

11 Management of Hazardous Substances

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Introduction

11.1.1 This chapter provides guidance on the management of hazardous substances (including natural or artificial substances and mixtures). It describes how the risk assessment process works and the responsibilities for implementing the resulting actions to reduce the risk so far as is reasonably practicable (SFARP) at the point of use.

11.1.2 The objective of the Control of Substances Hazardous to Health Regulations (COSHH) is to prevent, or where this is not reasonably practical, adequately control, exposures to substances hazardous to health so as to prevent ill health. Failure to assess the health risks or to prevent exposures where reasonably practicable to do so is a breach of the regulations. A template for a COSHH assessment (MOD Form 5011) and for a COSHH master register (MOD Form 5011a) are available on the MOD Intranet, these are optional and should be regarded as the minimum standard.

11.1.3 It is the activity involving the hazardous substance where personnel may be exposed that dictates the need for a COSHH assessment (not just the presence of the substance), typical activities may include:

- Moving/Handling
- Use
- Maintenance
- Storage
- Final disposal.

11.1.4 Although the use of lead in the workplace can be assessed using the COSHH process, The Control of Lead at Work Regulations (CLAW) specifies its own control requirements that differ slightly to those in the COSHH regulations. One of the control

measures specific to CLAW is the need to ensure that, so far as is reasonably practicable, staff do not eat, drink or smoke in any place which is, or is liable to be, contaminated by lead and that staff do not eat, drink or smoke in any place which there is reason to believe may be contaminated by lead. For any COSHH assessment that includes the use of or exposure to lead, the requirements of CLAW shall take primacy over those of the COSHH regulations.

11.1.5 Hazardous substances can be defined as falling into at least one of the following groups:

- substances classified by legislation as very toxic, toxic, harmful, irritant or corrosive.
- substance that have been assigned a Workplace Exposure Limit (WEL).
- clinical waste (including animal tissue, animal waste, body parts etc.)
- biological agents e.g. fungi, bacteria (including legionella), moulds, parasites etc.
- dust of any kind (except those covered in bullets 1 & 2) if it is present in airborne concentrations;
 - equal to or greater than 10 mg/m³ 8 hour time weighted average, of inhalable dust; or
 - 4 mg/m³ 8 hour time weighted average of respirable dust.
- any substance that is not classified in the above bullet points but because of its chemical or toxicological properties and the way it is used or is present in the workplace could create a risk to health.

11.1.6 The Health and Safety Executives' COSHH Essentials on-line tool can be used as an aid in the process of hazardous substance risk assessments.

11.1.7 European Union regulation concerning the Registration, Evaluation, Authorisation and restriction of CHemicals (REACH) operates alongside COSHH to ensure information on the hazards of chemicals and how to use them safely will be passed down the supply chain by chemical manufacturers and importers through improved safety data sheets.

Role and Responsibilities

Procurement or Acquisition

11.2.1 Early identification within the supply chain of the potential use or generation of hazardous substances will have a significant impact on the hazard analysis, relevant safety cases and overall project risk management, and should be evaluated as to whether a substance can be eliminated or an alternative, less hazardous substance used whilst maintaining capability.

11.2.2 Consideration should be given to design alterations to minimise exposure and the management of residual exposure to be designed into process/user instructions.

11.2.3 Defence acquisition teams and persons responsible for the local procurement should ensure that they acquire any hazard analysis, hazard data information, Material Safety Data Sheets (MSDS), and any other appropriate information on proposed control measures for hazardous substances procured and make this information available to all users for use in their COSHH assessments.

11.2.4 Suppliers to MoD may have carried out COSHH risk assessments as part of development studies and for their own use during commissioning, trials, maintenance, repair and overhaul. These assessments should be provided to all users as assistance for subsequent COSHH risk assessments.

Assessors

11.2.5 Wherever there is a potential for exposure, the risk should be assessed and evaluated by a competent person having adequate knowledge, training and expertise in the assessment, evaluation and control of risks arising from exposure to substances hazardous to health together with knowledge of the process/equipment, how and in what environment the hazardous substance or material is to be used/produced. The assessor (if not the process manager) should bring the findings of the assessment (taking into account any variation due to local conditions, changes in use and personnel issues and, if appropriate, explain the risks) and the required control measures to manage those risks to the attention of the process manager. The competences required of assessors are described in Annex D.

11.2.6 Processes that use or produce hazardous substances should (iaw COSHH Regulation 6) be risk assessed:

- in the design and development process to design out or minimise their use.
- when substances (e.g. dust or vapours) result from a process or activity or which arise as a result of an accident or emergency;
- when substances arise as wastes or residues from processes or activities, including scrap material;
- when substances arise as a result of interaction with another process or activity in the vicinity.

Managers

11.2.7 Managers should ensure that end users have access to all of the relevant information about the materials, exposure routes, the potential health effects and the types of control to be implemented (these should be incorporated into process/user instructions) of hazardous substances used. Where the information is inadequate to allow a suitable and sufficient assessment to be carried out at the point of use, the users' manager in conjunction with the supplier (e.g. acquisition team) should obtain the required information to ensure the risks are able to be suitably assessed and effective control measures agreed and implemented. This information should be recorded at the point of use and where appropriate, copied into the safety case documentation. Where actions or controls are identified to reduce exposure there is a statutory requirement to implement those controls.

11.2.8 The manager should ensure that monitoring of exposure to hazardous substances within an activity or process is undertaken where an assessment concludes that:

- there could be serious risks to health if control measures failed or deteriorated;
- exposure limits might be exceeded
- control measures might not be working properly; or
- when employees are exposed to certain substances and processes specified in Schedule 5 to the COSHH Regulations

11.2.9 The manager should ensure that those undertaking and interpreting exposure monitoring are competent to do so; where there is any doubt advice should be sought from the Service Medical Officer, the TLB CESO organisation or a competent occupational hygienist.

11.2.10 Managers should ensure that where the regulations require persons to undergo health surveillance that provision is made for that health surveillance and that the requirement is adhered to, See JSP 375 Part 2, Vol 1, Chapter 14 – Health Surveillance and Health Monitoring.

11.2.11 The responsibility to ensure that all control measures identified by the COSHH assessment including any additional arrangements to the emergency procedures are implemented, communicated, monitored and reviewed rests with the manager.

All Personnel

11.2.12 It is a legal requirement for all personnel to comply with instructions provided for the safe use, handling or storage of substances as defined in the COSHH assessment or as otherwise communicated by management including the correct use of control measures, as well as any health surveillance or health monitoring that is required. Personnel should undertake such training as is required to understand the information and instruction provided on the potential health risks and the exposure controls to be implemented for the safe use, handling and storage of substances and processes used therein.

Assessing the Risk

11.3.1 Procurers and importers of hazardous substances must understand the requirement for manufacturers and suppliers to provide information to enable the assessment process to be completed. This information is usually included in the MSDS.

11.3.2 The MSDS for most substances procured by the MOD and classified as 'hazardous' are available from [The MOD Hazardous Stores Information System \(HSIS\) website](#). Any changes or updates to the substances used should be passed to the Movements and Transport Regulator (contact details are on the website) so that the HSIS database can be updated.

11.3.3 The MSDS is the principal source of information for most substances and forms the basis of the assessment process and therefore assessments can not be easily completed if this information is not available. Manufacturers and suppliers within the European Union (EU) have a legal requirement to provide that information.

11.3.4 Where substances are purchased from outside the EU or the hazard is a by-product of a process (e.g. fume from welding or wood dust from machining), this information may not be readily accessible (HSE advice sheets cover some processes but not all). In these cases assistance/advice should be sought from a competent person (e.g. an occupational hygienist) on the properties of the substance or process. It is not acceptable to allow substances or processes into use without proper assessment of the health risks.

11.3.5 COSHH risk assessments should be conducted by 'competent' persons who have a working knowledge of the processes and activities to be assessed. Competent

persons are required throughout the organisation and shall be involved at all stages of managing COSHH in a process or activity from concept to disposal (by sale or as waste).

11.3.6 The assessment should consider activities and processes and should NOT just be substance specific. Whilst substance specific assessment may appear an easier way of doing the assessment it does not enable consideration of the interfaces and additive effects where more than one substance is used in a task. Therefore the assessment shall:

- Fully identify the activity or process,
- identify all substances or products being used or produced,
- Consider who and how many are likely to be exposed, how and for how long.
- Consider exposure resulting from accidents, incidents and emergencies.

11.3.7 The management of COSHH risks should be controlled using the following in order of priority:

- Elimination of the hazard
- Substitution of the hazard (alternative substances or procedures)
- Hazard control (e.g. physical protective measures, engineering control),
- Provision of safety procedures or safe systems of work,
- Provision of personal and/or respiratory protective equipment.

11.3.8 The assessment should consider all routes by which exposures to hazardous substances may occur (inhalation, skin contact, ingestion, eye contact etc) and under all circumstances, hence assessors must have working knowledge of these processes and activities in order to complete the required 'suitable and sufficient' assessment. It should also consider if any end users might be more vulnerable i.e. pregnant workers, young persons.

11.3.9 There are a number of inter-related factors that can affect the risk from exposure;

- The type of damage or harm that the substance can cause and the amount needed to cause it
- How much of the substance is likely to be: ingested, get airborne and breathed in, or come into contact with the skin or eyes
- The duration of exposure and environmental conditions
- The amount being used and its physical properties i.e. its dustiness or volatility
- Interaction with other substances (synergistic effects, simultaneous or sequential exposure)

11.3.10 The completed assessment should be recorded using MOD Form 5011 and passed to the Line Manager or Project Leader for implementation of the control measures and inclusion on the establishment/unit COSHH master register (MOD Form 5011a).

11.3.11 Where specialist advice is required, or training identified, specialist groups (e.g. establishment safety advisers, TLB safety focal points, area safety groups, relevant CESO organisations) should be contacted who have access to MOD Occupational Hygiene support and Environmental Health Professionals.

COSHH Essentials

11.4.1 COSHH essentials is a simple to use on line system that is menu led using the information provided in the MSDS to produce generic advice. It can be used as a simple initial assessment to identify and record significant findings. However as it is a legal

requirement that the risk assessment must be 'suitable and sufficient', the generic information provided should only be used as guidance to assist in completing the full risk assessment.

11.4.2 Information on the COSHH Essentials process is available on the HSE website at www.hse.gov.uk. Access to the HSE Web tool is available on www.coshh-essentials.org.uk/

NOTE: USERS OF THE ON LINE SYSTEM SHOULD NOTE THAT COSHH ESSENTIALS ASSESSMENTS ARE ONLY HELD ON THE DATABASE FOR 30 DAYS FROM COMPLETION. ASSESSMENTS MAY BE DOWNLOADED AND STORED ELECTRONICALLY.

11.4.3 COSHH Essentials follows a step by step process resulting in a recommended control approach. Supporting this are Control Guidance Sheets that the HSE have produced. Whilst it is not expected that these approaches will apply in all cases, the principles shall be used with suitable adjustments to enable appropriate controls to be implemented. The assessment summary and Control Guidance Sheets should provide the user with enough information to identify if specialist help is required to complete a full COSHH risk assessment. If COSHH Essentials has been used the output should be saved and if necessary kept with the MoD Form 5011.

Control Measures

11.5.1 The 'principles of good control practice' are shown in Annex C and should be used at all stages of the risk assessment process as a checklist to help plan through life controls and to help reduce the risks from exposure to hazardous substances in the MOD.

NOTE: KNOWN CARCINOGENS OR MUTAGENS SHALL, IF AT ALL POSSIBLE, BE ELIMINATED OR SUBSTITUTED

11.5.2 The Health and Safety Executive guidance is explicit that where there is a practical cost effective solution, then the solution should be adopted. Where specific controls have been identified but it is not practicable to implement them, the justification for rejection shall be recorded and included in the activity, process or project documentation. However if such controls are not practicable given the working environment or where adequate control of exposure cannot be achieved by other means or if there is a temporary failure of control measures, then Personal Protective Equipment (PPE) and /or Respirator Protective Equipment (RPE) will need to be used. The use of PPE and /or RPE will often be required for maintenance operations for which the risk of exposure shall be COSHH assessed.

11.5.3 Any additional emergency procedures specific to the assessment must be clearly documented and recorded on the COSHH assessment form; these are in addition to the existing emergency arrangements.

Review

11.6.1 An initial review should take place shortly after implementation, in order to check the effectiveness of control measures.

11.6.2 Subsequent reviews should be undertaken:

- should an accident or incident occur.
- when there has been a significant change in the activity or process (location, duration, quantity, etc).
- there is reason to suspect that the assessment is no longer valid.
- at a frequency based on the risk but normally not exceeding every two years.

NOTE: EACH REVIEW SHOULD INCLUDE THE LINE MANAGER'S ASSESSMENT OF THE EFFECTIVENESS OF CONTROL MEASURES, AND ANY FURTHER CONTROLS THAT MAY BE REQUIRED.

Retention of Records

11.7.1 Risk assessments are to be held in accordance with JSP 375, Part 2, Volume 1, Chapter 39.

Related Documents

11.8.1 The following documents should be consulted in conjunction with this chapter.

JSP 375 Part 2, Volume 1

- Chapter 08 - Risk Assessment
- Chapter 14 - Health Surveillance and Health Monitoring
- Chapter 15 - Personal and Respiratory Protective Equipment

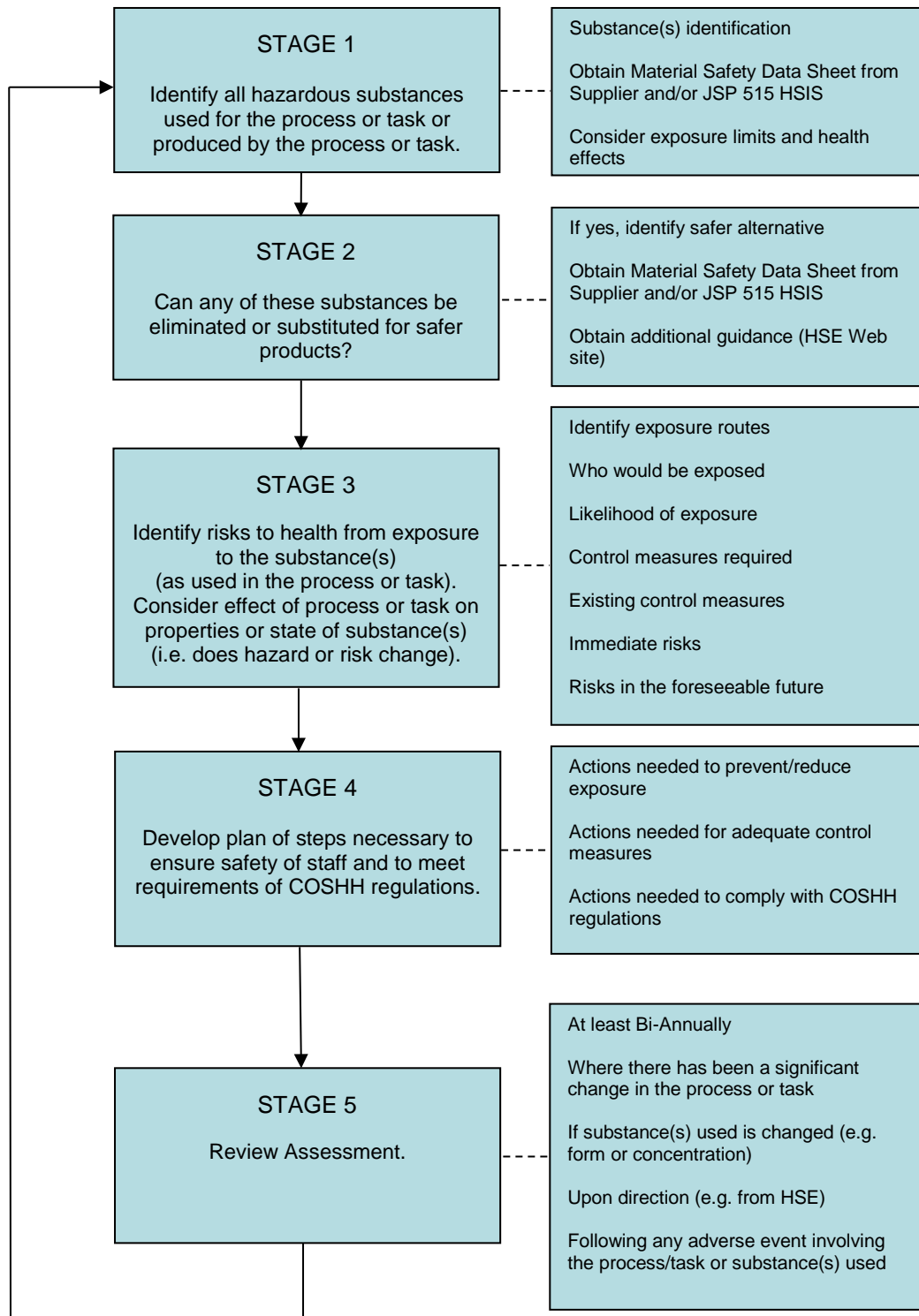
Other MOD Guidance

- [Hazardous Stores Information System \(HSIS\) Website](#)

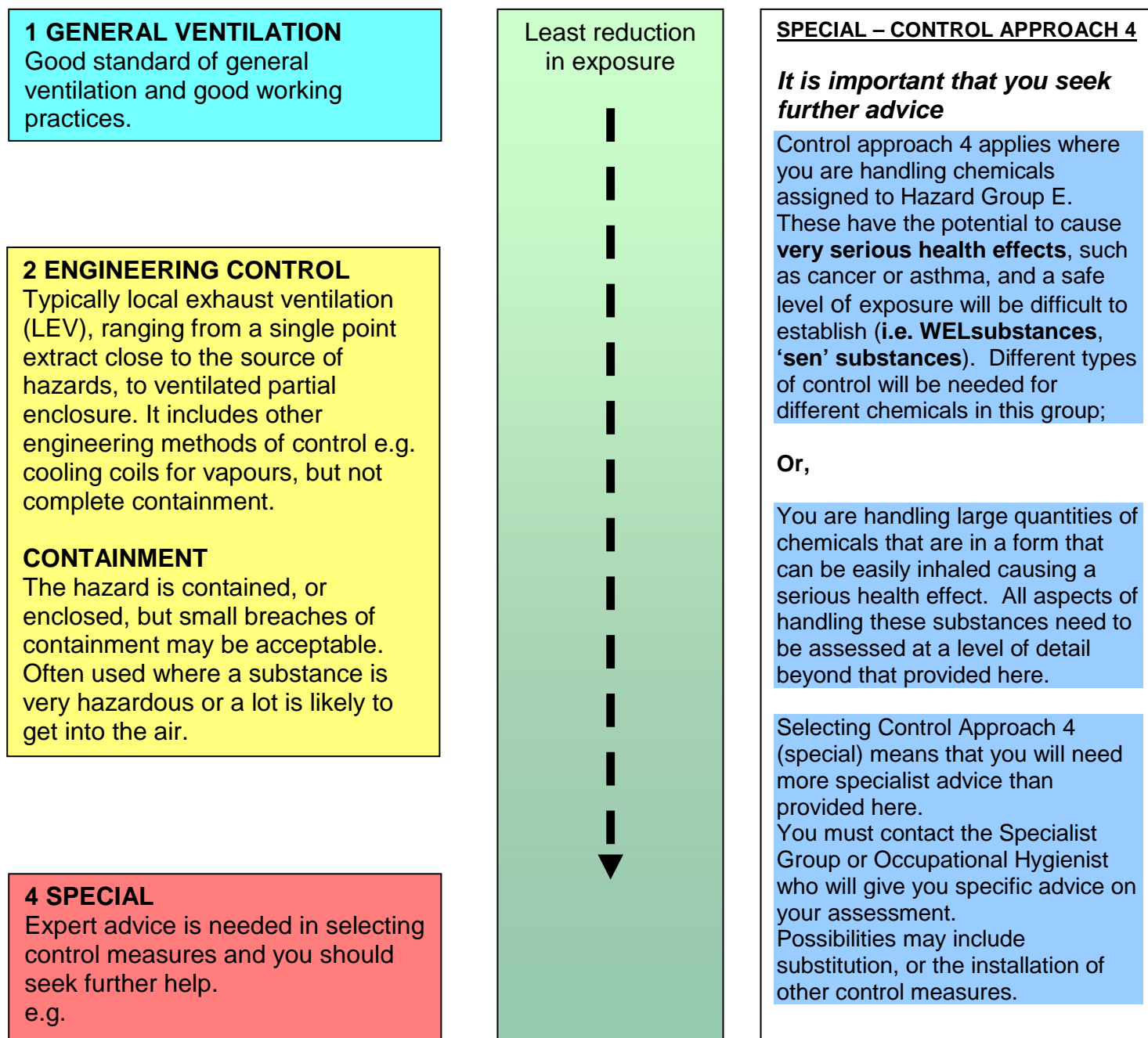
Legislation and Guidance

- [Legislation.Gov.uk - Health and Safety at Work etc. Act](#)
- [Legislation. Gov.uk - Control of Substances Hazardous to Health Regulations](#)
- [Legislation.Gov.uk - Control of Lead at Work Regulations \(CLAW\)](#)
- [HSE – ACOP - L5 - The Control of Substances Hazardous to Health](#)
- [HSE – Technical Basis for COSHH Essentials – Easy Steps to Control Chemicals](#)
- [HSE – COSHH Essentials Web Page](#)
- [HSE - HSG 97 - A Step by Step guide to COSHH Assessments](#)
- [HSE - HSG 258 Controlling airborne contaminants at work – A guide to local exhaust ventilation \(LEV\)](#)
- [HSE - HSG 53 Respiratory Protective Equipment at Work](#)
- [HSE - HSG 262 - Managing Risks From Skin Exposure at Work](#)
- [HSE - EH40 - Workplace Exposure Limits](#)
- [HSE – COSHH Essentials Guidance Publications](#)
- [HSE – COSHH Safety Data Sheet Guidance](#)
- [HSE - Asthma](#) and [HSE About Asthma](#)

COSHH Assessment Process Flowchart



IDENTIFYING CONTROL APPROACHES



If you have any doubts about which categories to use contact the Specialist Groups or Occupational Hygienist for additional advice.

source: HSE COSHH Essentials

PRINCIPLES OF GOOD CONTROL PRACTICE

<p>1. Design and operate processes and activities to minimise emission, release and spread of substances hazardous to health</p>	<ul style="list-style-type: none"> - Consider ways to achieve and maintain control of exposures where prevention is not deemed practicable (decisions must be recorded) e.g. ventilation systems, containment, substituting materials. - Disposal and other similar issues following an incident have been considered and documented. - This information may also inform the final equipment disposal requirements allowing the risk from such activities to be considered and planned for early on the equipment life cycle. - Identify all potentially exposed groups (including cleaners & maintenance) - List significant sources of exposure and how people exposed - Reduce number of sources - Reduce emission rate - Segregation of large sources - Enclosure of sources - Local Exhaust Ventilation (LEV) - Alter work process- Arrangements if controls fail - Organise the work to to minimise the number of people exposed and the duration, frequency and level of exposure
<p>2. Take into account all relevant routes of exposure - inhalation, skin absorption and ingestion - when developing control measures.</p>	<ul style="list-style-type: none"> - How does contaminant get into the air - How does contaminant get onto skin - Looking at the process which is the greater exposure risk (consider environment process is in)

PRINCIPLES OF GOOD CONTROL PRACTICE

<p>3. Control exposure by measures that are proportionate to the health risk.</p>	<ul style="list-style-type: none"> - What are the long and short term health effects - Is there a need for measuring exposures to ensure that assessments are valid and that the control measures implemented are effective in reducing exposures - Is there enough information to decide the risk to health - Have Workplace Exposure Limits been assigned - Is health surveillance indicated - Are the proposed control measures likely to be sufficient to control exposure adequately i.e. below the WELs - How often will the control measures be reviewed and by whom
<p>4. Choose the most effective and reliable control options which minimise the escape and spread of substances hazardous to health.</p>	<ul style="list-style-type: none"> - Can the process or substance be eliminated/substituted - Can process be modified to reduce spread, emissions, use less - Minimising numbers involved in the activity, - Maintaining good hygiene practices e.g. cleaning of workplaces to reduce the potential for exposures via ingestion for example; - Are the working methods compatible with the control measures - Have the control measures been integrated with the work process
<p>5. Where adequate control of exposure cannot be achieved by other means, provide, in combination with other control measures, suitable personal protective equipment.</p>	<ul style="list-style-type: none"> - List types and performance - Respiratory Protective Equipment must fit the process workers to ensure protection. (Fit testing required) - Is it compatible with the task - Have the wearers received training and information about the equipment and how to look after it - Correct storage will be needed to reduce the risk of contamination and further incidental exposure - Who is going to be responsible for checking and maintaining the equipment

PRINCIPLES OF GOOD CONTROL PRACTICE

<p>6. Check and review regularly all elements of control measures for their continuing effectiveness.</p>	<ul style="list-style-type: none"> - Arrange exposure monitoring and health surveillance where identified - Checks of LEV systems in between statutory testing and examination - Maintenance of control measures including statutory examination and testing (HSG 258) by competent engineers. Special arrangements for dealing with the aftermath of any incident are included in the user instructions. - Review written instructions, do they encourage use of controls and training - Check process regularly for signs of control effectiveness e.g. visible dust on surfaces = possible leakage.
<p>7. 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.</p>	<ul style="list-style-type: none"> - Ensure information about the health risks, the control measures etc are communicated to those carrying out the task, that any training required to carry out the task has been completed and recorded - Use of control measures by employees ensuring it is part of work instructions;
<p>8. Ensure that the introduction of control measures does not increase the overall risk to health and safety</p>	<ul style="list-style-type: none"> - Emergency procedures are in place and demonstrated on a regular basis. - Assess proposed control measures to ensure that no new risks are introduced or that they are adequately controlled such that the overall risk of exposure is minimised

Source: Control of Substances Hazardous to Health Approved Code of Practice; Schedule 2A

COSHH ASSESSOR COMPETENCE REQUIREMENTS

1. Those persons most likely to be competent assessors will usually have:
 - a basic understanding of the COSHH Regulations – **or have access to someone who does**. The assessor or their adviser will need a good working knowledge of the content and principles of the Approved Code of Practice (ACOP) and relevant guidance.
 - and be able to systematically gather relevant information about how exposure may occur and the risks to health from that exposure. This requires the ability to:
 - understand the significance of what is being observed during the process, particularly if it is different from written procedures;
 - identify where operational conditions may influence the way the process is carried out and how this may affect the risk to health/exposure;
 - identify and review technical literature where relevant;
 - ask relevant questions of operators, supervisors, managers, advisers etc and draw all the information together from all sources in a systematic way, to estimate likelihoods and consequences;
 - form valid and justifiable conclusions about the risks to health.
 - the ability to specify the actions required to comply with the regulations. This involves:
 - asking fundamental questions about whether exposures need to occur (i.e. can process or substances be eliminated);
 - having an appreciation of the range of possible control measures and the actions required to maintain those control measures;
 - ability to look critically at existing arrangements and identify where they may not be appropriate and/or effective (assistance may be required from specialists).
2. Understand their limitations
 - 2.1 The assessor must know or be aware of where expertise that is likely to be required during the assessment process can be sourced, and to know at what stage that expertise will need to be involved, e.g. air monitoring (exposure monitoring) should only be carried out by professionally trained persons.
 - 2.2 Occupational hygiene advice on the selection and fit testing of respiratory protective equipment should be sought where its use has been identified,.
3. Make a report
 - 3.1 Effectively communicate the findings about the risks and the precautions to be taken to all stakeholders (therefore the assessor should be in such a position that all stakeholders can be identified and the information provided).

SAFETY DATA SHEET TERMINOLOGY

Absorption	Uptake of material into the body, e.g. the blood, cells, organs, etc. Materials are inhaled into the lungs and ingested into the digestive tract from where they are absorbed to other parts of the body.
Acute Effects	Health effect which appears within a short period of exposure to the causative agent. Usually associated with short term, high level exposure.
Additive/Synergistic	Substances are said to be synergistic in their effects when they act either on the same organs or by the same mechanisms so that the overall effect is considerably greater than the sum of the individual effects. This may arise from mutual enhancement of the effects of the constituents or because one substance 'potentiates' another causing it to act in a way it would not if used on its own.
Approved Supply List	The list published by the Health & Safety Commission under the Chemicals (Hazard Information & Packaging for Supply) Regulations 1994. It details the information approved for the classification of labelling of substances and preparations dangerous for supply.
Carcinogenic	A substance is said to be carcinogenic if, after inhalation, ingestion or penetration of the skin occurs, it may induce cancer in man or increase its incidence.
Chronic Effect	Health effect which appears some time after first exposure to the causative agent. Usually associated with repeated, prolonged exposure.
Control Measure	A method for reducing exposure to external influences, e.g. substitution, engineering control, respiratory protective equipment.
DSEAR	Dangerous Substances and Explosive Atmospheres Regulations
Dust	Created when solid materials are broken down into fine particles. The smaller the dust, the longer it remains in the air and the easier it is to inhale
Fume	Created when solid materials (usually metals) vapourise when subjected to high temperatures. The metal vapour rapidly cools and condenses into an extremely small particle, with particle size generally less than one micrometer in diameter

SAFETY DATA SHEET TERMINOLOGY

Gas	Substance similar to air which becomes airborne at room temperature and, because they are able to diffuse or spread freely, can travel very far, very quickly
Health surveillance	Systematic, close overview of an individual's health
Ingestion	Taking in of material via the mouth
Mist	Tiny liquid droplets that are formed from liquid materials by atomisation and condensation processes such as spraying. Many mists are a combination of several hazardous ingredients.
Mutagenic	A substance is said to be mutagenic if, after inhalation, ingestion or penetration of the skin, it may involve a risk of hereditary genetic defects.
'Sen' Notation	Substances assigned this notation are capable of causing occupational asthma. Risk phrases used include R42 or R42/43
'Sk' Notation	Substances assigned a 'sk' notation in EH40 indicate the ability of such substances to be absorbed through intact skin. There is concern that the substance is absorbed and transported to other parts of the body (systemic toxicity).
Teratogenic	A substance is said to be teratogenic if, after inhalation, ingestion or penetration of the skin, it may involve a risk of subsequent non-hereditary birth defects in offspring.
Time Weighted Average (TWA)	This term applies to exposure to airborne concentrations of substances averaged over a time period. The two periods used are: long term (8 hours) and short term (15 minutes). Short term exposure limits (STEL) are set to help prevent effects, such as eye irritation, which may occur after exposures of a few minutes.
Vapour	Gaseous state of substances that are either liquids or solids at room temperature. They are formed when solids or liquids evaporate.
Workplace Exposure Limits (WELs)	Are occupational exposure limits (OELs) set under COSHH in order to help protect the health of workers. They are concentrations of hazardous substances in the air averaged over a specified period of time referred to as a time weighted average (TWA).