

Section 6

Syllabus

The qualification is structured into five sections, each with an indicative time allocation:

Section		Time allocation
1	Introduction to hazard and risk	5%
2	Legal aspects	15%
3	Fundamental principles of risk assessments	20%
4	Making a risk assessment	50%
5	Workplace controls	10%

1 Introduction to hazard and risk (5%)

Educational objectives

Candidates should appreciate the different types of hazards that are presented by hazardous substances, understand the difference between hazard and risk, and identify the factors that influence risk.

- 1.0.1 Formal definition of hazard and risk.
- 1.0.2 Common examples of hazard and risk, illustrating their differences.

2 Legal aspects (15%)

Educational objectives

Candidates should understand the legal framework for risk assessments, and be familiar with key provisions and guidance documents.

- 2.1 *Health and Safety at Work etc. Act 1974 (HASAWA)*
 - 2.1.1 The role of HASAWA as enabling legislation.
 - 2.1.2 Section 2 of HASAWA: inference for assessment and other key provisions.
- 2.2 *COSHH Regulations 2002 [as amended]*
 - 2.2.1 The aim of the Regulations (to prevent occupational ill health).
 - 2.2.2 Scope of the Regulations (including definitions of substances hazardous to health).
 - 2.2.3 Key provisions:
 - Assessment of risks to health
 - Prevention and control of risks.

- Use of different controls.
 - Maintenance, examination and testing of controls.
 - Monitoring of exposure to hazardous substances
 - Health surveillance
 - Information, instruction and training
 - Arrangements for accidents, incidents and emergencies.
- 2.2.4 COSHH 2002 (as amended) Approved Code of Practice (ACoP) and guidance (L5).

2.3 *Guidance notes*

An overview of:

- 2.3.1 HSE Guidance Note EH40 [latest edition].
- 2.3.2 HSE Guidance Note HSG97 (2004): A step by step guide to COSHH assessment.
- 2.3.3 HSE COSHH Essentials: www.hse.gov.uk/coshh/essentials
- 2.3.4 INDG136 (Rev. 5, 2012): Working with substances hazardous to health: A brief guide to COSHH, HSE

3 Fundamental principles of risk assessments (20%)

Educational objectives

Candidates should understand the effects caused by hazardous substances on the human body. They should also understand the different types of sampling techniques used to determine levels of exposure, along with the exposure limits that should be adhered to.

3.1 *Toxicology*

- 3.1.1 Routes of entry, target organs, dose effects, classification of toxic effects, signs and symptoms, dose response.
- 3.1.2 Toxicity testing and interpretation of toxicological data.
- 3.1.3 Terminology/trade names such as International Union of Pure and Applied Chemistry (IUPAC); Chemical Abstracts Service (CAS); European Inventory of Existing Commercial Chemical Substances (EINECS) and other trade names.

3.2 *Monitoring techniques*

- 3.2.1 Principles of air monitoring and biological monitoring, in accordance with HSG167 (1997), MDHS method series and other accepted methods (NIOSH, OSHA, etc.)
- 3.2.2 Other sampling techniques and their application (e.g. use of direct-reading instruments, grab sampling, swab sampling for surface contamination).

3.3 *Criteria and standards*

- 3.3.1 Inhalation exposure and Workplace Exposure Limits (WELs).
- 3.3.2 Other exposure limits such as: Indicative Occupational Exposure Limit Values (IOELVs); ACGIH Threshold Limit Values (TLVs); MAKs (German exposure limits); OSHA Permissible Exposure Limits (PELs).
- 3.3.3 Application of standards: personal exposure, time weighting, definitions, terminology, units, 'Sk' and 'Sen' notations.
- 3.3.4 Special arrangements for mixed exposures: the reciprocal calculation procedure, carcinogens, asthmagens, action for non-published standards.

- 3.3.5 Derivation of limits: criteria document summaries and individual susceptibility.
- 3.3.6 Biological Monitoring Guidance Values, other indices and their application.

3.4 Interpretation of results

3.4.1 Analysis of results:

- Accuracy and precision of results, including degree of variation in exposure between workers.
- Validity of data.
- Planning and monitoring to ensure proper comparison with WELs (or other exposure limits).

4 Making a risk assessment (50%)

Educational objectives

Candidates should be able to gather and evaluate critical information from a wide range of sources, and use this information to make a rational assessment of risk.

4.1 Scope of an assessment under COSHH

4.1.1 The meaning of a 'suitable and sufficient' assessment. HSE's five steps for risk assessment:

1. Gathering information about the substances, the work and working practices.
2. Evaluating the risks to health.
3. Deciding on control options to comply with Regulations 7-13 (including the use of COSHH Essentials).
4. Recording assessments.
5. Reviewing the assessment, including frequency of review.

Also consider other methods of assessment.

4.2 Gathering information

- 4.2.1
- Identification of relevant hazardous substances, including intermediates and by-products.
 - General sources of information – texts, journals, computer databases, HSE, trade literature etc.
 - Specific sources of information – safety data sheets, requirement for suppliers to provide information.
 - Interpretation of safety data sheets.
 - The Classification Labelling and Packaging (CLP) Regulations 2015 – Globally Harmonised System for warning symbols, hazard and precautionary statements.
- 4.2.2
- Identification of critical aspects of processes, task and local conditions (e.g. confined spaces) and source of hazard.
 - Nature and circumstance of contaminant release, fugitive emissions, variability of production and equipment.
 - Ventilation, storage, transport, transfer, use, disposal and maintenance.
 - Arrangements covering accidents, incidents and emergencies.

- 4.2.3 Human variability and exposure effects. Work methods, techniques and abnormalities. Existing provision of information, instruction and training.
- 4.2.4 Identifying persons exposed, circumstances of exposure (when, where and who) and variability of exposure. This includes process workers, maintenance workers, peripatetic workers, visitors and others.
- 4.2.5
- Review existing exposure data. Identify whether there is a need for air monitoring to quantify exposure.
 - Specify sampling criteria (if required), sampling protocol, who should be monitored, when and where to carry out monitoring, and under what circumstances.
 - Consider need for health surveillance, biological monitoring, biological effect monitoring, and other monitoring types.
 - Consider appropriate standards and the limitations of monitoring alone for assessing exposure.
- 4.2.6
- Assessment of new processes/work not yet in operation.
 - Gathering of information on anticipated procedures, including commissioning, simulated breakdowns and emergencies.
 - Information from raw material and equipment suppliers.
 - Experience of similar processes - employers, employees and trade associations.
- 4.3 *Risk evaluation*
- 4.3.1 Review of hazard data (i.e. data collected in 4.2.1).
- 4.3.2 Review of exposure data:
- Consideration of data collected in 4.2.2 to 4.2.5.
 - Interpretation of monitoring results: reliability of method, reliability of results, their representation, assessing variability etc.
 - Application of results to circumstances not monitored: consequences of control failure, maintenance or cleaning operations.
 - Use of example case studies.
- 4.3.3 Application of hygiene standards:
- Basis and reliability of standards.
 - Evaluation of risk.
 - Evaluation of adequacy of control under COSHH.

5 Workplace controls (10%)

Educational objectives:

Candidates must understand the principles of the control of risk: this includes the full range of control options, how they are applied, and the importance of effective management systems to ensure that control of hazardous substances is maintained at work.

5.0.1 Hierarchy of Control

Outline of the main controls in order of effectiveness: elimination, substitution (substance used and form of substance), design and process modification (use of enclosures, isolation, ventilation, supervision, modification of work method etc.), work

systems (include permits), personal hygiene, education and training, and PPE.
Outline importance of good practice in control of substances hazardous to health (see Principles of Good Practice, Schedule 2A, COSHH).

5.0.2 Assessing effectiveness of control

Qualitative and quantitative assessment techniques: visual observation, use of the dust lamp, flow visualisation (e.g. smoke tubes), air monitoring, ventilation measurements etc.

5.0.3 Maintaining effectiveness of control

Obligations under COSHH for establishing procedures for:

- Maintenance, examination and testing of local exhaust ventilation systems.
- Reliability checks for RPE, including respirator inspections checks on storage facilities and breathing air quality
- Face-fit testing for RPE
- Record keeping.