Risk Management (November 2014 specification)

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1. Introduction

The International Fire Certificate has been designed for managers, supervisors, employee representatives and others to provide an appropriate breadth of underpinning knowledge for non-specialists in fire safety to enable them to discharge more effectively their organisational duties or functions with respect to workplace fire safety. It also aims to equip holders to contribute to the conduct and review of fire risk assessments and preventative and protective measures within most low risk workplaces, in accordance with International and European best practice conventions.

The International Fire Certificate is modelled on the NEBOSH National Fire Certificate. The key difference between the two qualifications is in the applicability of legal requirements. Rather than be guided by a specific UK framework, the International Fire Certificate takes a risk management approach based on best practice and international standards, such as International Labour Organisation (ILO) codes of practice. Local laws and cultural factors form part of the study programme where relevant and appropriate.

The syllabus and means of assessment described in the Guide were introduced in 2011 and have been revised in 2013 to take account of current developments in health and safety, fire safety, risk management and vocational assessment. The 2013 revision has been mapped to the 'Competency Criteria for Fire Risk Assessors' which has been produced by the Fire Risk Assessment Competency Council.

The Fire Risk Assessment Competency Council is a broad group of UK stakeholders which was encouraged to form by the UK Department of Communities and Local Government. The Council's objective is to establish agreed, industry-wide, criteria against which the competence of a fire risk assessor can be judged. In the UK the criteria will be used by professional bodies and third party certification bodies who register or certificate fire risk assessors and, by commercial companies providing fire risk assessment services. However, the 'Criteria' can also be considered as good-practice and the principles contained in the 'Criteria' are relevant to global fire safety.

1.1 Benefits for employers

All statistics are taken from the *'World Fire Statistics Bulletin, No. 28, October 2012'* (published by the Geneva Association). The Bulletin indicates that the trend for fire death rates appear to be decreasing year-on-year from 1979 but the number of fire related deaths is still too high. The following are example statistics reproduced from the Bulletin:

Finland - 110 deaths (1.98 deaths per 100000 persons)
Czech Republic - 120 deaths (1.30 deaths per 100000 persons)
Australia - 175 deaths (0.79 deaths per 100000 persons)
United Kingdom - 460 deaths (0.76 deaths per 100000 persons)
USA - 3300 deaths (1.17 deaths per 100000 persons).

In addition to the cost in human life there is all the expense (medical, rehabilitation, sick pay etc) of dealing with non-fatal fire casualties; in the UK during 2011/12 there were 9300 such casualties (figure taken from the *'Fire Statistics Monitor, April 2011 to March 2012'* published by the UK Department for Communities and Local Government).

As well as the effects to health, there is also the monetary cost of fires to business to be taken into consideration. The following statistics relate to the total cost of direct fire losses (includes private dwelling fires and fires on commercial properties):

Finland - €295million
Czech Republic - Kč2450million
Australia - AU$945million
United Kingdom - £1800million
USA - US$14000million.

On top of the direct costs, employers can find themselves dealing with criminal prosecution, claims for compensation, adverse publicity and harm to both business reputation and profitability. Even a minor fire at a key production stage can mean very large losses for individual firms. Fire Protection Association statistics indicate that 77% of businesses experiencing a major fire never fully recover. Furthermore, fires causing the closure of premises could have a significant effect on staff.

The vast majority of fire-related incidents can be avoided using sound health, safety and risk management. Many larger organisations choose the NEBOSH International Fire Safety Certificate as a key part of their supervisors' or management development programme and this qualification is also suitable for smaller organisations operating in lower risk environments, to assist in applying good practice.

This course can be delivered within an organisation, or employees can attend accredited training courses run by our network of accredited course providers. NEBOSH accredited course providers offer a variety of flexible course formats, so training can be arranged according to employer needs.

1.2 Professional membership

Holders of the NEBOSH International Certificate in Fire Safety and Risk Management are entitled to Associate Membership (AIOSH) of the Institution of Occupational Safety and Health (IOSH). The qualification also meets the academic requirements for Technical membership (Tech IOSH) of the Institute of Occupational Safety and Health (IOSH – www.iosh.co.uk) and Associate membership (AIIRSM) of the International Institute of Risk and Safety Management (IIRSM – www.iirsm.org).

The International Fire Certificate meets the requirements of Technician membership (TIFPO) of the Institute of Fire Prevention officers (IFPO – www.ifpo.org.uk) and the qualification meets the academic requirements for Associate Membership (AMIFPO). Qualifications holders with the relevant skills and experience may also apply to join the IFPO Fire Risk Assessors register.

1.3 Qualification level and UK accreditation

The NEBOSH National General Certificate is accredited and credit rated by the Scottish Qualifications Authority Accreditation (SQA Accreditation - www.sqa.org.uk) for delivery across the UK. It is rated within the Scottish Credit and Qualifications Framework (SCQF - www.scqf.org.uk) at SCQF Level 6 with 13 SCQF credit points.

For users in England, Wales and Northern Ireland, this is comparable to a Vocationally-Related Qualification (VRQ) at Level 3 within the National Qualifications Framework (NQF) and Qualifications and Credit Framework (QCF), or A-Level standard.

For further information please refer to the *"Qualifications can cross boundaries"* comparison chart issued by the UK regulators, available from the SQA website (www.sqa.org.uk).

1.4 Key topics covered

- Managing international fire safety
- Principles of fire and explosion
- Causes and prevention of fires
- Fire protection in buildings and safety of people in the event of a fire
- Fire safety risk assessment

1.5 Course tuition and private study time requirements

Unit IGC1: 36 hours tuition and 23 hours private study	**Total: 59 hours**
Unit IFC1: 29 hours tuition and 24 hours private study	**Total: 53 hours**
Unit FC2: 4 hours tuition and 4 hours private study	**Total: 8 hours**

A programme of study therefore needs to be based around a minimum of **69 taught hours** and approximately **51 hours of private study** for an overall total of **120 hours.**

A full-time block release course would be expected to last for a minimum of two weeks (ten working days) and a part-time day release course would be spread over at least ten weeks. For candidates studying by open or distance learning, the tuition hours should be added to the recommended private study hours to give the minimum number of hours that this mode of study will require.

Quoted hours *do not* include assessment time, ie, sitting written examinations or the practical application unit (see 1.4).

1.6 Entry requirements

There are no specific barriers, in terms of academic qualifications, skills or experience to entry to the NEBOSH International Fire Certificate programme. However, it should be noted that currently the assessments are offered, and must be answered, in English only. The qualification includes a requirement to complete a 'fire risk assessment sheet' and a 'summary fire risk assessment sheet' which must also be completed in English. Candidates should discuss this with the accredited course provider before undertaking the qualification.

1.7 Minimum standard of English required for candidates

The standard of English required by candidates studying for the NEBOSH International Fire Certificate must be such that they can both understand and articulate the concepts contained in the syllabus. It is important to stress that the onus is on accredited course providers to determine their candidates' standards of proficiency in English.

NEBOSH recommends to accredited course providers that candidates undertaking this qualification should reach a minimum standard of English *equivalent* to an International English Language Testing System score of **6.0** or higher in IELTS tests in order to be accepted onto an International Fire Certificate programme.

For further information please see the latest version of the IELTS Handbook or consult the IELTS website: http://www.ielts.org/institutions/test_format_and_results.aspx.

Candidates wishing to assess their own language expertise may consult the IELTS website for information on taking the test: http://www.ielts.org/faqs.aspx.

1.8 Legislation

The syllabus refers to international conventions and recommendations. Where this qualification is delivered overseas, accredited course providers may refer to examples of local legislation as part of the course programme but examination questions will not refer to specific legislation, but will refer to international conventions, recommendations and good practice as indicated in the syllabus.

1.9 Legislative updates

Relevant new conventions and recommendations will become examinable six months after their date of introduction. However, candidates will be expected to be essentially up-to-date at the time of the examination and, whilst a detailed knowledge will not be expected, reference to new or impending international conventions and recommendations, where relevant to an examination question, will be given credit.

Please note, NEBOSH will not ask questions related to conventions and recommendations that have been repealed, revoked or otherwise superseded.

NB: Accredited course providers are expected to ensure their course notes remain current with regard to new conventions and recommendations.

1.10 National Occupational Standards (NOS) and best practice

To ensure parity between UK and international qualifications, the qualification syllabus is mapped to the relevant National Occupational Standard (NOS):

- NOS for Health and Safety (Standalone units) 2011, published by Proskills Standards Setting Organisation (www.proskills.co.uk)
- NOS for Fire Safety 2010 published by Skills for Justice Sector Skills Council (www.skillsforjustice.com)

The mapping of the syllabus units to each NOS can be found in Section 4.

The syllabus has also been mapped against the 'Competency Criteria for Fire Risk Assessors' produced by the Fire Risk Assessment Competency Council and can be found in Section 4.

1.11 Qualification type

NEBOSH qualifications are categorised as 'Other' qualifications by SQA Accreditation in Scotland. These are categorised as Vocationally-Related Qualifications (VRQs) in England, Wales and Northern Ireland.

VRQs provide the knowledge and practical skills required for particular job roles through a structured study-based training programme, that combine the testing of knowledge and understanding in written examinations with practical application of learning in the workplace.

VRQs are a popular type of qualification because they are nationally recognised, flexible and offer routes for progression to employment or further study.

1.12 Qualification progression

Unit IGC1 is common to:

- NEBOSH International General Certificate in Occupational Health and Safety
- NEBOSH International Certificate in Construction Health and Safety
- NEBOSH International Certificate in Fire Safety and Risk Management.

Unit FC2 is common to:

- NEBOSH International Certificate in Fire Safety and Risk Management
- NEBOSH National Certificate in Fire Safety and Risk Management.

This enables students seeking to develop specialist knowledge to combine units across these NEBOSH qualifications. IGC1/FC2 unit holders do not need to re-sit the assessment providing it was successfully achieved within the five year completion period for each qualification.
Candidates wishing to further develop their health and safety expertise may consider studying:

- NEBOSH International Diploma in Occupational Health and Safety
- NEBOSH International Technical Certificate in Oil and Gas Operational Safety.

This is designed to provide students with the expertise required to undertake a career as a health and safety practitioner and also provides a sound basis for progression to postgraduate study.

Further information regarding our qualification portfolio can be found on our website: www.nebosh.org.uk/qualifications

1.13 Programmes offered by NEBOSH-accredited course providers

Accredited course providers can be located using the 'Where to study' tab on our website: www.nebosh.org.uk

NB: Candidates are advised to check up-to-date information on course dates with accredited course providers directly.

1.14 Examination dates

'Standard' examination dates for this qualification are available in March, June, September and December annually. Accredited course providers may request 'on-demand' examinations on a date of their choosing for this qualification.

1.15 Specification date

The November 2014 specification for this qualification replaces the previous April 2013 specification for this qualification.

1.16 Syllabus development and review

The syllabus has been developed by NEBOSH following extensive consultation with key stakeholders, notably accredited course providers, professional bodies, employers, standards setting organisations, enforcement bodies and subject experts. NEBOSH would like to take this opportunity to thank all those who participated in the development, piloting and implementation of this qualification.

1.17 Further information for candidates

Further information for candidates including a qualification overview leaflet, practical guidance and a sample examiner's report can be found via the NEBOSH website (www.nebosh.org.uk). Examiners' reports may be purchased from the NEBOSH online shop.

1.18 Further information for accredited course providers

Further information for accredited course providers including policies and procedures and guidance on the practical unit can be found in the accredited course providers' section of the NEBOSH website.

2. Qualification structure

2.1 Unit assessment

The International Certificate in Fire Safety and Risk Management is divided into three units. All units are mandatory unless an exemption can be applied (see 2.2). There are no optional units. Candidates may choose to take one, two or all three units at the same time or at different times.

Note: For candidates planning to do two or all three units, Unit FC2 (Fire safety practical application) is not normally offered independently of the taught units (IGC1/IFC1). Candidates will be required to complete the FC2 assessment within 10 working days of sitting the examination for unit IGC1 and/or IFC1, on a date to be agreed with their accredited course provider. Unit FC2 can normally only be taken as a stand-alone unit if a candidate has either previously registered for three units and was not able to sit the examination, or if the candidate has previously taken Unit FC2 and has either been referred or has chosen to retake the unit to try to improve their overall grade.

Unit IGC1: International management of health and safety

- Unit IGC1 is a taught unit, assessed by a two-hour written examination
- Each written examination consists of ten 'short-answer' questions (8 marks each) and one 'long-answer' question (20 marks)
- Each examination paper covers the whole unit syllabus. All questions are compulsory
- Candidate scripts are marked by external examiners appointed by NEBOSH
- A sample examination paper can be found in Section 5.

Unit IFC1: International fire safety and risk management

- Unit IFC1 is a taught unit, assessed by one two-hour written examination
- Each written examination consists of ten 'short-answer' questions (8 marks each) and one 'long-answer' question (20 marks)
- Each examination paper covers the whole unit syllabus. All questions are compulsory
- Candidate scripts are marked by external examiners appointed by NEBOSH
- A sample examination paper can be found in Section 5.

Unit FC2: Fire safety practical application

- Unit FC2 is assessed by a practical application carried out in the candidate's own workplace
- This is held on a date set by the accredited course provider and must be taken within 10 working days of a written (IGC1 and/or IFC1) examination
- The practical examination is internally assessed by the accredited course provider and moderated by a NEBOSH
- Guidance for candidates and accredited course providers is available in a separate document available on the NEBOSH website (www.nebosh.org.uk).

NEBOSH applies best practise in relation to assessment setting and marking. NEBOSH uses external assessment for written examinations and assignments: scripts are sent to NEBOSH and undergo rigorous marking, checking and results determination processes to ensure accuracy and consistency.

2.2 Unit exemptions

Exemptions for the following units are available:

- Unit IGC1: Management of international health and safety
- Unit FC2: Fire safety practical application.

Exemptions are allowable for a set time period, usually 5-years. Candidates/accredited course providers must, therefore, refer to the NEBOSH website (www.nebosh.org.uk) for an up-to-date list of applicable exemptions and the rules for use of the exemptions.

2.3 Achieving the qualification

Candidates will need to pass **all three units** within a **five year** period to achieve the overall qualification. The five years commences from the result declaration date of the first successful unit.

2.4 Unit pass standard

The pass standard for each unit may vary according to pre-determined criteria but is normalised to 45% for the written papers (IGC1 and IFC1) and 60% for the practical application unit (FC2).

2.5 Unit certificates

Candidates who are successful in an individual unit will be issued with a unit certificate, normally within 40 working days of the issue of the unit result notification letter. Units are not graded and the unit certificates will, therefore, not show a grade or mark.

2.6 Qualification grades

When candidates have been awarded a unit certificate for all three units (have achieved a Pass in units IGC1, IFC1 and FC2), the marks are added together and a final grade is awarded as follows:

Pass	150 - 179 marks
Credit	180 - 209 marks
Distinction	210 marks or more

2.7 Qualification parchment

Once a candidate has achieved a Pass in all three units and the qualification grade awarded they are normally considered to have completed the qualification and a qualification parchment will be issued within 40 working days of the result declaration date for the third successfully completed unit.

However, once the result of the third successfully completed unit has been issued the candidate has **20 working days** from the date of issue of that result to either:

- Inform NEBOSH in writing of their intention to re-sit a successful unit for the purposes of improving a grade*
- Submit an Enquiry About Result (EAR) request (see Section 3.3).

* In the event that the candidate does not re-sit the unit(s) as intended, on expiry of the units (five years from the declaration date of the first successful unit), a qualification parchment will automatically be issued showing the original declaration date.

2.8 Re-sitting unit/s

If a candidate's performance in a unit is lower than a pass, candidates may re-sit just the unit in which they have been unsuccessful providing that they re-sit **within 5-years of the result declaration date for their first successful unit** (also see Section 2.3). Where a candidate has yet to achieve a successful unit of a qualification, the 5-year rule does not apply until a unit has been successfully achieved.

Candidates who wish to improve the mark from a unit they have successfully passed in order to improve their qualification grading to a credit or distinction, may do so providing that they re-sit the examination within the qualifying period (see section 2.3). The candidate must notify NEBOSH in writing if they wish to do this (see section 2.7). Any candidate who re-sits a successful unit, and does not surpass their original mark, eg, is referred in the paper, will keep the *original* mark awarded. Re-sit marks are not capped. There is no limit to the number of re-sits within this five year period.

Candidates who register for any unit of the International Fire Certificate whilst awaiting a result from a previous sitting of an examination for the same qualification may not seek a refund of the registration fee if they retrospectively claim exemption from any part of the qualification, subsequent to the issue of the awaited result.

3. Policies

3.1 Requests for access arrangements/reasonable adjustments

Access arrangements and reasonable adjustments are modifications which are approved in advance of an examination to allow attainment to be demonstrated by candidates with either a permanent or long-term disability or learning difficulty, or temporary disability, illness or indisposition.

Requests for access arrangements/reasonable adjustments must be made to NEBOSH by accredited course providers at least one month before the assessment.

For further details see the NEBOSH *"Policy and procedures for access arrangements, reasonable adjustments and special consideration"* available from the NEBOSH website (www.nebosh.org.uk).

3.2 Requests for special consideration

Special consideration is a procedure that may result in an adjustment to the marks of candidates who have not been able to demonstrate attainment because of temporary illness, injury, indisposition or an unforeseen incident at the time of the assessment.

Candidates who feel disadvantaged due to illness, distraction or any other reason during the assessment must report this to the invigilator (or the accredited course provider in the case of a practical examination) before leaving the examination room and request that their written statement, together with the invigilator's comments on the statement, be sent by the accredited course provider to NEBOSH.

Requests for special consideration must be made to NEBOSH by the accredited course provider as soon as possible and no more than seven working days after the assessment.

For further details see the NEBOSH *"Policy and procedures for access arrangements, reasonable adjustments and special consideration"* available from the NEBOSH website (www.nebosh.org.uk).

3.3 Enquiries about results and appeals

NEBOSH applies detailed and thorough procedures to moderate and check assessment results before they are issued. It thereby ensures that the declared results are a fair and equitable reflection of the standard of performance by candidates.

There are, however, procedures for candidates or accredited course providers to enquire about results that do not meet their reasonable expectations. An 'enquiry about result' (EAR) must be made in writing within one month of the date of issue of the result to which it relates.

For details see the NEBOSH *"Enquiries and appeals policy and procedures"* document available from the NEBOSH website (www.nebosh.org.uk).

3.4 Malpractice

Malpractice is defined as any deliberate activity, neglect, default or other practice by candidates and/or accredited course providers that compromise the integrity of the assessment process, and/or the validity of certificates. Malpractice may include a range of issues from collusion or use of unauthorised material by candidates, to the failure to maintain appropriate records or systems by accredited course providers, to the deliberate falsification of records in order to claim certificates. Failure by an accredited course provider to deal with identified issues may in itself constitute malpractice.

For further details see the NEBOSH *"Malpractice policy and procedures"* document available from the NEBOSH website (www.nebosh.org.uk).

4. Syllabus - NEBOSH International Certificate in Fire Safety and Risk Management (November 2014 specification)

Structure

The qualification is divided into three units. Unit IGC1 is further divided into five elements and Unit IFC1 into six elements.

The following matrix indicates how the syllabus elements map to the relevant UK National Occupational Standards (See also section 1.11):

- National Occupational Standards (NOS) for Health and Safety (Standalone units) published in 2011 by Proskills Standards Setting Organisation (www.proskills.co.uk)
- NOS for Fire Safety 2010 published by Skills for Justice Sector Skills Council (www.skillsforjustice.com)

The matrix also indicates how the syllabus elements map to the UK 'Competency Criteria for Fire Risk Assessors' produced by the Fire Risk Assessment Competency Council which was published in February 2013.

Unit IGC1: Management of international health and safety

Element Number	***Element Title***	***Recommended Hours***	***Proskills units/ Elements***	***Skills for Justice units/ Elements***	***Fire criteria Appendix***	***Page***
1	Foundations in health and safety	7	*PROHSS 1-3, 5-6, 9*	*N/A*	*A, B, G*	16
2	Health and safety management systems - Plan	3	*PROHSS 1-3, 9*	*N/A*	*N/A*	18
3	Health and safety management systems - Do	17	*PROHSS 1-3, 9*	*N/A*	*N/A*	20
4	Health and safety management systems - Check	5	*PROHSS 1-3 6, 8-9*	*N/A*	*N/A*	23
5	Health and safety management systems - Act	4	*PROHSS 2-3 5, 8*	*N/A*	*N/A*	27
	Minimum unit tuition time	***36***				
	Recommended private study time	***23***				

Unit IFC1: International fire safety and risk management

Element Number	***Element Title***	***Recommended Hours***	***Proskills units/ Elements***	***Skills for Justice units/ Elements***	***Fire criteria Appendix***	***Page***
1	Managing fire safety	7	*PROHSS 1-3, 9*	*FS1-9*	*Definitions B, C, I*	30
2	Principles of fire and explosion	3	*N/A*	*FS2*	*D, I*	33
3	Causes and prevention of fire	4	*N/A*	*FS 2, 6, 8*	*A, B, D, I*	36
4	Fire protection in buildings	7	*N/A*	*FS2-3, 6-7, 9*	*Definitions B, D, F, G, H H1, H2, I*	39
5	Safety of people in the event of a fire	3	*N/A*	*FS2-3, 6*	*E, F, H2, I*	43
6	Fire risk assessment	5	*PROHSS 6*	*FS1-3, FS5-6, 9*	*Definitions A, D, E, G H, I*	46
	Minimum unit tuition time	***29***				
	Recommended private study time	***24***				

Unit FC2: Fire safety practical application

Element Number	***Element Title***	***Recommended Hours***	***Proskills units/ Elements***	***Skills for Justice units/ Elements***	***Fire criteria Appendix***	***Page***
	Fire safety practical application	4	*PROHSS 1-3, 5-6, 8-9*	*FS1-3, 5-6, 8-9*	*A, B, H, I*	50
	Minimum unit tuition time	***4***				
	Recommended private study time	***4***				
	Minimum total tuition time	***69***				
	Recommended total private study time	***51***				

4.1 Unit IGC1: Management of international health and safety

Element 1: Foundations in health and safety

Learning outcomes

1.1 Outline the scope and nature of occupational health and safety

1.2 Explain the moral, social and economic reasons for maintaining and promoting good standards of health and safety in the workplace

1.3 Explain the role of national governments and international bodies in formulating a framework for the regulation of health and safety.

Content

1.1 The scope and nature of occupational health and safety

- The multi-disciplinary nature of health and safety; the barriers to good standards of health and safety (complexity, competing and conflicting demands, behavioural issues)
- Meanings and distinctions between:
  - health, safety and welfare.

1.2 The moral, social and economic reasons for maintaining and promoting good standards of health and safety in the workplace

- The size of the health and safety 'problem' in terms of the numbers of work-related fatalities and injuries and incidence of ill-health
- Societal expectations of good standards of health and safety
- The need to provide a safe place of work, safe plant and equipment, safe systems of work, training and supervision, and competent workers
- The business case for health and safety: costs of insured and uninsured accidents and ill-health; employers' liability insurance.

1.3 The role of national governments and international bodies in formulating a framework for the regulation of health and safety

- Employers' responsibilities
- Workers' responsibilities and rights
- The role of enforcement agencies and the consequences of non-compliance
- International standards and conventions (eg, International Standards Organisation (ISO) and the International Labour Organisation - ILO)
- Sources of information on National Standards.

Tutor references

ILO Guidelines on Occupational Safety and Health Management Systems (ILO-OSH 2001)
http://www.ilo.org/global/publications/ilo-bookstore/order-online/books/WCMS_PUBL_9221116344_EN/lang--en/index.htm

ILOLEX (ILO database of International Law) http://www.ilo.org/ilolex/index.htm

Occupational Health and Safety Assessment Series (OHSAS 18000):
Occupational Health and Safety Management Systems OHSAS 18001:2007
ISBN: 978-0-5805-9404-5
OHSAS18002:2008 ISBN: 978-0-5806-2686-9

Occupational Safety and Health Convention (C155), ILO
http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_ILO_CODE:C155

Occupational Safety and Health Recommendation (R164), ILO
http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312502

Recommended tuition time not less than 7 hours

Element 2: Health and safety management systems - Plan

Learning outcomes

On completion of this element, candidates should be able to demonstrate understanding of the content through the application of knowledge to familiar and unfamiliar situations. In particular they should be able to:

2.1 Outline the key elements of a health and safety management system

2.2 Explain the purpose and importance of setting policy for health and safety

2.3 Describe the key features and appropriate content of an effective health and safety policy.

Content

2.1 The key elements of a health and safety management system

- With reference to ILO Guidelines on Occupational Safety and Health Management Systems (ILO-OSH 2001)
  - policy (Plan)
  - organising (Plan)
  - planning and implementing (Do)
  - evaluation - monitoring, review, measurement, investigation (Check)
  - auditing (Check)
  - action for improvement - preventative and corrective action; continual improvement (Act)
- With reference to OHSAS 18001: Occupational health and safety management systems
  - policy (Plan)
  - planning (Plan)
  - implementation and operation (Do)
  - checking and corrective action (Check)
  - management review (Act)
  - continual improvement (Act)

2.2 The purpose and importance of setting policy for health and safety

- The role of the health and safety policy in decision-making; the needs of different organisations.

2.3 The key features and appropriate content of an effective health and safety policy

- Stating the overall aims of the organisation in terms of health and safety performance:
  - general statement of intent
  - setting overall objectives and quantifiable targets (specific, measurable, achievable, reasonable, time bound (SMART) principles)
  - basic concept of benchmarking
  - views of interested parties

- technological options
- financial, operational, and business requirements
- signatory to statement

- Defining the health and safety roles and responsibilities of individuals within the organisation:
  - organising for health and safety: allocation of responsibilities; lines of communication; feedback loops; the role of the line managers in influencing the health and safety policy and monitoring effectiveness

- Specifying the arrangements for achieving general and specific aims:
  - health and safety arrangements: the importance of specifying the organisation's arrangements for planning and organising, controlling hazards, consultation, communication and monitoring compliance with, and assessing the effectiveness of, the arrangements to implement the health and safety policy
- The circumstances that may lead to a need to review the health and safety policy (eg, passage of time, technological, organisational or legal changes, results and monitoring)
- Standards and guidance relating to health and safety policy.

Tutor references

ILO Guidelines on Occupational Safety and Health Management Systems (ILO-OSH 2001)
ISBN: 978-0-580-37805-5 http://www.ilo.org/global/publications/ilo-bookstore/order-online/books/WCMS_PUBL_9221116344_EN/lang--en/index.htm

Occupational Health and Safety Assessment Series (OHSAS 18000):
Occupational Health and Safety Management Systems OHSAS 18001:2007
ISBN: 978-0-5805-9404-5
OHSAS18002:2008 ISBN: 978-0-5806-2686-9

Recommended tuition time not less than 3 hours

Element 3: Health and safety management systems - Do

Learning outcomes

On completion of this element, candidates should be able to demonstrate understanding of the content through the application of knowledge to familiar and unfamiliar situations. In particular they should be able to:

3.1 Outline the health and safety roles and responsibilities of employers, directors, managers, supervisors, workers and other relevant parties

3.2 Explain the concept of health and safety culture and its significance in the management of health and safety in an organisation

3.3 Outline the human factors which influence behaviour at work in a way that can affect health and safety

3.4 Explain how health and safety behaviour at work can be improved

3.5 Explain the principles and practice of risk assessment

3.6 Explain the preventive and protective measures

3.7 Identify the key sources of health and safety information

3.8 Explain what factors should be considered when developing and implementing a safe system of work for general activities

3.9 Explain the role and function of a permit-to-work system.

3.10 Outline the need for emergency procedures and the arrangements for contacting emergency services

3.11 Outline the requirements for, and effective provision of, first aid in the workplace.

Content

3.1 Organisational health and safety roles and responsibilities of employers, directors, managers, supervisors, workers and other relevant parties

- Organisational roles of directors/managers/supervisors
- Top management demonstrating commitment by:
  - ensuring availability of resources so the occupational health and safety management system is established, implemented and maintained
  - defining roles and responsibilities
  - appointing member of senior management with specific responsibility for health and safety
  - appointing one or more competent persons and adequate resources to provide assistance in meeting the organisation's health and safety obligations (including specialist help where necessary)
  - role in reviewing health and safety performance
- The roles and responsibilities of:
  - middle managers and supervisors for the health and safety of workers
  - persons with primary health and safety functions
  - workers for the health and safety of themselves and others who may be affected by their acts or omissions

  - persons in control of premises for the health and safety of those who are not directly employed by the organisation using the premises as a place of work and for those using plant or substances provided, eg, contractors
  - the self-employed for the health and safety of themselves and others
- The supply chain and requirements on suppliers, manufacturers and designers of articles and substances for use at work in relation to the health and safety of their products and the provision of information
- The relationship between client and contractor and the duties each has to the other and to the other's workers; effective planning and co-ordination of contracted work
- Principles of assessing and managing contractors
  - scale of contractor use
  - pre-selection and management of contractors
- Shared responsibilities in the case of joint occupation of premises: co-operation and co-ordination.

3.2 Concept of health and safety culture and its significance in the management of health and safety in an organisation

- Meaning and extent of the term 'health and safety culture'
- Relationship between health and safety culture and health and safety performance
- Indicators which could be used to assess the effectiveness of an organisation's health and safety culture:
  - tangible outputs or indicators of an organisation's health and safety culture (eg, accidents, absenteeism, sickness rates, staff turnover, level of compliance with health and safety rules and procedures, complaints about working conditions)
- Influence of peers.

3.3 Human factors which influence behaviour at work

- Organisational factors:
  - eg culture, leadership, resources, work patterns, communications
- Job factors:
  - eg task, workload, environment, display and controls, procedures
- Individual factors:
  - eg competence, skills, personality, attitude and risk perception
- Link between individual, job and organisational factors.

3.4 How health and safety behaviour at work can be improved

- Securing commitment of management
- Promoting health and safety standards by leadership and example and appropriate use of disciplinary procedures

- Competent personnel with relevant knowledge, skills and work experience
- Identifying and keeping up to date with legal requirements
- Effective communication within the organisation:
  - merits and limitations of different methods of communication (verbal, written and graphic)
  - use and effectiveness of notice boards and health and safety media such as films, digital media, company intranet, posters, toolbox talks, memos, worker handbooks
  - co-operation and consultation with the workforce and contractors where applicable (roles and benefits of worker participation, safety committees and worker feedback)
- Training:
  - the effect of training on human reliability
  - opportunities and need for training provision (induction and key health and safety topics to be covered, job change, process change, introduction of new legislation, introduction of new technology).

3.5 Principles and practice of risk assessment

- Meaning of hazard, risk and risk assessment:
  - hazard: 'something with the potential to cause harm (this can include articles, substances, plant or machines, methods of work, the working environment and other aspects of work organisation)'
  - risk: 'the likelihood of potential harm from that hazard being realised'
  - risk assessment: 'identifying preventive and protective measures by evaluating the risk(s) arising from a hazard(s), taking into account the adequacy of any existing controls, and deciding whether or not the risk(s) is acceptable'
- Objectives of risk assessment; prevention of workplace accidents
- Risk assessors:
  - composition of risk assessment team
  - competence
- Criteria for a 'suitable and sufficient' risk assessment
- Identification of hazards
  - sources and form of harm; task analysis, legislation, manufacturers' information, incident data
- Identifying population at risk:
  - workers, operators, maintenance staff, cleaners, contractors, visitors, public, etc
- Evaluating risk and adequacy of current controls:
  - likelihood of harm and probable severity
  - risk rating
  - apply the general hierarchy of control with reference to OHSAS 18001
  - application based on prioritisation of risk
  - use of guidance; sources and examples of legislation
  - applying controls to specified hazards

- residual risk; acceptable / tolerable risk levels
- distinction between priorities and timescales

- Recording significant findings:
  - format; information to be recorded
- Reviewing: reasons for review (eg incidents, process / equipment / worker / legislative changes; passage of time)
- Special case applications to young persons, expectant and nursing mothers; disabled workers and lone workers.

3.6 Preventive and protective measures

- General principles of the preventive and protective measures with reference to ILO-OSH 2001: Guidelines on Occupational Safety and Health Management Systems:
  - eliminate the hazard/risk;
  - control the hazard/risk at source, through the use of engineering controls or organizational measures;
  - minimize the hazard/risk by the design of safe work systems, which include administrative control measures;
  - where residual hazards/risks cannot be controlled by collective measures, the employer should provide for appropriate personal protective equipment, including clothing, at no cost, and should implement measures to ensure its use and maintenance.

  Hazard prevention and control procedures or arrangements should be established and should:
  - be adapted to the hazards and risks encountered by the *organization;*
  - be reviewed and modified if necessary on a regular basis;
  - comply with national laws and regulations, and reflect good practice;
  - consider the current state of knowledge, including information or reports from *organizations,* such as labour inspectorates, occupational safety and health services, and other services as appropriate.

3.7 Sources of health and safety information

- Internal to the organisation (eg, accident/ill health/absence records, inspection, audit and investigation reports, maintenance records)
- External to the organisation (eg, manufacturers' data, legislation, EU (European Union) / HSE (Health and Safety Executive) publications, trade associations; International, European and British Standards, ILO (International Labour Organisation) Occupational Safety and Health Administration (USA), Worksafe (Western Australia) and other authoritative texts, IT sources).

3.8 Factors that should be considered when developing and implementing a safe system of work for general work activities

- Employer's responsibility to provide safe systems of work
- Role of competent persons in the development of safe systems
- Importance of worker involvement in the development of safe systems
- Importance and relevance of written procedures

- The distinction between technical, procedural and behavioural controls
- Development of a safe system of work
- Analysing tasks, identifying hazards and assessing risks
- Introducing controls and formulating procedures
- Instruction and training in the operation of the system
- Monitoring the system
- Definition of and specific examples of confined spaces and lone working and working and travelling abroad in relation to safe systems of work.

3.9 Role and function of a permit-to-work system

- Meaning of permit-to-work system
- Role and function in controlling a permit-to-work
- Operation and application of a permit-to-work system
- Circumstances in which a permit-to-work system may be appropriate, with reference to: hot work, work on electrical systems, machinery maintenance, confined spaces, work at height.

3.10 Emergency procedures and the arrangements for contacting emergency services

- Importance of developing emergency procedures
- What needs to be included in an emergency procedure
  - why an emergency procedure is required
  - size and nature of potential accidents and the consequences if they occur
  - procedures for raising the alarm
  - action of the employees on site
  - dealing with the media
  - arrangements for contacting emergency and rescue services
- Importance of training and testing emergency procedures.

3.11 Requirements for, and effective provision of, first-aid in the workplace

- First-aid requirements
- Role, training and number of first-aiders
- Requirements for first-aid boxes
- Coverage in relation to shift work and geographical location.

Tutor references

EU/International references

ILO Guidelines on Occupational Safety and Health Management Systems (ILO-OSH 2001) http://www.ilo.org/global/publications/ilo-bookstore/order-online/books/WCMS_PUBL_9221116344_EN/lang--en/index.htm

ILOLEX (ILO database of International Law) http://www.ilo.org/ilolex/index.htm

Occupational Health and Safety Assessment Series (OHSAS 18000):
Occupational Health and Safety Management Systems OHSAS 18001:2007
ISBN: 978-0-5805-9404-5
OHSAS18002:2008 ISBN: 978-0-5806-2686-9

Occupational Safety and Health Convention (C155) 2003, ILO http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_ILO_CODE:C155

Occupational Safety and Health Recommendation (R164) 2006, ILO http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312502

ILO Safety and health in construction, Code of Practice, ILO Geneva, ISBN: 92-2-107104-9 http://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---safework/documents/normativeinstrument/wcms_107826.pdf

ILO Training package on workplace risk assessment and management for small and medium size enterprises, 2013, ILO Geneva, ISBN: 978-92-2-127065-2 (web pdf) http://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---safework/documents/instructionalmaterial/wcms_215344.pdf

ILO Code of Practice Ambient Factors in the Workplace (Chapter 3 – General principles of prevention and control) http://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---safework/documents/normativeinstrument/wcms_107729.pdf

ISO 7010:2011/Amd5:2014, Graphical symbols – Safety colours and safety signs – Registered Safety Signs

Safe Work in Confined Spaces (ACoP, Regulations and guidance), L101, HSE Books, ISBN: 978-0-7176-6233-3 www.hse.gov.uk/pubns/priced/l101.pdf

Appropriate UK national references

Reducing Error and Influencing Behaviour (HSG48), HSE Books ISBN 978-0-7176-2452-2 http://www.hse.gov.uk/pubns/priced/hsg48.pdf

Five Steps to Risk Assessment (INDG163), HSE Books, ISBN: 978-0-7176-6440-5

Example risk assessments, HSE, http://www.hse.gov.uk/risk/casestudies/index.htm

Guidance on permit-to-work systems. A guide for the petroleum, chemical and allied industries, HSE Books, ISBN: 978-0-7176-2943-5 www.hse.gov.uk/pubns/priced/hsg250.pdf

Recommended tuition time not less than 17 hours

Element 4: Health and safety management systems - Check

Learning outcomes

On completion of this element, candidates should be able to demonstrate understanding of the content through the application of knowledge to familiar and unfamiliar situations. In particular they should be able to:

4.1 Outline the principles, purpose and role of active and reactive monitoring

4.2 Explain the purpose of, and procedures for, investigating incidents (accidents, cases of work-related ill-health and other occurrences)

4.3 Describe the legal and organisational requirements for recording and reporting incidents

Content

4.1 Active and reactive monitoring

- Active monitoring procedures including the monitoring of performance standards and the systematic inspection of plant and premises
- Role of safety inspections, sampling, surveys and tours and their roles within a monitoring regime
- Factors governing frequency and type of inspection; competence and objectivity of inspector; use of checklists; allocation of responsibilities and priorities for action
- Effective report writing: style, structure, content, emphasis, persuasiveness, etc
- Reactive monitoring measures including data on incidents, dangerous occurrences, near misses, ill-health, complaints by workforce and enforcement action.

4.2 Investigating incidents

- Role and function of incident investigation as a reactive monitoring measure
- Distinction between different types of incident: ill-health, injury accident, dangerous occurrence, near-miss, damage-only; typical ratios of incident outcomes and their relevance in terms of the proportion of non-injury events; utility and limitations of accident ratios in accident prevention (Bird's Triangle)
- Basic incident investigation procedures
- Interviews, plans, photographs, relevant records, checklists
- Immediate causes (unsafe acts and conditions) and root causes (management systems failures)
- Remedial actions.

4.3 Recording and reporting incidents

- Internal systems for collecting, analysing and communicating data
- Organisational requirements for recording and reporting incidents
- Reporting of events to external agencies. Typical examples of major injuries, diseases and dangerous occurrences that might be reportable to external agencies
- Lessons learnt.

Tutor references

EU/International references

ILO Guidelines on Occupational Safety and Health Management Systems (ILO-OSH 2001) http://www.ilo.org/global/publications/ilo-bookstore/order-online/books/WCMS_PUBL_9221116344_EN/lang--en/index.htm

Occupational Health and Safety Assessment Series (OHSAS 18000):
Occupational Health and Safety Management Systems OHSAS 18001:2007
ISBN: 978-0-5805-9404-5
OHSAS18002:2008 ISBN: 978-0-5806-2686-9

Recording and Notification of Occupational accidents and Diseases, ILO Code of Practice, Geneva, 1996, ISBN: 92-2-109451-0 http://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---safework/documents/normativeinstrument/wcms_107800.pdf

Appropriate UK national references

Investigating Incidents and Accidents at Work, HSG245, HSE Books, 2004,
ISBN: 978-0-7176-2827-8 http://www.hse.gov.uk/pubns/books/hsg245.htm

Recommended tuition time not less than 5 hours

Element 5: Health and safety management systems - Act

Learning outcomes

On completion of this element, candidates should be able to demonstrate understanding of the content through the application of knowledge to familiar and unfamiliar situations. In particular they should be able to:

5.1 Explain the purpose of, and procedures, for health and safety auditing

5.2 Explain the purpose of, and procedures for, regular reviews of health and safety performance.

Content

5.1 Health and safety auditing

- Meaning of the term 'health and safety audit'
- Scope and purpose of auditing health and safety management systems; distinction between audits and inspections
- Pre-audit preparations, information gathering, notifications and interviews, selection of staff, competence of auditors, time, resources
- Responsibility for audits
- Advantages and disadvantages of external and internal audits
- Actions taken following audit (eg, correcting nonconformities).

5.2 Review of health and safety performance

- Purpose of reviewing health and safety performance
- Who should take part in review
- Review at planned intervals
- Assessing opportunities for improvement and the need for change
- Review to consider:
  - evaluations of compliance with applicable legal and organisational requirements
  - accident and incident data, corrective and preventive actions
  - inspections, surveys, tours and sampling
  - absences and sickness
  - quality assurance reports
  - audits
  - monitoring data/records/reports
  - external communications and complaints
  - results of participation and consultation
  - objectives met
  - actions from previous management reviews
  - legal/good practice developments
- Maintenance of records of management review

- Reporting on health and safety performance
- Feeding into action and development plans as part of continuous improvement
- Role of Boards, Chief Executive/Managing Director and Senior Managers.

Tutor references

ILO Guidelines on Occupational Safety and Health Management Systems (ILO-OSH 2001)
http://www.ilo.org/global/publications/ilo-bookstore/order-online/books/WCMS_PUBL_9221116344_EN/lang--en/index.htm

Occupational Health and Safety Assessment Series (OHSAS 18000):
Occupational Health and Safety Management Systems OHSAS 18001:2007
ISBN: 978-0-5805-9404-5
OHSAS18002:2008 ISBN: 978-0-5806-2686-9

ISO 19011:2011 – Guidelines for auditing management systems

Recommended tuition time not less than 4 hours

4.2 Unit IFC1: International fire safety and risk management

Element 1: Managing fire safety

Learning outcomes

On completion of this element, candidates should be able to demonstrate understanding of the content through the application of knowledge to familiar and unfamiliar situations. In particular they should be able to:

1.1 Outline the moral, social and economic benefits of good management of fire safety

1.2 Outline the key features of a fire safety policy

1.3 Explain the role of national governments and international bodies in formulating a framework for the regulation of fire safety

1.4 Outline the main sources of external fire safety information and the principles of their application

1.5 Explain the purpose of, and the procedures for, investigating fires in the workplace

1.6 Explain the requirements for recording and reporting fire related incidents.

Content

1.1 The moral, social and economic benefits of good management of fire safety

- Financial implications of false alarms (such as possible penalties that may be imposed, business interruption, etc)
- The size of the fire safety 'problem' in terms of the numbers of fire-related fatalities and injuries and environmental damage
- The roles and responsibilities of the occupier of a building
- Costs of inadequate management of fire safety including loss of business continuity.

1.2 The key features of a fire safety policy

- Responsibility for fire safety within an organisation and the arrangements for ensuring fire safety. To include arrangements for:
  - planning
  - organisation
  - control
  - monitoring
  - review
  - arrangements for vulnerable people
  - degraded systems planning.

1.3 The role of national governments and international bodies in formulating a framework for the regulation of fire safety

- Employers' responsibilities
- Workers' responsibilities
- The role of enforcement agencies and the consequences of non-compliance
- International standards and conventions (eg, International Standards Organisation (ISO) and the International Labour Organisation - ILO)
- Sources of information on National Standards.

1.4 Main sources of external fire safety information and the principles of their application

- Appropriate national legislation and guidance such as the UK Department for Communities and Local Government practical fire safety guidance
- Fire guidance eg, British Standards Institute (BSI) for fire safety, The Confederation of Fire Protection Europe (CFPA-Europe), the European Fire and Security Advisory Council, National Fire Protection Association (NFPA) and National Insurance Associations eg, ABI (Association of British Insurers), industry standards
- The principles of application of local guidance including:
  - implications and/or dangers of applying different parts of different guidance documents as a solution
  - appropriate guidance applicable to premises
  - applying guidance in a proportional manner
  - keeping up-to-date with guidance and standards.

1.5 The purpose of, and the procedures for, investigating fires in the workplace

- Purpose of investigating fires in the workplace
- Basic fire-related investigation procedures – procedural differences and definitions (eg, fatal and non-fatal fires, accidental or arson fires and false alarms)
- Investigation preparation, preserving the fire scene
- Liaison and working protocols with the police and other external agencies
- Identify the underlying causes of the fire
- Remedial actions to prevent recurrence.

1.6 Recording and reporting fire-related incidents (please also refer to Element 6.1)

- The need for processes and procedures for the recording and reporting of fire-related injuries, fatalities and dangerous occurrences in the workplace
- Process and procedures for recording and reporting fire related fatalities, major injuries or dangerous occurrences

- Examples of typical records:
  - accident book
  - fire logbook
  - general incident or occurrence book
  - appropriate country specific forms
- Use and review of fire safety risk assessments.

Tutor references

EU/International references

ATEX Guidelines: 3rd Edition, June 2009 (updated May 2011)
http://ec.europa.eu/enterprise/sectors/mechanical/files/atex/guide/atexguidelines_june2009_en.pdf

Fire Code, 2012 Edition - NFPA 1

Fire protection documentation - CFPA-E Guideline No 13:2006
http://www.cfpa-e.eu/wp-content/uploads/files/guidelines/Guideline_No_13_2006.pdf

Guidance signs, emergency lighting and general lighting - CFPA-E Guideline No 5:2003
http://www.cfpa-e.eu/wp-content/uploads/files/guidelines/Guideline_No_5_2003.pdf

Internal fire protection control - CFPA-E Guideline No 1:2002
http://www.cfpa-e.eu/wp-content/uploads/files/guidelines/CFPA_E_Guideline_No_1_2002.pdf

International Fire Code, International Code Council (ICC), ISBN: 978-1609-8304-65

Recording and notification of occupational accidents and diseases - ILO Code of Practice (CoP) ISBN: 92-2-109451-0
http://www.ilocarib.org.tt/images/stories/contenido/pdf/OccupationSafetyandHealth/codes/recording-notification-occ-accidents.pdf

Securing the operational readiness of fire control systems - CFPA-E Guideline No 23:2010 F
http://www.cfpa-e.eu/wp-content/uploads/files/guidelines/CFPA_E_Guideline_No_23_2010_F.pdf

Appropriate UK national references

Fire Safety Guidance booklet 'Are you aware of your responsibilities?' - Scottish Executive (Safer Scotland) downloadable publication -
http://www.firelawscotland.org/files/Summary_Guide_Full.pdf

The Scottish Government's Sector Specific Guidance
http://www.scotland.gov.uk/Topics/Justice/public-safety/Fire-Rescue/FireLaw/FireLaw/SectorSpecificGuidance

UK Department for Communities and Local Government practical fire safety guidance, which can be found at http://www.gov.uk/workplace-fire-safety-your-responsibilities/fire-safety-advice-documents

Recommended tuition time not less than 7 hours

Element 2: Principles of fire and explosion

Learning outcomes

On completion of this element, candidates should be able to demonstrate understanding of the content through the application of knowledge to familiar and unfamiliar situations. In particular they should be able to:

2.1 Explain the principles of the combustion process in relation to fire safety

2.2 Explain the principles and conditions for the ignition of solids, liquids and gases

2.3 Identify the classification of fires

2.4 Describe the principles of fire growth and fire spread

2.5 Outline the principles of explosion and explosive combustion.

Content

2.1 The principles of the combustion process in relation to fire safety

- The concept of the fire triangle
- The chemistry of combustion, chemical reactivity, the conditions for the maintenance of combustion, examples of combustion products in relation to combustion reaction conditions (complete and incomplete reaction); exothermic reaction releasing heat energy; oxidising agents/materials
- The stages of fire: induction, ignition, fire growth, steady state, and decay.

2.2 The principles and conditions for the ignition of solids, liquids and gases

- Meaning and relevance of: flash point, fire point and ignition point (kindling point); auto ignition temperature; vapour density; vapour pressure; flammable; highly flammable; upper flammable limit; lower flammable limit; combustible
- The conditions required to cause the ignition of combustible solids, flammable liquids and gaseous materials
- The methods of preventing or controlling ignition of combustible solid and flammable liquid and gaseous materials in relation to their physical and chemical properties
- The properties and safe storage of liquefied petroleum gas (LPG) – also see Element 3.2.

2.3 The classification of fires

- The classification of fire according to its fuel source (local classification systems will be accepted).

2.4 The principles of fire growth and fire spread

- Factors that influence fire growth rates and smoke movement:
  - building design (such as cavities, ducts, shafts)
  - insulated core panels
  - construction materials
  - internal linings
  - ventilation levels
  - contents of the premises
- Methods of heat transfer; conduction, convection, radiation and direct burning and how they contribute to fire and smoke spread through buildings and to neighbouring properties
- The development of a fire under free burning conditions and a fire in enclosed conditions
- The conditions in which flashover and backdraught may occur.

2.5 The principles of explosion and explosive combustion

- Meaning of deflagration and detonation
- Common materials involved in explosions (such as flammable vapours, LPG, gases, dusts)
- The mechanism of types of explosion such as gas and vapour explosion (including boiling liquid expanding vapour explosion - BLEVE) and dust explosion (including primary and secondary explosion)
- The principles of preventing explosions:
  - good housekeeping
  - good ventilation
  - safe storage including bunding
  - handling of explosive materials
  - control of detonation sources
  - cooling
  - inerting, including the advantages and disadvantages of reduced oxygen atmospheres
- The principles for controlling explosions:
  - suppression
  - venting (pressure relief valves, bursting discs, explosion venting panels)
  - containment.

Tutor references

EU/International references

ATEX Guidelines: 3rd Edition, June 2009 (updated May 2011) http://ec.europa.eu/enterprise/sectors/mechanical/files/atex/guide/atexguidelines_june2009_en.pdf

European Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulation), adopting in the EU the Globally Harmonised System (GHS) http://ec.europa.eu/enterprise/sectors/chemicals/documents/classification/

Fire protection on chemical manufacturing sites - CFPA Europe Guideline No 18:2008 http://www.cfpa-e.eu/wp-content/uploads/files/guidelines/CFPA_E_Guideline_No_18_2013_F.pdf

Flammable and Combustible Liquids Code, 2012 Edition - NFPA 30

Guidelines for vapour cloud explosion, pressure vessel burst, BLEVE and flash fire hazards, Centre for Chemical Process Safety, Centre for Chemical Process Safety, second edition 2010, ISBN: 978-0-4702-5147-8

International Fire Code, ICC, ISBN: 978-1609-8304-65

Safety in the Use of Chemicals at Work, International Labour Office (ILO) Code of Practice (CoP), ILO, 1993. ISBN: 92-2-108006-4

Section 6: Operational control measures and Section 7: Design and installation http://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---safework/documents/normativeinstrument/wcms_107823.pdf

Utility LP Gas Plant Code - NFPA 59

Appropriate UK national references

Statutory provisions

The Building Regulations 2010

Other references

Energetic and spontaneously combustible substances - identification and safe handling, HSG131, first edition 1995, HSE Books, ISBN: 978-0-7176-0893-5 http://www.hse.gov.uk/pubns/priced/hsg131.pdf

Generic risk assessment 5.8: Flashover, backdraught and fire gas ignitions, Communities and local government, ISBN: 978-0-1175-4011-8

Safe Handling of Combustible Dusts – precautions against explosions, HSG103, second edition 2003, HSE Books, ISBN: 978-0-7176-2726-4 http://www.hse.gov.uk/pubns/priced/hsg103.pdf

Safe use and handling of flammable liquids, HSG140, HSE Books, ISBN: 978-0-7176-0967-3 http://www.hse.gov.uk/pubns/priced/hsg140.pdf

Safe working with flammable substances, INDG227, HSE free publication, http://www.hse.gov.uk/pubns/indg227.pdf

Storage of Full and Empty LPG Cylinders and Cartridges (March 2004) - UKLPG - Code of Practice 7

The Building Regulations 2010 Approved Document B - Fire Safety, Volume 2, Buildings other than dwelling houses http://www.planningportal.gov.uk/uploads/br/AD_B_v2_wm.pdf

Recommended tuition time not less than 3 hours

Element 3: Causes and prevention of fires and explosions

Learning outcomes

On completion of this element, candidates should be able to demonstrate understanding of the content through the application of knowledge to familiar and unfamiliar situations. In particular they should be able to:

3.1 Explain the causes of fires and explosions in typical work activities

3.2 Outline appropriate control measures to minimise fire and explosion risks.

Content

3.1 The causes of fires and explosions in typical work activities

- Common sources of ignition of accidental fires including:
  - electrical appliances and installations
  - lightning
  - cooking
  - heating (including ambient temperature) and lighting
  - smoking
  - overheating of machinery
  - spontaneous ignition of oil and solvent soaked materials
  - hot work
- Sources of fuel including:
  - paper and cardboard
  - furniture
  - fixtures and fittings
  - electrical insulation
  - structural materials
  - wall and ceiling linings
  - piped gas supply
  - cylinders of flammable gas
  - flammable chemicals, liquids and solvents
- Sources of oxygen including:
  - oxygen levels in the air
  - natural ventilation
  - forced ventilation or air-conditioning systems
  - oxidising materials
- Factors influencing the severity and frequency of an arson attack:
  - location
  - security
  - access control
- Fire and explosion risks from flammable materials (also see Element 2.2) in use, storage and transport within the workplace
- The concept of fire load

- Fire risks in construction and maintenance work:
  - site storage of combustible and flammable materials such as LPG cylinders and other gases; drums of fuel
  - waste disposal considerations
  - demolition hazards
  - use of oxy-fuel equipment
  - temporary electrical installations.

3.2 Appropriate control measures to minimise fire and explosion risks (also see Element 2.2)

- Control of sources of ignition
  - intrinsically safe electrical equipment for use in flammable and explosive atmospheres; zoning of hazardous locations; use of mobile phones; maintenance and portable appliance testing (PAT) of portable electrical equipment
  - designated smoking areas; use of fire proof cigarette bins
  - shielding to block radiant heat and sparks
  - maintain separation of ignition sources and fuel sources
- Control of sources of fuel:
  - safe storage, transport and use of flammable, highly flammable and combustible materials
  - design and installation of storage facilities
  - inspection and maintenance programmes, safe waste disposal methods
  - housekeeping
  - control of fire load
- Control of sources of oxygen including:
  - closing doors and windows
  - shutting of ventilation/air conditioning systems/ducting (also see Element 4.1)
  - safe use and storage of oxidising materials
- Safe systems of work; safe-operating procedures; planned preventive maintenance programmes; management of contractors; permits-to-work; provision of information and training to employees and others; maintaining fire protection systems during maintenance; construction work on an existing building
- Actions to minimise risks from arson.

Tutor references

EU/International references

ATEX Guidelines: 3rd Edition, June 2009 (updated May 2011)
http://ec.europa.eu/enterprise/sectors/mechanical/files/atex/guide/atexguidelines_june2009_en.pdf

European Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulation), adopting in the EU the Globally Harmonised System (GHS) http://ec.europa.eu/enterprise/sectors/chemicals/documents/classification/

Fire protection on chemical manufacturing sites, CFPA-E Guideline No 18:2008
http://www.cfpa-e.eu/wp-content/uploads/files/guidelines/CFPA_E_Guideline_No_18_2013_F.pdf

National Electrical Code, NFPA 70:2014

Safety in the Use of Chemicals at Work, International Labour Office (ILO) Code of Practice (CoP), ILO, 1993. ISBN: 92-2-108006-4
Section 6: Operational control measures and
Section 7: Design and installation
http://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---safework/documents/normativeinstrument/wcms_107823.pdf

Seveso III Directive 2012/18/EU
http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:197:0001:0037:EN:PDF

Utility LP Gas Plant Code, NFPA 59:2012

Appropriate UK national references

Risk Control, Arson Prevention, The protection of premises from deliberate fire raising
http://www.stoparsonuk.org/documents/resources/RC48ArsonPreventiontheprotectionofpremises[1].pdf

Fire safety in construction, HSG168, HSE Guidance, ISBN: 978-0-7176-6345-3
http://www.hse.gov.uk/pubns/priced/hsg168.pdf

Requirements for Electrical Installations, IET Wiring Regulations (17th Edition incorporating amendment No. 1), BS 7671:2008 Incorporating Amendment No 1: 2011

Safe use and handling of flammable liquids, HSG140, HSE Books,
ISBN: 978-0-7176-0967-3 http://www.hse.gov.uk/pubns/priced/hsg140.pdf

Safe working with flammable substances, INDG227, HSE free publication – general series
http://www.hse.gov.uk/pubns/indg227.pdf

Storage of Full and Empty LPG Cylinders and Cartridges (March 2004) - UK LPG, Code of Practice 7

The storage of flammable liquids in containers, HSG51, second edition 1998, HSE Books,
ISBN: 978-0-7176-1471-4 http://www.hse.gov.uk/pubns/priced/hsg51.pdf

The storage of flammable liquids in tanks, HSG176, first edition 1998, HSE Books,
ISBN: 978-0-7176-1470-7 http://www.hse.gov.uk/pubns/priced/hsg176.pdf

Recommended tuition time not less than 4 hours

Element 4: Fire protection in buildings

Learning outcomes

On completion of this element, candidates should be able to demonstrate understanding of the content through the application of knowledge to familiar and unfamiliar situations. In particular they should be able to:

4.1 Outline the means of fire protection and prevention of fire and smoke spread within buildings in relation to building construction and design

4.2 Explain the requirements of a means of escape

4.3 Outline the methods and systems available to give early warning in case of fire, both for life safety and property protection

4.4 Outline the selection procedures for basic fire extinguishing methods for both life risk and process risk

4.5 Explain the requirements for ensuring access for the fire service is provided and maintained

4.6 Outline steps to minimise the environmental impact of fire and fire-fighting operations.

Content

4.1 The means of fire protection and prevention of fire and smoke spread within buildings in relation to building construction and design

- Meaning of the term ‘elements of structure’ eg, ‘elements of structure is the term applied to the main structural load bearing elements, such as structural frames, floors and load bearing walls’
- Properties and requirements of fire resistance for elements of structure; resistance to collapse, fire and smoke penetration and transfer of excessive heat, resistance of fire doors and glazing, the significance of any immediately visible damage and the need to repair it
- Compartmentation to inhibit spread of fire and smoke within buildings, protection of openings in compartment walls and floors and fire stopping, cavity barriers, penetration seals, fire resisting ductwork
- Fire-resisting dampers (mechanical or intumescent)
- Internal fire growth, wall lining materials (including over-painting), fixtures, fittings and contents
- Fire resisting walls, floors and ceilings forming escape routes and the need to maintain fire resistance
- Alarm systems linked to forced ventilation systems (automatic shutdown of ventilation system on activation of fire the fire alarm) - also see Element 3.2

- Means of preventing external fire spread:
  - construction of external walls and roofs
  - distance between buildings
  - use/activities undertaken at premises
  - surrounding premises
  - the role of external walls in protecting escape routes at the boundaries.

4.2 Means of escape (please also refer to Element 5.2)

- Understanding of a means of escape
- Principles, features and general requirements of means of escape:
  - alternative escape routes
  - understanding that all persons within the premises should be able to reach a place of ultimate safety before life-threatening conditions arise; either unaided or with the assistance of staff but without Fire Rescue Service (FRS) assistance (Required Safe Egress Time (RSET) versus Available Safe Egress Time (ASET))
  - escape distances (maximum travel distances)
  - number and size of escape route for number of occupants, (and basic occupancy calculations for offices and places of work and public assembly)
  - requirements for escape stairs, passageways and doors
  - use of door releases and other escape devices (including the need for these to fail safe)
  - protection of escape routes
  - emergency escape lighting (EEL) - common forms, modes of operation and signage; siting of luminaires and "Point of Emphasis"; limitations of emergency generators
  - design for progressive horizontal evacuation
  - final exit to a place of safety, etc
- Management actions to maintain means of escape
- Need for means of escape for vulnerable people and people with disabilities and/or mobility problems:
  - use of evacuation lifts and refuges
  - visual (including graphics), aural and tactile way-finding and exit sign systems
  - personal emergency evacuation plan.

4.3 The methods and systems available to give early warning in case of fire, both for life safety and property protection

- Principles of fire alarm and fire detection systems and their objectives
- Types of automatic fire detection and their limitations and links with other systems and equipment eg, fire doors and fire extinguishing systems
- Principles of fire alarm zoning, the need for zone plans and their value to the FRS
- Alarm signalling, common alarm devices and their limitations
- Emergency Voice Communication (EVC) systems
- Use of alarm receiving centres
- Manual and automatic systems

- Factors to be considered in the selection of fire detection and fire alarm systems:
  - life risk
  - process risk
  - behavioural issues
  - social behaviour and minimising false alarms
  - requirements for vulnerable people and people with disabilities and/or mobility problems
- Requirements for certification, maintenance and testing of fire detection and alarm systems.

4.4 Selection procedures for basic fire extinguishing methods for both life risk and process risk

- Factors in the provision, design and application of portable fire-fighting equipment and fixed installations
  - relevance of classification of fires when choosing fire-fighting equipment (different local classification systems will be accepted)
- Extinguishing media
  - water
  - foam
  - dry powder / agent
  - vapourising liquids
  - gaseous
  - and mode of action, advantages and limitations
- Portable fire-fighting equipment: siting, maintenance and training requirements
- Fixed installations (for example sprinkler, gas flooding and drencher systems and hose reels).

4.5 Requirements for ensuring access for the fire service is provided and maintained

- Need for vehicle and building access, fire mains/water source and smoke/heat venting of basements
- Fire-fighting shafts and stairwells
- Liaison with fire authority on arrival; contents of building.

4.6 Steps to minimise the environmental impact of fire and fire-fighting operations

- Sources of pollution in the event of a fire; toxic and corrosive smoke, run-off of contaminated fire-fighting water
- Legal obligations related to environmental protection in the event of a fire, the role of enforcement agencies
- Factors to be considered in pre-planning the minimisation of environmental impact of fire
- Site and damaged area clean up consideration.

Tutor references

EU/International references

Directive 89/391/EEC - OSH Framework Directive
https://osha.europa.eu/en/legislation/directives/the-osh-framework-directive/1

Directive 89/654/EEC - Workplace requirements
https://osha.europa.eu/en/legislation/directives/workplaces-equipment-signs-personal-protective-equipment/osh-directives/2

Emergency Plan (section 3.3) - CFPA-Europe Guideline No 25:2010 F
http://www.cfpa-e.eu/wp-content/uploads/files/guidelines/CFPA_E_Guideline_No_25_2010_F.pdf

Fire detection and alarm systems - ISO 7240 series

Fire protection, portable and wheeled fire extinguishers
Part 1: Selection and installation - ISO/TS 11602-1:2010
Part 2: Inspection and maintenance – ISO/TS 11602-2:2010

Fire protection documentation - CFPA-Europe Guideline No 13:2006
http://www.cfpa-e.eu/wp-content/uploads/files/guidelines/Guideline_No_13_2006.pdf

Graphical symbols - safety colours and safety signs. Safety signs used in workplaces and public areas - ISO 7010:2011 (last amendment 5:2014)

International Building Code, ICC 2012, ISBN: 978-1-6098-3044-1

International Existing Building Code, ICC 2012, ISBN: 978-1-6098-3044-1

International Fire Code, ICC, ISBN: 978-1-6098-3046-5

National Fire Alarm and Signalling Code (NFPA 72), 2013 Edition

Appropriate UK national references

Statutory provisions

The Building Regulations 2010

The Building (Amendment No 2) Regulations (Northern Ireland) 2010

The Building (Scotland) Regulations 2004

Other references

2011 Technical Handbooks - Non Domestic Section 2 Fire, The Building (Scotland) Regulations 2004 http://www.scotland.gov.uk/Resource/Doc/217736/0121754.pdf

BS5839-1:2013 - Fire detection and fire alarm systems for buildings, code of practice for design, installation, commissioning and maintenance of systems in don-domestic premises

BS9999:2008 - Code of practice for fire safety in the design, management and use of buildings

DFP Technical Booklet E - Fire Safety, The Building (Amendment No 2) Regulations (Northern Ireland) 2010 http://www.dfpni.gov.uk/fire_2.pdf

The Building Regulations 2010 Approved Document B - Fire Safety, Volume 2, Buildings other than dwelling houses http://www.planningportal.gov.uk/uploads/br/AD_B_v2_wm.pdf

The Building Regulations 2010, Approved Document M 2004 - Access to and use of buildings http://www.planningportal.gov.uk/uploads/br/BR_PDF_ADM_2004.pdf

Securing the operational readiness of fire control systems - CFPA-Europe Guideline No 23:2010 F
http://www.cfpa-e.eu/wp-content/uploads/files/guidelines/CFPA_E_Guideline_No_23_2010_F.pdf

Standard for Portable Fire Extinguishers (NFPA 10), 2013 Edition

Recommended tuition time not less than 7 hours

Element 5: Safety of people in the event of fire

Learning outcomes

On completion of this element, candidates should be able to demonstrate understanding of the content through the application of knowledge to familiar and unfamiliar situations. In particular they should be able to:

5.1 Explain the purpose and requirements of a fire emergency plan

5.2 Describe the development and maintenance of a fire evacuation procedure

5.3 Outline the perception and behaviour of people in the event of a fire

5.4 Outline appropriate training requirements.

Content

5.1 Fire emergency plan

- Purpose:
  - ensure people on premises know what to do in the event of fire
  - ensure appropriate action is taken in the event of fire to enable the premises to be evacuated safely
- Content of a fire emergency plan to include issues such as:
  - how people will be warned
  - action people should take on discovering a fire
  - action people should take in the event of a fire
  - arrangements for calling the Fire and Rescue Service
  - isolations
  - fire alarm activities
  - evacuation procedure
  - assembly points
  - fire-fighting arrangements
  - procedures for meeting the Fire and Rescue Service on arrival (including access arrangements)
  - provision of information on incident, etc
  - vulnerable people and those with disabilities
- Multi-occupied premises (need to consult/comply with all occupiers)
- Compatibility of the emergency plan with the everyday use of the premises.

5.2 The development and maintenance of a fire evacuation procedure (please also refer to Element 4.2)

- The purposes of, and essential requirements for, evacuation procedures and drills, alarm evacuation and roll call
- Procedures to evacuate vulnerable people and people with disabilities and/or mobility problems

- Types of evacuation procedures (staged, phased, horizontal, etc) and interaction with staged alarm systems
- Actions required when evacuating members of the public
- Maintenance of a fire evacuation procedure.

5.3 Perception and behaviour of people in the event of a fire

- Principles of sensory perception:
  - early recognition by the senses
  - recognition of fire threat
  - perception versus reality
  - response to different forms of audible and visual warnings including negative aspects of warnings, recognition of alarms and reaction problems of people with sensory impairment, etc
- The effect of time pressure and stress on the decision making process during fire emergencies:
  - difficulties of spatial orientation and way-finding in large and complex locations
  - patterns of exit choice in fire emergencies
  - the implications of exit choice behaviour in designing for fire safety
- Likely behaviour of individuals responsible for others during a fire such as: parents and elder siblings, nurses, teachers, etc
- The effect of different behaviours on fire and evacuation
- Crowd movement (individuals and in groups); how crowd flow can cause danger and prohibit safe escape, modification of crowd flow by physical design and messages
- Measures to overcome behavioural problems:
  - clear roles and responsibilities
  - clear alarms
  - well practiced drills
  - clear escape routes
  - measures to assist vulnerable people and people with disabilities and/or mobility problems
  - include contingency to deal with sleeping people within the evacuation strategy.

5.4 Appropriate training requirements

- Fire safety training information for workers, temporary, agency staff and volunteers, etc
- The need for competent people to assist employers (ie, persons with suitable training, experience, knowledge and other qualities)
- Individual roles and responsibilities in an emergency
- Workers with management/supervisory roles (may include: fire safety plan, fire alarm control panel, knowledge of special evacuation arrangements for persons with disabilities).

Tutor references

Guidelines for assessing the fire threat to people - BS ISO 19706:2011

Emergency plan, CFPA-Europe Guideline No 25:2010 F
http://www.cfpa-e.eu/wp-content/uploads/files/guidelines/CFPA_E_Guideline_No_25_2010_F.pdf

Fire protection documentation, CFPA-Europe Guideline No 13:2006
http://www.cfpa-e.eu/wp-content/uploads/files/guidelines/Guideline_No_13_2006.pdf

Fire protection in offices, CFPA-Europe Guideline No 16:2008
http://www.cfpa-e.eu/wp-content/uploads/files/guidelines/CFPA_E_Guideline_No_16_2008.pdf

International Fire Code, ICC, ISBN: 978-1-6098-3046-5

Recommended tuition time not less than 3 hours

Element 6: Fire safety risk assessment

Learning outcomes

On completion of this element, candidates should be able to demonstrate understanding of the content through the application of knowledge to familiar and unfamiliar situations. In particular they should be able to:

6.1 Explain the aims and objectives of fire safety risk assessments

6.2 Outline the principles and practice of fire safety risk assessments including principles of prevention (measures to remove and reduce risk)

6.3 Outline matters to be considered in a risk assessment of dangerous substances

6.4 Outline measures to be taken to control risk in respect of dangerous substances.

Content

6.1 Aims and objectives of fire safety risk assessments

- Meaning of hazard and risk in relation to a fire
- Objectives of fire safety risk assessments: outcomes of incidents in terms of human harm, social and economic effects on the organisation and impact on overall risk magnitude; safety measures and management policies necessary to reduce the risk to persons from fire
- Distinction between different types of fire incident (please also refer to 1.5 and 1.6)
  - injury
  - ill-health
  - dangerous occurrence
  - near miss
  - fire damage-only.

6.2 Principles and practice of fire safety risk assessments

- Identification of laws, regulations and guidance to be considered
- Identify fire hazards:
  - sources of ignition
  - sources of fuel
  - sources of oxygen including oxidising agents
- Methods of identifying hazards such as inspections, job/task analysis, etc
- Identify people at risk such as:
  - workers
  - maintenance staff
  - cleaners
  - contractors

  - visitors
  - public
  - people using establishments including sleeping accommodation eg workers' accommodation
  - young workers
  - vulnerable people and people with disabilities and/or mobility problems, etc
- Evaluation of risk and the adequacy of existing fire safety measures
- Evaluate the likelihood that a fire may occur (ie, the risk of ignition sources, oxygen and fuel coming together) by either an accidental event, by an act or omission or by deliberate intent
- Evaluate the hazards to people in the event of a fire, ie, loss of visibility, elevated temperature, toxic gases and oxygen depletion
- Evaluate the consequence to people from a fire starting in the building (ie, potential for a fire to cause death or injury) such as the need to consider available escape routes in relation to location where fire may start, potential fire and smoke spread due to level of protection, etc)
- Risk reduction
- Avoid or reduce hazards that may cause a fire
- Put in place fire safety measures to reduce the risk to persons from fire (such as means of detecting fires, means of escape, means of fighting fires, arrangements for action to be taken in event of fire, etc)
- Principles of prevention:
  - avoid risk
  - evaluate risk that cannot be avoided
  - combat risk at source
  - adapt to technical progress
  - replace the dangerous by the non-dangerous or less dangerous
  - develop a coherent overall prevention policy that covers technology, organisation of work and the influence of factors relating to the working environment, collective fire safety protective measures priority over individual protective measures; instruction to workers
- Recording significant findings: format, information to be recorded such as:
  - significant fire hazards
  - persons at risk
  - actions taken to reduce risk to persons
  - fire preventive measures
  - details of emergency plan
  - information
  - instruction
  - and training requirements
- Reviewing the fire risk assessment, reasons for review such as:
  - a change in the number of persons present or persons with disabilities
  - any alterations to the building
  - changes to work procedures
  - introduction of new equipment
  - significant changes to furniture and fittings
  - introduction of or storage of dangerous substances

- becoming aware of shortcomings in fire safety measures or improvements, legislative changes
- elapse of time

- Sources of information that could be consulted reference to Element 1 'Managing fire safety' and information such as:
  - country specific legislation
  - fire plan
  - previous risk assessments
  - general monitoring records
  - records of electrical checks, installations etc
  - fire log book or country equivalent
  - previous incidents
  - visitor register
  - current fire precaution checks (fire alarm systems, emergency lighting, fire signs, portable fire-fighting equipment etc)
  - training and maintenance records
  - health and safety file
  - operator and machine manuals etc.

6.3 Matters to be considered in a risk assessment of dangerous substances

- Matters can include:
  - the hazardous properties of the substance
  - information on safety provided by the supplier
  - the circumstances of the work (special/technical/organisational measures, the substance and possible interactions, amount of substance, risk presented by combination of substances)
  - arrangements for safe handling
  - the likelihood that an explosive atmosphere will occur
  - the likelihood that ignition sources will be present and become active and effective
  - the scale of the anticipated effects
  - any places which are, or can be connected via openings, to places in which explosive atmospheres may occur
  - any additional information which may be needed to completed the assessment.

6.4 Measures to be taken to control risk in respect of dangerous substances

- Measures can include:
  - reduce quantities to a minimum
  - avoid/minimise the release of a dangerous substance
  - control the release of a dangerous substance at source
  - prevent the formation of an explosive atmosphere (including appropriate ventilation)
  - ensure that any release of a dangerous substance which may give rise to risk is suitably collected, safely contained, removed to a safe place, or otherwise rendered safe, as appropriate
  - avoid ignition sources and electrostatic discharges
  - segregate incompatible dangerous substances
  - reduce number of persons exposed to a minimum
  - provide and maintain fire suppression equipment

- provide and maintain explosion pressure relief arrangements
- measures to avoid propagation of fires/explosions
- ensure premises are designed, constructed and maintained so as to reduce risk
- any hazardous jobs involving dangerous substances are carried out using an appropriate system of work including permits-to-work

Tutor references

EU/International references

Emergency plan - CFPA-Europe Guideline No 25:2010F
http://www.cfpa-e.eu/wp-content/uploads/files/guidelines/CFPA_E_Guideline_No_25_2010_F.pdf

Fire safety engineering, fire risk assessment, part1: general, ISO 16732-1:2012

Fire safety in care homes for the elderly - CFPA-Europe Guideline No 6:2011F
http://www.cfpa-e.eu/wp-content/uploads/files/guidelines/CFPA_E_Guideline_No_6_2011_F.pdf

Introduce to qualitative fire risk assessment - CFPA-Europe Guideline No 4:2010f
http://www.cfpa-e.eu/wp-content/uploads/files/guidelines/CFPA_E_Guideline_No_4_2010_F.pdf

Appropriate UK national references

Regulatory Reform (Fire Safety) Order 2005

Dangerous Substances and Explosive Atmospheres Regulations 2002

Communities and Local Government Fire Risk Assessment Series
https://www.gov.uk/workplace-fire-safety-your-responsibilities/fire-safety-advice-documents

Dangerous substances and explosive atmospheres, ACoP and guidance, L138, HSE Books, ISBN: 978-0-7176-6616-4 http://www.hse.gov.uk/pubns/priced/l138.pdf

Guidelines for assessing the fire threat to people, BS ISO 19706:2011

Fire Risk Assessment, guidance and a recommended methodology, PAS79:2011

Recommended tuition time not less than 5 hours

4.3 Unit FC2: Fire safety practical application

Learning outcomes

- Demonstrate the ability to apply knowledge of the unit IGC1 and IFC1 syllabus, by successful completion of a fire risk assessment within the workplace.

Content

This unit contains no additional syllabus content. However, completion of study for units IGC1 and IFC1 is recommended in order undertake the practical application unit FC2.

4.3.1 Purpose and aim

The aim of the fire safety practical application is to test a candidate's ability to complete a fire safety risk assessment of a workplace. In particular, to:

- Identify fire hazards in the workplace;
- Identify persons who could be at risk should a fire start;
- Assess the adequacy of existing fire safety measures to control risk;
- Assess the risk of fire occurring;
- Assess and demonstrate understanding of the speed at which fire and smoke could spread once started;
- Assess the risk to persons from fire;
- Where necessary, recommend additional fire safety measures to further reduce risk;
- Recommend a risk assessment review date.

This will require candidates to apply the knowledge and understanding gained from their studies of elements of Units IGC1 and IFC1 in a practical environment and to carry out an evaluation of information gathered. The practical application may be submitted in the candidate's own handwriting or be word processed.

4.3.2 Marking

Practical applications will be marked by an internal assessor – a person proposed to NEBOSH by an accredited course provider and approved by NEBOSH. Internal assessors will be at least Grad IOSH of the Institution of Occupational Health and Safety or equivalent and working towards chartered membership, CMIOSH, (or similar).

A marking sheet will be completed by the internal assessor for each candidate and attached to the candidate's report. The total percentage mark for each candidate will be transferred to a results sheet and returned to NEBOSH by no later than 15 working days after the examination date of IGC1 and/or IFC1.

Candidates must achieve the pass standard (60%) in this unit in order to satisfy the criteria for the qualification.

4.3.3 Assessment location

The practical application must be carried out in the candidate's own workplace. Where the candidate does not have access to a suitable workplace, the accredited course provider should be consulted to help in making arrangements for the candidate to carry out the practical application at suitable premises. Providers seeking to run the practical unit in this way should contact NEBOSH for advice and approval.

Candidates do not require supervision when carrying out the practical application, but the candidate must sign a declaration that the practical application is their own work.

The candidates, employers and internal assessors should be aware that the status of the risk assessment undertaken to fulfil the requirements of unit FC2, which is **for educational purposes only**. It *does not* constitute an assessment for the purposes of any legislation or regulations.

4.3.4 Assessment requirements

Assessment of the practical unit (FC2) must normally take place within 10 working days of (before or after) the date of the IGC1 and/or IFC1 written papers (the 'date of the examination'). The results sheet completed by the accredited course provider must reach NEBOSH by no later than 15 working days after the date of the examination.

Any practical application not submitted by this deadline will be declared as absent. The candidate will then be required to re-register (and pay the registration fee) at the next standard (or on demand) sitting date.

If a candidate is absent from the written papers because of illness corroborated by a doctor's note, but successfully completes the FC2 unit within the deadline, the result will stand. If a candidate is unable to complete the FC2 unit under similar circumstances, NEBOSH may allow it to be taken at a later date beyond the normal deadline.

4.3.5 Submission of completed work

The accredited course provider should advise the candidate of the latest date by which the completed practical application documents must be received by the accredited course provider for marking. It is the responsibility of the accredited course provider to ensure that the results of the practical application (Unit FC2) are available to NEBOSH by no later than **15 working days** after the date of the examination for IGC1 and/or IFC1 as appropriate.

Candidates planning to post their assessments to the accredited course provider are reminded of the need to guard against loss in the post by sending their work by trackable delivery. Candidates are, therefore, advised to retain copies of both their completed risk assessment.

4.3.6 Further information

Further detailed information regarding the practical application unit including forms and mark schemes can be found in a separate guidance document for candidates and accredited course providers available from the NEBOSH website (www.nebosh.org.uk): *"Unit FC2: Fire safety practical application: Guidance and information for accredited course providers and candidates"*.

5. Sample examination papers

5.1 Unit IGC1: Management of international health and safety

NEBOSH

UNIT IGC1: MANAGEMENT OF INTERNATIONAL HEALTH AND SAFETY

For: NEBOSH International Certificate in Occupational Health and Safety
NEBOSH International Certificate in Construction Health and Safety
NEBOSH International Certificate in Fire Safety and Risk Management

[DATE]
2 hours, 0930 to 1130

Answer both Section 1 and Section 2. Answer **ALL** questions.

The maximum marks for each question, or part of a question, are shown in brackets.

Start each answer on a new page.

Answers may be illustrated by sketches where appropriate.

This question paper must be returned to the invigilator after the examination.

SECTION 1

You are advised to spend about **half an hour** on this section, which contains **ONE** question.

---

1 A fire has occurred at a workplace and a worker has been badly injured.

(a) **Outline** the process for investigating the accident. **(10)**

(b) **Outline** why the investigation report needs to be submitted to senior management. **(5)**

(c) In addition to senior managers, **identify** who may need to know the outcome of the investigation. **(5)**

SECTION 2

You are advised to spend about **one and a half hours** on this section, which contains **TEN** questions.

2 Outline the key elements of a health and safety management system. **(8)**

3 (a) (i) Give the meaning of the term 'hazard'. **(2)**

(ii) Give the meaning of the term 'risk'. **(2)**

(b) Identify means of hazard identification that may be used in the workplace. **(4)**

4 (a) **Outline** the main health and safety responsibilities of an employer. **(6)**

(b) **Identify** actions that an enforcement agency could take if it finds that an employer is not meeting his/her responsibilities. **(2)**

5 **Identify** precautions that could be taken to help ensure the health and safety of visitors to a workplace. **(8)**

6 A university has a security worker who works alone when all staff and students have left.

Outline what needs to be considered in order to reduce the health and safety risks to this lone worker. **(8)**

7 **Outline** potential barriers to achieving good standards of health and safety. **(8)**

8 (a) **Give** the meaning of the term *'permit-to-work'*. **(2)**

(b) **Identify THREE** types of activity that may require a permit-to-work **AND give** the reason why in **EACH** case. **(6)**

9 (a) **Explain** the difference between consulting and informing workers of health and safety issues. **(2)**

(b) **Outline** factors that may determine the effectiveness of a health and safety committee. **(6)**

10 **Identify** documentation that is likely to be inspected in a health and safety audit. **(8)**

11 (a) **Outline** why it is important for an organisation to set health and safety targets. **(2)**

(b) **Identify** health and safety targets that an organisation could set. **(6)**

5.2 Unit IFC1: International fire safety and risk management

NEBOSH

NEBOSH INTERNATIONAL CERTIFICATE IN FIRE SAFETY AND RISK MANAGEMENT

UNIT IFC1: INTERNATIONAL FIRE SAFETY AND RISK MANAGEMENT

[DATE]
2 hours, 1400 to 1600

Answer both Section 1 and Section 2. Answer **ALL** questions.

The maximum marks for each question, or part of a question, are shown in brackets.

Start each answer on a new page.

Answers may be illustrated by sketches where appropriate.

This question paper must be returned to the invigilator after the examination.

SECTION 1

You are advised to spend about **half an hour** on this section, which contains **ONE** question.

---

1 (a) Outline issues that should be considered when carrying out a fire risk assessment. **(10)**

(b) Outline the principles of prevention that must be applied when deciding on appropriate control measures to minimise the risk from fire. **(8)**

(c) Identify circumstances that would require the significant findings of a fire risk assessment to be recorded. **(2)**

SECTION 2

You are advised to spend about **one and a half hours** on this section, which contains **TEN** questions.

2 **Outline** factors that may influence the choice of building materials used in construction work to reduce the risk of fire. **(8)**

3 **Identify** possible causes of accidental fires in a restaurant kitchen. **(8)**

4 **Identify** information that may be contained in a fire log book. **(8)**

5 (a) Give the meaning of the term 'risk' in relation to the occurrence of fire in a workplace. **(2)**

(b) Outline types of physical harm that could be caused to people by a workplace fire. **(6)**

6 Following refurbishment work in a multi-storey factory, it has been discovered that holes drilled into fire-resisting walls to allow cables through have not been fire-stopped.

(a) Outline adverse effects that this situation may have on fire protection within the building. **(3)**

(b) Outline other ways that the protection offered by compartmentation in the building may have been compromised. **(5)**

7 Outline factors that should be considered when developing an evacuation procedure for a shared-occupancy office building. **(8)**

8 (a) Give the meaning of the following terms:

(i) deflagration; **(2)**

(ii) detonation. **(2)**

(b) **Identify TWO** common types of material that may be involved in explosions **AND**, in **EACH** case, **give** an example. **(4)**

9 Outline fire precautions that should be included in a hot work permit. **(8)**

10 Outline factors that should be considered when determining the adequacy of an escape route. **(8)**

11 Outline economic costs to an employer of inadequate fire safety management. **(8)**

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