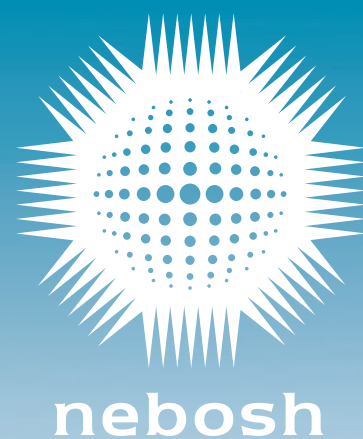


November 2015

# **Guide** to the NEBOSH National Diploma in Occupational Health and Safety



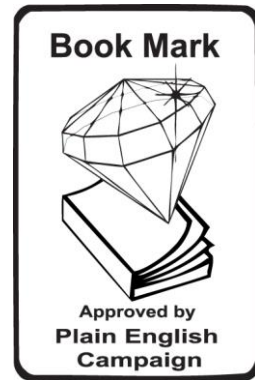
**Front cover photograph:**

Matt McDonnell

B&Q Health and Safety Adviser

Awarded the:

- NEBOSH National General Certificate in Occupational Health and Safety in 2012
- NEBOSH National Certificate in Fire Safety and Risk Management in 2012
- NEBOSH Certificate in Environmental Management in 2015
- NEBOSH National Diploma in Occupational Health and Safety in 2017



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# Guide to the NEBOSH National Diploma in Occupational Health and Safety (November 2015 specification)

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## **1. Introduction**

The NEBOSH National Diploma is the flagship NEBOSH qualification and is the first UK vocational qualification to be developed specifically for health and safety professionals. The National Diploma has become established as the most popular professional qualification for safety and health practitioners in the UK, with over 11000 students having achieved the qualification since its introduction in 1988.

The NEBOSH National Diploma is the qualification for aspiring health and safety professionals, building directly upon the foundation of knowledge provided by the NEBOSH National General Certificate. It is designed to provide students with the knowledge and understanding required for undertaking a career as a health and safety practitioner and it also provides a sound basis for progression to postgraduate study.

### **1.1 Qualification withdrawal (transitional arrangements)**

The NEBOSH National Diploma in Occupational Health and Safety (November 2015 specification) has been replaced by the NEBOSH National Diploma for Occupational Health and Safety Management Professionals (July 2020 specification).

**New** learners must be enrolled and/or registered to the November 2015 specification by 30 November 2021.

Learners will then have until the following final assessment dates to complete their qualification:

Units A, B and C – February 2026

Unit DNI – February 2026

If the learner does not complete their qualification at or before the above dates, they will need to take the assessments for the revised Diploma if they still wish to gain the qualification.

### **1.2 Benefits for employers**

Accidents and work-related ill-health affect all types of workplaces and occupations. In the year 2014/15 the following UK statistics were reported by the Health and Safety Executive:

- 142 people killed at work;
- 1.2million people suffered from work-related illness;
- 2358 Mesothelioma deaths due to past exposures (2013 figures);
- 13000 deaths occur each year from work-related lung disease and cancer due to past exposure (primarily from dust and chemicals at work);
- 76000 other injuries reported under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013;
- 611000 other injuries occurred at work (Labour Force Survey);
- 27.3million days lost due to work-related illness and workforce injury;
- Mental ill-health gave rise to most working days lost (an estimated 234000 cases);
- £14.3billion is the estimated cost of injuries (£4.96billion) and ill health (£9.46billion) from working conditions (2013/14 figures).

In addition to the direct costs of sick pay and absence, employers can find themselves dealing with criminal prosecution, claims for compensation, adverse publicity and harm to both

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(November 2015 specification)*

business reputation and profitability. The following enforcement actions were taken in Great Britain during 2014/15:

- 586 cases were prosecuted by the HSE in England and Wales;
- 70 cases were prosecuted by Local Authorities in England and Wales;
- 72 cases were prosecuted by the Procurator Fiscal in Scotland;
- 12430 enforcement notices were issued by all enforcing authorities.

In addition to prosecutions and enforcement notices the HSE is also able to charge Fees for Intervention (FFI) for those organisations that are found to have made a 'material breach'. The FFI is currently £129 per hour.

The management of health and safety in the workplace is not only a legal obligation and a moral imperative, it also makes good business sense. Qualified health and safety professionals are an asset to their organisation. They can help to reduce costs by preventing accidents and ill health of employees, while at the same time avoiding unnecessary expense by over-reacting to trivial risks. This in turn can lead to improved productivity and the raising of workforce morale. Effective health and safety management should be recognised as an essential element of a successful management strategy.

Courses leading to the NEBOSH National Diploma may be taken in a variety of formats and at a pace to fit around the needs of the individual and the business. Its unitised structure recognises success as the student progresses. Its practical approach promotes the application of the knowledge acquired on the course to problem solving in the student's own workplace.

### **1.3 Designatory letters**

Holders of the NEBOSH National Diploma in Occupational Health and Safety may use the designatory letters 'DipNEBOSH' after their name.

### **1.4 Professional membership**

The qualification meets the academic requirements for application for Graduate Membership (Grad IOSH) of the Institution of Occupational Safety and Health (IOSH – [www.iosh.co.uk](http://www.iosh.co.uk)). This is the first step to becoming a Chartered Health and Safety Practitioner as a Chartered Member of IOSH (CMIOSH).

Holders of the National Diploma are able to waive the Board of Certified Safety Professionals' Associate Safety Professional (ASP) examination so that, if they meet all other requirements, they may sit directly for the Certified Safety Professional (CSP) examination.

Holders of the NEBOSH National Diploma in Occupational Health and Safety *and* either the NEBOSH National or International Certificate in Construction Health and Safety meet the headline entrance criteria requirements for Registered Construction Safety Practitioner (RMaPS) and membership of the Association for Project Safety (APS).

The National Diploma is also accepted by the International Institute of Risk and Safety Management (IIRSM) as meeting the academic requirements for full membership (MIIRSM).

## **1.5 Qualification level and UK accreditation**

The NEBOSH National Diploma in Occupational Health and Safety (November 2015 specification) is accredited and credit rated by the Scottish Qualifications Authority (SQA - [www.sqa.org.uk](http://www.sqa.org.uk)) for delivery across the UK. It is rated within the Scottish Credit and Qualifications Framework (SCQF - [www.scqf.org.uk](http://www.scqf.org.uk)) at SCQF Level 10 with 51 SCQF credit points. The accreditation end date for this qualification is 30 November 2021.

For users in England, Wales and Northern Ireland, this is comparable to a Vocationally-Related Qualification (VRQ) at Level 6 within the Regulated Qualifications Framework (RQF) and Qualifications and Credit Framework (QCF), or Honours Degree 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](http://www.sqa.org.uk)).

## **1.6 Key topics covered**

- Managing health and safety
- Hazardous agents in the workplace
- Workplace and work equipment safety
- Practical application of health and safety theory

## **1.7 Course tuition and private study time requirements**

<b>Unit A:</b> 103 hours tuition and 85 hours private study	<b>Total: 188 hours</b>
<b>Unit B:</b> 65 hours tuition and 50 hours private study	<b>Total: 115 hours</b>
<b>Unit C:</b> 70 hours tuition and 50 hours private study	<b>Total: 120 hours</b>
<b>Unit DNI:</b> 5 hours tuition and 72 hours private study	<b>Total: 77 hours</b>

A programme of study therefore needs to be based around a minimum of **243 taught hours** and approximately **257 hours of private study** for an overall total of **500 Hours**.

A full-time block release course would be expected to last for a minimum of 7-weeks (35-working days) and a part-time day release course would be spread over at least 30-weeks. The tuition hours should be added to the recommended private study hours to give the minimum number of hours for students studying by open or distance learning.

Tuition time should normally be allocated proportionate to the tuition time for each element but may require adjustment to reflect the needs of a particular student group.

Quoted hours *do not* include assessment time, ie, sitting written examinations.

## **1.8 Entry requirements**

The NEBOSH National Diploma syllabus assumes that students will have knowledge of health and safety equivalent to that provided by the NEBOSH National General Certificate (NGC).

**The achievement of the NGC or direct equivalent prior to undertaking the Diploma course is highly recommended, because of the demands of high level study, the time commitment required and the complementary nature of the NEBOSH NGC and National Diploma.** Further information on the NEBOSH National General Certificate can be found via our website [www.nebosh.org.uk](http://www.nebosh.org.uk).

It should be noted that currently the assessments are offered (and must be answered) in English only. The qualification includes a requirement to write an extended assignment based on the student's own workplace, which must also be in English. Students should discuss this requirement with the accredited course provider before undertaking the qualification.

Students must satisfy any entry requirements specified by the course provider. Acceptance on to the programme may be based on the admission tutor's judgement on the student's ability to benefit from the programme.

## **1.9 Minimum standard of English required for students**

The standard of English required by students studying for the NEBOSH National Diploma must be such that they can both understand and articulate the concepts contained in the syllabus. It is important to stress that it is the responsibility of Learning Partners to determine their learners' standards of proficiency in English.

NEBOSH recommends that learners undertaking this qualification should reach a minimum standard of English *equivalent* to an International English Language Testing System score of **7.0** or higher in order to be accepted onto a National Diploma 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](http://www.ielts.org/institutions/test_format_and_results.aspx).

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

## **1.10 Legislation**

The syllabus refers to UK legislation. Where the syllabus refers to the legislative system of England and Wales, learners may refer to the legislative systems and requirements that apply in Scotland or Northern Ireland, provided that these references are clearly indicated as such.

If 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 refer to UK legislation only.

## **1.11 Legislative updates**

Relevant new legislation will become examinable in detail six months after its date of introduction. However, learners will be expected to be up-to-date at the time of the examination and, whilst detailed knowledge will not be expected, reference to new or impending legislation, where relevant to an examination question, will be given credit.

Please note, NEBOSH will not ask questions related to legislation that has been repealed, revoked or otherwise superseded.

**NB:** Learning Partners are expected to ensure their course notes remain current with regard to new legislation. NEBOSH issues bi-annual legal updates to assist Learning Partners with this process.

## **1.12 National Occupational Standards (NOS) and best practice**

The syllabus is mapped to the relevant National Occupational Standard (NOS). The mapping of the syllabus against each of the above standards can be found on pages 15-18.

## **1.13 Qualification type**

NEBOSH offers 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 combines 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.

In Scotland, VRQs are known as 'Other accredited qualifications'.

## **1.14 Qualification progression**

National Diploma holders with Environmental responsibilities may wish to take the NEBOSH National Diploma in Environmental Management.

Learners who wish to continue their studies overseas may wish to consider the NEBOSH International Diploma in Occupational Health and Safety. Unit DNI is a 'common unit' and forms part of the National and International Diplomas. Therefore, learners who wish to study the International Diploma will only need to pass three additional units to achieve this additional qualification.

Learners who have achieved the NEBOSH National Diploma may be considering further health and safety study. NEBOSH has entered into partnership with the University of Hull to offer a range of Masters Degrees.

A number of other universities offer MSc programs which accept the NEBOSH Diploma as a full or partial entry requirement. Some MSc courses may require additional

qualifications/expertise such as a degree, further significant work experience or expect learners to complete specific modules eg, in environmental management.

Further information can be found on our website: [www.nebosh.org.uk/qualifications](http://www.nebosh.org.uk/qualifications)

## **1.15 Programmes offered by NEBOSH-Learning Partners**

Learning Partners can be located using the 'Where to study' tab on our website: [www.nebosh.org.uk](http://www.nebosh.org.uk)

**NB:** Learners are advised to check up-to-date information on course dates directly with Learning Partners. It is also recommended that learners contact only Learning Partners which appear on the NEBOSH website; this ensures that the Learning Partners have met NEBOSH's quality standards.

## **1.16 Examination dates**

'Standard' examination dates for this qualification are available annually in January and July. Unit DNI assignment submission dates are available annually in February, May, August and November.

'On-demand' examinations are **not** available for this qualification.

## **1.17 Specification date**

The November 2015 specification for this qualification replaces the previous February 2010 specification for all examinations from (and including) January 2017.

## **1.18 Syllabus development and review**

The syllabus has been developed by NEBOSH following extensive consultation with key stakeholders, notably previous Diploma learners, Learning Partners, 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.

## **1.19 Further information for learners**

Further information for learners, including a qualification overview leaflet and examiners' reports, can be found via the NEBOSH website ([www.nebosh.org.uk](http://www.nebosh.org.uk)).

## **1.20 Further information for Learning Partners**

Further information for Learning Partners, including policies and procedures and guidance regarding the Unit DNI assignment, can be found in the Learning Partners' section of the NEBOSH website.

## **2. Qualification structure**

### **2.1 Student enrolment**

- At the start of their studies, learners will enrol with NEBOSH. The enrolment period is 5-years.
- On completion of the first successful unit, the enrolment start date will change to the same as the declaration date (the date which appears on the unit certificate) of the successful unit. The student will then have 5-years from this new date to achieve the qualification.
- All units will have a 5-year validity period. Units which are older than 5-years will no longer be valid and will not count towards the qualification grading. Any such unit/s will need to be retaken by the student to allow the student to complete the qualification.
- Once the oldest unit is no longer valid ie, it is 5 or more years older than the current date, the enrolment start date will move to the declaration date of the second successful unit.
- The student's enrolment period will end:
  - when the student has successfully completed all 4 units; or
  - when all successful units have expired (ie the declaration date/s are 5 or more years older than the current date; or
  - 5-years from the enrolment start date if the student has not attempted any unit assessment; or
  - 5-years from the enrolment start date if unit assessment/s have been attempted but the student has received a 'Refer' result and/or has been marked as 'absent'.
- If a student cannot complete all 4 units within the 5-year completion time-frame they may apply for a unit validity extension for each affected unit. Please refer to the 'Enrolment Policy for NEBOSH Diploma Level Qualifications' for further information.

### **2.2 Common unit and exemption**

The NEBOSH National Diploma in Occupational Health and Safety shares a 'common unit' (Unit DNI) with the NEBOSH International Diploma in Occupational Health and Safety. Learners can, therefore, take the assessments for Units IA, IB and IC and they will gain an additional qualification.

The 'common unit' can be used as an exemption against the International Diploma in Occupational Health and Safety for up to five years after the declaration date (the date printed on the unit certification) of Unit DNI. Likewise, holders of the International Diploma in Occupational Health and Safety will have five years to use their Unit DNI pass as an exemption against the same unit for the National Diploma in Occupational Health and Safety.

### **2.3 Unit assessments**

The National Diploma in Occupational Health and Safety is divided into four units. All units are mandatory and there are no optional units. The student may choose to take the units together or at different times.

### **Unit A: Managing health and safety**

- Unit A is a taught unit which is assessed by a 3-hour written examination
- The written examination consists of 11 questions split into Section A and Section B
- Section A consists of 6 'short-answer' questions (10 marks each) – all questions are compulsory
- Section B consists of 5 'long-answer' questions (20 marks each) – the student answers 3 out of the 5 questions
- There is a total of 120 marks available for the paper; the total mark for the paper (Section A + Section B) will then be converted to a percentage
- Student scripts are marked by external examiners appointed by NEBOSH
- A sample examination question paper can be found in Section 6.

### **Unit B: Hazardous substances/agents**

- Unit B is a taught unit which is assessed by a 3-hour written examination
- The written examination consists of 11 questions split into Section A and Section B
- Section A consists of 6 'short-answer' questions (10 marks each) – all questions are compulsory
- Section B consists of 5 'long-answer' questions (20 marks each) – the student answers 3 out of the 5 questions
- There is a total of 120 marks available for the paper; the total mark for the paper (Section A + Section B) will then be converted to a percentage
- Student scripts are marked by external examiners appointed by NEBOSH
- A sample examination question paper can be found in Section 6.

### **Unit C: Workplace and work equipment safety**

- Unit C is a taught unit which is assessed by a 3-hour written examination
- The written examination consists of 11 questions split into Section A and Section B
- Section A consists of 6 'short-answer' questions (10 marks each) – all questions are compulsory
- Section B consists of 5 'long-answer' questions (20 marks each) – the student answers 3 out of the 5 questions
- There is a total of 120 marks available for the paper; the total mark for the paper (Section A + Section B) will then be converted to a percentage
- Student scripts are marked by external examiners appointed by NEBOSH
- A sample examination question paper can be found in Section 6.

### **Unit DNI: Application of health and safety management in the workplace**

- Unit DNI consists of a written assignment set by NEBOSH

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- The report should be approximately 8000 words in total, excluding the references, bibliography and appendices. No penalty will be applied to reports which exceed 8000 words but learners should aim to keep their word count under 12000
- Submission dates for Diploma assignments are in February, May, August and November each year
- The assignment is marked by external examiners appointed by NEBOSH.

For more information on the assessment feedback provided for this qualification, please visit the NEBOSH website: <https://www.nebosh.org.uk/faqs/how-can-i-gain-feedback-on-my-performance-to-assist-with-future/>.

## **2.4 Assessment setting and marking**

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.

## **2.5 Unit pass standards**

The provisional pass mark for Units A, B and C is 45%. More information on how provisional marks are set can be found in our FAQs: <https://www.nebosh.org.uk/faqs/how-does-nebosh-set-the-pass-mark-for-each-assessment/>.

The pass standard for the assignment unit (Unit DNI) is 50%.

## **2.6 Unit certificates**

Learners 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. Units are not graded and the unit certificates will show a 'Pass' only.

## **2.7 Qualification grade**

When learners have been awarded a unit certificate for all four units (ie, have achieved a Pass in units A, B, C and DNI), the percentage for each of the units are added together and a final grade is awarded as follows:

<b>Distinction</b>	280 or more
<b>Credit</b>	240 – 279
<b>Pass</b>	185 – 239

## **2.8 Qualification parchment**

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

However, once the result of the fourth successfully completed unit has been issued the student 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).

## **2.9 Re-sitting unit/s**

If a student's performance in any unit is lower than a 'Pass', the student may re-sit the unit/s in which they have been unsuccessful providing that this happens within the 5-year completion period. However, each re-sit will incur an additional fee.

Learners may re-sit units at any time within their enrolment period and the qualification transitional arrangements\*. This includes re-sitting successful unit/s to try to improve the qualification grade. When all four units have been successfully completed, learners will need to inform NEBOSH of their intention to re-sit the successful unit/s **within 20-working days of the date of the results issue for the fourth unit**. There is no limit to the number of re-sits which can be taken within the enrolment period.

If a re-sit results in a lower mark than a previously declared mark for that unit, the highest mark will be used when calculating the qualification grade.

For the Unit DNI assignment, there is no limit to the number of submissions within the completion period. If a student gains lower than the pass standard in the assignment, they may revise and submit the assignment again. However, they must re-register for the assignment in order to do so. Please note that no feedback will be given on the referred assignment and each additional submission will incur a fee. Marks awarded for subsequent submissions will not be capped.

If a student registers for any unit of the National Diploma whilst awaiting a result from a previous sitting of an examination that student may not seek a refund of the registration fee if they retrospectively claim exemption for that unit except in the case of an Enquiry About Result.

- Please refer see Section 1.1

### **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. They allow attainment to be demonstrated by learners with either a permanent or long-term disability or learning difficulty, or temporary disability, illness or indisposition.

Learning Partners must make requests to NEBOSH for access arrangements or reasonable adjustments 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](http://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 a student who has been unable to demonstrate attainment because of temporary illness, injury, indisposition or an unforeseen incident at the time of the assessment.

Learners who feel they have been 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 the assignment) before leaving the examination room. They must 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 on reasonable adjustments and special consideration”* available from the NEBOSH website ([www.nebosh.org.uk](http://www.nebosh.org.uk)).

#### **3.3 Enquiries about results and appeals**

NEBOSH applies detailed and thorough procedures to review and check assessment results before they are issued. This includes a particular review of borderline results. This ensures that the declared results are a fair and equitable reflection of the standard of performance by learners.

There are, however, procedures for learners or Learning Partners 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](http://www.nebosh.org.uk)).

### **3.4 Malpractice**

Malpractice is defined as any deliberate activity, neglect, default or other practice by learners and/or accredited course providers that compromises the integrity of the assessment process, and/or the validity of certificates. Malpractice may include a range of issues. These include collusion or use of unauthorised material by learners, the failure to maintain appropriate records or systems by Learning Partners, and 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](http://www.nebosh.org.uk)).

## **4. Notes for tutors**

### **4.1 Case studies / past incidents**

The tutor references for Units A and C contain references to past incidents which were previously part of the syllabus content. These references can be used during teaching to help to illustrate the topic being taught. The references quoted are not an exhaustive list and tutors are at liberty to use different incidents to those quoted in the syllabus.

The case studies/past incidents will **not** be examinable.

### **4.2 Decided cases**

Decided cases are included in Units A and B and form part of the syllabus content; these cases are, therefore, examinable. Learning Partners are only expected to give an overview of the cases, the decision of the court and the legal precedent set in relation to health and safety. Marks will also be awarded in assessments for other relevant case law which is applied correctly to the scenario given.

### **4.3 Tutor references**

Tutor references are given at the end of each unit and are split between statutory provisions and guidance documents. These references are given to aid tutors with the teaching of the syllabus content; they are not an exhaustive list and tutors can use other references to those quoted in the syllabus.

### **4.4 Teaching of units**

Although the syllabus sets out the Units and Elements in a specific order, tutors can teach the Units and Elements in any order they feel is appropriate. Course providers will need to reflect this in the timetables which are submitted for approval as part of the accreditation/re-accreditation process.

Element A11 (the role of the health and safety practitioner) has been included within the content for Unit A but will not be examinable by the Unit A written examination. The content of this element will be assessed only through Unit DNI.

### **4.5 Conflict of interest**

Accredited Course Provider staff including Head of Learning Partners, Tutors, Administrators, Examinations Officers and Invigilators must declare in writing to NEBOSH any employment and/or familial, spousal or other close personal relationship with any examination or assessment candidate. Further information can be found in the '*Instructions for Conducting Examinations*' document.

## **4.6 Minimum standard of English required for tutors**

Tutors who are based overseas and wish to deliver the NEBOSH National Diploma must have a good standard of English. They must be able to articulate the concepts contained in the syllabus. The accredited course provider must provide evidence of the tutor's standard of English when submitting the tutor's CV for approval.

NEBOSH's requirement is for tutors delivering this qualification to have reached a minimum standard of English *equivalent* to an International English Language Testing System score of **7.0** or higher in IELTS tests.

## **5. Syllabus - NEBOSH National Diploma in Occupational Health and Safety (November 2015 specification)**

### **Structure**

The qualification is divided into 4 units; Units A is further divided into 11 elements and Units B and C into 10 elements.

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

- National Occupational Standards (NOS) for Health and Safety (Practitioner units) published by Proskills Sector Skills Council. The standards can be found at <https://www.ukstandards.org.uk/Pages/index.aspx>.

### **Unit A: Managing health and safety**

<b>Element number</b>	<b>Element title</b>	<b>Recommended tuition hours</b>	<b>Relevant Proskills units</b>	<b>Page number</b>
1	Principles of health and safety management	6	PROHSP1, 3, 11 12, 13, 16	19
2	Principles of health and safety law	12	PROSHP12, 13	21
3	Criminal law	9	PROHSP12	24
4	Civil law	12	PROHSP12	26
5	Loss causation and incident investigation	6	PROHSP8	29
6	Measuring and reviewing health and safety performance	9	PROHSP6, 7, 8 9, 11	31
7	Assessment and evaluation of risk	11	PROHSP4, 6, 8	33
8	Risk control	8	PROHSP6, 8	35
9	Organisational factors	14	PROHSP1, 2, 3 14, 15	37
10	Human factors	10	PROHSP2, 5, 6, 14	40
11	The role of the health and safety practitioner	6	PROHSP1, 2, 4, 5 6, 12, 13, 14	42
<b>Total taught hours</b>		<b>103</b>		
<b>Total self-study hours</b>		<b>85</b>		

## **Unit B: Hazardous substances / agents**

<b>Element number</b>	<b>Element title</b>	<b>Recommended tuition hours</b>	<b>Relevant Proskills units</b>	<b>Page number</b>
1	Managing occupational health	7	PROHSP6, 7, 8	47
2	Identification, assessment and evaluation of hazardous substances	8	PROHSP6, 8	49
3	Control of hazardous substances	7	PROHSP6	51
4	Monitoring and measuring of hazardous substances	6	PROHSP6, 7, 8	54
5	Biological agents	5	PROHSP6	56
6	Noise and vibration	10	PROHSP6, 7, 8	58
7	Radiation	6	PROHSP6, 7, 8	62
8	Mental ill-health and dealing with violence and aggression at work	6	PROHSP6, 8	65
9	Musculoskeletal risks and controls	5	PROHSP6	68
10	Work environment risks and controls	5	PROHSP6, 7, 8 10	70
<b>Total taught hours</b>		<b>65</b>		
<b>Total self-study hours</b>		<b>50</b>		

## **Unit C: Workplace and work equipment safety**

<b>Element number</b>	<b>Element title</b>	<b>Recommended tuition hours</b>	<b>Relevant Proskills units</b>	<b>Page number</b>
1	Workplace welfare requirements and specific workplace issues	7	PROHSP6	76
2	Fires and explosions	5	PROHSP6	78
3	Workplace fire risk assessment	6	PROHSP6	80
4	Storage, handling and processing of hazardous substances	7	PROHSP6, 10	82
5	Work equipment	9	PROHSP5, 6	84
6	Workplace machinery	9	PROHSP6	87
7	Mobile, lifting, access and work at height equipment	6	PROHSP6	89
8	Electrical safety	7	PROHSP5, 6	91
9	Construction and works of a temporary nature – hazards and controls	8	PROHSP6	93
10	Workplace transport and managing work-related road risk	6	PROHSP6, 11, 12	95
<b>Total taught hours</b>		<b>70</b>		
<b>Total self-study hours</b>		<b>50</b>		

## **Unit DNI: Application of health and safety management in the workplace**

<b>Element number</b>	<b>Element title</b>	<b>Recommended tuition hours</b>	<b>Relevant Proskills units</b>	<b>Page number</b>
1	N/A	5	PROHSP1, 3, 4 5, 6, 8, 9, 11, 13	102
<b>Total taught hours</b>		<b>5</b>		
<b>Total self-study hours</b>		<b>72</b>		
<b>Qualification taught hours</b>		<b>243</b>		
<b>Qualification self-study hours</b>		<b>257</b>		
<b>Overall hours</b>		<b>500</b>		

## **5.1 Unit A: Managing health and safety**

### **Aim of the unit**

This unit provides learners with a thorough grounding in all major aspects of managing health and safety. It aims to prepare learners for a career in health and safety by providing them with the ability to apply their knowledge and understanding of health and safety management issues in the workplace. In addition this knowledge and understanding prepares learners for the written question paper assessment in Unit A and the practical application (Unit DNI) which will be carried out in their own workplace.

### **Element A1: Principles of health and safety management**

#### **Learning outcomes**

- A1.1 Explain the moral, legal and economic reasons for the effective management of health and safety
- A1.2 Outline the societal factors which influence an organisation's health and safety standards and priorities
- A1.3 Outline the uses of, and the reasons, for introducing a health and safety management system
- A1.4 Explain the principles and content of an effective health and safety management system including the reasons for integration with other management systems.

#### **Content**

##### **A1.1 Reasons for the effective management of health and safety**

- Moral:
  - the duty of reasonable care
  - the unacceptability of putting the health and safety of people at risk
  - society's attitude to moral obligations
  - national accident/incident and ill-health statistics
  - the effect of size of organisation on accident/incident rates
- Legal:
  - preventive
  - punitive
  - the compensatory effects of law
  - the principle of self-regulation
- Economic:
  - the costs associated with accidents/incidents and ill-health and their impact on society and on organisations
  - the insured and un-insured costs
  - the financial benefits of effective health and safety management.

**A1.2 Societal factors which influence an organisation's health and safety standards and priorities**

- Factors:
  - economic climate, government policy and initiatives
  - industry/business risk profile
  - globalisation of business
  - migrant workers
  - national level of sickness absence
  - incapacity
  - societal expectations of equality eg, adjustments for employees with disabilities.

**A1.3 The uses of, and the reasons for, introducing a health and safety management system**

- The legal requirements to manage health and safety:
  - written health and safety policy
  - the arrangements for effective planning, organisation, control, monitoring and review of preventive and protective measures
  - access to competent health and safety advice
- What is a management system:
  - application of the plan, do, check, act cycle (with reference to '*Managing for health and safety (HSG65)*')
- The reasons for introducing health and safety management systems.

**A1.4 Principles and content of effective health and safety management systems**

- Health and safety policy
  - the legal requirements relating to health and safety policies and arrangements
  - the role of the health and safety policy in relation to a health and safety management system and as a vehicle for communicating health and safety information
  - the requirements for a written health and safety policy and for recording arrangements in relevant standards
  - the general principles and objectives of a health and safety policy document
- The key elements/components of ISO 45001:2018 (Occupational health and safety management systems)
- The benefits and limitations of integration of quality, environmental, and health and safety management systems.

***Recommended tuition time not less than 6 hours***

## **Element A2: Principles of health and safety law**

### **Learning outcomes**

- A2.1 Explain the sources and types of law in force in the UK relevant to health and safety
- A2.2 Explain the concept of absolute and qualified duties in relation to health and safety legislation
- A2.3 Outline the influence and role of the European Union on UK health and safety legislation
- A2.4 Outline the status and procedure for the creation of UK Acts, Regulations and Orders
- A2.5 Outline the structure and functions of courts and related institutions in the UK
- A2.6 Outline the principles of the law of contract and its application to health and safety issues
- A2.7 Explain the principles of employment and discrimination law as it affects health and safety issues.

### **Content**

#### **A2.1 Sources and types of law**

- Sources of law:
  - common law: nature and development, judicial precedent
  - statute law: European Directives and Regulations, UK Acts of Parliament and Regulations; prescriptive and goal-setting legislation
- Types of law:
  - criminal law: purpose, sanctions
  - civil law: purpose, types of remedy
- Burden of proof – civil and criminal law.

#### **A2.2 Absolute and qualified duties**

- The concept of absolute and qualified duties
- Meaning of the terms ‘absolute’, ‘practicable’ and ‘reasonably practicable’ with reference to relevant decided cases.

#### **A2.3 The role of the European Union**

- The influence and role of the European Union and its main institutions as they affect UK health and safety legislation:
  - European Parliament
  - Council of the European Union
  - European Commission
- The status of instruments in EU law – Treaties, Regulations, Directives and Decisions

- Directives – the role of the European Parliament, Council and Commission in the Co-Decision (Ordinary) Procedure and the significance of qualified majority voting.
- Distinction between directives made under Article 114 and Article 153 of the Treaty on the Functioning of the European Union (TFEU). UK response to EU Directives
- The role of the European Court of Justice (ECJ) and procedure for referring cases; how decisions of the ECJ are enforced through courts of Member States; effect of decisions of the ECJ on UK law.

#### **A2.4 UK Acts, Regulations and Orders**

- The status and procedure for making UK Acts of Parliament, Regulations and Orders:
  - Acts of Parliament – the functions of green and white papers, progression of a Bill through Parliament
  - Regulations – procedure under section 15 of the Health and Safety at Work etc. Act 1974 and permissible subject matter of Regulations, role of the Secretary of State and the HSE in making Regulations; the various stages of consultation
- The use of socio-technical cost-benefit analysis in the economic assessment of proposed legislative/regulatory change.

#### **A2.5 Structure and function of the courts and related institutions**

- The functions, jurisdiction and powers of:
  - Employment Tribunals
  - Magistrates' Courts
  - County Courts
  - High Court
  - Crown Court
  - Court of Appeal
  - Supreme Court
  - Court of Justice (European)
  - In Scotland - Court of Session, High Court of Justiciary, Sheriff Courts, District and Justice of the Peace Courts
- The basic procedures for bringing prosecutions for breaches of health and safety legislation and for pursuing civil actions (cross-refer to Element A4)
- The role of Employment Tribunals in matters of health and safety
- The appeals system: routes and grounds of appeal.

#### **A2.6 The principles of the law of contract**

- Law of contract:
  - the meaning of contract including written, verbal, express and implied
  - the principles of the law of contract and their application to health and safety issues; the relationship between producer and vendor, vendor and consumer, client and contractor; exclusion clauses and effect of the Unfair Contract Terms Act 1977.

## **A2.7 The principles of employment and discrimination law**

- The purpose of contract of employment
- Employment law as it relates to health and safety issues in connection with:
  - disciplinary procedures
  - fair and unfair dismissal
  - protected characteristics such as age, sex, race and disability discrimination
  - associative discrimination
  - undertaking safety roles at work
  - disclosure of wrong-doing at work
- Situations where it is lawful to discriminate and protection for those undertaking safety roles at work or disclosing wrong-doing at work with reference to:
  - Employment Rights Act 1996
  - Trade Union and Labour Relations (Consolidation) Act 1992 (sections 152 and 153)
  - Equality Act 2010
  - Public Interest Disclosure Act 1998.

### **Decided cases**

- Adsett v K&L Steelfounders & Engineers Ltd [1953] 2 All ER 320
- Edwards v National Coal Board [1949] 1 All ER 743
- Stark v The Post Office [2000] ICR 1013

***Recommended tuition time not less than 12 hours***

## **Element A3: Criminal law**

### **Learning outcomes**

- A3.1 Explain the key requirements of the Health and Safety at Work etc Act 1974 and the Management of Health and Safety at Work Regulations 1999
- A3.2 Explain the status of Approved Codes of Practice and guidance and the statutory procedures for making Approved Codes of Practice
- A3.3 Explain the responsibilities and powers of enforcing agencies and officers and the range of options related to enforcement action, their implications and appeal procedures.

### **Content**

#### **A3.1 The Health and Safety at Work etc. Act 1974 and the Management of Health and Safety at Work Regulations 1999**

- The requirements and application of sections 2-4 and 6-9 of the Health and Safety at Work etc. Act 1974, relationship between general and specific duties
- The requirements and application of the Management of Health and Safety at Work Regulations 1999:
  - suitable and sufficient risk assessments
  - providing employees with information on significant risks
  - providing instruction and training for employees
  - effective planning, organisation, control, monitoring and review of preventative and protective measures
- Implications of sections 36 and 37 of the Health and Safety at Work etc. Act and regulation 21 of the Management of Health and Safety at Work Regulations with reference to relevant decided cases.

#### **A3.2 Approved Codes of Practice and guidance**

- The purpose, role, structure, application and status of approved codes of practice and HSE guidance notes
- The statutory procedures for making approved codes of practice.

#### **A3.3 The enforcement of health and safety law**

- The identification of authorities empowered to enforce health and safety legislation
- The division of responsibilities between enforcing authorities
- The powers of enforcing authorities and their inspectors (Health and Safety at Work etc. Act section 20 and 25)
- The obligations of enforcing officers: duty to give information to employees or their representatives; the duty not to disclose information (Health and Safety at Work etc. Act section 28)
- Offences and maximum penalties under the law (Health and Safety at Work etc. Act section 33); offences for which imprisonment is, and is not, a form of sanction

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- The implications of amendments to section 3 of the Health and Safety at Work etc. Act by the Deregulation Act 2015 and related Regulations
- The principles of enforcement with reference to the HSE's '*Enforcement policy statement*' (HSE41): proportionality of enforcement; consistency of approach; transparency
- Choice of enforcement option linked to the HSE's '*Enforcement Management Model (EMM)*'
- The consequences of material breach:
  - fee for intervention
  - enforcement notices: types, purpose, status, conditions for being served, grounds for appeal, appeal procedures, effects of appeal (Health and Safety at Work Act sections 21-24 and 39)
- Prosecution options:
  - simple cautions
  - summary offences
  - indictable offences (solemn procedure in Scotland)
  - hybrid/triable either way offences
- The effect on criminal proceedings of section 40 of the Health and Safety at Work Act
- The application of common law manslaughter (culpable homicide in Scotland) and the Corporate Manslaughter and Corporate Homicide Act 2007 to work-related accident/incidents. The legal criteria for prosecution, enforcement and prosecution responsibilities.

**Decided cases**

- R v Associated Octel Co Ltd [1996] 4 All ER 846
- R v British Steel plc [1995] IRLR 310
- R v Chagot Ltd [2008] UKHL 73
- R v HTM [2006] EWCA Crim 1156
- R v Nelson Group Services (Maintenance) Ltd [1998] 4 All ER 420
- RvP [2007] EWCA Crim 1937
- R v Porter [2008] EWCA Crim 1271
- R v Swan Hunter Shipbuilders Ltd and Another [1982] 1 All ER 264.

***Recommended tuition time not less than 9 hours***

## **Element A4: Civil law**

### **Learning outcomes**

- A4.1 Explain the principles of common law
- A4.2 Explain the criteria required to establish a successful civil action for breach of statutory duty and negligence, the main defences available and the procedure for assessment of damages under civil law
- A4.3 Outline the main civil law statutory duties owed by the occupiers of premises to lawful and unlawful visitors.

### **Content**

#### **A4.1 Principles of common law**

- The principles of tort (delict – in Scottish law) of negligence:
  - duty of care owed
  - breach of the duty of care
  - causal link between the breach and the loss suffered
  - foreseeability of the type of damage
- The concept of 'duty of care':
  - to whom a duty is owed (the 'neighbour test')
  - the duty of care owed by:
    - designers, manufacturers and suppliers to customers/users
    - occupiers of premises to those using or visiting the premises
    - contractors to clients and vice versa
  - extent of duty (reasonableness, foreseeability)
  - greater duty of care to more vulnerable individuals
- The common law duties owed by employers to employees to provide:
  - a safe place of work and safe access and egress
  - safe systems of work
  - safe plant, equipment and materials
  - instruction, training and supervision
  - competent fellow employees
- Damage for which the tortfeasor is liable and relevance of damage of foreseeable type, date of knowledge of risk
- The concept of vicarious liability.

#### **A4.2 Breach of statutory duty and negligence**

- The principle that a breach of a statutory duty may give rise to civil liability. Criteria for a successful action
- The implications of section 47 of the Health and Safety at Work etc. Act 1974, the Enterprise and Regulatory Reform Act 2013 (section 69) and the Health and Safety at Work etc Act 1974 (Civil Liability) (Exceptions) Regulations 2013 in relation to breach of statutory duty including the criteria for a successful action

- The main defences to the tort (delict) of breach of statutory duty:
  - statutory duty not on the defendant
  - no breach of statutory duty
  - injured party not within the class of persons protected by the statute
  - harm not of the type that the statute was designed to prevent
  - no causal connection between the breach and the loss suffered
  - contributory negligence
- Main defences to claims of negligence:
  - denial
  - no duty owed
  - no breach of duty (with reference to foreseeability, reasonableness)
  - the breach did not lead to damage
  - the type of damage not foreseeable
  - volenti non fit injuria
  - contributory negligence
  - time limitation
- The implications of the Social Action, Responsibility and Heroism Act 2015
- The factors to be considered in the assessment of damages; general and special (solatium and patrimonial loss in Scotland)
- Contributory negligence and its effects
- The concept of joint tortfeasors:
  - the meaning of joint and several liabilities
  - the recovery of damages from joint tortfeasor
- Personal Injury Pre-Action Protocol under the Civil Procedures Rules (England and Wales only).

### **A4.3 Occupier's liability**

The main provisions of the Occupiers' Liability Acts 1957 and 1984 or the Occupiers' Liability (Scotland) Act 1960 or the Occupiers' Liability Act (Northern Ireland) 1957 and The Occupiers' Liability (Northern Ireland) Order 1987.

#### **Decided cases:**

- Caparo Industries Plc v Dickman [1990] 2 AC 605
- Corr (Administratrix of Corr, decd) v I B C Vehicles Ltd [2008] HL
- Donoghue v Stevenson [1932] AC 562
- Fairchild v Glenhaven Funeral Services Ltd and Others [2002] UKHL 22
- Jones v Livox Quarries Ltd [1952] 2 QB 608
- Latimer v AEC Ltd [1953] 2 All ER 449, HL
- Mersey Docks and Harbour Board v Coggins and Griffith (Liverpool) Ltd [1946] 2 All ER 345
- Paris v Stepney Borough Council [1951] 1 All ER 42, HL
- Sutherland v Hatton and others [2002] EWCA Civ 76

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- Viasystems (Tyneside) Ltd v Thermal Transfer (Northern) Ltd (2005) CA
- Wilsons and Clyde Coal Co v English [1938] 3 All ER 628.

***Recommended tuition time not less than 12 hours***

## **Element A5: Loss causation and incident investigation**

### **Learning outcomes**

- A5.1 Outline theories/models and use of loss causation techniques
- A5.2 Explain the use of quantitative methods in analysing loss data
- A5.3 Explain the significance and use of statutory and internal reporting of loss events
- A5.4 Explain the reasons for loss and near miss investigations and the procedures to be followed.

### **Content**

#### **A5.1 Theories/models and use of loss causation techniques**

- Understand the following theories/models:
  - accident/incident ratio studies, understanding their use and their limitations
  - Birds domino and multi-causality theories (immediate, underlying and root causes)
  - latent and active failures: purpose of Reason's model of accident causation (swiss cheese model), fault tree, event tree and the Bowtie model
  - behavioural root cause analysis.

#### **A5.2 The quantitative analysis of accident and ill-health data**

- Methods of calculating loss rates from raw data: accident/incident frequency rate, accident incidence rate, accident severity rate, ill-health prevalence rate
- Presenting and interpreting loss event data in graphical and numerical format, using examples of histograms, pie charts and line graphs
- The principles of statistical variability, validity and the use of distributions (eg, importance of representative samples, sampling a population, errors in data).

#### **A5.3 Reporting and recording of loss events (injuries, ill-health, dangerous occurrences) and near misses**

- Statutory reporting requirements and procedures
- The significance of internal reporting and recording systems.

#### **A5.4 Loss and near miss investigations**

- Implied legal requirements
- The reasons for carrying out investigations:
  - legal reasons
  - information/data gathering
  - establishing the root, underlying and immediate causes
- The benefits of carrying out an investigation:
  - to prevent recurrence
  - improved employee morale
  - developing managerial skills

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- Investigation procedure with reference to '*Investigating accidents and incidents - a workbook for employers, unions, safety representatives and safety professionals* (HSG245)':
  - initial report (preserve the scene, note people and equipment involved, report event)
  - decide whether further investigation is required
  - gather information
  - analyse the information
  - identifying risk control measures
  - produce and implement an action plan
- Sharing of information/lessons learned to prevent recurrence.

***Recommended tuition time not less than 6 hours***

## **Element A6: Measuring and reviewing health and safety performance**

### **Learning outcomes**

- A6.1 Explain the purpose and use of performance measurement in relation to health and safety objectives and arrangements
- A6.2 Explain the need for, and the objectives and limitations of, health and safety monitoring
- A6.3 Describe the variety of health and safety monitoring and measurement techniques
- A6.4 Explain the need for and process of reviewing health and safety performance.

### **Content**

#### **A6.1 The purpose and use of health and safety performance measurement**

- The meaning of health and safety performance measurement
- The need for a range of both active and reactive measures to determine whether health and safety objectives have been met
- The meaning of key performance indicators and their role in setting business objectives
- The types, benefits and limitations of leading and lagging indicators
- The assessment of the effectiveness and appropriateness of health and safety objectives and arrangements, including control measures
- Making recommendations, based on performance, for the review of current health and safety management systems.

#### **A6.2 Health and safety monitoring**

- The objectives of active monitoring – to check that health and safety plans have been implemented and to monitor compliance with the organisation's systems/procedures and legislative/technical standards
- The objectives of reactive monitoring – to analyse data relating to accidents, ill-health and other loss causing events
- The limitations of reliance on accident/incident and ill-health data
- The distinction between, and applicability of, active/reactive, objective/subjective and qualitative/quantitative performance measures.

#### **A6.3 Health and safety monitoring and measurement techniques**

- The range of measures available to evaluate the health and safety performance of an organisation and how these measures can be utilised to review the effectiveness of the health and safety management system
- Collecting and using sickness absence and ill-health data to develop occupational policy, strategy and targets

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- The role, purpose and key elements of health and safety audits, workplace inspections, safety tours, safety sampling, safety surveys, safety conversations and behavioural observations
- The in-house health and safety practitioner's role in audits carried out by external/third parties eg, during a certification audit
- Comparison of previous performance data with that of similar organisations/industry sectors and with national performance data. Use and potential benefits of benchmarking.

**A6.4 Reviewing health and safety performance**

- Need for formal and informal performance reviews
- The review process
- The inputs to a review process – internal performance data, health and safety objectives, organisational arrangements and change, external standards and expectations
- The outputs from a review process – actions and improvement plans, stakeholder reports, performance targets.

***Recommended tuition time not less than 9 hours***

## **Element A7: The assessment and evaluation of risk**

### **Learning outcomes**

- A7.1 Explain how to use internal and external information sources in identifying hazards and the assessing of risk
- A7.2 Outline the use of a range of hazard identification techniques
- A7.3 Explain how to assess and evaluate risk and to implement a risk assessment programme
- A7.4 Explain the analysis, assessment and improvement of system failures and system reliability with the use of calculations
- A7.5 Explain the principles and techniques of failure tracing methodologies with the use of calculations.

### **Content**

#### **A7.1 Sources of information used in identifying hazards and assessing risk**

- Accident/incident and ill-health data and rates – incidence, frequency, severity, prevalence
- External information sources (eg, HSE and other relevant governmental agencies, European Safety Agency, International Labour Organisation (ILO), World Health Organisation (WHO), professional and trade bodies)
- Internal information sources – collection, provision, analysis and use of damage, injury, and ill-health data, near-miss information and maintenance records
- The uses and limitations of external and internal information sources.

#### **A7.2 Hazard identification techniques**

- Using observation, task analysis and checklists and failure tracing techniques such as hazard and operability studies
- The importance of employee input.

#### **A7.3 Assessment and evaluation of risk**

- Key steps in a risk assessment process including:
  - ensuring comprehensive identification of risks
  - identifying hazards
  - identifying persons at risk
  - the factors affecting probability and severity
  - risk evaluation and required risk control standards
  - formulating actions
  - prioritising actions
  - requirement to record findings
- Use and limitations of generic, specific and dynamic risk assessment
- The meaning of 'suitable and sufficient'
- Limitations of risk assessment processes

- Temporary and non-routine situations
- Consideration of long-term hazards to health
- Principles of and differences between qualitative, semi-quantitative and quantitative assessments
- Organisational arrangements for implementing and maintaining an effective risk assessment programme including procedures, recording protocols, training, competence, responsibilities, authorisation and follow-up of actions, monitoring and review
- Acceptability/tolerability of risk; principles in HSE's 'Reducing risks, protecting people' (R2P2).

#### **A7.4 Systems failures and system reliability**

- The meaning of the term 'system'
- The principles of system failure analysis – holistic and reductionist approaches and application to actual examples
- Using calculations in the assessment of system reliability: parallel, series and mixed systems, common mode failures, principles of human reliability analysis
- Methods for improving system reliability: using reliable components, quality assurance, parallel redundancy; standby systems, minimising failures to danger; planned preventive maintenance; minimising human error.

#### **A7.5 Failure tracing methodologies**

- Principles and techniques, including the use of calculations, of the following failure tracing methods in the assessment of risk:
  - hazard and operability studies
  - fault tree analysis
  - event tree analysis.

***Recommended tuition time not less than 11 hours***

## **Element A8: Risk control**

### **Learning outcomes**

- A8.1 Explain the use of common risk management strategies
- A8.2 Outline factors to be taken into account when selecting risk controls
- A8.3 Explain the development, main features and operation of safe systems of work and permit-to-work systems.

### **Content**

#### **A8.1 Common risk management strategies**

- The concepts of avoidance, reduction, transfer and retention with/without knowledge within a health and safety management system, with relevant examples (eg, redesign of tasks, automation of process, insurance policies, use of specialist contractors)
- Circumstances when each of the above strategies would be appropriate
- Factors to be considered in the selection of an optimum solution based on relevant risk data
- The principles and benefits of risk management in a global context
- The link between the outcomes of risk assessments and the development of risk controls.

#### **A8.2 Factors to be taken into account when selecting risk controls**

- The general principles of prevention in the Management of Health and Safety at Work Regulations
- Determine the technical/procedural/behavioural control measures required using the general hierarchy of control (with reference to ISO 45001):
  - elimination (technical)
  - substitution (technical / procedural)
  - engineering controls (technical / behavioural)
  - signage/warnings and/or administrative controls (procedural / behavioural)
  - personal protective equipment (technical / behavioural)

(Note: technical to include design, fencing, ventilation etc; procedural to include safe systems of work, permit-to-work, maintenance regime etc; behavioural to include information and training)
- Factors affecting the choice of control measures – long term/short term, applicability, practicability, cost, proportionality, effectiveness of control, legal requirements and associated standards, the competence of personnel and training needs relevant to preferred controls.

#### **A8.3 Safe systems of work and permit-to-work system**

- Safe systems of work: meaning; legal (HASWA section 2(2)(a)) and practical requirements; components (people, equipment, materials, environment); development and implementation
- Permit-to-work systems – essential features, general application, operation and monitoring

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- The use of risk assessment in the development of safe systems of work and safe operating procedures.

***Recommended tuition time not less than 8 hours***

## **Element A9: Organisational factors**

### **Learning outcomes**

- A9.1 Explain the types of health and safety leadership, their advantages, disadvantages and likely impact on safety performance
- A9.2 Explain the organisational benefits of effective health and safety leadership
- A9.3 Explain the internal and external influences on health and safety in an organisation
- A9.4 Outline the different types of organisation, their structure, function and the concept of the organisation as a system
- A9.5 Explain the requirements for managing third parties in the workplace
- A9.6 Explain the role, influences on and procedures for formal and informal consultation with employees in the workplace
- A9.7 Explain health and safety culture and climate
- A9.8 Outline the factors which can both positively and negatively affect health and safety culture and climate.

### **Content**

#### **A9.1 Types of safety leadership and their likely impact on health and safety performance**

- The meaning of safety leadership
- Types of safety leadership, their advantages, disadvantages and likely impact on safety performance:
  - transformational
  - transactional
  - servant
  - situational and contextual (Hersey and Blanchard)
- Behavioural attributes of an effective leader.

#### **A9.2 Benefits of effective health and safety leadership**

- Purpose of the HSE/IOD guidelines 'Leading health and safety at work'
- Leadership as a core element of effective health and safety management
- Benefits of effective safety leadership on the health and safety culture and performance of an organisation
- The link between effective leadership and employee engagement
- The role of both an organisation and a health and safety practitioner in encouraging positive leadership and supporting managers at all levels to exhibit commitment to a safe and healthy workplace
- Influence of corporate social responsibility and business ethics on health and safety management
- Influence of the Financial Reporting Council Guidance on Internal Control (formerly the Turnbull guidance) on health and safety management.

### **A9.3 Internal and external influences**

- The internal influences on health and safety within an organisation eg, finance, production targets, trade unions, organisational goals and culture
- The external influences on health and safety within an organisation eg, legislation, Parliament/HSE, enforcement agencies, courts/tribunals, contracts, clients/contractors, trade unions, insurance companies, public opinion.

### **A9.4 Types of organisations**

- The concept of the organisation as a system
- Organisational structures and functions – including formal and informal; large or small; organisation charts, role of management, hierarchical vs flat management structures
- Potential conflict between organisational goals and the goals of the individual
- The integration of the goals of the organisation with the needs of the individual – authority, responsibility, accountability.

### **A9.5 Requirements for managing third parties**

- Identifying third parties: contractors, agency workers and other employers (shared premises)
- Internal rules and procedures concerned with the selection, appointment and control of contractors
- Responsibilities for control of risk associated with contractors and visitors
- Requirements to provide information relating to hazards/risks to third parties
- Review of contractor performance.

### **A9.6 Consultation with employees**

- The role and benefits of consultation within the workplace with reference to the Safety Representatives and Safety Committee Regulations 1977 and the Health and Safety (Consultation with Employees) Regulations 1996
- Formal consultation:
  - the functions and rights of representatives on health and safety (trade union-appointed, elected) reference to sections 168, 168a, 169, 170 of the Trade Union and Labour Relations (Consolidation) Act 1992
  - the functions of a safety committee
  - formal consultation directly with employees
- Informal consultation:
  - discussion groups, safety circles, departmental meetings, employee discussion, email and web-based forums
- Behavioural aspects associated with consultation – peer group pressures, danger of tokenism, potential areas of conflict
- The role of the health and safety practitioner in the consultative process.

#### **A9.7 Health and safety culture and climate**

- The meaning of 'health and safety culture' and 'health and safety climate'
- The influence of health and safety culture on behaviour and the effect of peer group pressure and norms
- The impact of organisational cultural factors and associated values on individual behaviour
- Indicators of culture
- The correlation between health and safety culture/climate and health and safety performance; the subjective and objective nature of culture and climate
- The measurement of the health and safety culture and climate, ie, safety climate assessment tools, perception surveys, findings of accident/incident investigations, effectiveness of communication, evidence of commitment by personnel at all levels in the organisation.

#### **A9.8 Factors affecting health and safety culture and climate**

- Factors that may promote a positive health and safety culture or climate (ie, management commitment and leadership, high business profile of health and safety, provision of information, involvement and consultation, training, promotion of ownership, setting and meeting targets)
- Factors that may promote a negative health and safety culture or climate (ie, organisational change, lack of confidence in organisation's objectives and methods, uncertainty, management decisions that prejudice mutual trust or lead to confusion regarding commitment)
- Effecting change: planning and communication, strong leadership, the need for a gradualist (step-by-step) approach, direct and indirect action to promote change (including cultural benefits from risk assessment), strong employee engagement, training and performance measurements and the importance of feedback
- Problems and pitfalls (ie, attempts to change culture too rapidly, adopting too broad an approach, absence of trust in communications, resistance to change).

***Recommended tuition time not less than 14 hours***

## **Element A10: Human factors**

### **Learning outcomes**

- A10.1 Outline psychological and sociological factors which may give rise to specific patterns of safe and unsafe behaviour in the working environment
- A10.2 Explain the nature of the perception of risk and its relationship to performance in the workplace
- A10.3 Explain the classification of human failure
- A10.4 Explain appropriate methods of improving individual human reliability in the workplace
- A10.5 Explain how organisational factors can contribute to improving human reliability
- A10.6 Explain how job factors can contribute to improving human reliability
- A10.7 Outline the principles, conditions and typical content of behavioural change programmes designed to improve safe behaviour in the workplace.

### **Content**

#### **A10.1 Human psychology, sociology and behaviour**

- The meaning of the terms psychology and sociology
- The influence of personality, attitude, aptitude and motivation on human behaviour
- Key theories of human motivation: Mayo (Hawthorne experiments), Maslow (hierarchy of needs), Vroom, Blanchard and their relevance to health and safety
- Effects experience, social and cultural background, education and training on behaviour at work.

#### **A10.2 Perception of risk**

- Human sensory receptors and their reaction to stimuli, sensory defects and basic screening techniques
- The process of perception of danger, perceptual set and perceptual distortion
- Errors in perception caused by physical stressors
- Perception and the assessment of risk, perception and the limitations of human performance, filtering and selectivity as factors for perception.

#### **A10.3 Human failure classification**

- HSG48 classification of human failure
- Cognitive processing; knowledge-based, rule-based and skill-based behaviour (Rasmussen)
- Contribution of human failure to serious incidents.

#### **A10.4 Improving individual human reliability in the workplace**

- Motivation and reinforcement; workplace incentive schemes; job satisfaction and appraisal schemes
- Selection of individuals – matching skills and aptitudes; training and competence assessment; fitness for work
- Health surveillance; support for ill-health including mental health problems.

#### **A10.5 Organisational factors**

- The effect of weaknesses in the health and safety management system on the probability of human failure, eg, inadequacies in the setting of standards, policy, planning, information responsibilities or monitoring
- The influence of formal and informal groups within an organisation
- Organisational communication mechanisms and their impact on human failure probability, eg, shift handover communication, organisational communication routes and their complexity, reliability and degree of formality.

#### **A10.6 Job factors**

- The effect of job factors on the probability of human error (eg, task complexity, patterns of employment, payment systems, shift work)
- The application of task analysis in predicting the probability and prevention of error
- The role of ergonomics in job design:
  - the influence of process and equipment design on human reliability
  - the employee and the workstation as a system
  - elementary physiology and anthropometry
  - the degradation of human performance resulting from poorly designed workstations
- Ergonomically designed control systems in relation to human reliability – ie, examples of applications: production process control panels, crane cab controls, aircraft cockpit, CNC lathe, etc
- The relationship between physical stressors and human reliability
- The effects of under-stimulation, fatigue and stress on human reliability.

#### **A10.7 Behavioural change programmes**

- The principles of behavioural change programmes
- The organisational conditions needed for success in behavioural change programmes
- Examples of the content of typical behavioural change programmes.

***Recommended tuition time not less than 10 hours***

## **Element A11: The role of the health and safety practitioner**

Note to tutors: Element A11 does not have to be taught as part of Unit A, as it will be assessed only as part of the Unit DNI assessment.

### **Learning outcomes**

- A11.1 Explain the role of the health and safety practitioner
- A11.2 Explain the importance of effective communication and negotiation skills when promoting health and safety
- A11.3 Outline how health and safety practitioners can use financial justification to aid decision making.

### **Content**

#### **A11.1 The role of the health and safety practitioner**

- The role of the health and safety practitioner and the potential conflicts that this role brings ie, who the practitioner is there to protect; employees, employers or third parties
- The meaning of the term 'competence' and the importance of a health and safety practitioner recognising the limits of their own competence
- The need for health and safety practitioners to evaluate and develop their own practice so as to maintain competence
- The role of the health and safety practitioner in mentoring and supporting the development of health and safety competency in other relevant employees
- The distinction between leadership and management and how this can apply to a health and safety practitioner
- The need to adopt different management styles dependent on any given situation
- The role of health and safety practitioners in the development, implementation, maintenance and evaluation of health and safety management systems
- The meaning of the term sensible risk management including the importance of proportionality when assessing and controlling risk
- The health and safety practitioner's role in enabling work activities as part of proportionate and sensible risk management
- Organisational risk profiling; its purpose, practicality and organisational context
- The contribution of the health and safety practitioner in achieving the objectives of an organisation
- The meaning of the term 'ethics'
- The practical application of ethical principles (ie, honesty, respect, integrity, personal conflicts of interest) that underpin professional health and safety practitioner codes of conduct.

**A11.2 The importance of effective communication and negotiation skills when promoting health and safety**

- Why effective communication is important
- The need for health and safety practitioners to consult and negotiate with others when developing an organisation's health and safety objectives
- Influencing ownership of health and safety at all levels of an organisation via:
  - participation
  - management accountability
  - consultation
  - feedback
- The importance of receiving and acting on feedback on health and safety performance from all stakeholders
- The use of different methods of communication media available to promote the health and safety message ie, verbal, electronic, printed, pictorial and social
- Procedures for resolving conflict and introducing change
- Ensuring roles and responsibilities are clear, understood by all workers and implemented.

**A11.3 The health and safety practitioner's use of financial justification to aid decision making**

- The significance of budgetary responsibility, including profit, loss and payback analysis
- Importance of recognising who is the responsible budget holder and how they can be influenced to make appropriate health and safety decisions
- Cost-benefit analysis in relation to risk control decisions (organisational, design, planning, operational)
- The internal and external sources of information that should be considered when determining costs
- The necessity of both short and long term budgetary planning when seeking approval for new initiatives, projects and campaigns.

***Recommended tuition time not less than 6 hours***

## Unit A: Tutor References

### Health and safety incidents (reference to Element 10.3)

[Kegworth air disaster report](#)

[Herald of Free Enterprise report](#)

[Learning from the Piper Alpha Accident](#)

[Ladbroke Grove report](#)

[Three Mile Island accident](#)

### Statutory instruments

Legislation	Country	Element/s
Treaty of the Functioning of the European Union (2012/C326/01)	Europe	2
Corporate Manslaughter and Corporate Homicide Act 2007	UK / Great Britain	3
Deregulation Act 2015 (Section 1)	UK / Great Britain	3
Deregulation Act 2015 (Health and Safety at Work) (General Duties of Self-Employed Persons) (Consequential Amendments) Order 2015	UK / Great Britain	3
Employers' Health and Safety Policy Statements (Exceptions) Regulations 1975	UK / Great Britain	1
Employment Rights Act 1996	UK / Great Britain	3
Enterprise and Regulatory Reform Act 2013 (section 69)	UK / Great Britain	4
Equality Act 2010	UK / Great Britain	2
Health and Safety at Work etc Act 1974	UK / Great Britain	3, 8
Health and Safety at Work etc Act 1974 (Civil Liability) (Exceptions) Regulations 2013	UK / Great Britain	4
Health and Safety at Work etc. Act 1974 (General Duties of Self-Employed Persons) (Prescribed Undertakings) Regulations 2015	UK / Great Britain	3
Health and Safety (Consultation with Employees) Regulations 1996	UK / Great Britain	9
Health and Safety (Fees) Regulations 2012	UK / Great Britain	3
Health and Safety Information for Employees Regulations 1989	UK / Great Britain	9
Legal Aid, Sentencing and Punishment of Offenders Act 2012	UK / Great Britain	2
Legal Aid, Sentencing and Punishment of Offenders Act 2012 (Fines on Summary Conviction) Regulations 2015	UK / Great Britain	2
Management of Health and Safety at Work Regulations 1999 (as amended)	UK / Great Britain	1, 7
Public Interest Disclosure Act 1998	UK / Great Britain	2

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Legislation	Country	Element/s
Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013	UK / Great Britain	5
Safety Representatives and Safety Committee Regulations 1977	UK / Great Britain	9
Social Action, Responsibility and Heroism Act 2015	UK / Great Britain	3, 4
Trade Union and Labour Relations (Consolidation) Act 1992 (as amended)	UK / Great Britain	2, 9
Unfair Contract Terms Act 1977	UK / Great Britain	2
Occupiers' Liability Act 1957 and 1984	England and Wales	4
Health and Safety (Consultation with Employees) Regulations (Northern Ireland) 1996	Northern Ireland	9
Management of Health and Safety at Work Regulations (Northern Ireland) 2000 (as amended)	Northern Ireland	1, 7
Occupiers' Liability Act (Northern Ireland) 1957	Northern Ireland	4
Public Interest Disclosure (Northern Ireland) Order 1988	Northern Ireland	2
Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (Northern Ireland) 1997 (as amended)	Northern Ireland	5
Courts Reform (Scotland) Act 2014	Scotland	2
Damages (Scotland) Act 2011	Scotland	4
Inquiries into Fatal Accidents and Sudden Deaths etc. (Scotland) Act 2016	Scotland	3
Occupiers' Liability (Scotland) Act 1960	Scotland	4

### Other relevant references

Reference title	Reference detail eg ISBN number	Element/s
<a href="#">About sentencing</a> , information and videos explaining how sentences are worked out	Sentencing Council	2, 3
Consulting workers on health and safety, Safety Representatives and Safety Committee Regulations 1977 (as amended) and Health and Safety (Consultation with Employees) Regulations 1996 (as amended), <a href="#">L146</a>	HSE Books, ISBN: 978-0-7176-6461-0	9
Controlling the risks in the workplace	<a href="#">HSE's controlling risks</a>	7
Enforcement Management Model ( <a href="#">EMM</a> )	HSE	3
Enforcement Policy Statement, <a href="#">HSE41</a>	HSE	3
<a href="#">Guidance on Risk Management</a> , Internal Control and Related Financial and Business Reporting (September 2014)	Financial Reporting Council	9

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Reference title	Reference detail eg ISBN number	Element/s
Guidance on permit-to-work systems. A guide for the petroleum, chemical and allied industries, <a href="#">HSG250</a>	HSE Books, ISBN: 978-0-7176-2943-5	8
Guidance on the application of Fees for Intervention (FFI), <a href="#">HSE47</a>	HSE Books, ISBN: 978-0-7176-6456-6	3
Guidelines for auditing management systems, BS EN ISO 19011:2011	ISBN: 978-0-5807-7524-6	6
<a href="#">Health and Safety Offences</a> , Corporate Manslaughter and Food Safety and Hygiene Offences, Definitive Guideline (effective from 1 February 2016)	Sentencing Council	2, 3
<a href="#">Hersey-Blanchard</a> Situational Leadership Theory		9
HSE's The Health and Safety Toolbox: how to control risks at work	<a href="#">The health and safety toolbox</a>	7
<a href="#">IIRSM Code of Ethics</a>		1, 11
<a href="#">IOSH Code of Conduct</a>		1, 11
Investigating accidents and incidents – a workbook for employers, unions, safety representatives and safety professionals, <a href="#">HSG245</a>	HSE Books	5
Involving your workforce in health and safety, <a href="#">HSG263</a>	HSE Books, ISBN: 978-0-7176-6227-2	9
Leading health and safety at work, <a href="#">INDG417</a>	IOD and HSE publication, HSE Books,	9, 11
Managing for health and safety, <a href="#">HSG65</a>	HSE Books, ISBN: 978-0-7176-6456-6	1, 7, 11
<a href="#">Manslaughter, Definitive Guideline</a>	Published by the Sentencing Council	2, 3
Occupational health and safety management systems – requirements	ISO 45001:2018 ISBN: 978-0-580-86393-6	1, 8
Occupational Safety and Health Consultants Register (OSHCR)	<a href="http://www.oshcr.org/">http://www.oshcr.org/</a>	11
Plan, Do, Check, Act, An introduction to managing for health and safety, <a href="#">INDG275</a>	HSE Books	1
Reducing error and influencing behaviour, <a href="#">HSG48</a>	HSE Books, ISBN: 978-0-7176-2452-2	10
Reducing risks, protecting people, <a href="#">R2P2</a>	HSE books, ISBN: 978-0-7176-2151-0	7
Reporting accidents and incidents at work, <a href="#">INDG453</a>	HSE Books	5
Risk assessment, A brief guide to controlling risks in the workplace, <a href="#">INDG163</a>	HSE Books	7
When a health and safety inspector calls, what to expect when we visit your premises, <a href="#">HSC14</a>	HSE Books	3

## **5.2 Unit B: Hazardous substances / agents**

### **Aim of the unit**

This unit provides learners with a thorough grounding in all major aspects of managing hazardous substances and agents. It aims to prepare learners for a career in health and safety by providing them with the ability to apply the knowledge and understanding of hazardous substances / agents in the workplace. In addition, this knowledge and understanding prepares learners for the written question paper assessment in Unit B and the practical application (Unit DNI) which will be carried out in their own workplace.

### **Element B1: Managing occupational health**

#### **Learning outcomes**

- B1.1 Outline the nature of occupational health
- B1.2 Outline the principles and benefits of the management of return to work including the role of outside support agencies
- B1.3 Outline the management of occupational health (including the practical and legal aspects).

#### **Content**

##### **B1.1 Nature of occupational health**

- The meaning of health (with reference to definition used by the World Health Organisation)
- The meaning of occupational health (with reference to definition used by the International Labour Organisation)
- The meaning of well-being (with reference to the definition used by the Economic and Social Research Council (ESRC))
- The categories of occupational health hazard – chemical, physical, biological, psycho-social, ergonomic
- The prevalence of work-related sickness and ill-health with reference to reportable and self-reported sources of information
- The links between occupational health and general/public health, with reference to current government strategy for managing health in relation to work including arrangements to deal with epidemics.

##### **B1.2 The principles and benefits of the management of return to work and vocational rehabilitation**

- The basic principles of the bio-psycho-social model and how it relates to the health of individuals
- The elements of the Equality Act 2010 that relate to health and wellbeing at work:
  - the definition of disability
  - employer responsibilities
  - the meaning of reasonable adjustment within the Act

- The principles of fitness to work and fitness to work standards
- The role and benefits of 'pre-placement' assessment
- The role of 'Fit Note' in returning an individual back to work following sickness
- Managing long-term and short-term frequent sickness absence/incapacity for work (with reference to PH19 – NICE)
- The meaning of vocational rehabilitation
- The benefits of vocational rehabilitation within the context of the employee and the employer
- Overcoming any barriers to ensure that rehabilitation of the individual is effective
- The need to undertake or review risk assessments prior to return to work
- Liaison with other disciplines in assessing and managing fitness for work with specific reference to; existing health problems, fitness to work standards, discrimination
- The role of agencies that can support the employers and employees, eg, Access to Work, 'Fit for Work' service etc.

### **B1.3 Managing occupational health**

- The role, function and benefits of occupational health services
- The make-up and roles of a typical occupational health service and the importance of determining competency: occupational health physician, occupational health nurse, occupational health adviser, occupational health technician
- Typical services offered by an occupational health service:
  - health promotion, eg, advice on work related health, lifestyle (diet, exercise, smoking etc)
  - health assessment, eg, fitness for work, pre-placement/employment, return to work, job-related medical screening, pregnant workers
  - advice to management, eg, input to risk assessments, no-smoking policy, absence management etc
  - treatment services, eg, first aid, counselling, physiotherapy, other rehabilitation services
  - medical and health surveillance
- The benefits of health needs assessment in relation to the planning of occupational health services
- The importance of auditing against standards in occupational health provision with specific reference to SEQOHS.

***Recommended tuition time not less than 7 hours***

## **Element B2: Identification, assessment and evaluation of hazardous substances**

### **Learning outcomes**

- B2.1 Explain the main routes of entry and the human body's defensive responses to hazardous substances
- B2.2 Explain the identification, classification and health effects of hazardous substances used in the workplace
- B2.3 Outline the factors to consider when undertaking assessment and evaluation of risks from hazardous substances
- B2.4 Outline the role of epidemiology and toxicological testing.

### **Content**

#### **B2.1 The routes of entry and the human body's defensive responses to hazardous substances**

- The structure and function of human anatomical systems: respiratory, digestive, circulatory, nervous system and the special sensory organs (skin, eyes and nose)
- The main routes, (eyes, nose, mouth, skin) and methods of entry (inhalation, ingestion, skin pervasion, injection, aspiration) of hazardous substances into the human body
- The concepts of target organs and target systems in relation to attack by hazardous substances; local and systemic effects
- The body's defensive responses (innate and adaptive) with particular reference to the respiratory system.

#### **B2.2 The identification, classification and health effects of hazardous substances used in the workplace**

- The influence of physical form (dust, fibre, fume, gas, mist, vapour, liquid) and properties (ie, solubility) on routes of entry
- The distinction between inhalable and respirable dust
- The purpose of classification and the role of hazard and precautionary statements for hazardous substances with reference to the Globally Harmonised System of Classification and Labelling of Chemicals (GHS) and the EC Regulation No 1272/2008 Classification, Labelling and Packaging of Substances and Mixtures (CLP)
- Health hazard classes (meaning of terms, with reference to chapter 3 of GHS) – acute toxicity, skin corrosion, skin irritation, serious eye damage, eye irritation, respiratory sensitisation, skin sensitisation, germ cell mutagenicity, carcinogenicity, reproductive toxicity, specific target organ toxicity (single and repeated exposure), aspiration hazard
- The purpose of the European Regulation Registration, Evaluation, Authorisation and restriction of Chemicals (REACH)

- Hazardous substances: hazard class/es, route/s of entry, target organ/s and likely acute/chronic health effect/s:
  - Carbon Monoxide
  - Isocyanates
  - metal working fluids
  - used engine oil
  - Silica
  - wood dusts (hard and soft wood)
  - asbestos.

### **B2.3 The assessment and evaluation of risk from hazardous substances**

- Information on substances or preparations/mixtures which have the potential to cause harm to be communicated to users: the typical content (format and types of data) of labels; Safety Data Sheets; Chemical Safety Assessments/Reports
- The factors to be considered in the assessment of risks to health from hazardous substances (with reference to COSHH, Regulation 6):
  - the hazardous properties of the substance, including health effects and the likely routes of exposure (eg, what is likely to get into the air and be inhaled (volatility (liquids) or dustiness (solids) or come into contact with skin/eyes or be swallowed)
  - the effect of mixtures (antagonism eg poison vs antidote, additivity and potentiation/synergy)
  - the quantity (amounts/concentration) in use ie, level of exposure
  - the operating conditions and processes used (eg, nature of the task, methods used, high temperature)
  - the range of uses of the chemicals (eg, production, handling)
  - the numbers of people exposed
  - the type and duration of exposure
  - the frequency of exposure
  - the variety and nature of tasks and the methods used (especially where exposure is likely to be unusually high eg maintenance and accidental release)
  - the thresholds of exposure (the amount needed to cause harm)
  - the consequences and likelihood of failure of existing control measures
  - the results from relevant health surveillance and exposure monitoring
  - individual susceptibilities (eg, atopic persons, women of child bearing capacity, age, sensitisation)
- Review of risk assessment – to take place when there is reason to suspect it is no longer valid or where significant change to the work to which the assessment relates has occurred.

### **B2.4 The role of epidemiology and toxicological testing**

- Human epidemiological investigations: the role of case control studies and cohort studies (retrospective and prospective)
- The role of toxicological testing: vertebrate animal testing, Ames test, Qualitative/Quantitative Structure Activity Relationship (QSAR), 'read across' and grouping
- The meaning of dose-response relationship, NOAEL, LD50, LC50.

***Recommended tuition time not less than 8 hours***

## **Element B3: The control of hazardous substances**

### **Learning outcomes**

- B3.1 Explain the principles of prevention and control of exposure to hazardous substances (including carcinogens and mutagens)
- B3.2 Outline the specific requirements for working with asbestos
- B3.3 Explain the uses and limitations of dilution ventilation and the purpose and operation of local exhaust ventilation, including assessing and maintaining effectiveness
- B3.4 Explain the effectiveness of various types of personal protective equipment (PPE) and the factors to consider in selection of PPE.

### **Content**

#### **B3.1 The prevention and control of exposure to hazardous substances (including carcinogens and mutagens)**

- The requirement for prevention and adequate control of exposure to hazardous substances (COSHH Regulation 7)
- The principles of good practice (COSHH, Schedule 2A), in order of priority (COSHH Regulations 2002, Regulation 7):
  - design and operate processes and activities to minimise emission, release and spread of substances hazardous to health
  - take into account all relevant routes of exposure – inhalation, skin absorption and ingestion – when developing control measures
  - control exposure by measures that are proportionate to the health risk
  - choose the most effective and reliable control options which minimise the escape and spread of substances hazardous to health
  - where adequate control of exposure cannot be achieved by other means, provide, in combination with other control measures, suitable personal protective equipment
  - check and review regularly all elements of control measures for their continuing effectiveness
  - inform and train all employees on the hazards and risks from the substances with which they work and the use of control measures developed to minimise the risks
  - ensure that the introduction of control measures does not increase the overall risk to health and safety
- The control of hazardous substances with reference to the hierarchy quoted in '*Working with substances hazardous to health (INDG136)*':
  - eliminate the use of a harmful product or substance and use a safer one
  - use a safer form of the product, ie, paste rather than powder
  - change the process to emit less of the substance
  - enclose the process so that the product does not escape
  - extract emissions of the substance near the source
  - have as few employees as possible in harm's way
  - provide appropriate personal protective equipment (PPE)

- Adequate control of carcinogens and mutagens (as low as is reasonably practicable) (COSHH, Regulation 7)
  - total enclosure
  - prohibition of eating and drinking in contaminated areas
  - designation and cleaning of contaminated areas and use of suitable warning signs
  - closed and labelled containers.

### **B3.2 The specific requirements for working with asbestos**

- Identification of types of asbestos
- Distinctions between licensed, notifiable non-licensed and non-licensed asbestos work
- Typical locations where asbestos can be found
- The duty to manage asbestos, including the types of asbestos surveys and keeping asbestos register/s
- The use of specialist contractors for removal and disposal of asbestos; checking competence of specialist contractors
- The control limits for working with asbestos.

### **B3.3 Ventilation**

- The uses and limitations of dilution ventilation for hazardous substances
- Roles and responsibilities in relation to Local Exhaust Ventilation (LEV):
  - the LEV owner (employer, employee - process operator and routine checks)
  - the LEV supplier (designer and installer)
  - the LEV service provider (commissioner, maintenance engineer, examiner)
  - overlap of roles
  - competence requirements for each of the roles
  - effective communication between all roles
- The typical components of an LEV and their function: hood (enclosing, receiving, capturing), ducting, air cleaner/arrestor, air mover (engine/fan), discharge/exhaust
- Source strength (area from which the contaminant arises) and capture zones
- Thorough examinations of LEV
  - the need for routine checks
  - the legal requirements for examinations/inspections
  - the competence of those carrying out the testing
  - the frequency of testing
  - understanding the risks from the system
  - co-operation between employer and examiner
  - the sources of information available to the examiner
  - the equipment required for testing
  - the three stages to carrying out testing
  - report on LEV testing
  - the interpretation of results and implementing recommendations.

### **B3.4 Personal protective equipment**

- The requirements of the Personal Protective Equipment at Work Regulations 1992 in relation to hazardous substances
- The types of PPE for use with hazardous substances
- Respiratory protective equipment (RPE):
  - the types of respirators and breathing apparatus and their applications and limitations
  - the selection of RPE:
    - atmosphere/substance-related factors: consideration of likely oxygen deficiency (ie, BA vs respirator); the level of protection required (significance of assigned protection factors); the type of filter required (for respirators)
    - task and work area related factors eg, work rate, duration; extremes of temperature and/or humidity; criticality of clear vision, communications and mobility; space constraints; tools used; presence of explosive atmospheres
    - wearer-related factors eg, fit/comfort/acceptability issues caused by beards, face-marking, spectacles, compatibility with other protective equipment or head coverings; medical conditions
    - quality related factors - conformity with relevant standards
  - face fit testing
- Skin and eye protection:
  - types of skin and eye protection and their applications and limitations
  - selection:
    - substance-related factors eg, chemical compatibility, level of protection required
    - task-related factors eg, duration (breakthrough time); choice between dexterity vs durability; choice of gloves vs gauntlets
    - wearer-related factors eg, fit/comfort, compatibility, acceptability
    - quality-related factors – conformity with relevant standards
- The storage and maintenance of PPE
- The need for training in the correct use of PPE.

***Recommended tuition time not less than 7 hours***

## **Element B4: The monitoring and measuring of hazardous substances**

### **Learning outcomes**

- B4.1 Explain how workplace exposure limits are used in the workplace
- B4.2 Outline the methods for sampling of airborne contaminants
- B4.3 Outline the principles of biological monitoring.

### **Content**

#### **B4.1 Workplace exposure limits (WELs)**

- The concept of WELs
- The meaning of WELs
- How WELs are established: the work of the Workplace Health Expert Committee (WHEC) and other sub-committees; criteria used
- The status and use of EH40
- The significance in occupational health and hygiene practice of short-term and long-term exposure limits (STEL, LTEL) and time-weighted average (TWA) values.

#### **B4.2 Strategies, methods and equipment for the sampling and measurement of airborne contaminants**

- The role of the occupational hygienist; the competence of hygienist
- Interpreting a hygienist's report, ensuring the strategy and methods are suitable and that results are valid, reliable, representative and correctly evaluated relative to any exposure standards
- Monitoring strategy (ref HSG173):
  - initial appraisal
  - basic survey
  - detailed survey
  - reappraisal
  - routine monitoring and factors that determine the necessity and frequency (including where this is mandatory – COSHH Regulation 10)
  - the difference between static and personal monitoring
  - the importance of using standard methods (MDHS series)
- Direct reading instruments (give immediate or near immediate reading); advantages and disadvantages; stain tube (colour metric) detectors
- General equipment and methodology for *personal* sampling of solid particulates (fibres; respirable and/or inhalable dusts):
  - sampling heads (IOM\*, cowl, protected, cyclone)
  - pump (calibrated)
  - measurement principles: dusts (gravimetric, physical and chemical analysis), fibres (microscopy)

- General equipment and methodology for *personal* sampling of vapours:
  - active devices (eg, liquid or solid sorbents and pumps)
  - passive devices
  - measurement principles (chemical and physical analysis techniques such as spectroscopy and chromatography)
- The calculation of 8 hour equivalent TWA exposures from gathered data (ie, sample mass, pump flow rate and flow time); comparison with LTEL and evaluation of significance in terms of further action needed.

### **B4.3 Biological monitoring**

- The distinction between general health assessment and health surveillance
- The elements of the HSE health surveillance cycle (with reference to <http://www.hse.gov.uk/health-surveillance/assets/documents/health-surveillance-cycle.pdf>)
- The legal requirements for medical surveillance with reference to Control of Substances Hazardous to Health Regulations, Control of Lead at Work Regulations, Control of Asbestos Regulations and Ionising Radiation Regulations
- The legal requirements for keeping health records and medical records including issues of confidentiality, sharing of information with the individual and others
- Biological monitoring (a form of health surveillance) personal sampling/monitoring, as opposed to approximate airborne monitoring:
  - the basic principles (with workplace examples)
  - the circumstances where it is especially applicable
  - the role of biological monitoring guidance values (in EH40)
  - the relative advantages and disadvantages when compared to airborne monitoring
  - statutory biological limits (eg, Control of Lead at Work Regulations, Regulation 10)
  - blood-lead concentration and urinary-lead concentration action levels and suspension levels.

### ***Recommended tuition time not less than 6 hours***

\* IOM – invented by the Institute of Occupational Medicine

## **Element B5: Biological agents**

### **Learning outcomes**

- B5.1 Explain the types and properties of biological agents found at work
- B5.2 Explain the assessment and control of risk from deliberate and non-deliberate exposure to biological agents at work.

### **Content**

#### **B5.1 Types and properties of biological agents**

- The meaning of 'biological agent' with reference to the Control of Substances Hazardous to Health Regulations 2002 (as amended)
- The main types of biological agent (fungi, bacteria, viruses, protozoa) and sources (human, animal and environmental); with examples in each case
- The special properties of biological agents (rapid mutation, incubation period, infectious, rapid multiplication)
- Zoonotic/Vector-borne diseases: occupational contexts, occurrence, symptoms, target organs and control:
  - Animal Influenza
  - Cryptosporidiosis
  - Malaria
  - Psittacosis
- Biological agents: occupational contexts, occurrence, symptoms, target organs and control:
  - Blood-borne viruses ie, Hepatitis B, C, D and Human Immunodeficiency Virus (HIV)
  - Legionella
  - Leptospira
  - Norovirus.

#### **B5.2 The assessment and control of risk from exposure to deliberate and non-deliberate biological agents**

- Distinction between deliberate work (eg, in laboratories) vs. non-deliberate infection (eg, farming, sewers, refuse collection)
- Purpose of the Approved List of Biological Agents
- Reportable diseases caused by biological agents (eg, needle-stick injuries)
- The factors to take into account in risk assessment:
  - hazard category, (Groups 1, 2, 3 and 4 of COSHH Schedule 3)
  - the criteria for categorisation
  - the pathogenicity of the agent and infectious dose
  - the activities and people at risk
  - the likelihood and nature of resultant disease
  - the modes of transmission with examples
  - the stability of the agent in the environment
  - the concentration and amounts

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- the presence of a suitable host (human or animal)
  - data available (ie, animal studies)
  - the nature of activity (ie, aerosol formation, genetic manipulations)
  - the local availability of prophylaxis/treatment
- Special control measures required when working with biological agents (with reference to COSHH Schedule 3, Part I(3)).

***Recommended tuition time not less than 5 hours***

## **Element B6: Noise and vibration**

### **Learning outcomes**

- B6.1 Explain the basic physical concepts relevant to noise
- B6.2 Explain the effects of noise on the individual and the use of audiometry
- B6.3 Explain the measurement and assessment of noise exposure
- B6.4 Explain the principles and methods of controlling noise and noise exposure
- B6.5 Explain the basic physical concepts relevant to vibration
- B6.6 Explain the effects of vibration on the individual
- B6.7 Explain the measurement and assessment of vibration exposure
- B6.8 Explain the principles and methods of controlling vibration and vibration exposure.

### **Content**

#### **B6.1 The basic physical concepts relevant to noise**

- The meaning of noise under the Control of Noise at Work Regulations 2005, with workplace examples
- The basic concepts of sound:
  - nature (progressive longitudinal wave, transmitted through the displacement of the medium through which it travels)
  - wave properties - wavelength, amplitude, frequency/pitch
  - the concepts of sound pressure, sound intensity
  - the decibel (dB) scale and its logarithmic nature (with workplace examples at different sound levels)
  - human auditory frequency sensitivity and the significance of A-weighting 'dB(A)' and C weighting 'dB(C)', in relation to occupational noise exposure
- The concept of equivalent noise dose ( $LA_{eq}$ ,  $L_{EP,d}$ , weekly and peak).

#### **B6.2 Effects of noise on the individual**

- The physiology of the ear in relation to the mechanism of hearing
- The physical and psychological effects on the individual; types of hearing loss with reference to their significance in the workplace, the acute and chronic physiological effects of exposure to high noise levels (ie, noise induced hearing loss, instantaneous hearing loss, temporary threshold shift, permanent threshold shift, Tinnitus)
- Health surveillance:
  - the legal requirements for audiometry as required by the Control of Noise at Work Regulations 2005 and Controlling Noise at Work, Guidance on Regulations, L108
  - the circumstances when it may be required (pre-employment, periodic, based on findings of workplace assessments, following complaints etc)

- the use of audiometry to measure hearing and hearing loss; method, interpretation and the use of results (interpretation of audiograms), the advantages and disadvantages of audiometry programmes including civil law implications of audiometry.

### **B6.3 The measurement and assessment of noise exposure**

- Noise risk assessment to consider:
  - the risk of hearing impairment, impairment of communications, fatigue
  - the identification of sources, tasks
  - the expected noise emission levels from equipment
  - the expected time of exposure
  - planning (who, how, where, how often)
  - the types of instrumentation
  - the importance of calibration
  - the types of measurements to be taken
  - the use of specialist noise consultants
  - the interpretation and evaluation of results
  - the use of noise calculators to determine mixed exposures
  - comparison with legal limits to make control decisions.

### **B6.4 Controlling noise and noise exposure**

- Legal requirements and duties to manage exposure to noise as required by Control of Noise at Work Regulations 2005
- Lower and upper exposure action values, exposure limit values
- The hierarchy of noise control:
  - eliminate/control at source (substitution, damping, workplace layout (eg, relocation of all noisy equipment), re-design of equipment/task, maintenance, purchasing policy)
  - control along transmission path:
    - the behaviour of sound at interfaces – transmission, reflection, absorption
    - sound reduction indices and absorption coefficients and their use in materials selection
    - techniques of damping, isolation, diffusion, barriers, acoustic enclosures, distance
    - active noise cancellation
  - control exposure at the receiver (acoustic havens, hearing protection zones, and PPE, limiting exposure time, role of health surveillance (audiometry, referenced earlier)
- The selection, maintenance and use of appropriate hearing protection:
  - the types of hearing protection
  - the use of octave band analysis to aid selection of hearing protection and other control measures
  - SNR (single number rating) and HML (high, medium, low) methods
  - the problems of over-protection.

### **B6.5 The basic physical concepts relevant to vibration**

- The meaning of vibration as defined in the Control of Vibration at Work Regulations 2005
- The basic concepts of displacement, velocity, amplitude, frequency and acceleration for oscillating particles in relation to:
  - occupational vibration exposure, with examples of machinery and their typical emission levels
  - comfort levels
  - the concept of vibration dose A(8).

### **B6.6 The effects of vibration on the individual**

- The groups of workers at risk from, and the physiological and ill-health effects of, exposure to:
  - whole body vibration (WBV)
  - hand-arm vibration (HAV), including aggravating factors (eg, low temperatures, smoking) and the use of the Stockholm scale to indicate severity.

### **B6.7 The measurement and assessment of vibration exposure**

- Vibration risk assessment to consider:
  - the risk of ill-health
  - the results of health surveillance
  - the identification of sources, tasks
  - the expected vibration emission levels from equipment
  - the expected time of exposure
  - exposure to cold, nature of the vibration (WBV, HAV etc)
  - planning (who, how, where, how often)
  - instrumentation for carrying out vibration assessments
  - the importance of calibration
  - the types of measurements to be taken
  - the use of specialist consultants
  - the interpretation and evaluation of results
  - the use of vibration calculators to determine mixed exposures
  - comparison with legal limits to make control decisions.

### **B6.8 Controlling vibration and vibration exposure**

- The legal requirements and duties to manage exposure to vibration as required by the Control of Vibration at Work Regulations 2005
- Practical control measures to prevent or minimise exposure to both WBV and HAV including:
  - automation
  - change of work method
  - improved/alternative equipment
  - purchasing policy
  - maintenance
  - job rotation

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- instruction/training
- the use and limitations of PPE.

***Recommended tuition time not less than 10 hours***

## **Element B7: Radiation**

### **Learning outcomes**

- B7.1 Outline the nature of the different types of ionising and non-ionising radiation
- B7.2 Explain the effects of exposure to non-ionising radiation, its measurement and control
- B7.3 Outline the effects of exposure to ionising radiation, its measurement and control
- B7.4 Outline the different sources of lasers found in the workplace, the classification of lasers and the control measures.

### **Content**

#### **B7.1 The nature and different types of ionising and non-ionising radiation**

- The distinction between ionising and non-ionising radiation
- The electromagnetic spectrum:
  - Gamma ray, X-ray, optical (ie, ultraviolet (UV), visible, infra-red (IR)) and radiofrequency (ie, microwaves, radio waves) with examples of origins and sources (occupational and natural)
  - electromagnetic (EM) wave properties - wavelength, frequency, energy
- Particulate radiation properties (alpha, beta, neutrons), with examples of origins and sources (occupational and natural)
- The role of the International Commission for Radiological Protection, Public Health England, Health Protection Scotland and the Environment Agency/Scottish Environment Protection Agency and the Office for Nuclear Regulation.

#### **B7.2 Non-ionising radiation**

- Sources of non-ionising Radiation:
  - workplace examples: leisure industry, manufacturing, healthcare, research, telecommunications
  - naturally occurring (sunlight): indoor / outdoor work
- The routes and effects of exposure, both acute and chronic:
  - damage to eyes: early onset of cataract risk, photokeratitis and photoconjunctivitis ('arc eye'), photochemical damage to the retina (blue light hazard),
  - damage to skin – reddening of the skin (erythema), burns, skin cancer
- The concept of exposure values and limits with examples ie, Specific Absorption Rate values and limits

- Radiation risk assessment to consider:
  - sources of non-ionising radiation
  - the comparison of measured exposure levels with exposure limits and values (where applicable)
  - the potential for misuse or misunderstanding of safety precautions
- The control measures to prevent or minimise exposure to non-ionising radiation both generated in workplaces and naturally occurring including:
  - design
  - siting
  - direction control
  - reduction of stray fields/beams
  - screening
  - enclosures
  - distance
  - safe systems of work
  - instructions
  - training
  - personal protective equipment
- General duties to manage exposure to non-ionising radiation as required by existing legislation.

### **B7.3 Ionising radiation**

- Sources of ionising radiation:
  - workplace examples: manufacturing, healthcare, research, power generation
  - naturally occurring: radon
- The units (mSv) and concepts of ionising radiation:
  - radioactivity, half-life, absorbed dose, equivalent dose, effective dose, dose rates
- The routes and effects of exposure to each type of ionising radiation (alpha, beta, gamma, x-rays, neutrons):
  - somatic (early/acute, late/chronic)
  - genetic
- The measurement and assessment of ionising radiation workers exposure:
  - the use of passive dosimeters: thermoluminescent dosimeters (TLDs) to measure whole body dose and extremity dose
  - the use of active dosimeters: personal alarm dosimeters
  - dose assessment and recording: approved dosimetry service, communicating information to classified persons, record keeping
- Practical measures to prevent or minimise exposure to:
  - external ionising radiation (shielding, distance, time)
  - internal ionising radiation (preventing inhalation, ingestion, entry through the skin including contaminated wounds and absorption through the skin)
- Legal requirements to minimise occupational exposure to ionising radiation as required by Ionising Radiations Regulations 2017.

#### **B7.4 Lasers**

- Typical laser sources in workplaces (entertainment, retail, manufacturing, healthcare, research)
- Hazard classifications of lasers (British Standard BS EN 60825-1:2014), exposure limits
- The routes and effects of exposure to lasers:
  - damage to the eyes from laser beams/IPL (intense pulsed light) including blindness
  - damage to the skin – reddening of the skin (erythema) and burns
- The control measures to prevent or minimise exposure to lasers used in workplaces including:
  - design
  - siting
  - direction control
  - reduction of stray beams
  - screening
  - enclosures
  - distance
  - safe system of work/instructions
  - training
  - PPE
- The legal requirements to manage exposure to lasers
- Role and competency of a “Laser Protection Adviser”.

***Recommended tuition time not less than 6 hours***

## **Element B8: Mental ill-health and dealing with violence and aggression at work**

### **Learning outcomes**

- B8.1 Explain the effects and causes of common types of mental ill-health within the workplace
- B8.2 Explain the identification and control of workplace mental ill-health with reference to legal duties and other standards
- B8.3 Explain the scope, effects and causes of work-related violence/aggression
- B8.4 Explain the identification and control of work-related violence/aggression with reference to legal duties.

### **Content**

#### **B8.1 The extent, effects and causes of mental ill-health at work**

- The prevalence of mental ill-health within the workplace with reference to reportable and self-reported sources of information
- The characteristics of common types of mental ill-health observed within the workplace and their effects on an individual's health and behaviour:
  - depression
  - anxiety
- The meaning of work-related stress
- The causes of **work-related** mental ill-health relating to organisation, job and individual:
  - organisation of work: working hours, long hours, shift work, unpredictable hours, changes in working hours
  - workplace culture: communication, organisational structure, resources, support
  - working environment: space, noise, temperature, lighting, etc
  - job content: work load, time pressures, boredom, etc
  - job role: clarity, conflict of interests, lack of control, etc
  - relationships: bullying and harassment, verbal/physical abuse
  - home-work interface: commuting, childcare issues, relocation, etc
- Recognition that common mental health problems found within the workplace are rarely entirely due to work-related factors, but are a combination of a number of factors.

#### **B8.2 The identification and control of work-related mental ill-health, legal duties and standards**

- Recognition that most people with mental health problems can continue to work effectively and how this can be facilitated / supported by employers
- The identification and assessment of work-related mental ill-health at individual and organisational level (eg, discussions, absence data, interviews, surveys, questionnaires, etc)

- Practical control measures to reduce and manage work-related stress based on the HSE management standards (including counselling and return to work policies)
- The HSE stress management standards and their role in assessing and managing work related stress (demand, control, support, relationships, role, change)
- Legal requirements for employers to manage work-related stress as part of criminal and civil law with reference to relevant statutory provisions and case law examples, Sutherland v Hatton and others [2002]; Walker v Northumberland County Council [1995]; Barber v Somerset County Council [2004]; Intel Corporation (UK) Limited v Daw [2007].

### **B8.3 The scope, effects and causes of work-related violence/aggression**

- The meaning of work-related violence/aggression (physical/verbal, actual harm and threats)
- The physical and psychological effects of violence and aggression
- The prevalence/extent of work-related violence/aggression and consequences with reference to reportable and self-reported sources (ie, RIDDOR, Crime Survey England and Wales / Scottish Crime Survey / Northern Ireland Crime Survey):
  - the difficulty of quantifying prevalence between reportable and non-reported sources
- The factors likely to increase the risk of work-related violence, eg, people working with the public, the caring/teaching professions, working with psychiatric clients or alcohol/drug impaired people, working alone, home visiting, handling money/valuables, inspection and enforcement duties, retail and licensed trade
- The legal requirements for employers to manage work related violence as part of criminal and civil law with reference to relevant statutory provisions and case law examples, O'Toole v First Quench [2005]; Mitchell and Others v United Co-operative Ltd [2012].

### **B8.4 The identification and control of workplace violence/aggression**

- The identification and assessment of risks of work-related violence/aggression (eg, use of staff surveys, incident reporting and risk assessment)
- The identification of practical control measures to reduce and manage work-related violence/aggression including using physical, organisational and behavioural controls:
  - cash free systems, the layout of public areas and the design of fixtures and fittings
  - the use of cameras, protective screens, and security-coded doors
  - communication systems, passing on information on risks from individual clients (violent marker flags), recording of staff whereabouts and recognition when staff are overdue, the use of mobile communications equipment phones, radios, GPS)
  - staff training: recognition of situations where violence could result, interpersonal skills to defuse aggression, the use of language and body language; guidance to staff on dealing with an incident; support for staff post-incident including training in counselling for managers

**Decided cases**

- Sutherland v Hatton and others [2002] EWCA Civ76
- Walker v Northumberland County Council [1995] IRLR 35
- Barber v Somerset County Council [2004] UKHL 13
- Intel Corporation (UK) Limited v Daw [2007] EWCA Civ 70
- O'Toole v First Quench [2005]
- Mitchell and Others v United Co-operatives Ltd [2012]

***Recommended tuition time not less than 6 hours***

## **Element B9: Musculoskeletal risks and controls**

### **Learning outcomes**

- B9.1 Outline types, causes and relevant workplace examples of injuries and ill-health conditions associated with repetitive physical activities, manual handling and poor posture
- B9.2 Explain the assessment and control of risks from repetitive activities, manual handling and poor posture.

### **Content**

#### **B9.1 The types, causes and examples of musculoskeletal injuries and ill-health**

- Basic understanding of the human musculoskeletal system, including bones, tendons, ligaments, nerves and muscles
- The types of injury and ill-health conditions resulting from repetitive physical activities, manual handling and poor posture, including: WRULDs, musculoskeletal injury and discomfort, back pain, eye and eyesight effects, fatigue, stress, sprains/strains, fractures, lacerations
- Examples of jobs and workplace situations that give rise to risks of these injuries and ill-health conditions, eg, production/assembly lines, working in restricted work spaces, use of DSE, manual handling of objects and people.

#### **B9.2 The assessment and control of risks from repetitive physical activities, manual handling and poor posture**

- The legal requirements to manage risks associated with repetitive physical activities, manual handling and poor posture, with specific reference to duties under:
  - Management of Health and Safety at Work Regulations 1999
  - Manual Handling Operations Regulations 1992
  - Health and Safety (Display Screen Equipment) Regulations 1993
  - Workplace (Health, Safety and Welfare) Regulations 1992
- The principles of ergonomic design as applied to the control of musculoskeletal risks
- Consideration of: task, load, force, working environment, equipment, individual capability when assessing risks associated with repetitive physical activities, manual handling and poor posture
- The methods of assessing the risks associated with jobs/tasks involving repetitive physical activities, manual handling and poor posture
- The appropriate application of the following assessment tools:
  - HSE Manual Handling Assessment Tool (MAC)
  - HSE Assessment tool for repetitive tasks of the upper limbs (ART)
  - HSE Variable Manual Handling Assessment chart (V-MAC)
  - appendix 5 (VDU checklist) from HSE guidance (L26)
  - NIOSH Manual Material Handling (MMH) Checklist
  - Rapid Upper Limb Assessment (RULA)

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- Practical control measures to avoid or minimise the risk associated with repetitive physical activities, manual handling and poor posture including:
  - elimination
  - automation
  - alternative work methods/job design
  - ergonomic design of tools/equipment/workstations and workplaces
  - job rotation
  - work routine
  - eye and eyesight testing
  - training and information
  - efficient movement principles
  - personal considerations.

***Recommended tuition time not less than 5 hours***

## **Element B10: Work environment risks and controls**

### **Learning outcomes**

- B10.1 Explain the need for, and factors involved in, the provision and maintenance of temperature in both moderate and extreme thermal environments
- B10.2 Explain the need for suitable and sufficient lighting in the workplace, units of measurement of light and the assessment of lighting levels in the workplace
- B10.3 Explain the need for welfare facilities and arrangements in fixed and temporary workplaces
- B10.4 Explain the requirements and provision for first aid in the workplace.

### **Content**

#### **B10.1 The need for, and factors involved in, the provision and maintenance of temperature in both moderate and extreme thermal environments**

- The importance of maintaining heat balance in the body
- The effects of working in high and low temperatures and humidity
- Typical work situations likely to lead to thermal discomfort
- The environmental parameters affecting thermal comfort (air temperature, radiant temperature, relative humidity, air velocity)
- The meaning of thermal comfort and the legal duty to provide a 'reasonable' temperature for inside workplaces
- Equipment for measuring environmental parameters: thermometers; dry bulb, wet bulb, globe, anemometers, psychrometers, integrated electronic instruments including heat stress monitors
- Other parameters affecting thermal comfort: metabolic rate, clothing, sweat rate, duration of exposure
- The purpose of the heat stress index WBGT
- The practical control measures to minimise the risks when working in extreme thermal environments:
  - control heat source
  - control other environmental parameters
  - separation
  - workplace design
  - job design including job rotation
  - providing hot/cold drinks
  - clothing/PPE
  - health surveillance
  - training.

**B10.2 Suitable and sufficient lighting in the workplace, the units of measurement of light and the assessment of lighting levels in the workplace**

- Legal requirements for providing suitable and sufficient lighting in workplaces
- The necessity for lighting in workplaces
- The impact of lighting levels on safety issues – incorrect perception, failure to see clearly, stroboscopic effects, colour assessment, effect on attitudes
- ‘Suitable and sufficient lighting’, natural and artificial lighting, emergency/backup situations ie, failure of lighting in critical areas such as operating theatres
- The effects of brightness contrast – disabling and discomfort glare, eye damage from light exposure, visual fatigue
- Instrumentation, units (Lux) and measurement of light, assessment of lighting levels and standards; distinction between minimum lighting levels required for safety and higher levels often implemented taking account of ie,, amenity, productivity, cost-effectiveness.

**B10.3 Welfare facilities and arrangements in fixed and temporary workplaces**

- The legal requirements for welfare facilities and arrangements in fixed and temporary workplaces
- The provision of toilet, washing and changing facilities
- The storage of clothing
- Facilities for eating, rest rooms
- Facilities for pregnant women and nursing mothers, together with the practical arrangements
- The provision of facilities for smokers, company vehicles, care homes and flats where residents smoke
- The need to take account of disabled persons.

**B10.4 The requirements and provision for first aid in the workplace**

- Legal requirements for first aid in the workplace
- The basis of provision (numbers of employees, workplace risks and their assessment, proximity of emergency services etc)
- Typical arrangements eg, people, equipment and training.

***Recommended tuition time not less than 5 hours***

## Unit B: Tutor References

### Statutory instruments

Legislation	Country	Element/s
Directive 2013/35/EU on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (electromagnetic fields) (or equivalent regulations)	European Directive	7
Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), 18 December 2006 and subsequent amendments	European Regulation	2
Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures	European Regulation	2, 3
Regulation (EU) 2016/425 on personal protective equipment at work	European Regulation	3, 6
Control of Artificial Optical Radiation at Work Regulations 2010	UK / Great Britain	7
Control of Asbestos Regulations 2012	UK / Great Britain	3, 4
Control of Electromagnetic Fields at Work Regulations 2016	UK / Great Britain	7
Control of Lead at Work Regulations 2002	UK / Great Britain	4
Control of Noise at Work Regulations 2005	UK / Great Britain	6
Control of Substances Hazardous to Health Regulations 2002 (as amended)	UK / Great Britain	2, 3, 4, 5
Control of Vibration at Work Regulations 2005	UK / Great Britain	6
Criminal Law Act 1967, section 3 (reasonable force)	UK / Great Britain	8
Employment Rights Act 1996	UK / Great Britain	8
Equality Act 2010	UK / Great Britain	1
Health Act 2006 (Part 1)	UK / Great Britain	10
Health and Safety at Work etc, Act 1974	UK / Great Britain	7
Health and Safety (Display Screen Equipment) Regulations 1992 (as amended)	UK / Great Britain	9
Health and Safety (First-Aid) Regulations 1981 (as amended)	UK / Great Britain	10
Ionising Radiations Regulations 2017	UK / Great Britain	4, 7
Management of Health and Safety at Work Regulations 1999 (as amended)	UK / Great Britain	7, 9
Manual Handling Operations Regulations 1992 (as amended)	UK / Great Britain	9
Personal Protective Equipment at Work Regulations 1992	UK / Great Britain	3, 6
Personal Protective Equipment (Enforcement) Regulations 2018	UK / Great Britain	3, 6
Public Order Act 1986	UK / Great Britain	8

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<b>Legislation</b>	<b>Country</b>	<b>Element/s</b>
REACH Enforcement Regulations 2008 (as amended)	UK / Great Britain	2
Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013	UK / Great Britain	8
Working Time Regulations 1988	UK / Great Britain	8
Workplace (Health, Safety and Welfare) Regulations 1992	UK / Great Britain	7, 9, 10
Smoke-free (Premises and Enforcement) Regulations 2006	England	10
Control of Asbestos Regulations (Northern Ireland) 2012	Northern Ireland	3, 4
Control of Electromagnetic Fields at Work Regulations (Northern Ireland) 2016	Northern Ireland	7
Control of Lead at Work Regulations (Northern Ireland) 2003	Northern Ireland	4
Control of Noise at Work Regulations (Northern Ireland) 2006	Northern Ireland	6
Control of Substances Hazardous to Health Regulations (Northern Ireland) 2003	Northern Ireland	2, 3, 4, 5
Control of Vibration at Work Regulations (Northern Ireland) 2005	Northern Ireland	6
Ionising Radiations Regulations (Northern Ireland) 2017	Northern Ireland	4, 7
Management of Health and Safety at Work Regulations (Northern Ireland) 2000	Northern Ireland	7, 9
Personal Protective Equipment at Work Regulations (Northern Ireland) 1993	Northern Ireland	3, 6
Smoking (Northern Ireland) Order 2006	Northern Ireland	10
Workplace (Health, Safety and Welfare) Regulations (Northern Ireland) 2000	Northern Ireland	7
Inquiries into Fatal Accidents and Sudden Deaths etc. (Scotland) Act 2016	Scotland	3
Prohibition of Smoking in Certain Premises (Scotland) Regulations 2006	Scotland	10
Smoking, Health and Social Care (Scotland) Act 2005	Scotland	10
Smoke-free Premises etc. (Wales) Regulations 2007	Wales	10

### Other relevant references

<b>Reference title</b>	<b>Reference detail eg ISBN number</b>	<b>Element/s</b>
<a href="#">A healthy return</a> , Good practice guide to rehabilitating people at work	IOSH	1
Asbestos: The survey guide, <a href="#">HSG264</a>	HSE Books, ISBN: 978-0-7176-6502-0	3
Assessment of Repetitive Tasks ( <a href="#">ART</a> ) Tool	HSE	9

*The Guide to the NEBOSH National Diploma in Occupational Health and Safety  
(November 2015 specification)*

Reference title	Reference detail eg ISBN number	Element/s
Controlling airborne contaminants at work; A guide to local exhaust ventilation (LEV), <a href="#">HSG258</a>	HSE Books, ISBN: 978-0-7176-6415-3	3
Controlling Noise at Work, The Control of Noise at Work Regulations, Guidance on Regulations, <a href="#">L108</a>	HSE Books, ISBN: 978-0-7176-6164-4	6
Control of lead at work, Approved Code of Practice and guidance, <a href="#">L132</a>	HSE Books, ISBN: 978-0-7176-2565-6	4
Control of Substances Hazardous to Health, Approved Code of Practice and guidance, <a href="#">L5</a>	HSE Books, ISBN: 978-0-7176-6582-2	2, 3, 4
<a href="#">COSHH Essentials</a>	HSE	2, 3, 4
Drug misuse at work a guide for employers, <a href="#">INDG91</a>	HSE Books	8
<a href="#">EH40</a> /2005 Workplace exposure limits (as amended), third edition	HSE Books, ISBN: 978-0-7176-6446-7	4
Electromagnetic fields at work, A guide to the Control of Electromagnetic Fields at Work Regulations, <a href="#">HSG281</a>	HSE Books	7
Ergonomics and human factors at work, <a href="#">INDG90</a>	HSE Books	9
First aid at work, Guidance on Regulations, third edition, <a href="#">L74</a> (amended 2018)	HSE Books, ISBN: 978-0-7176-6560-0	10
Globally Harmonized System of Classification and Labelling of Chemicals ( <a href="#">GHS</a> )	United Nations	2
<a href="#">Guidance</a> for Employers on the Control of Artificial Optical Radiation at Work Regulations (AOR) 2010	HSE Books	7
Hand-arm vibration, Control of Vibration at Work Regulations 2005, Guidance on Regulations, <a href="#">L140</a>	HSE Books, ISBN: 978-0-7176-6125-1	6
Hand-arm vibration exposure <a href="#">calculator</a>	HSE	6
<a href="#">Health Surveillance Cycle</a>	HSE	4
How to tackle work-related stress. A guide for employers on making the Management Standards work, <a href="#">INDG430</a>	HSE Books	8
<a href="#">Laser radiation: safety advice</a>	Public Health England	7
Lighting at Work, <a href="#">HSG38</a>	HSE Books, ISBN: 978-0-7176-1232-1	10
Managing asbestos in buildings: a brief guide, <a href="#">INDG223</a>	HSE Books,	3
Managing and working with asbestos, Control of Asbestos Regulations 2012, Approved Code of Practice and guidance, <a href="#">L143</a>	HSE Books, ISBN: 978-0-7176-6618-8	3
Managing skin exposure risks at work, <a href="#">HSG262</a>	HSE Books, ISBN: 978-0-7176-6649-2	2
Manual handling assessment charts ( <a href="#">MAC tool</a> )	HSE	9
Manual Handling, Manual Handling Operations Regulations 1992 (as amended), Guidance on Regulations, <a href="#">L23</a>	HSE Books, ISBN: 978-0-7176-6653-9	9

*The Guide to the NEBOSH National Diploma in Occupational Health and Safety  
(November 2015 specification)*

Reference title	Reference detail eg ISBN number	Element/s
Methods for the Determination of Hazardous Substances ( <a href="#">MDHS</a> ) guidance	HSE	4
Monitoring strategies for toxic substances, <a href="#">HSG173</a>	HSE Books, ISBN: 978-0-7176-6188-6	4
<a href="#">Noise calculators</a>	HSE	6
Personal protective equipment at work, Guidance on Regulations, <a href="#">L25</a>	HSE Books, ISBN: 978-0-7176-6597-6	3, 6
Personal protective equipment (PPE) at work; A brief guide, <a href="#">INDG174</a>	HSE Books	3, 6
<a href="#">UK Radon</a>	Public Health England	7
<a href="#">Radon in the workplace</a>	HSE website	7
Respiratory protective equipment at work; A practical guide, <a href="#">HSG53</a>	HSE Books, ISBN: 978-0-7176-6454-2	3
Safe, Effective, Quality Occupational Health Service ( <a href="#">SEQOHS</a> )		1
Safety of laser products; equipment classification and requirements BS 60825-1:2014	ISBN: 978-0-580-77969-5	7
Seating at Work, <a href="#">HSG57</a>	HSE Books, ISBN: 978-0-7176-1231-4	9
<a href="#">Stress Management Standards</a>	HSE	8
Tackling work-related stress using the Management Standards approach. A step-by-step workbook, <a href="#">WBK1</a>	HSE Books	8
The health and safety toolbox, How to control risks at work, <a href="#">HSG268</a>	HSE Books, ISBN: 978-0-7176-6587-7	6, 9
Upper Limb Disorders in the Workplace, <a href="#">HSG60</a>	HSE Books, ISBN: 978-0-7176-1978-8	9
Variable manual handling assessment chart ( <a href="#">V-MAC</a> ) tool	HSE	9
Violence at work: A guide for employers, <a href="#">INDG69</a>	HSE Books	8
<a href="#">Whole body vibration calculator</a>	HSE	6
Whole-body vibration; The Control of Vibration at Work Regulations 2005, Guidance on Regulations, <a href="#">L141</a>	HSE Books, ISBN: 978-0-7176-6126-8	6
Working together to reduce stress at work, A guide for employees, <a href="#">INDG424</a>	HSE Books	8
Working with display screen equipment (DSE): A brief guide <a href="#">INDG36</a>	HSE Books	9
Workplace health, safety and welfare, Workplace (Health, Safety and Welfare) Regulations 1992, ACOP, <a href="#">L24</a>	HSE Books, ISBN: 978-0-7176-0413-5	7, 9, 10
Work with display screen equipment: Health and Safety (Display Screen Equipment) Regulations 1992 as amended by the Health and Safety (Miscellaneous Amendments) Regulations 2002: Guidance on Regulations, <a href="#">L26</a>	HSE Books, ISBN: 978-0-7176-2582-6	9
Working with ionising radiation, Approved Code of Practice and guidance, <a href="#">L121</a> approved, no longer in draft	HSE Books, ISBN: 978-0-7176-6662-1	7
Working with substances hazardous to health, a brief guide to COSHH <a href="#">INDG136</a>	HSE Books	3

*The Guide to the NEBOSH National Diploma in Occupational Health and Safety  
(November 2015 specification)*

Reference title	Reference detail eg ISBN number	Element/s
Workplace health: long-term sickness absence and incapacity to work, ( <a href="#">PH19</a> )	NICE guidelines	1

## **5.3 Unit C: Workplace and work equipment safety**

### **Aim of the unit**

This unit provides learners with a thorough grounding in all major aspects of health and safety. It aims to prepare learners for a career in health and safety by providing them with the ability to apply their knowledge and understanding of workplace and work equipment safety issues in the workplace. In addition, this knowledge and understanding prepares learners for the written question paper assessment in Unit C and the practical application (Unit DNI) which will be carried out in their own workplace.

### **Element C1: Workplace welfare requirements and specific workplace issues**

#### **Learning outcomes**

- C1.1 Explain the need for, and factors involved in, the provision and maintenance of a safe working environment
- C1.2 Explain the hazards, risks and control measures associated with work in confined spaces
- C1.3 Outline the main issues associated with maintaining structural safety of workplaces
- C1.4 Explain the hazards, risks, and controls when working at height
- C1.5 Explain the hazards, risks and controls for lone working.

#### **Content**

##### **C1.1 Safe working environment**

- Legal requirement to manage workplaces with reference to the Workplace (Health, Safety and Welfare) Regulations 1992
- Practical considerations in providing and maintaining safe places of work and safe means of access and egress; using safety signs ie, type of safety signs and the typical areas where they would be used
- The design of surfaces to reduce slipping
- Coefficient of Friction (CoF), slip resistant testing of footwear and surfaces:
  - effects of wetting
  - different CoF between one surface and another
  - effects of contamination on surfaces in terms of CoF
  - methods for cleaning floors and the appropriate footwear to wear whilst cleaning
  - the importance of good housekeeping.

##### **C1.2 Confined spaces**

- The meaning of confined spaces with reference to the Confined Spaces Regulations 1997

- Examples of where confined space entry may occur in the workplace eg, pits in garages, trunking ducts, watercourses, trenches, tanks, silos, sewers
- The factors to be considered when assessing risk: access arrangements; likely atmospheres to be encountered (including oxygen enriched, oxygen depleted, toxic and flammable); the task, materials and equipment; persons at risk; reliability of safeguards (including personal protective equipment)
- The factors to be considered in designing safe working practices: operating procedures and emergency policy/procedures; and training for work in confined spaces.

### **C1.3 Structural safety of workplaces**

- Causes of damage to the structure of buildings: adverse weather conditions; overloading of structures; hot and corrosive atmospheres; vibration; alteration to structural members; subsidence; deterioration of building materials; excavations; and unauthorised modifications to buildings
- Failure modes: possible causes of structural failures such as poor design, substandard construction, cutting roof beams; puncturing holes through floors; removal of internal walls can lead to collapse.

### **C1.4 Working at height**

- The main hazards and risks, the alternatives to working at height, precautions and safe working procedures for working at height in general workplaces (including rescue measures)
- Hierarchy of control measures with reference to the Work at Height Regulations 2005:
  - avoid working at height
  - use an existing safe place of work
  - provide work equipment to prevent falls (including MEWPS)
  - mitigate the distance and consequences of a fall
  - instruction and training and/or other means.

### **C1.5 Lone working**

- The main hazards and risks
- Particular problems facing lone workers: medical conditions, training, supervision, emergency procedures, lifting objects that are too heavy for one person, more than one person needed to operate essential controls or transport
- Alternatives, precautions and safe working procedures for lone working
- Lone worker emergency devices and personal communications.

***Recommended tuition time not less than 7 hours***

## **Element C2: Fire and explosion**

### **Learning outcomes**

- C2.1 Outline the properties of flammable and explosive materials and the mechanisms by which they ignite
- C2.2 Outline the behaviour of structural materials, buildings and building contents in a fire
- C2.3 Outline the main principles and practices of prevention and protection against fire and explosion.

### **Content**

#### **C2.1 Properties of flammable and explosive materials and the mechanisms by which they ignite**

- The properties of solids, liquids and gases with respect to influence on combustion
- The meaning of: flash point, fire point, auto-ignition temperature, vapour density, limits of flammability, maximum explosion pressure, and rate of pressure rise; with examples of the importance of these properties in relation to the initiation and propagation of fire and explosion
- The fire triangle
- Ignition sources (eg, naked flame, hot surfaces, arcing, sparking, smoking, electrostatic discharge)
- Mechanisms of explosions and mechanisms of fire-spread including:
  - how an explosion/fire occurs
  - the stages of combustion: induction, ignition, growth, steady state and decay
  - mechanisms of unconfined vapour cloud explosions, confined vapour cloud explosions and boiling liquid expanding vapour explosions
- The effects of atomisation/particle size and oxygen content on the likelihood and severity of fire/explosion
- How failure of control measures coupled with the physico-chemical properties of flammable materials can bring about an explosion
- The process of oxidation and the effects of oxidising substances on fire and explosion mechanisms
- Flammable atmospheres; how they arise and where they are found. Control measures for entering flammable atmospheres, including purging to keep flammable atmospheres below Lower Explosion Limits (LEL)
- The causes and effects of:
  - unconfined vapour cloud explosion
  - boiling liquid expanding vapour explosion (BLEVE)
  - confined vapour cloud explosion
- The prevention and mitigation of vapour phase explosions; structural protection, plant design and process control, segregation and storage of materials, hazardous area zoning, inerting, explosion relief

- Control of amount of material, prevention of release, control of ignition sources, sensing of vapour between Lower Explosive Limit (LEL) and Upper Explosive Limit (UEL)
- Dust explosions:
  - examples of industries/plant with potential dust explosion hazards (ie, food industry, LEV)
  - the mechanisms of dust explosions including the importance of combustible solid particle size, dispersal, explosive concentrations, ignition, energy, temperature and humidity
  - the dust pentagon
  - primary and secondary explosions
  - the prevention and mitigation of dust explosions.

## **C2.2 The behaviour of structural materials, buildings and building contents in a fire**

- The behaviour of building structures and materials in fire: fire properties of common building materials and structural elements (eg, steel, concrete, wood); level of fire resistance
- The behaviour of common building contents in fire (eg, paper-based, fabrics, plastics).

## **C2.3 Fire and explosion prevention and protection**

- Structural protection (eg, openings and voids, compartmentation, fire-stopping)
- The key features of plant design and process control
- The segregation and storage of flammable, combustible and incompatible materials
- Hazardous area zoning, exclusion of ignition sources
- Inerting
- Methods of explosion relief: venting, explosion panels, bursting discs, suppression.

***Recommended tuition time not less than 5 hours***

## **Element C3: Workplace fire risk assessment**

### **Learning outcomes**

- C3.1 Outline the main legal requirements for fire safety in the workplace
- C3.2 Explain the processes involved in the identification of hazards and the assessment of risk from fire
- C3.3 Describe common fire detection and alarm systems and procedures
- C3.4 Outline the factors to be considered when selecting fixed and portable fire-fighting equipment for the various types of fire
- C3.5 Outline the factors to be considered in providing and maintaining the means of escape
- C3.6 Explain the purpose of, and essential requirements for, emergency evacuation procedures.

### **Content**

#### **C3.1 Legal requirements**

- The regulatory powers of a fire authority with respect to fire safety
- Dual enforcement by the HSE and Fire Authority
- The requirements of the Regulatory Reform (Fire Safety) Order 2005 (or alternative related local Statutory Instrument eg, Fire Safety (Scotland) Regulations 2006, Fire Safety Regulations (Northern Ireland) 2010)
- The purpose of the Building Regulations 2010 Approved Document B.

#### **C3.2 The identification of hazards and the assessment of risk from fire**

- The five steps to fire risk assessment:
  - identify fire hazards; how could a fire start, what could burn (ie, common flammable solids, liquids and gases)
  - identify people at risk; including those especially at risk
  - evaluate, remove, reduce (i.e. control of ignition, fuel and oxygen sources), and protect from risk
  - record, plan, inform, instruct and train
  - review.

#### **C3.3 Fire detection and alarm systems and procedures**

- Common fire detection and alarm systems and procedures:
  - factors in design and application of fire detection and alarm systems
  - the principal components of alarm systems; detection and signalling
  - manual and automatic systems.

### **C3.4 Fixed and portable fire-fighting equipment**

- Factors in design and application of fixed fire-fighting systems and equipment:
  - classification of fires
  - portable fire-fighting equipment
  - extinguishing media and mode of action
  - siting, maintenance and training requirements
  - environment, including fire water runoff.

### **C3.5 Means of escape**

- The factors to be considered in the provision and maintenance of a means of escape
- The general requirements for travel distances, stairs, passageways and doors, emergency lighting, exit and directional signs
- Maintaining fire safety in communal areas.

### **C3.6 Emergency evacuation procedures**

- The purposes of and essential requirements for, evacuation procedures and drills, alarm evacuation and roll call
- The provision of Fire Wardens and their role
- Personal Emergency Evacuation Plans (PEEPs).

***Recommended tuition time not less than 6 hours***

## **Element C4: The storage, handling and processing of dangerous substances**

### **Learning outcomes**

- C4.1 Outline the main physical and chemical characteristics of industrial chemical processes
- C4.2 Outline the main principles of the safe storage, handling and transport of dangerous substances
- C4.3 Outline the main principles of the design and use of electrical systems and equipment in adverse or hazardous environments
- C4.4 Explain the need for emergency planning, the typical organisational arrangements needed for emergencies and relevant regulatory requirements.

### **Content**

#### **C4.1 Industrial chemical processes**

- The effects of temperature, pressure and catalysts on rates of chemical reactions
- Heat of reaction in terms of exothermic and runaway reactions
- Examples of exothermic reaction (ie, combustion); example of runaway reaction (ie, Bhopal, 1984)
- Methods of controlling exothermic and runaway reactions.

#### **C4.2 The storage, handling and transport of dangerous substances**

- The storage methods and quantities – bulk storage, intermediate storage, drum storage, specific locations
- The storage of incompatible materials and their segregation requirements
- Leakage and spillage containment – bunding, problems encountered during filling and transfer
- The storage and handling of dangerous substances:
  - flow through pipelines
  - the principles of filling and emptying containers
  - the principles of dispensing, spraying and disposal of flammable liquids
  - the dangers of electricity in hazardous areas
- The transport of dangerous substances:
  - key safety principles in loading and unloading of tankers and tank containers
  - labelling of vehicles and packaging of substances
  - the importance of driver training programmes and the role of the Dangerous Goods Safety Adviser under the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009.

#### **C4.3 Hazardous environments**

- The principles of: resistance to mechanical damage, protection against solid objects and dusts, protection against liquids and gases
- Wet environments – including corrosion and degradation of installation and damage to electrical equipment
- The principles of selection of electrical equipment for use in flammable atmospheres
- The classification of hazardous areas, zoning
- The use of permits-to-work
- The principles of pressurisation and purging
- Intrinsically safe equipment, flameproof equipment, type 'N' equipment, type 'e' equipment.

#### **C4.4 Emergency planning**

- The need for emergency preparedness within an organisation with reference to duties under the Management of Health and Safety at Work Regulations 1999 and Control of Major Accident Hazards Regulations 2015
- Consequence minimisation via emergency procedures; eg, first-aid/medical, fire evacuation, spill containment
- The need to develop and prepare an emergency plan, including the content of both on-site and off-site plans, for major emergency scenarios in order to meet regulatory requirements
- The role of external emergency services and local authorities in emergency planning and control
- The need for the development of emergency plans in order to reduce the impact on the organisation, including post-incident recovery
- The need for on-going monitoring and maintenance of emergency plans.

***Recommended tuition time not less than 7 hours***

## **Element C5: Work equipment**

### **Learning outcomes**

- C5.1 Outline the criteria for the selection of suitable work equipment for particular tasks and processes to eliminate or reduce risks
- C5.2 Explain how risks to health and safety arising from the use of work equipment are controlled
- C5.3 Explain safe working procedures for the maintenance, inspection and testing of work equipment according to the risks posed
- C5.4 Explain the role of competence, training, information and supervision in the control of risks arising from the installation, operation, maintenance and use of work equipment
- C5.5 Outline the maintenance and prevention strategies when working with pressure systems.

### **Content**

#### **C5.1 The selection of suitable equipment**

- The suitability of work equipment for the required task, process and environment
- The suitability of the design, construction and adaptation of work equipment
- The means by which all forms of energy used or produced and all substances used or produced can be supplied and/or removed in a safe manner
- Ergonomic, anthropometric and human reliability considerations in use of work equipment including: the layout and operation of controls and emergency controls; and reducing the need for access (automation, remote systems)
- The importance of size of openings; height of barriers; and distance from danger.

#### **C5.2 Risks to health and safety arising from the use of work equipment**

- The need for conducting risk assessments in the use of work equipment
- The risks associated with using work equipment which arise from its initial integrity, the location where it will be used, and the purpose for which it will be used
- The risks associated with using work equipment which arise from its: incorrect installation or re-installation; deterioration; or, exceptional circumstances which could affect the safe operation of work equipment
- The risk control hierarchy relating to work equipment: eliminating the risks; taking 'hardware' (physical) measures (such as providing guards); taking appropriate 'software' measures (such as following safe systems of work and providing information, instruction and training).

#### **C5.3 Maintenance, inspection and testing**

- The hazards and control measures associated with the maintenance of work equipment
- The three maintenance management strategies of: planned preventive; condition based; and breakdown

- The factors to be considered in developing a planned maintenance programme for safety-critical components
- The statutory duties for the maintenance of work equipment, including hired work equipment
- The factors to be considered in determining inspection regimes having consideration of the type of equipment; where it is used; and how it is used
- The need for functional testing of safety-related parts, including interlocks, protection devices, controls and emergency controls
- The typical causes of failures – excessive stress, abnormal external loading, metal fatigue, ductile failure, brittle fracture, buckling and corrosive failure
- The advantages and disadvantages of non-destructive testing.

#### **C5.4 Competence, training, information and supervision in relation to work equipment**

- The difference between training and competence
- The circumstances when training is likely to be required including: induction; changes in work activities; introduction of new technology or new equipment; changes in systems of work; refresher training due to declining skills
- The groups of people having specific training needs including supervisors, young and vulnerable persons
- The relationship between competence and supervision (external and self-supervision)
- The circumstances where there are specific training needs for certain hazardous types of work equipment (including self-propelled work equipment, chainsaws, woodworking machines, power presses, abrasive wheels)
- The scope of information required for the safe use and operation of work equipment specifically: the conditions under which the work equipment may be used; foreseeable abnormal situations and the action to be taken; and any conclusions to be drawn from experience in usage
- The methods by which information and instructions regarding the operation and use of work equipment can be easily understood by those concerned.

#### **C5.5 Pressure systems**

- Definition of a pressure system
- Types of inspection, frequencies and the statutory basis for examination of pressure systems
- Prevention and testing strategies: design and construction, repair and modification, information and marking, safe operating limits, written scheme of examination, maintenance and record keeping, competent persons.

***Recommended tuition time not less than 9 hours***

## **Element C6: Workplace machinery**

### **Learning outcomes**

- C6.1 Outline the principles of safety integration and the considerations required in a general workplace machinery risk assessment
- C6.2 Outline the principal generic mechanical and non-mechanical hazards of general workplace machinery
- C6.3 Outline the main types of protective devices found on general workplace machinery
- C6.4 Explain the principles of control associated with the maintenance of general workplace machinery
- C6.5 Explain the key safety characteristics of general workplace machinery control systems.

### **Content**

#### **C6.1 Safety integration and machinery risk assessment**

- Definition of machinery
- The principles of safety integration from The Supply of Machinery (Safety) Regulations 2008:
  - machinery must be designed and constructed to be fit for purpose and to eliminate or reduce risks throughout the lifetime of the machinery including the phases of transport, assembly, dismantling, disabling and scrapping
  - the principles must be applied in order to eliminate or reduce risks as far as possible; take necessary protective measures where risk cannot be eliminated; and inform users of any residual risks
  - when designing and constructing machinery and when drafting the instructions: use and foreseeable misuse must be considered
  - take account of operator constraints due to necessary or foreseeable use of personal protective equipment
  - machinery must be supplied with all the essentials to enable it to be adjusted, maintained and used safely
- The factors to be considered when assessing risk: persons at risk, severity of possible injury, probability of injury, need for access, duration of exposure, reliability of safeguards, operating procedures and personnel
- The purpose of CE marking and the relevance and limitation of the CE mark; selection and integration of work equipment in the workplace
- Conformity assessments, the use of harmonised standards, the technical file and the declaration of conformity.

#### **C6.2 Generic hazards**

- Common machinery hazards in a range of general workplaces: drills (radial arm, pedestal), circular saws, guillotines, disc sanders, abrasive wheels, lathes, automatic doors and gates, mechanical and hydraulic presses, portable power tools, CNC machines, robotics

- The types of generic machinery hazards:
  - potential consequences from mechanical hazards (ISO 12100:2010, Table B.1): being run over, being thrown, crushing, cutting/severing, drawing-in/trapping, entanglement, friction/abrasion, impact, injection, shearing, slips/trips/falls, stabbing/puncture, suffocation
  - non-mechanical hazards: noise, vibration, electricity, high/low temperature, radiation, hazardous substances, ergonomic, environment in which the machine is used.

### **C6.3 Protective devices**

- The main types of safeguarding devices: characteristics, key features, limitations and typical applications of fixed enclosed guards, fixed distance guards, interlocked guards, automatic guards, trip devices, adjustable/self-adjusting guards, two-hand controls, mechanical restraints, jigs and push-sticks.

### **C6.4 Maintenance**

- The means by which machinery is safely set, cleaned and maintained including: safe systems of work; permits; isolation; procedures for working at unguarded machinery
- The means by which machines are isolated from all energy sources.

### **C6.5 Machinery control systems**

- The key safety characteristics of machinery control systems to include:
  - making allowance for the failures, faults and constraints to be expected in the planned circumstances of use; do not create any increased risk to health or safety; faults or damage to the control system or the loss of energy supply must not result in additional risk to health or safety; do not impede the operation of any stop/energy stop controls
  - the controls for starting or making a significant change in operating conditions including any change in speed, pressure or other operating condition
  - stop controls readily accessible and leads to a safe condition
  - emergency stop controls provided and to be readily accessible
  - the position and marking of controls to be visible and identifiable
  - the consideration of ergonomic principles.

***Recommended tuition time not less than 9 hours***

## **Element C7: Mobile, lifting, access and work at height equipment**

### **Learning outcomes**

- C7.1 Outline the main hazards and control measures associated with mobile work equipment
- C7.2 Outline the main hazards and control measures associated with lifting equipment
- C7.3 Outline the main hazards and control measures associated with access equipment and equipment for working at height.

### **Content**

#### **C7.1 Mobile work equipment: hazards and control measures**

##### *Hazards*

- The applications of different types of mobile work equipment (self-propelled, towed, attached, pedestrian-controlled and remotely-controlled) - to include lift trucks (counterbalance, reach, rough terrain, telescopic materials handlers, side loading trucks, pedestrian controlled trucks), agricultural tractors and works vehicles
- The hazards associated with mobile work equipment (rollover, overturning, suitability for carrying passengers, unauthorised start-up, safe operating station/platform, excessive speed, failure to stop, contact with wheels and tracks, falls of objects, moving parts/drive shafts/power take-offs, over-heating)
- The hazards associated with the refuelling or charging (electrical, LPG, diesel) of mobile work equipment

##### *Control measures*

- The control measures to be used in the use of mobile work equipment (self-propelled, towed, attached, pedestrian-controlled and remotely-controlled), to include: lift trucks (counterbalance, reach, rough terrain, telescopic materials handlers, side loading trucks, pedestrian controlled trucks), agricultural tractors and works vehicles, including safe layout of areas where mobile equipment is used and the protection of pedestrians and using lifting plans
- Using lift trucks to move people – conditions and equipment necessary, other attachments used on lift trucks
- The importance of roll-over protection, falling objects protection, speed control systems (stopping and emergency braking), guards, barriers and restraining systems, means of fire-fighting, vision aids (plane, angled and curved mirrors, Fresnel lenses, radar, CCTV)
- The requirements for training lift truck operators (basic, specific job training and familiarisation).

#### **C7.2 Lifting equipment: hazards and control measures**

- The applications and types of different types of lifting equipment including cranes (mobile cranes, tower cranes, overhead cranes) and hoists
- The hazards associated with cranes and lifting operations

- The main hazards associated with using: hoists (gin wheel, construction site platform hoist) and lifts (passenger and goods, scissor, vehicle inspection, MEWPs)
- The control measures when using: cranes (selection, siting, and stability of cranes); hoists and lifts; integrity of lifting equipment; competence of personnel; maintenance, inspection; and statutory examinations.

### **C7.3 Access and work at height equipment: hazards and control measures**

- The applications and types of and different types of access and work at height equipment including self-propelled, trailer and truck-mounted hydraulic lifts (MEWPs), booms, scissor lifts, loaders and mobile work platforms
- The hazards arising from lack of mechanical strength of the carrier or lack of loading control and control devices; hazards to persons on or in the carrier (movements of the carrier, persons falling from the carrier, objects falling from the carrier); exceeding safe working load/persons permitted
- The appropriate control measures for use of access and work at height equipment: space and strength corresponding to the maximum number of persons and maximum working load; fitted with a suspension or supporting system; controlled by persons in the carrier; emergency stop devices; hold-to-run controls; preventing tilting if there is a risk of the occupants falling; trapdoors open in a direction that eliminates any risk of falling; protective roof if risk of falling objects endanger persons, marked with maximum number of persons and maximum working load.

***Recommended tuition time not less than 6 hours***

## **Element C8: Electrical safety**

### **Learning outcomes**

- C8.1 Outline the basic concepts of electricity
- C8.2 Outline the hazards of electricity and static electricity
- C8.3 Outline the issues relevant to the installation, use, inspection and maintenance of electrical systems
- C8.4 Outline the main principles for safe working in the vicinity of high voltage systems
- C8.5 Outline the main hazards, risks and controls associated with the use of portable electrical equipment.

### **Content**

#### **C8.1 Basic concepts of electricity**

- Differences between Low and High Voltage
- Potential difference, current, resistance, impedance, Ohm's law
- Basic electrical circuitry
- Earthing principles
- The difference between direct and alternating currents.

#### **C8.2 Hazards of electricity and static electricity**

- The effects of electric shock on the body: pain, muscular contraction, respiratory failure, heart fibrillation, cardiac arrest, burns
- The factors influencing the severity of the effects of electric shock on the body: voltage, frequency, duration, impedance/resistance, current path, direct and indirect shock
- Common causes of fires: overloading of conductors, overheating, ignition of flammable vapour, ignition of combustible material, breakdown of insulation
- Electric arcs: molten metal splash and radiation
- Circumstances giving rise to the generation of static electricity
- Hazards and controls for static electricity.

#### **C8.3 The installation, use and inspection of electrical systems**

- The meaning of duty holders' and 'construction' under the Electricity at Work Regulations 1989
- The importance of:
  - strength and capability of electrical equipment
  - insulation, protection and placing of conductors
  - reducing the risk of shock
  - excess current protection
  - cutting off supply and isolation
  - working space, access and lighting

- Control measures:
  - the selection and suitability of equipment
  - protective systems: fuses, reduced voltage systems, isolation, residual current devices, double insulation, earth free zones
- Inspection and maintenance strategy: user checks, formal visual inspections, combined inspection and tests, records of maintenance and tests, frequency of inspection and testing, competent persons, HSG107
- Relationship between BS 7671:2018 Requirements for Electrical Installations, IET Wiring Regulations 18<sup>th</sup> Edition and The Electricity at Work Regulations 1989
- The importance of schemes of maintenance, schedules, plans and records
- Safe systems of work on installations made dead
- Safe systems of work and criteria of acceptability for live working
- The use of permits-to-work
- The meaning of 'competent person'.

#### **C8.4 Safe working in the vicinity of high voltage systems**

- Common high voltage systems and the prevention of danger
- Competent and authorised persons role related to system modifications
- Safe systems of work, permit-to-work procedures
- Safe working near overhead power lines, underground cables – hazards and precautions
- High voltage glove working and live line overhead working.

#### **C8.5 Portable electrical equipment**

- Conditions and practices likely to lead to accidents, including unsuitable equipment, inadequate maintenance, use of defective apparatus
- Electrical risks from portable appliances, eg, portable generators, arc/mig/tig welding etc
- Control measures, including portable appliance inspection and testing
- Aspects of supply to portable electrical equipment, eg, height of cables, siting of RCDs etc.

***Recommended tuition time not less than 7 hours***

## **Element C9: Construction and works of a temporary nature - hazards and controls**

### **Learning outcomes**

- C9.1 Outline the scope and nature of construction activities
- C9.2 Explain the scope and application of the Construction (Design and Management) Regulations 2015 and associated guidance
- C9.3 Explain the appropriate site control measures that should be adopted to protect employees and others during construction work
- C9.4 Outline the hazards and control measures associated with working at height from fixed work or temporary platforms
- C9.5 Explain the hazards and control measures, associated with demolition work
- C9.6 Explain the hazards and control measures associated with excavation work.

### **Content**

#### **C9.1 The scope and nature of construction activities**

- Types of work: building works: renovation; alteration; maintenance of existing premises (occupied or unoccupied); civil engineering; works of engineering construction; and demolition
- The range of activities, including: site clearance; demolition; dismantling; excavation; loading, unloading and storage of materials; site movements; fabrication; decoration; cleaning; installation; removal and maintenance of services (electricity, water, gas); landscaping
- Particular construction issues relating to the: transitory nature of workers; temporary nature of construction activities and the constantly changing workplace; fire arrangements; time pressures from clients; weather conditions; levels of numeracy and literacy of workers; non-English speaking workers.

#### **C9.2 Scope and application of the Construction (Design and Management) Regulations 2015 and associated guidance**

- The scope of the Construction (Design and Management) Regulations 2015
- The particular duties under the Construction (Design and Management) Regulations 2015 and relevant guidance for clients, designers, principal designers, principal contractors, contractors, workers and domestic clients in relation to:
  - the appointment and competence required of relevant parties
  - notification of projects
  - the preparation of pre-construction information (including the purpose and requirements)
  - the construction phase plan (including the purpose and typical content of the plan)
  - the provision of appropriate and relevant information to all parties
  - the preparation of the health and safety file (including the purpose and typical content of the file)
  - the duties of domestic clients.

### **C9.3 Protecting employees and others during construction work**

- Site security (perimeter fencing, signs, safe viewing points, means of securing plant/chemicals, means of controlling dangers such as mud on public highways)
- Arrangements (including site rules, cooperation, shared facilities, first aid and welfare facilities)
- Arrangements for site inductions.

### **C9.4 Working at height from fixed or temporary platforms**

- The hazards associated with working at height
- The safe use of temporary (immobile) access equipment including ladders, trestles, scaffolds – simple independent and tower scaffolds
- The requirements for the erection, use and dismantling of scaffolds and falsework
- Inspection of working platforms above 2 metres (Regulation 12 Work at Height Regulations 2005)
- The hazards associated with falling materials and appropriate precautionary measures
- Safe methods for roof work: precautions during work on fragile roofs, edge protection for flat and sloping roofs
- The means of temporary access: types and safety features of cradles, boatswains' chairs, rope access and positioning systems
- The use of personal and collective fall arrest devices (safety nets, airbags, belts and harnesses).

### **C9.5 Demolition work**

- The main techniques used in demolition of buildings and the associated hazards and control measures with reference to:
  - falling materials; premature collapse of buildings, materials of construction
  - planning, structural surveys and surveys for hazardous substances, provision of working places and means of access/egress, use of method statements and permits-to-work, security of site boundaries and protection of the public.

### **C9.6 Excavations**

- The hazards and controls associated with excavation work:
  - collapse; access; falls of persons, objects and vehicles; use of transport; flooding
  - buried services: types and consequences of damage
  - the need for temporary shoring (drag boxes, piling)
  - the methods for checking for buried services and the precautions to be observed
  - the use of 360° excavators
- The requirements for statutory inspections and examinations of excavations.

***Recommended tuition time not less than 8 hours***

## **Element C10: Workplace transport and managing work-related road risk**

### **Learning outcomes**

- C10.1 Outline the factors to be considered in a workplace transport risk assessment and the controls available for managing workplace transport risk
- C10.2 Outline the role and purpose of a work-related road risk policy and the key components of a work-related road traffic safety management system.

### **Content**

#### **C10.1 Workplace transport risk assessment and risk controls**

- The legal requirements under the Workplace (Health, Safety and Welfare) Regulations 1992 to manage workplace transport (including vehicles and pedestrians)
- The factors to be considered in a workplace transport risk assessment (including those factors associated with shared workplaces)
- The reasons for providing information to all employees and visitors to site relating to workplace transport issues
- Controlling risks from workplace transport with reference to HSG136 (A guide to workplace transport safety):
  - safe site:
    - traffic route design
    - activity
  - safe vehicle
  - safe driver

#### **C10.2 Work-related road risk policy and components of a work-related road traffic safety management system (RTSMS)**

- Work-related road risk policy:
  - role and purpose of the policy
  - established and signed by 'top management'
  - typical content, including the policy being appropriate to the organisation
  - communicating the policy to all relevant employees
  - recording and review
- The reasons for the introduction of a road traffic safety management system and the possible key elements/components (with reference to ISO 39001:2012 – Road traffic safety (RTS) management systems):
  - planning
    - actions to address risks and opportunities
    - identification of performance factors: risk exposure factors (distance travelled, road traffic volume (major roads vs minor roads))

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- intermediate safety outcome factors: the use of appropriate roads (vehicle type and cargo); the use of personal safety equipment (seat belts, motorcycle helmets etc); safe speed limits; weather conditions; fitness of drivers; journey planning; the use of road-worthy vehicles; employees authorised to drive; removal of unfit drivers and vehicles; post-crash response (including recovery and rehabilitation)
  - setting objectives
  - support
    - allocation of resources
    - the use of competent drivers (based on appropriate education, training and experience)
    - make employees aware of the policy, their contribution to the effectiveness of the policy/RTSMS, implications of individual non-compliance
  - document information
    - ensure relevant policies/procedures/information is documented
    - control of documented information
  - operation
    - operational planning and control
    - emergency preparedness and response
  - performance evaluation
    - monitoring, measurement, analysis and evaluation of the RTSMS
    - accident investigation
    - internal audit
    - management review
  - improvement
    - non-conformity and corrective action
    - continual improvement
- Benefits and limitations of a RTSMS.

***Recommended tuition time not less than 6 hours***

## Unit C: Tutor References

### Health and safety incidents

*(reference to Element C2.1)*

[Buncefield: Why did it happen?](#) (unconfined vapour cloud explosion)

[Flixborough accident summary](#) (unconfined vapour cloud explosion)

[Mexico City accident summary](#) (boiling liquid expanding vapour explosion – BLEVE)

[Hickson & Welch accident summary](#) (confined vapour cloud explosion)

*(reference to Element C4.1)*

Union Carbide, Bhopal <http://www.bhopal.com/>

*(reference to Element C4.2)*

[Albright and Wilson accident summary](#)

### Statutory instruments

Legislation	Country	Element/s
Directive 2014/68/EU on the marketing of pressure equipment	EU Directive	5
Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures (CLP)	European Regulation	4
Regulation (EU) 2016/425 on personal protective equipment at work	European Regulation	1
Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (as amended)	UK / Great Britain	4
Construction (Design and Management) Regulations 2015	UK / Great Britain	9
Confined Spaces Regulations 1997	UK / Great Britain	1
Control of Major Accident Hazards Regulations 2015	UK / Great Britain	2, 4
Controls on Dangerous Substances and Preparations Regulations 2006 (as amended)	UK / Great Britain	4
Dangerous Substances and Explosives Atmospheres Regulations 2002	UK / Great Britain	2, 4, 5
Dangerous Substances (Notification and Marking of Sites) Regulations 1990	UK / Great Britain	4
Deregulation Act 2015 (Section 6)	UK / Great Britain	1, 9
Electrical Equipment (Safety) Regulations 2016	UK / Great Britain	5, 6, 8
Electricity at Work Regulations 1989	UK / Great Britain	8
Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016	UK / Great Britain	5
Health and Safety at Work etc. Act 1974	UK / Great Britain	1, 9

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<b>Legislation</b>	<b>Country</b>	<b>Element/s</b>
Health and Safety (Safety Signs and Signals) Regulations 1996	UK / Great Britain	1
Lifting Operations and Lifting Equipment Regulations 1998	UK / Great Britain	7, 9
Management of Health and Safety at Work Regulations 1999 (as amended)	UK / Great Britain	1, 4, 5, 9
Personal Protective Equipment at Work Regulations 1992	UK / Great Britain	1
Personal Protective Equipment (Enforcement) Regulations 2018	UK / Great Britain	1
Provision and Use of Work Equipment Regulations 1998 (as amended)	UK / Great Britain	5, 6, 10
Pressure Equipment (Safety) Regulations 2016	UK / Great Britain	5
Pressure Systems Safety Regulations 2000	UK / Great Britain	5
Regulatory Reform (Fire Safety) Order 2005	UK / Great Britain	3
Road Traffic Act 1988 and 1991	UK / Great Britain	10
Supply of Machinery (Safety) Regulations 2008 (as amended)	UK / Great Britain	6
The Work at Height Regulations 2005 (as amended)	UK / Great Britain	1, 7, 9
Workplace (Health, Safety and Welfare) Regulations 1992	UK / Great Britain	1, 10
Building Regulations 2010 (as amended)	England and Wales	3
Building Regulations (Northern Ireland) 2012	Northern Ireland	3
Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations (Northern Ireland) 2010 (as amended)	Northern Ireland	4
Confined Spaces Regulations (Northern Ireland) 1999	Northern Ireland	1
Construction (Design and Management) Regulations (Northern Ireland) 2016	Northern Ireland	9
Control of Major Accident Hazards Regulations (Northern Ireland) 2015	Northern Ireland	2, 4
Dangerous Substances and Explosive Atmospheres Regulations (Northern Ireland) 2003	Northern Ireland	2, 4, 5
Deregulation Act 2015 (Section 7)	Northern Ireland	1, 9
Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations (Northern Ireland) 2017	Northern Ireland	5
Fire and Rescue Services (Northern Ireland) Order 2006	Northern Ireland	3
Fire Safety Regulations (Northern Ireland) 2010	Northern Ireland	3
Lifting Operations and Lifting Equipment Regulations (Northern Ireland) 1999	Northern Ireland	7
Management of Health and Safety at Work Regulations (Northern Ireland) 2000 (as amended)	Northern Ireland	1, 4, 5, 9
Marketing and Use of Dangerous Substances Regulations (Northern Ireland) 2004 (as amended)	Northern Ireland	4

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Legislation	Country	Element/s
Personal Protective Equipment at Work Regulations (Northern Ireland) 1993	Northern Ireland	3
Provision and Use of Work Equipment Regulations (Northern Ireland) 1993	Northern Ireland	5, 6
Work at Height Regulations (Northern Ireland) 2005	Northern Ireland	1, 7, 9
Workplace (Health, Safety and Welfare) Regulations (Northern Ireland) 1993	Northern Ireland	1
Building (Scotland) Regulations 2004	Scotland	3
Fire (Scotland) Act 2005	Scotland	3
Fire Safety (Scotland) Regulations 2006	Scotland	3

### Other relevant references

Reference title	Reference detail eg ISBN number	Element/s
A guide to workplace transport safety, <a href="#">HSG136</a>	HSE Books	10
Avoiding danger from overhead power lines, <a href="#">GS6</a>	HSE Books,	8
Avoiding danger from underground services, <a href="#">HSG47</a>	HSE Books, ISBN: 978-0-7176-6584-6	8
BS ISO 39001:2012 Road traffic safety (RTS) management systems – requirements with guidance for use	ISBN: 978-0-5806-6851-7	10
Building Regulations, <a href="#">Approved Document B</a> – Fire Safety: Volume 2 – Buildings other than dwelling houses	Planning Portal	3
Buying new machinery, <a href="#">INDG271</a>	HSE Books	6
Controlling fire and explosion risks in the workplace; A brief guide to the Dangerous substances and Explosive Atmospheres Regulations, <a href="#">INDG370</a>	HSE Books	2, 4
Control of Major Accident Hazards Regulations 2015, Guidance on Regulations, <a href="#">L111</a>	HSE Books, ISBN: 978-0-7176-6605-8	2
Dangerous substances and explosive atmospheres, Approved Code of Practice and guidance, <a href="#">L138</a>	HSE Books, ISBN: 978-0-7176-6614-4	2
Dangerous Substances (Notification and Marking of Sites) Regulations 1990 – A brief guide on an amendment to the Regulations 2013, <a href="#">INDG467</a>	HSE Books	4
Driving at Work – Managing Work-Related Road Safety, <a href="#">INDG382</a>	HSE Books	10
Electricity at Work – Safe Working Practices, <a href="#">HSG85</a>	HSE Books, ISBN: 978-0-7176-2164-4	8
<a href="#">Emergency procedures</a>	HSE website	4
<a href="#">Fire Safety Risk Assessment series</a> , Home Office Publications 1. Offices and shops	1. ISBN: 978-1-8511-2815-0 2. ISBN: 978-1-8511-2816-7 3. ISBN: 978-1-8511-2817-4	3

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Reference title	Reference detail eg ISBN number	Element/s
2. Factories and warehouses 3. Sleeping accommodation 4. Residential care premises 5. Educational premises 6. Small and medium places of assembly 7. Large places of assembly 8. Theatres, cinemas and similar premises 9. Open air events and venues, 10. Healthcare premises, 11. Transport premises and facilities 12. Means of escape for disabled people	4. ISBN: 978-1-8511-2818-1 5. ISBN: 978-1-8511-2819-8 6. ISBN: 978-1-8511-2820-4 7. ISBN: 978-1-8511-2821-1 8. ISBN: 978-1-8511-2822-8 9. ISBN: 978-1-8511-2823-5 10. ISBN: 978-1-8511-2824-2 11. ISBN: 978-1-8511-2825-9 12. ISBN: 978-1-8511-2873-0	
Globally Harmonized System of Classification and Labelling of Chemicals ( <a href="#">GHS</a> )	United Nations	4
Health and Safety (Safety Signs and Signals) Regulations 1996, Guidance on regulations, <a href="#">L64</a>	HSE Books, ISBN: 978-0-7176-6359-0	1
IET Wiring Regulations 17th Edition (first amendment)	BS7671: 2008+A3:2015, ISBN: 978-0-580-084896-4	8
Maintaining portable electrical equipment, <a href="#">HSG107</a>	HSE Books, ISBN: 978-0-7176-2805-6	8
Managing health and safety in construction, Construction (Design and Management) Regulations 2015, Guidance on regulations, <a href="#">L153</a>	HSE Books, ISBN: 978-0-7176-6623-3	9
The Electricity At Work Regulation 1989, Guidance on Regulations, <a href="#">HSR25</a>	HSE Books, ISBN: 978-0-7176-6636-2	8
<a href="#">Occupational health risk management in construction</a>	IOSH/CONIAC/HSE	9
Personal protective equipment at work, Guidance on Regulations, <a href="#">L25</a>	HSE Books, ISBN: 978-0-7176-6597-6	3, 6
Providing and using work equipment safely, A brief guide, <a href="#">INDG291</a>	HSE Books	5
<a href="#">Pressure Equipment (Safety) Regulations 2016 - Guidance</a>	Department for Business, Energy and Industrial Strategy	5
Rider operated lift trucks, Approved Code of Practice and guidance, <a href="#">L117</a>	HSE Books, ISBN: 978-0-7176-6441-2	7
Risk assessment, A brief guide to controlling risks in the workplace, <a href="#">INDG163</a>	HSE Books	3
Safe handling of combustible dusts: precautions against explosions, <a href="#">HSG103</a>	HSE Books, ISBN: 978-0-7176-2726-4	2
Safe use of work equipment, Approved Code of Practice and guidance, <a href="#">L22</a>	HSE Books, ISBN: 978-0-7176-6619-5	5, 6, 10
Safe use of lifting equipment, Approved Code of Practice and Guidance, <a href="#">L113</a> (amended 2018)	HSE Books, ISBN: 978-0-7176-1628-2	7, 9
Safe work in confined spaces, Approved Code of Practice and guidance, <a href="#">L101</a>	HSE Books, ISBN: 978-0-7176-6622-5	1
Safety of pressure systems, Approved Code of Practice and guidance, <a href="#">L122</a>	HSE Books, ISBN: 978-0-7176-6644-7	5
Supplying new machinery, <a href="#">INDG270</a>	HSE	6
<a href="#">Technical Booklet E</a> , Fire Safety, Guidance on the Building Regulations (Northern Ireland) 2012	Produced by the Department of Finance and Personnel ( <a href="http://www.dfpni.gov.uk">www.dfpni.gov.uk</a> )	3

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Reference title	Reference detail eg ISBN number	Element/s
<a href="#">Technical Handbook</a> : Non-Domestic (Guidance on the Building (Scotland) Regulations 2004	Produced by Scottish Government	3
The Construction (Design and Management) Regulations 2015, <a href="#">Industry guidance for Clients</a>	Produced by CONIAC, published by CITB, ISBN: 978-1-85751-389-9	9
The Construction (Design and Management) Regulations 2015, <a href="#">Industry guidance for Principal designers</a>	produced by CONIAC, published by CITB, ISBN 978-1-85751-390-5	9
The Construction (Design and Management) Regulations 2015, <a href="#">Industry guidance for Designers</a>	produced by CONIAC, published by CITB, ISBN 978-1-85751-393-6	9
The Construction (Design and Management) Regulations 2015, <a href="#">Industry guidance for Principal contractors</a>	produced by CONIAC, published by CITB, ISBN 978-1-85751-393-6	9
The Construction (Design and Management) Regulations 2015, <a href="#">Industry guidance for Contractors</a>	Produced by CONIAC, published by CITB, ISBN: 978-1-85751-391-2	9
The Construction (Design and Management) Regulations 2015, <a href="#">Industry guidance for Workers</a>	produced by CONIAC, published by CITB, ISBN 978-1-85751-394-3	9
The health and safety toolbox, How to control risks at work, <a href="#">HSG268</a>	HSE Books, ISBN: 978-0-7176-6587-7	1, 3, 5, 6, 8, 10
The safe isolation of plant and equipment, <a href="#">HSG253</a>	HSE Books, ISBN: 978-0-7176-6171-8	8
Work at height, A Brief Guide, <a href="#">INDG401</a>	HSE Books	1, 7
Working alone, Health and safety guidance on the risks of lone working, <a href="#">INDG73</a>	HSE Books	1
Workplace health, safety and welfare, Approved Code of Practice and guidance, <a href="#">L24</a>	HSE Books, ISBN: 978-0-7176-0413-5	1, 10

## **5.4 Unit DNI: Application of health and safety management in the workplace**

### **Aim of the unit**

Unit DNI will enable learners to demonstrate their ability by applying the knowledge and understanding gained from their Unit A, B and C studies to a practical workplace situation.

### **Purpose and aim**

The purpose of this Unit is for learners to complete an assignment which will assess the practical application of the knowledge and understanding gained from their studies of Units A, B and C of the syllabus in a vocational setting.

The aim of the assignment is for learners to carry out a review of the arrangements for managing health and safety in a workplace and to produce justified, proportionate recommendations to improve health and safety performance.

Learners will be required to demonstrate their understanding of the role of a health and safety practitioner and the adoption of a proportionate response to risk.

### **Content**

Unit DNI contains no additional syllabus content. However, completion of study for Units A, B and C is recommended in order to undertake the Unit DNI assignment. Learning Partners and learners are reminded that Element A11 of Unit A will only be assessed in Unit DNI.

### **Assignment brief**

The student is required to carry out a review of the arrangements for managing health and safety in a workplace and to produce justified, proportionate recommendations to improve performance.

The assignment will require the student to apply the knowledge and understanding gained from their studies of elements of Units A, B and C in a practical environment and to carry out critical analysis and evaluation of information gathered during the review.

The assignment should include the following.

- An introduction that sets the scene by stating clear aims and objectives and a description of the methodology used to carry out the assignment. The introduction should also include a description of the chosen workplace and the role of the health and safety practitioner to set a context for the assignment.
- A critical analysis of how health and safety is currently managed by the organisation in which the student reviews leadership, management, worker involvement, competence, legal compliance and risk profile.
- An evaluation based on the review, of where improvements should be made.
- Conclusions which summarise the main issues identified.
- Justified, proportionate, recommendations based on the outcome of the review.
- An executive summary.

- References / Bibliography
- Appendices.

## **Assessment location**

The Unit DNI assignment must be carried out in the student's own workplace. Where the student does not have access to a suitable workplace, the accredited course provider should be consulted to help in making arrangements for the student to carry out the assignment at suitable premises.

Learners do not require supervision when carrying out the assignment, but the student must sign a declaration that Unit DNI is their own work.

Learners and employers should be aware that the status of the report undertaken to fulfil the requirements of Unit DNI is for educational purposes only. It does not constitute an assessment for the purposes of any legislation, regulations, or standards.

## **Submission of completed work**

Assignment reports should be submitted before the set submission date; there are four submission dates each year in February, May, August and November.

The actual dates will be published by NEBOSH annually. Learners intending to submit an assignment must register through their accredited course provider using the appropriate form and paying the appropriate fee. On registration learners will receive a submission form which must accompany the assignment.

Assignments must be submitted electronically directly to NEBOSH. Learners are strongly advised to keep a copy of their assignment report.

No refund of fees will be made in cases where assignments are rejected or where learners register but fail to submit.

## **Marking**

The Unit DNI assignment is marked by appropriately qualified Examiners appointed by NEBOSH. Learners must achieve the pass standard (50%) in Unit DNI in order to satisfy the criteria for the qualification.

## **Further information**

Further detailed information regarding Unit DNI including forms and mark schemes will be produced in a separate guidance document for learners and Learning Partners available from the NEBOSH website ([www.nebosh.org.uk](http://www.nebosh.org.uk)): 'Unit DNI Assignment guidance and information for learners'.

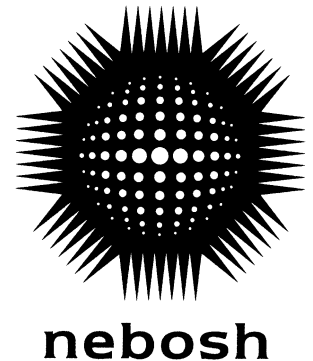
## 5. Sample question papers

### 5.1 Unit A: Managing health and safety

THE NATIONAL EXAMINATION BOARD IN  
OCCUPATIONAL SAFETY AND HEALTH

NEBOSH NATIONAL DIPLOMA IN  
OCCUPATIONAL HEALTH AND SAFETY

Unit A: Managing health and safety



[DATE]

3 hours, 0930 to 1230

*10 minutes reading time is allowed before the start of this examination. You may not write anything during this period.*

Answer both Section A and Section B

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#### SECTION A

This section contains six questions. Answer **ALL SIX** questions.

All questions carry equal marks.

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

You are advised to spend about **15 minutes** on each question.

Start each answer on a new page.

---

**1** **Outline**, with appropriate examples, the key features of the following risk management concepts:

- |                     |     |
|---------------------|-----|
| (a) risk avoidance; | (2) |
| (b) risk reduction; | (2) |
| (c) risk transfer;  | (3) |
| (d) risk retention. | (3) |

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- 2 The following table shows the number of lost-time accidents recorded at two organisations involved in similar manufacturing processes. The figures in brackets show the average numbers of employees at each organisation for the year in question.

Year	Organisation A	Organisation B
2005	22 (2500)	8 (250)
2006	24 (2450)	8 (265)
2007	31 (2300)	8 (300)
2008	30 (2100)	7 (340)

- (a) **Calculate AND compare** the annual lost-time accident incidence rates for the two organisations for the years shown **AND comment** on any trends. (5)
- (b) **Outline** any possible limitations with the data itself, or the way that it is collected, that might make direct comparisons of the rates at the two organisations unreliable or misleading. (5)
- 3 (a) **Outline** reasons for establishing effective consultation arrangements with employees on health and safety matters in the workplace. (4)
- (b) **Outline** a range of formal and informal consultation arrangements that may contribute to effective consultation on health and safety matters in the workplace. (6)
- 4 A risk assessment has identified the need to introduce a safe system of work for cleaning some moving machinery. The system proposed would allow the machinery to be cleaned by the operator whilst it was running at normal speed with the guards removed. This would present a risk of injury from the moving parts. To reduce this risk it is proposed that the cleaning is undertaken with a long-handled device which would enable the operator's hands to be kept away from the moving parts.
- (a) **Outline** the extent to which the proposed system of work meets the 'general principles of prevention' referred to in Regulation 4 and Schedule 1 of the Management of Health and Safety at Work Regulations 1999. **Your answer should refer to the specific 'general principles of prevention' which are relevant to this scenario.** (5)
- (b) **Outline** the steps that an organisation should take to ensure the effective implementation of a new safe system of work, assuming that a detailed risk assessment has already been undertaken. (5)

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(November 2015 specification)*

- 5 Human failure was identified as a significant factor in an accident involving a crane. An employee was seriously injured when struck by material being transported by the crane.
- Outline** the types of human failure which may have contributed to the accident **AND** in **EACH** case **give** examples relevant to the scenario to illustrate your answer. (10)
- 6 (a) **Outline** potential costs to an organisation if a health and safety management system is not implemented effectively. (7)
- (b) **Outline** the meaning of the terms 'insured' AND 'uninsured' costs of accidents, clearly showing the relative size of these two costs as demonstrated by accident costing studies. (3)

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## SECTION B

This section contains five questions. Answer **THREE** questions only.

All questions carry equal marks.

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

You are advised to spend about **30 minutes** on each question.

Start each answer on a new page.

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- 7 An organisation proposes to build a new gas compression installation to provide energy for its manufacturing processes. An explosion in the installation could affect the public and a nearby railway line. In view of this, the organisation has been told that a qualitative risk assessment for the new installation may not be adequate and that some aspects of the risk require a quantitative risk assessment.
- (a) **Explain** the terms 'qualitative risk assessment' **AND** 'quantitative risk assessment'. (5)
- (b) **Identify** external sources of information and advice that the organisation could refer to when deciding whether the risk from the new installation is acceptable. (5)
- (c) As a preliminary part of the risk assessment process, a hazard and operability study is to be carried out.
- Describe** the principles and methodology of a hazard and operability (HAZOP) study. (10)

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(November 2015 specification)*

- 8 A forklift truck is used to move loaded pallets in a large distribution warehouse. On one particular occasion the truck skidded on a patch of oil. As a consequence the truck collided with an unaccompanied visitor and crushed the visitor's leg.

(a) **Outline** reasons why the accident should be investigated. (4)

(b) The initial responses of reporting and securing the scene of the accident have been carried out.

**Outline** the actions which should be taken in order to *collect evidence* for an investigation of the accident. (8)

(c) The investigation reveals that there have been previous skidding incidents which had not been reported and the company therefore decides to introduce a formal system for reporting 'near miss' incidents.

**Outline** the factors that should be considered when developing and implementing such a system. (8)

- 9 An employee suffered a fractured skull when he fell 3 metres from storage racking as he was loading cartons on to a pallet held on the forks of a lift truck. An investigation revealed that, despite a safe system of work having been written and provided to employees some months previously, it had become common practice for employees to be lifted up on the forks and for them to climb up the outside of the racking. Employees stated that they could not understand the written safe system of work but admitted that they had not brought this to their employer's attention.

(a) **Outline** possible relevant breaches of the Health and Safety at Work etc Act 1974 **AND** the Management of Health and Safety at Work Regulations 1999. (10)

(b) The injured employee intends to bring a negligence claim (delict in Scotland) against his employer. With reference to relevant case law, **outline** what the employee will need to show in order for his claim to succeed. (6)

(c) Shortly after the injured employee brings his negligence claim, he is dismissed for 'a serious breach of safety rules'. The injured employee considers this to be unfair and so decides to bring further proceedings, this time for unfair dismissal.

(i) **Identify** the body that would hear such a claim. (1)

(ii) **Outline** the orders that could be made if the injured employee wins his dismissal case. (3)

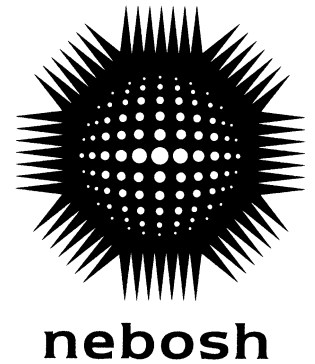
- 10** (a) **Explain** the difference between:
- (i) common law and statute law; **(4)**
  - (ii) civil law and criminal law. **(6)**
- (b) Employers have a duty under common law to take reasonable care to ensure the safety of their employees.
- Referring to relevant case law where appropriate, **outline** the nature of this duty in terms of:
- (i) safe plant and equipment; **(6)**
  - (ii) safe places of work. **(4)**
- 11** As the Health and Safety Adviser to a large organisation, you have decided to develop and introduce an in-house auditing programme to assess the effectiveness of the organisation's health and safety management arrangements.
- Describe** the organisational and planning issues to be addressed in the development of the audit programme.
- You do not need to consider the specific factors to be audited.*** **(20)**

## 5.2 Unit B: Hazardous agents in the workplace

THE NATIONAL EXAMINATION BOARD IN  
OCCUPATIONAL SAFETY AND HEALTH

NEBOSH NATIONAL DIPLOMA IN  
OCCUPATIONAL HEALTH AND SAFETY

Unit B: Hazardous agents in the workplace



[DATE]

3 hours, 0930 to 1230

*10 minutes reading time is allowed before the start of this examination. You may not write anything during this period.*

Answer both Section A and Section B

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### SECTION A

This section contains six questions. Answer **ALL SIX** questions.

All questions carry equal marks.

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

You are advised to spend about **15 minutes** on each question.

Start each answer on a new page.

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- 1 A grounds maintenance contractor is selecting eye protection to wear during grass strimming.
  - (a) **Describe** the specific features of the eye protection that is required for this task. (7)
  - (b) **Outline** arrangements that the grounds maintenance contractor should put in place when the selected eye protection is in use. (3)
- 2
  - (a) **Outline** the nature and properties of alpha particles. (4)
  - (b) **Outline** the principles that could be used to control exposure to alpha particles. (6)

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(November 2015 specification)*

- 3 (a) **Identify** the possible range of specialists involved in Occupational Health provision in a large manufacturing company. (5)
- (b) **Outline** the specific activities that occupational health specialists could undertake as part of a programme to reduce accidents and absences relating to manual handling. For **EACH** activity **identify** the most appropriate occupational specialist to undertake the activity. (5)
- 4 A welder undertakes work in an open plan workshop.
- Outline** the factors to be considered when *selecting* suitable Respiratory Protective Equipment for this work. (10)
- 5 The Workplace (Health, Safety and Welfare) Regulations 1992 require 'suitable and sufficient' washing facilities to be provided at 'readily accessible places'.
- (a) **Outline** features of the washing facilities that determine if they are suitable. (7)
- (b) **Outline** other welfare requirements of The Workplace (Health, Safety and Welfare) Regulations 1992. (3)
- 6 Construction workers often spend much of their time working outdoors where they are exposed to naturally occurring ultra-violet (UV) radiation.
- (a) (i) **Identify** the acute effects that could result from exposure to UV radiation. (2)
- (ii) **Identify** the chronic effects that could result from exposure to UV radiation. (2)
- (b) **Explain** measures that the workers can take to reduce the risks associated with their exposure to UV radiation. (6)

## **SECTION B**

This section contains five questions. Answer **THREE** questions only.

All questions carry equal marks.

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

You are advised to spend about **30 minutes** on each question.

Start each answer on a new page.

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- 7** A parcel sorting depot is experiencing a high number of manual handling related injuries. The employees handle a large number of different parcels and packages each day.
- (a) **Identify** the different types of hazard that may be inherent in the loads being handled. **(6)**
  - (b) In order to reduce the level of manual handling required, the employer has decided to invest in a range of non-powered handling devices such as trolleys and trucks.  
  
**Outline** factors the employer should consider when selecting suitable devices. **(10)**
  - (c) **Outline** a range of additional control measures that could be introduced to minimise the risks associated with these manual handling activities. **(4)**
- 8**
- (a) **Outline** the role of a prospective cohort study, as used in epidemiology. **(4)**
  - (b) National public health monitoring has recorded several hundred cases of an illness. In at least half the cases the cause has been confirmed, by laboratory tests, as a new strain of virus.  
  
**Outline** the possible data **AND** data sources that could be used for a prospective cohort study of this outbreak. **(10)**
  - (c) **Outline** factors that may affect the reliability of such cohort studies. **(6)**
- 9** A company that operates hotels and health spas recognises the risks associated with the legionella bacteria.
- (a) **Identify** specific locations where there may be growth of, or potential exposure to, legionella for employees **AND** guests. **(5)**

- (b) **Outline** the control measures that this company should implement to minimise exposure to legionella bacteria. (15)
- 10** A small printing organisation operates a number of printing machines that are located in an Open-plan workshop. Following a noise survey the organisation discovers that its employees are being exposed to noise levels of 86 dB(A) LEP,d.
- (a) Outline the significance of this noise level to an employer. (5)
- (b) Describe a range of technical AND organisational control measures that could be introduced. (15)
- 11** A manufacturing process involves the use of three organic solvents, exposure to which is controlled by local exhaust ventilation (LEV) and personal protective equipment. The LEV system is regularly inspected and is subject to thorough examination and testing on an annual basis.
- (a) **Outline** how the exposure of the process workers to solvent vapours could be assessed. (10)
- (b) **Outline** how the data obtained could be used to determine if the exposure of the process workers to the solvents is adequately controlled. (10)

## 5.3 Unit C: Workplace and work equipment safety

THE NATIONAL EXAMINATION BOARD IN  
OCCUPATIONAL SAFETY AND HEALTH

NEBOSH NATIONAL DIPLOMA IN  
OCCUPATIONAL HEALTH AND SAFETY

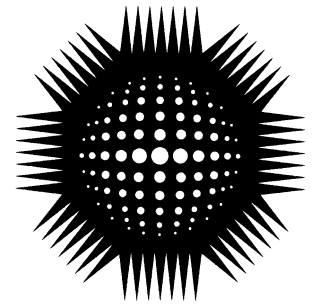
### Unit C: Workplace and work equipment

[DATE]

3 hours, 0930 to 1230

*10 minutes reading time is allowed before the start of this examination. You may not write anything during this period.*

Answer both Section A and Section B



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#### SECTION A

This section contains six questions. Answer **ALL SIX** questions.

All questions carry equal marks.

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

You are advised to spend about **15 minutes** on each question.

Start each answer on a new page.

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- 1 **Outline** the main *design* features of a warehouse and associated traffic routes intended to reduce the risks associated with internal transport. **(10)**
  
- 2 **Outline** what should be considered when developing a planned preventive maintenance programme for safety-critical machinery. **(10)**

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(November 2015 specification)*

- 3 (a) **Identify** features of floor design that help to reduce the risk of slipping. (4)
- (b) **Explain** the meaning of the term 'Coefficient of Friction'. (4)
- (c) **Explain** the relevance of Wet Coefficient of Friction to accident prevention. (2)
- 4 A large food processing factory has a range of new and older production machines of varying condition.
- Identify AND explain** the three main maintenance strategies that are available to the employer. (10)
- 5 The owners of a large distribution warehouse business have secured a contract from a stationery manufacturer. Their insurers have recommended that the proposed storage facility is sprinkler protected.
- Outline** the factors to be considered in providing an adequate sprinkler system for the storage facility. (10)
- 6 With reference to the *mechanical* hazards associated with the operation of a hydraulic robotic arm on a production line, **outline** a range of measures aimed at minimising the risk of injury. (10)

## **SECTION B**

This section contains five questions. Answer **THREE** questions only.

All questions carry equal marks.

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

You are advised to spend about **30 minutes** on each question.

Start each answer on a new page.

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- 7** A rectangular warehouse building (40m x 100m ground area and 18m high) was constructed on a structural steel framework, with a flat roof and coated steel walls. During a winter storm, the warehouse suffered a catastrophic failure of one of its long walls which in turn caused collapse of the roof and buckling of the other walls.
- (a) **Outline** the possible causes of this structural failure. **(10)**
- (b) **Outline** the health and safety issues to be considered when planning the subsequent demolition of the damaged warehouse. **(10)**
- 8** (a) **Outline** a range of factors that may cause instability of a mobile crane. **(8)**
- (b) **Outline** control measures that should be taken to reduce the likelihood of a mobile crane overturning during a lifting operation. **(12)**
- 9** A three-storey building is situated with one side fronting on to a pedestrian walkway. The building is to undergo extensive maintenance to the external fabric which includes a sloping roof. **Outline:**
- (a) the health and safety issues of the work that will need to be considered before work starts; **(11)**
- (b) the features of a scaffold designed to provide a safe place of work for working at height during the maintenance activity. **(9)**
- 10** **Outline** the precautions that can be taken to minimise the risks associated with a cable strike when excavating near underground electrical cables. **(20)**

- 11** An enclosed reactor vessel 30 metres high with a diameter of 10 metres needs cleaning, inspection and repair. The reactor was previously used for reacting flammable solids and gases that formed a toxic, acidic product.

It is not possible to avoid entry and the relevant personnel are suitably fit, trained, informed and supervised.

**Outline** additional arrangements that should be considered in order to comply with the Confined Spaces Regulations 1997. **(20)**