Social Partner Members of the OEL Working Group **Annex A**

Roger Alesbury (BP)	Member since 2001 (Industry)
Len Levy (University of Leicester)	Member since 2001 (Independent)
Mike Kingsland (Infineum)	Member since 2001 (Industry)
Steve Bailey (SmithKline Beecham)	Member since 2001 (Independent)
Bud Hudspith (GPMU)	Member since 2004 (Trade Union)
Elizabeth Jenkins (Prospect)	Member 2001 – 2003 (Trade Union)
Nigel Bryson (TUC)	Member 2002 – 2003 (Trade Union)
Andy Stirling (University of Sussex)	Member 2002 – 2004 (Independent)

The OEL Working Group has met twelve times since 2001.

Social Partner Members of the COSHH ACoP Drafting Group

The COSHH ACoP Drafting Group met once, on 13 May 2004.

Bud Hudspith (GPMU)	(Trade Union)
John Dobbie (BP)	(Industry)
John Edwards (Corus)	(Industry)
David O'Malley (Genesis Environmental Ltd)	(Independent)

D R A F T S T A T U T O R Y I N S T R U M E N T S

2004 No. 0

HEALTH AND SAFETY

The Control of Substances Hazardous to Health (Amendment) Regulations 2004

Made - - - -	*Day Month 2004*
Laid before Parliament	*Day Month 2004*
Coming into force - -	*Day Month 2004*

The Secretary of State, being the Minister designated ([1]) for the purpose of section 2(2) of the European Communities Act 1972([2]) in relation to the abolition of restrictions on the import or export of goods, in the exercise of the powers conferred on him by the said section 2(2) and sections 15(1), (2), (4), and (6)(b) and 82(3)(a) of, and paragraphs 1(1), 8, 9, 10, 11, 13(1), 14, 15 and 16 of Schedule 3 to the Health and Safety at Work etc. Act 1974([3]) hereby makes the following Regulations:

Citation and commencement

1. These Regulations may be cited as the Control of Substances Hazardous to Health (Amendment) Regulations 2004 and shall come into force on Day Month 2004.

Amendment of the Control of Substances Hazardous to Health Regulations 2002

2. In the Control of Substances Hazardous to Health Regulations 2002([4])—

i. in regulation 2(1)—

(i) delete the definition of "maximum exposure limit";

(ii) delete the definition of "occupational exposure standard";

(iii) after the definition of "the risk assessment" add the following definition—

""risk phrase" has the meaning assigned to it in regulation 2(1) of the CHIP Regulations;**"**;

(iv) in the definition of "substance hazardous to health" in sub-paragraph (b), for the words "a maximum exposure limit or an occupational exposure standard" substitute the words "a workplace exposure limit";

([1]) S.I. 1992/2661

([2]) 1972 c.68; the definition of the Treaties referred to in section 2(2) of the European Communities Act 1972 was extended by section 1 of the European Economic Area Act 1993 (c.51).

([3]) 1974 c.37; sections 11(2), 15(1) and 50(3) were amended by the Employment Protection Act 1975 (c.71), Schedule 15, paragraphs 4, 6 and 16(3) respectively.

([4]) S.I. 2002/2677, as amended by S.I. 2003/978.

(v) after the definition of "workplace" add the following definition—

" "workplace exposure limit" for a substance hazardous to health means the exposure limit approved by the Health and Safety Commission for that substance in relation to the specified reference period when calculated by a method approved by the Health and Safety Commission.**"** ;

ii. in regulation 6(2) sub-paragraph (f), for the words "occupational exposure standard, maximum exposure limit" substitute the words "workplace exposure limit";

iii. in regulation 7—

(vi) for paragraph (7), substitute the following paragraph—

"(7) Without prejudice to the generality of paragraph (1), where there is exposure to a substance hazardous to health, control of that exposure shall only be treated as being adequate if—

(a) the principles of good practice for the control of exposure to substances hazardous to health set out in Schedule 2A are applied;

(b) any workplace exposure limit approved for that substance is not exceeded; and

(c) for—

(i) a substance which carries the risk phrase R45, R46 or R49, or for a substance or process which is listed in Schedule 1; or

(ii) a substance which carries the risk phrase R42 or R42/43, or which is listed in section C of HSE publication 'Asthmagen? Critical assessments of the evidence for agents implicated in occupational asthma'([5]) as updated from time to time, or any other substance which the risk assessment has shown to be a potential cause of occupational asthma,

the level of exposure is reduced so far as is reasonably practicable.**"**;

(vii) delete paragraph (8);

iv. in regulation 12(2)—

(viii) in sub-paragraph (a)(ii) for the words "occupational exposure standard, maximum exposure limit" substitute the words "workplace exposure limit";

(ix) in sub-paragraph (d) for the words "maximum exposure limit", in each place where they occur, substitute the words "workplace exposure limit"; and

v. at the end of Schedule 2 insert the Schedule to these Regulations.

Signed by the authority of the Secretary of State for Work and Pensions

Jane Kennedy
Minister of State
Department for Work and Pensions

Day Month 2004

([5]) HSE Books 1997 ISBN 0 7176 1465 4

SCHEDULE

“ SCHEDULE 2A Regulation 7(7)

PRINCIPLES OF GOOD PRACTICE FOR THE CONTROL OF EXPOSURE TO SUBSTANCES HAZARDOUS TO HEALTH

(a) Design and operate processes and activities to minimise emission, release and spread of substances hazardous to health.

(b) Take into account all relevant routes of exposure – inhalation, skin absorption and ingestion – when developing control measures.

(c) Control exposure by measures that are proportionate to the health risk.

(d) Choose the most effective and reliable control options which minimise the escape and spread of substances hazardous to health.

(e) Where adequate control of exposure cannot be achieved by other means, provide, in combination with other control measures, suitable personal protective equipment.

(f) Check and review regularly all elements of control measures for their continuing effectiveness.

(g) 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.

(h) Ensure that the introduction of control measures does not increase the overall risk to health and safety.”

EXPLANATORY NOTE

(This note is not part of the Order)

1. These Regulations amend the Control of Substances Hazardous to Health Regulations 2002 (S.I. 2002/2677) by-

(a) introducing a new requirement to observe principles of good practice for the control of exposure to substances hazardous to health;

(b) introducing a single new workplace exposure limit for substances hazardous to health which replaces occupational exposure standards and maximum exposure limits;

(c) deleting regulation 7(8) concerning occupational exposure standards; and

(d) introducing a list of principles of good practice for the control of exposure to substances hazardous to health as Schedule 2A.

2. HSE publication ‘Asthmagen? Critical assessments of the evidence for agents implicated in occupational asthma’, ISBN 0 7176 1465 4, can be obtained from HSE Books, PO Box 1999 Sudbury, Suffolk CO10 2WA.

3. A copy of the regulatory impact assessment prepared in respect of these Regulations can be obtained from the Health and Safety Executive, Economic Advisers Unit, Rose Court, 2 Southwark Bridge, London, SE1 9HS.

THE CONTROL OF SUBSTANCES HAZARDOUS TO HEALTH (AMENDMENT) REGULATIONS 2004

PROPOSED REVISED ACOP TEXT SUPPORTING REGULATION 7

Prevention of exposure

89 An employer's overriding duty and first priority is to consider how to prevent employees being exposed to substances hazardous to health by all routes (regulations 7(1) and (2)). Employers who do not first consider this are failing to comply with a fundamental requirement of the Regulations. The duty to prevent exposure should be achieved by measures other than the use of personal protective equipment. Employers can best comply with this requirement by eliminating completely the use or production of substances hazardous to health in the workplace. This might be achieved by:

(a) changing the method of work so that the operation giving rise to the exposure is no longer necessary; or

(b) modifying a process to eliminate the production of a hazardous by-product or waste product; or

(c) substituting wherever reasonably practicable, a non-hazardous substance which presents no risk to health where a hazardous substance is used intentionally.

90 In many workplaces, it will not be possible or practicable to eliminate exposure to substances hazardous to health completely. Therefore, where it is necessary to use a hazardous substance, an employer should consider whether it is possible to ~~significantly~~ reduce exposure and risk to the health of employees significantly by using:

(a) ~~using~~ an alternative less hazardous substance; or

(b) a different form of the same substance; or

(c) a different process,

~~which, in the circumstances of the work, presents less risk to the health of employees. This might be achieved~~ For example, by changing the form of the substance concerned so that exposure is negligible, e.g. using a substance in pellet rather than powder form.

91 ~~The~~ Among the factors an employer will need to take ~~many factors~~ into account when considering ~~whether to use~~ an alternative substance~~,~~ ~~including all~~ are the harmful properties of any proposed replacement. The harmful properties

of many potential replacement substances may not all be known. Care should be taken when there are gaps in the knowledge about the potential of the substance to cause harm. ~~The harmful properties of many potential replacement substances may not all be known, and employers should be aware of this in considering alternatives.~~ **The ultimate decision should be based on a balance of any new risks they might present against the potential benefits. For example, ~~in seeking a less toxic substitute chemical for a process, the~~ an employer's choice of a replacement substance ~~one~~ with lower toxicity but higher flammability might increase the overall risk if the process has an intrinsic fire risk. ~~Therefore, i~~In considering potential substitutes, employers should be aware of the responsibilities they have under other regulations e.g. the Dangerous Substances and Explosives Atmospheres Regulations 2002.**

92 More guidance on substitution is provided by HSE's publication *Seven steps to successful substitution of hazardous substances*.

Adequate control of exposure ~~by all routes~~

93 Where prevention of exposure to substances hazardous to health is not reasonably practicable, employers must comply with the secondary duty in regulation 7(1) to ~~adequately~~ control exposure adequately by all routes. ~~Employers can achieve adequate control of exposure from all routes of exposure by complying with the provisions of regulation 7(7). These require employers to take the following measures~~ To achieve this, employers must consider and apply, where appropriate for the circumstance of the work:

(a) the measures set out in Regulation 7 (3) in the priority order given;

(b) the specific measures in Regulation 7 (4);

~~(a)~~(c) ~~apply~~ the principles of good practice for the control of exposure to substances hazardous to health ~~as~~ set out in Schedule 2A, as required by [~~r~~Regulation 7(7)(a)]; (see the guidance on the principles on page xx)~~and~~

~~(b)~~(d) ensure that any workplace exposure limit (WEL) approved for a substance hazardous to health is not exceeded [regulation 7(7)(b)]; and ~~where appropriate~~

(~~c~~e) reduce exposure so far as is reasonably practicable for:

(i) a substance which carries the risk phrase R45, R46 or R49, or for a substance or process which is listed in Schedule 1; or

~~substances assigned the risk phrase R45 "May cause cancer"; or R46 "May cause heritable genetic damage"; or R49 "May cause cancer by inhalation" (carcinogens and mutagens, regulation 7(7)(c)); and~~

(ii) a substance which carries the risk phrase R42 or R42/43, or which is listed in section C of HSE publication 'Asthmagen? Critical assessments of the evidence for agents implicated in occupational asthma', or any other substance which the risk assessment has shown to be a potential cause of occupational asthma ~~**(ii) substances or processes listed in Schedule 1 *Other substances and processes to which the definition of "carcinogen" relates* (regulation 7(7)(c)).**~~

~~**94 Where appropriate, employers should be able to comply with the requirements of sub-paragraphs (b) and (c) by applying the principles of good practice for the control of exposure to substances hazardous to health as required by sub-paragraph (a). Guidance on applying those principles is provided by HSE's publication *[title].***~~

~~**95 In complying with regulation 7(7) to achieve adequate control of exposure, employers must also comply with the provisions of regulation 7(3) supported by those in regulation 7(4). Regulation 7(3) requires that employers apply protection measures appropriate to the activity and consistent with the risk assessment in an order of priority.**~~

~~**96 At the same time as considering how to apply the protection measures set out in regulation 7(3) and (4), employers must also consider how to implement the general principles of good practice for the control of exposure to substances hazardous to health required by regulation 7(7) and Schedule 2A. Some aspects of the requirements in regulation 7(3) duplicate or overlap the list of principles in the Schedule. Therefore, this reinforces the need for employers to consider the separate requirements concurrently in order to achieve adequate control of exposure by all routes. The employer's aim should be to apply the principles of good practice and to select the most appropriate controls that are proportionate to the risks arising from the work. So if the risks to employees' health are serious or uncertain, stringent control of exposure by all routes will be required.**~~

~~**97 The order of priority in applying protection measures required by regulation 7(3) means that employers must first consider the application of the measures set out in regulation 7(3)(a) in so far as they are appropriate for the circumstances of the work, before considering those in 7(3)(b) and finally those in 7(3)(c).**~~

~~**98 Where employers cannot achieve adequate control of exposure by a combination of the measures in regulation 7(3), (4), (7) and Schedule 2A, then they may supplement them by the use of suitable personal protective equipment (PPE). Wherever possible, however, PPE should only be used as a last resort and then in addition to other control measures. For example, in certain circumstances, e.g. maintenance and cleaning operations where there is the potential for a high level of exposure that may be particularly difficult to adequately**~~

~~control, employers may also need to provide personal protective equipment, including respiratory protective equipment.~~

~~9594~~ ~~99~~ **The employer should apply the principles of good practice in all circumstances, but it will not always be necessary to apply all the controls described in regulations 7(3) and (4). ~~However, it will often be necessary to use a~~ A combination of them ~~which in practice will work~~ will often be necessary to best ~~to~~ protect the health of employees. The employer should give priority to those controls that contain or minimise the release of contaminants and the spread of hazardous substances into the workplace. Guidance on applying those principles is provided by HSE's publication *[title].***

95 The ~~A~~administrative and procedural options for control~~ling exposure~~ are also important elements that the employer should consider, e.g. the arrangements for the safe handling, storage and transport of hazardous substances, of waste containing such substances, and suitable maintenance procedures etc. ~~Many examples of how to adequately control exposure are provided in *COSHH Essentials: Easy steps to control hazardous substances.*~~

96 ~~100~~ The specific standards that are needed to achieve adequate control of exposure by ~~the all~~ different routes of exposure, i.e. inhalation, absorption through the skin and ingestion, are described in paragraphs ~~124-147~~120-141.

Specific control measures

97 ~~101~~ Regulation 7(4) supports regulation 7(3) by providing a list of typical control measures that employers should ~~consider~~apply if indicated as necessary in the risk assessment. ~~when applying the control measures set out in regulation 7(3).~~The objective is to use the findings of the risk assessment to select the control measure or the combination of control measures that are proportionate to the risk and which will achieve adequate control of exposure.

~~**102** The requirement at regulation 7(4)(c)(iii) - "reducing to the minimum required for the work concerned .... the quantity of substances hazardous to health present at the workplace" - is not intended to prevent employers buying hazardous substances in bulk in order to reduce their costs, but to reduce the overall risk by minimising the amount potentially released into the working area.~~

98 ~~103~~ Appropriate application of the principles of good practice for the control of exposure to hazardous substances will enable ~~**The control measures that**~~ **employers to select the optimum ~~may have to use could be any~~ combination of control measures ~~of the following~~ which may include:**

(a) totally enclosed process and handling systems;

(b) plant or processes changes ~~or systems of work~~ which, for instance:

(i) keep the production or generation of the hazardous dust, fume, vapour, biological agent etc. to a minimum, e.g. by modifying a process or changing its conditions such as temperature or pressure to reduce emissions; ~~or~~

(ii) contain ~~it~~ hazardous substances within the plant;

(iii) reduce or eliminate the need for maintenance staff to go into hazardous areas; and

(iv) limit the area contaminated if spills and leaks occur;

(c) ~~(c)~~ Changes to systems of work which, for instance:
(i) Identify and define methods of work which minimize emission, generation or release of substances hazardous to health;
(ii) Reduce people's exposure time;
(iii) Minimise the number of people exposed.

(d) ventilation -

(i) partial enclosure, with local exhaust ventilation;

(ii) local exhaust ventilation; and/or

(iii) sufficient general ventilation;

Further guidance is available from the HSE publications HSG37 *An introduction to local exhaust ventilation, and* HSG202 *General ventilation in the workplace. Guidance for employers…*

(~~d~~e) reducing to the minimum required for the work:

(i) the number of employees exposed and excluding non-essential employees, e.g. by using "refuges";

(ii) the level and duration of exposure; and

(iii) the quantities of hazardous substances used or produced;

(~~e~~f) regular cleaning of contamination from walls, surfaces etc. or their disinfection;

(~~f~~g) providing safe handling, storage, transport and disposal of substances hazardous to health and waste containing such substances;

(h) hygiene measures:

(i) adequate facilities for washing, changing and storage of clothing and PPE (see paragraph 185);

(ii) including arrangements for laundering contaminated clothing;

(iii) separate accommodation for clothing worn at work which may become contaminated ~~by work clothing~~; and

(iv) where appropriate, prohibiting employees from eating, drinking and smoking in contaminated areas which may result in the ingestion of hazardous substances.

99 ~~104~~ Employers should ensure by appropriate supervision that employees follow good practice and defined methods of work at all times. Employers should also ensure they involve safety representatives. This can play a significant role in helping to secure and maintain adequate control of exposure to hazardous substances.

100 ~~105~~ Employers must also ensure that whoever provides advice on the prevention or control of exposure is competent to do so in accordance with regulation 12(4). ~~The people who carry out this work should~~ A competent person will have adequate knowledge, training and expertise, e.g. in the design of processes, ventilation and personal protective equipment, the human and technical reasons why these control measures can fail, and the importance of following the principles of good practice. Such people will include qualified occupational hygienists and registered safety practitioners.

101 The requirement at regulation 7(4) (c) (iii) – "reducing to the minimum required for the work concerned....the quantity of substances hazardous to health present at the workplace" – is not intended to prevent employers buying hazardous substances in bulk in order to reduce their costs, but to reduce the overall risk by minimising the amount potentially released into the working area.

102 PPE must be used where it is not possible to achieve adequate control of exposure by other control measures alone, and then only in addition to them (regulation 7(3)(c) and schedule 2A, principle d)).

~~Control of exposure to hazardous substances not classified as carcinogens or mutagens~~

~~106 For these hazardous substances, the employer should make every effort to achieve adequate control of exposure by applying the principles of good practice in Schedule 2A and~~

~~the protection measures in regulation 7(3) other than personal protective equipment (PPE). However, PPE must be used where it is not reasonably practicable to achieve adequate control of exposure by other control measures alone, and then only in addition to them (regulation 7(3)(c)).~~

COSHH Essentials: Easy steps to control chemicals

103 ~~107~~ Employers may use the advice available from ~~step-by-step process described in~~ ***COSHH Essentials*** for identifying ~~the~~ appropriate control~~s~~ measures for a wide range of hazardous substances/task combinations. ~~Employers correctly using the~~When properly applied and followed ***COSHH Essentials'*** should indicate the appropriate control measures required. If correctly applied, these control measures should provide adequate control of exposure. ~~risk assessment scheme and following the control advice will be applying good practice and complying, in the vast majority of circumstances, with the control requirements of regulation 7(3).~~ However, it remains the responsibility of employers to ensure that they:

(a) have made a suitable and sufficient assessment in accordance with regulation 6;

(b) are ~~adequately~~ controlling exposure adequately to substances hazardous to health in accordance with regulation 7(7)~~. and, where appropriate, complying with any relevant workplace or in-house exposure limits; and~~

(c) are protecting employees' health.

104 ~~108~~ ~~They~~ Employers should seek specialist advice if they are in doubt about the suitability of control advice recommended by ***COSHH Essentials***. The BOHS Faculty of Occupational Hygiene (www.bohs.org/) keeps lists of qualified hygienists who can help.

105 ~~109~~ Employers who use the ***COSHH Essentials*** approach may use the completed checklist from the publication, or the printout from the web-based ***COSHH Essentials***, as part of the significant findings of the assessment that the employer may need to record in accordance with regulation 6(4).

106 To achieve adequate control employers must apply the principles of good practice for the control of exposure to hazardous substances. But there is more than one route by which they can get advice on control measures. The flow-diagrams in Figure 1 (page xx) illustrate two such routes: one of these is most suitable for the non-expert and the other for health and safety professionals such as Occupational Hygienists.

Control of exposure to carcinogens and mutagens

107 ~~110~~ If it is not reasonably practicable to prevent exposure to a ~~n~~ carcinogen or mutagen, ~~(~~substances assigned one of the risk phrases R45, R46 or R49 (see paragraph 93 (e)), or listed in Schedule 1 the employer must put into place the appropriate controls set out in regulation 7(3) and all the measures in regulation 7(5). This means that whether or not it is reasonably practicable to enclose totally the process and handling systems in accordance with regulation 7(5)(a), all the other measures in 7(5)(b)-(e) are still required.

~~**111 For carcinogens and mutagens assigned one of the risk phrases R45, R46 or R49 (see paragraph 93(c)), or listed in Schedule 1, the employer's overriding aim must be to reduce exposure so far as is reasonably practicable**~~.

108 ~~112~~ Further guidance on the control of exposure to ~~hazardous substances defined as carcinogens or mutagens for the purposes of COSHH~~ carcinogens and mutagens is set out in Appendix 1.

Control of exposure to substances that cause occupational asthma

109 ~~113 Further~~ Additional ACoP duties on the control of substances that cause occupational asthma are set out in Appendix 3. A list of ~~the~~ substances that can cause occupational asthma is available on the HSE website at www.hse.gov.uk/asthma/about.htm.

Further general guidance

110 ~~114~~ The HSE publication *[title]:*

(a) provides a list of those hazardous substances for which HSC has approved a WEL;

(b) gives details of the limit(s) concerned;

(c) provides a brief description of how exposure to the substance may affect health;

~~(d) lists the appropriate *COSHH Essentials* hazard group;~~

(~~e~~d) identifies substances with WELs ~~which, for~~that ~~the purposes of COSHH,~~ are also defined as carcinogens~~,~~ ~~or~~ mutagens or substances that can cause occupational asthma for the purposes of COSHH, ~~substances that may cause occupational asthma, and substances assigned a skin notation (see paragraph 143);~~

(~~f~~e) lists the appropriate control approach under *COSHH Essentials*, and

(~~g~~f) provides further helpful guidance, e.g. work activities which may result in exposure to the substance concerned.

The publication is available on the HSE website at www…..

Control of exposure to biological agents

111 ~~115~~ If employers cannot prevent exposure to a biological agent they should take steps to ensure that it is ~~adequately~~ controlled adequately and consider all the requirements set out in regulation 7(3), (4), (6) and (7). They should apply the principles of good practice and use each requirement where, and to the extent that:

(a) it is applicable; and

(b) the assessment carried out under regulation 6 shows that it will lead to a reduction in risk.

112 ~~116~~ The selection of control measures for biological agents should take into account the fact that there are no exposure limits for them. Their ability to replicate and to infect at very small doses means that exposure may have to be reduced to levels that are at the limit of detection.

113 ~~117~~ Not all the listed measures will be required in every case. The assessment may indicate for example that:

(a) a specific method of transmission and route of infection is required;

(b) a susceptible host is needed;

(c) there is a low prevalence of the infection in that particular activity; and

(d) illness is ~~easily~~ treatable easily leading to rapid and complete recovery.

114 ~~118~~ In these cases, the risk would be relatively low and the control measures required less stringent.

115 ~~119~~ Another factor that will determine which controls are to be applied may be the extent to which exposure to a biological agent is incidental to the main purpose of the work (see also paragraphs 48-49), or involves intentional work with a biological agent. The duties under COSHH apply in both circumstances. Schedule 3 applies for all work with biological agents that involves research, development, teaching or diagnosis.

116 ~~120~~ Where human patients or animals infected with a biological agent in Group 2 are accommodated, e.g. patients on a hospital ward, the choice of controls and containment, as in other cases, should be on the basis of risk assessment and in particular the nature of infection and the facility for mode of transmission of

the agent. The controls selected should reflect the principles in regulation 7(3), (4), (6) and (7). For patients and animals infected with a Group 3 or 4 biological agent the control and containment measures should reflect the above principles with appropriate measures selected from Part II of Schedule 3. The level of risk should be the employer's main consideration, and even where the exposure is incidental to the activity, if the risk is sufficiently high and some of the listed measures can reduce it, then the employer should apply those measures.

117 ~~**121**~~ There are effective vaccines against some biological agents. In addition to other measures designed to prevent or control the risk of exposure to such agents under regulation 7(3), (4), (6) and (7), employers should make arrangements for vaccination, free of charge to employees who are considered vulnerable to the biological agents to which they are exposed or likely to be exposed at work. It is also recommended that employers keep a vaccination record.

118 ~~**122**~~ In addition, employers and employees have responsibilities to protect others who might be put at risk from a work activity, e.g. patients, visitors and members of the public. Vaccination of employees can help prevent the spread of infection to such individuals.

119 ~~**123**~~ Employees should be informed of the benefits and drawbacks of both vaccination and non-vaccination. Protection against serious illness is the most obvious benefit; protection against spread of infection to patients and other members of the public is also important. Drawbacks include the possibility of reactions to the vaccine, and any potential effects on health should be explained to the individual. Having considered the risks and benefits, employers should recommend vaccination to their employees.

Adequate control of exposure by inhalation

Workplace exposure limits (WELs)

~~121~~120 ~~**124**~~ The HSC has established WELs for a number of substances hazardous to health. These are intended to prevent excessive exposure to specified hazardous substances by containing exposure at or below a set limit. If employers ~~correctly~~ apply the principles of good practice for the control of substances hazardous to health correctly, exposure should be below any relevant WEL. The principles require the degree to

which exposure is reduced below the WEL to be proportionate to the health risk.

121 ~~125~~ A WEL is the maximum concentration of an airborne substance averaged over a reference period, to which employees may be exposed by inhalation ~~under any circumstances~~. Substances which have been assigned a WEL fall into two broad groups~~, i.e.~~:

(a) a substance which carries the risk phrase R42 or R42/43, or which is listed in section C of HSE publication 'Asthmagen? Critical assessments of the evidence for agents implicated in occupational asthma', or any other substance which the risk assessment has shown to be a potential cause of occupational asthma ~~those defined as a carcinogen or mutagen for the purposes of COSHH; including those assigned one of the risk phrases R45, R46 or R49 (see paragraph 93(c)), or included in the list of substances and processes in Schedule 1;~~

(b) all other hazardous substances assigned a WEL.

122 ~~126~~ **For those substances included in (a) above, employers must ensure that the control measures are in place to reduce exposure ~~so far as is reasonably practicable below the WEL~~ as far below the WEL as is reasonably practicable (see paragraphs ~~110~~ 107 to ~~112~~108). For all other hazardous substances assigned WELs, ~~(paragraph (b) above),~~ employers should achieve adequate control of exposure by inhalation ~~will be achieved~~ by applying the principles of good practice (see page xx) ~~that are proportionate to the health risk~~ and ~~also~~ by ensuring that the WEL is not exceeded (see paragraphs 102 to 106 ~~to 109~~). The principles require that measures to control exposure are proportionate to the health risk from the substance.**

~~**127 Regulation 7(4)(c)(ii) requires employers to reduce to the minimum for the work concerned the level and duration of exposure. For substances that have been assigned a WEL or in-house exposure limit that should not be exceeded (regulation 7(7)(b)), employers can comply with this requirement by ensuring that they apply the principles of good practice required by regulation 7(7)(c) and as set out in Schedule 2A. In so doing, they will ensure that exposure is adequately controlled and complies with any relevant exposure limit for the substance concerned.**~~

123 ~~128~~ WELs apply only to people at work and to conditions where the atmospheric pressure is normal, i.e. between 900 and 1100 millibars.

124 ~~129~~ WELs refer to concentrations of hazardous substances in the air that people breathe, averaged over a specified period of time referred to as time weighted average (TWA). Two time periods are used: long term (8 hours); and short term (15 minutes). These limits cannot be ~~readily~~ adapted readily to evaluate or control non-occupational exposure.

Short-term exposure limits

125 Some substances for which WELs have been approved have been assigned short-term exposure limits (STELs) (15-minute reference period). These substances can cause acute effects and the purpose of the short-term limit is to ~~prevent~~ protect against the adverse health effect occurring from brief exposures to the substance. ~~For this reason and in keeping with the principles of good practice for the control of substances hazardous to health, short-term WELs should **not** be exceeed~~

126 ~~130~~ HSE's publication *[title]* includes the list of substances assigned WELs (see paragraph ~~114~~110). ~~HSE's publication *[title]*~~ It also provides more detailed guidance on the use of WEL's. This includes the approved methods for averaging over the specified reference periods, an explanation of the terms 'respirable' and 'inhalable', and related material.

Substances defined as carcinogens, ~~or~~ mutagens or a cause of occupational asthma and assigned a workplace exposure limit (WEL)

127 ~~131~~ To comply with the requirements in regulation 7(7)(c) to reduce exposure so far as is reasonably practicable, for substances with an 8-hour long-term reference period, employers may have to carry out a programme of air monitoring in accordance with regulation 10. This will generally be necessary unless the risk assessment made under regulation 6 shows that the level of exposure is most unlikely ever to exceed the WEL. The extent to which employers ~~can~~ should reduce exposure below the WEL ~~will~~ depends on the type of risk presented by the substance, weighed against the cost and the effort involved in taking measures to reduce the risk (see paragraph 34 on reasonable practicability).

Other substances assigned a workplace exposure limit

128 ~~132~~ For a ~~single~~ substance assigned a WEL that is not classified under COSHH as a carcinogen, ~~or~~ mutagen, or a cause of occupational asthma adequate control of exposure will be achieved by applying the principles of good practice to the work involving exposure to the substance concerned and keeping the exposure below any WEL. ~~In these circumstances, and particularly if *COSHH Essentials* is used to identify and apply the~~

~~appropriate control measures, the employer is unlikely to need a programme of air monitoring to check whether exposure is being maintained at or below the WEL.~~

~~***Short-term exposure limits***~~

~~**133** Some substances for which WELs have been approved have been assigned short-term exposure limits (STELs) (15-minute reference period). These substances can cause acute health effects and the purpose of the short-term limit is to prevent the adverse health effect occurring from brief exposures to the substance. For this reason, and in keeping with the principles of good practice for the control of substances hazardous to health, short-term WELs should **not** be exceeded.~~

Inhaled substances not assigned WELs

129 ~~134~~ The absence of a substance from the lists of WELs does not mean that it is safe. Many substances in use do not have a WEL, ~~F~~for these substances, employers should apply the principles of good practice for the control of substances hazardous to health ~~and~~ to control exposure to a level to which nearly all the working population could be exposed, day after day at work, without adverse effects on health. ~~As set out in paragraphs 107–109, employers may be able to use *COSHH Essentials* to help decide on suitable control measures. In addition,~~ HSE has published good practice advice to help employers decide on suitable control measures. Available material includes the guidance on Schedule 2A (page xx), ~~for a number of substances not covered by *COSHH Essentials*~~ (see paragraphs 103-106), ~~e.g. gases and~~ process specific guidance for a number of common processes ~~dusts and fumes. HSE has also produced~~ and Chemical Hazard Alert Notices (CHANs). ~~for a number of substances and a~~ A list of ~~those~~ CHANs and other HSE guidance currently available can be viewed on the HSE website at www.hse.gov.uk/pubns/~~chindex.htm~~. In addition, employers can obtain information about the substance concerned from a number of other sources, including:

(a) manufacturers and suppliers of the substance;

(b) industry association~~s publications~~; and

(c) occupational medicine and occupational hygiene journals.

130 ~~135 Employers may also have to set their own in-house exposure limit in situations where a substance they are using has an approved WEL, but it is not appropriate to apply it, e.g. it is being used in circumstances above normal atmospheric pressure.~~If it is not possible to identify suitable exposure control measures using, for instance, *COSHH Essentials* and no

WEL exists it may be possible and useful to identify or develop an exposure standard. Suppliers, trade associations or specialist advisers may be able to help.

Action if a workplace exposure limit ~~or in-house standard~~ is exceeded

131 ~~136~~ A Workplace Exposure Limit or other exposure standard should not normally be exceeded. If it is the employer should check the continuing effectiveness of the control measures. There may be something obviously wrong which can be corrected. If the reasons for the excessive exposure are not obvious a more detailed investigation may be needed. This could involve task-based and process-related measurements to identify when and why raised exposures are occurring.

~~**The employer's first step should be to consider if there is a visible, obvious reason for the result(s) which exceed the limit., e.g. the person to whom the result(s) relates may be subject to higher than normally expected exposure in a job that only that person carries out. If it is an isolated result, or one or two results which marginally exceed an 8-hour time-weighted average limit, the employer should consider whether they have real significance and indicate a failure to maintain adequate control, or whether they reflect an error in the measurement method. However, a single result above a 15 minute short term exposure limit (STEL) may be cause for concern and require the employer to take immediate remedial action: e.g. where the substance concerned has been assigned a WEL and also an accompanying STEL, and particularly where the substance is a carcinogen, mutagen or can cause occupational asthma.**~~ **Employers who are unsure of the implications of results that exceed a WEL or ~~in-house~~other exposure standard, should ~~may want to~~ obtain ~~consult~~ appropriate ~~expert~~ advice~~, e.g.~~ from an expert, such as an occupational hygienist ~~or the laboratory which carried out the air monitoring~~.**

132 ~~137~~ **If the employer concludes that the ~~air~~ exposure monitoring results do not indicate adequate control of exposure, ~~the~~ further steps to take should include:**

(a) checking control measures to ensure that they are working as they should~~, , and f~~For instance that exhaust ventilation ~~etc., that it~~ is performing to design specification or people are following the defined methods of working which are necessary to minimise their exposure;

(b) liaising with managers, safety representatives and employees to check that all the principles of good practice are being ~~correctly~~ applied correctly, and to establish possible reasons for the rise in the measured exposure ~~airborne concentration~~ of the substance concerned;

(c) considering whether it is necessary to provide the employees who may be exposed to the substance concerned

with suitable ~~RPE~~PPE. This should be a temporary measure only until the situation is returned to normal and adequate control of exposure is re-established;

(d) devising and implementing a programme of immediate action to reinforce the control measures where a WEL is exceeded and particularly so where the substance concerned is a carcinogen, ~~or~~ mutagen or a cause of occupational asthma; and

(e) ~~taking further air samples to confirm the concentration of the substance in the air~~ Making further measurements of exposure in order to check that any remedial action to tighten control has been effective.

133 **~~138~~** **If ~~the~~ further ~~air monitoring~~exposure measurements raise~~s~~ doubts as to whether adequate control is being achieved, the employer should review the assessment to decide whether additional and more ~~stringent~~ effective controls are needed.**

134 **~~139~~** For detailed advice on the sampling strategies suitable for measuring exposure and practical guidance on interpreting the results in relation to occupational exposure limits see HSE's publication: *Monitoring strategies for toxic substances.*

Adequate control of exposure by routes other than inhalation

135 **~~140~~** COSHH requires that employers prevent or ~~adequately~~ control exposure adequately by all routes, not just the inhalation route and deals with substances which can be hazardous to health by:

(a) absorption through the skin or mucous membranes; or

(b) contact with the skin or mucous membranes, e.g. dermatitis; chemical burns and microbial infection; or

(c) ingestion.

136 **~~141~~** Some information about substances, ~~that~~which can be absorbed into the body~~,~~ is contained in HSE's publication *[*EH 40 *Occupational Exposure Limits]*. HSE's publication *[title]* (see paragraph 1104) lists those substances that have been assigned a WEL and which can be absorbed through the skin to a significant extent and identifies them with a skin (Sk) notation. Safety data sheets and hazard warning labels are other useful sources of information about substances that have the potential to affect and be absorbed through the skin.

~~142 Exposure to any substance hazardous to health that can be absorbed by any of the routes listed in paragraph 140 should be controlled to a standard where nearly all the population could be exposed repeatedly without adverse health effect. Employers will achieve adequate control when they apply the principles of good practice in Schedule 2A and exposure by~~

~~these other routes does not result in adverse health effects. The following paragraphs provide some guidance on how employers can achieve adequate control of exposure by these other routes.~~

Absorption through the skin

137 ~~143~~ In handling any substance which has been assigned an "Sk" notation, the employers' application of good practice controls, work methods and other precautionary measures should prevent the substance coming into contact with the employee's skin. Employers should also prepare a contingency plan to deal with incidents where a substance makes contact with an employees' skin. The plan should draw on any information and advice provided by the supplier on the particular characteristics and properties of the substance and how to deal with spillages etc.

Contact with the skin and eyes

138 ~~144~~ Irritant and corrosive substances such as acids and alkalis can cause serious~~ly~~ damage to either the skin or the and eyes. ~~Therefore, w~~Where employers have to use these substances, therefore, they should design their systems of work and select their control equipment to minimise the possibility of skin and eyes being exposed. If this is not possible for a particular job, employers may have to provide suitable personal protective equipment and, in these circumstances, pay special attention to how employees wear and use it and how it is maintained.

139 ~~145~~ Some hazardous substances, e.g. solvents, remove the natural oils from the skin so that frequent or prolonged contact may cause dermatitis or more serious skin disorders. When such skin contact is likely to occur, employers should provide employees with suitable gloves and dispose of them when they become contaminated, i.e. before the solvent is likely to "break through" the glove material. HSE's publication ***Health risk management. A guide to working with solvents*** provides further guidance on selecting suitable glove materials for work with a number of the most commonly used solvents. Employers should also ensure that employees follow good personal hygiene practice, such as thoroughly washing their hands in warm (not hot) water whenever necessary, encouraging them to use moisturising creams after work, and introducing a regular programme of skin inspection.

Ingestion

140 ~~146~~ If employees do not follow a high standard of personal hygiene, or do not handle substances with care, solid materials or powder may get trapped under fingernails or transferred from overalls and clothing onto food. Where substances which are potentially

hazardous by ingestion are used, employers should ensure that employees remove any contaminated clothing in the area set aside for this activity, and thoroughly wash their hands and face (see paragraph ~~145~~139), and scrub their fingernails before eating, drinking or smoking. Employers should stress the importance of employees following good personal hygiene practices and of not eating food in the work area.

141 ~~147~~ Employers should ensure that the information, instruction and training given to employees in accordance with regulation 12 covers all aspects of achieving and maintaining adequate control of exposure by all routes. In particular, employers should stress the importance of how the combination of good practice under regulation 7(7) and the protection measures the employer applies under regulation 7(3) are designed to protect employees' health from exposure to hazardous substances.

Biological monitoring

142 **~~148~~** Biological monitoring can ~~also~~ make a valuable contribution to measuring levels of exposure in those situations where air sampling alone may not give a reliable indication of exposure. For example~~, e.g.~~ when personal protective equipment is used or where there is liable to be significant dermal exposure to a substance that can permeate the skin~~.~~, biological monitoring may be the only reliable way of measuring exposure. HSE's publication *Biological monitoring in the workplace: A guide to its practical application to chemical exposure* provides further guidance.

When personal protective equipment might be necessary

143 ~~149~~ Regulation 7(3)(c) and principle (e) in Schedule 2A require~~s~~ the employer to provide employees with suitable personal protective equipment, e.g. RPE, protective clothing, protective gloves, footwear; and equipment to protect the eyes, *in addition to* all other control measures if the combination of all control measures fails to achieve adequate control of exposure. The guidance on Schedule 2A (page xx) provides further information on the steps the employer needs to take.

144 ~~150~~ The situations where PPE will normally be necessary include:

(a) where adequate control of exposure cannot be achieved solely by good practice and the application of operational or engineering measures, appropriate to the activity and consistent with the risk assessment then, in addition, suitable PPE should be used to secure adequate control;

(b) where a new or revised assessment shows that PPE is necessary until adequate control is achieved by other measures;

(c) where there is temporary failure to achieve adequate control of the process, e.g. because of plant failure, and the only practicable solution to reimpose adequate control in the time available may be the provision and use of suitable PPE; and

(d) where maintenance operations have to be carried out. The risk of exposure during these operations should be assessed and appropriate control, such as prior decontamination of equipment and areas, should be identified and carried out. Although exposure may occur regularly during such work, the infrequency and small number of people involved and the difficulties of applying process and engineering controls often makes the use of PPE necessary.

145 ~~151~~ In assessing whether the use of PPE is the appropriate option, employers should consider:

(a) the limitations of PPE;

(b) the costs;

(c) the practical difficulties of ensuring its continued correct use;

(d) its effectiveness in the actual work situation; and

(e) the type and level of exposure to the hazardous substance concerned.

Suitable personal protective equipment

146 ~~152~~ PPE should ~~adequately~~ control exposure adequately to the hazardous substances to which the wearer is exposed, or is liable to be exposed, throughout the time it is used. When selecting PPE, it is important for employers to take into account:

(a) the circumstances in which it will be used, e.g. the substances to which it will be exposed and for how long, and the degree of protection necessary;

(b) whether it can resist penetration and permeation by the substance concerned ~~indefinitely~~ or for a specified or recommended period;

(c) whether the design is adequate and suitable, i.e. the equipment fits the wearer does not dislodge, deform, melt or otherwise fail to perform in the conditions in which it is used and is compatible with other PPE worn;

(d) the environment in which it will be worn; and

(e) in dusty environments, whether the materials selected reduce the tendency for dust to collect on the PPE and be re-released.

147 ~~153~~ Manufacturers of PPE must ensure that their products comply with the Personal Protective Equipment Regulations 2002.

Suitable respiratory protective equipment (RPE)

148 ~~154~~ For each work activity for which it is foreseen that employees will need to wear respiratory protective equipment (RPE), the employer should specify the suitable equipment to be worn to make sure that employees are given adequate protection. To be suitable, RPE must be capable of ~~adequately~~ controlling adequately the inhalation exposure using as a guide the equipment's assigned protection factor as listed in HSE publication *The selection, use and maintenance of respiratory protective equipment: A practical guide.* The selection and provision of suitable RPE should be based on a range of considerations:

(a) the level of protection claimed by manufacturers for different types of RPE, and identification of those types that will provide a greater degree of protection than that required for likely or known exposure;

(b) the type of work to be done; the physical effort required to do it; the length of time the equipment will have to be worn; the requirements for visibility, comfort and the need for employees to communicate with each other; its compatibility with any other PPE that may be needed (for example, safety glasses);

(c) the different facial characteristics of the RPE wearers, to ensure that the equipment fits correctly, and is matched to the wearer. In addition the equipment must be matched to the job and the environment in which it is to be used. The selection of suitable equipment should be undertaken in full consultation with the wearers. This will help to ensure that the wearers have the most comfortable equipment best suited for them and which, as a consequence, is likely to be the most effective in use;

(d) it must be "CE" marked if it was manufactured on or after 1 July 1995 to show that it is manufactured to meet minimum legal requirements. However, where RPE was manufactured before 1 July 1995 then it must either be "CE" marked or HSE approved;

(~~f~~e) employees should be ~~properly~~ trained properly in its use and supervised;

(~~g~~f) it should be ~~regularly~~ cleaned and checked regularly to ensure that it remains effective.

Fit testing of facepieces

149 ~~155~~ The performance of RPE with a tight-fitting facepiece (filtering facepieces, half and full-face masks) depends on a good contact between the wearer's skin and the face seal of the mask. A good face seal can only be achieved if the wearer is clean shaven in the region of the seal and the facepiece is of the correct size and shape to fit the wearer's face. If spectacles with side arms and other PPE are also worn, they should not interfere with the correct fitting of the facepiece or the face seal. The performance of RPE with a loose fitting facepiece, e.g. visors, helmets, hoods, etc. is less dependent on a tight fit on the face, but nevertheless requires the correct size to ensure the wearer achieves an adequate fit and protection.

150 ~~156~~ **Employers should ensure that the selected facepiece (tight and loose fitting types) is of the right size and can correctly fit each wearer. For a tight-fitting facepiece (filtering facepieces usually known as disposable masks, half and full face masks) the initial selection should include fit testing to ensure the wearer has the correct device. The test will assess the fit by determining the degree of face-seal leakage of a test agent while the RPE user is wearing the facepiece under test. For full-face masks, a suitable quantitative fit test should be used and the pass level fit factor is 2000. For devices such as filtering facepieces and half masks, the pass level fit factor is 100. For these lower performance facepieces, a suitable and validated qualitative method (often called a semi-quantitative test) can be carried out instead. Employers must ensure that whoever carries out the fit testing is competent to do so in accordance with regulations 12(4).**

151 ~~157~~ **Repeat fit testing will be needed when changing to a different model of RPE or a different sized facepiece or if there have been significant changes to the facial characteristics of the individual wearer, e.g. as a result of significant weight gain or weight loss or due to dentistry. Repeat fit testing will not be required following a change of employer, provided that the same model of RPE continues to be used by the employee.**

152 ~~158~~ The quantitative fit testing may be carried out using:

(a) a test chamber which uses a salt aerosol or sulphur hexafluoride gas to assess the face-seal leakage; or

(b) a portable device at the workplace which measures particulates in air to assess the face-seal leakage; or

(c) a portable device at the workplace which measures pressure variations inside the facepiece to assess face seal-leakage.

153 ~~159~~ Qualitative test methods use bitter or sweet-tasting aerosols. When the tests are carried out the facepiece wearer will perform simple exercises as indicated by the competent person carrying out the test. More information on the selection, including information on assigned protection factors, use and fit testing of RPE is contained in the HSE publications - *The selection, use and maintenance of respiratory protective equipment: A practical guide*, and *Fit testing of respiratory protective equipment facepieces*.

Facilities for washing, changing, eating and drinking

154 ~~160~~ Employers should provide certain facilities to:

(a) ensure that employees meet and maintain a standard of personal hygiene that is consistent with adequate control of exposure;

(b) avoid the spread of substances hazardous to health; and

(c) reduce the risk of ingestion of substances hazardous to health.

155 ~~161~~ The facilities include:

(a) ***adequate washing facilities*. These should be sited in a convenient position but situated so that they do not themselves become contaminated. The facilities provided should relate to the type and level of exposure;**

(b) ***changing facilities. These* should be provided when PPE is used or where outdoor clothing could be contaminated by substances hazardous to health. They should be located and designed to prevent the spread of contamination from protective clothing to personal clothing and from one facility to another, and to prevent contamination from getting on to the RPE from other equipment or protective clothing;**

(c) ***facilities for eating, drinking etc*. Employees should not eat, chew, drink or smoke in places that are contaminated by substances hazardous to health. This will help reduce the risk of employees ingesting hazardous substances. If employers have to prohibit eating, drinking etc. in**

certain areas, they should set aside an uncontaminated area or areas where these activities can be carried out. The eating and/or smoking area should be ~~conveniently~~ accessible conveniently to the working area and to washing facilities.

156 ~~162~~ Employers should ensure that not only are the hygiene measures provided but also that employees are made aware, through information, instruction and training of why, how and when they must be used. Employers should also ensure through appropriate supervision, that employees use the facilities in accordance with agreed procedures.

157 ~~163~~ Employers may also have duties under the Workplace (Health, Safety and Welfare) Regulations 1992 to provide the facilities described above.

PROPOSED REVISED ACOP TEXT SUPPORTING REGULATION 10

Another method of evaluation

201 In many workplace situations, employers are likely to have to rely on a body of evidence rather than a single measure in making a judgement that adequate control of exposure is being achieved. For that evidence, employers will need to include measures drawn from the principles of good practice for the control of exposure to hazardous substances (page xx) and the list in the ACoP on regulation 7 (paragraph ~~103~~97). In particular by:

(a) ensuring that all routes of exposure, including skin contact and ingestion, have been considered in the regulation 6 assessment;

(b) using totally enclosed processing and handling systems which ~~are demonstrably~~can be shown to be working efficiently without leaking a hazardous substance into the work area;

(c) ensuring that engineering controls and ventilation systems, including LEV, ~~are demonstrably~~can be shown to be working to specification;

(d) ensuring that the work system is well-defined, predictable, properly supervised and consistent at all times with the assessment.

202 By demonstrating the effective implementation of these and other pertinent measures (for example by correctly applying ~~such as good practice and, where appropriate,~~ *COSHH Essentials* guidance), an employer can show sufficient evidence that he does not require specific exposure monitoring to demonstrate adequate control of exposure.

PROPOSED REVISED TEXT FOR APPENDIX 3 – CONTROL OF SUBSTANCES THAT CAUSE OCCUPATIONAL ASTHMA

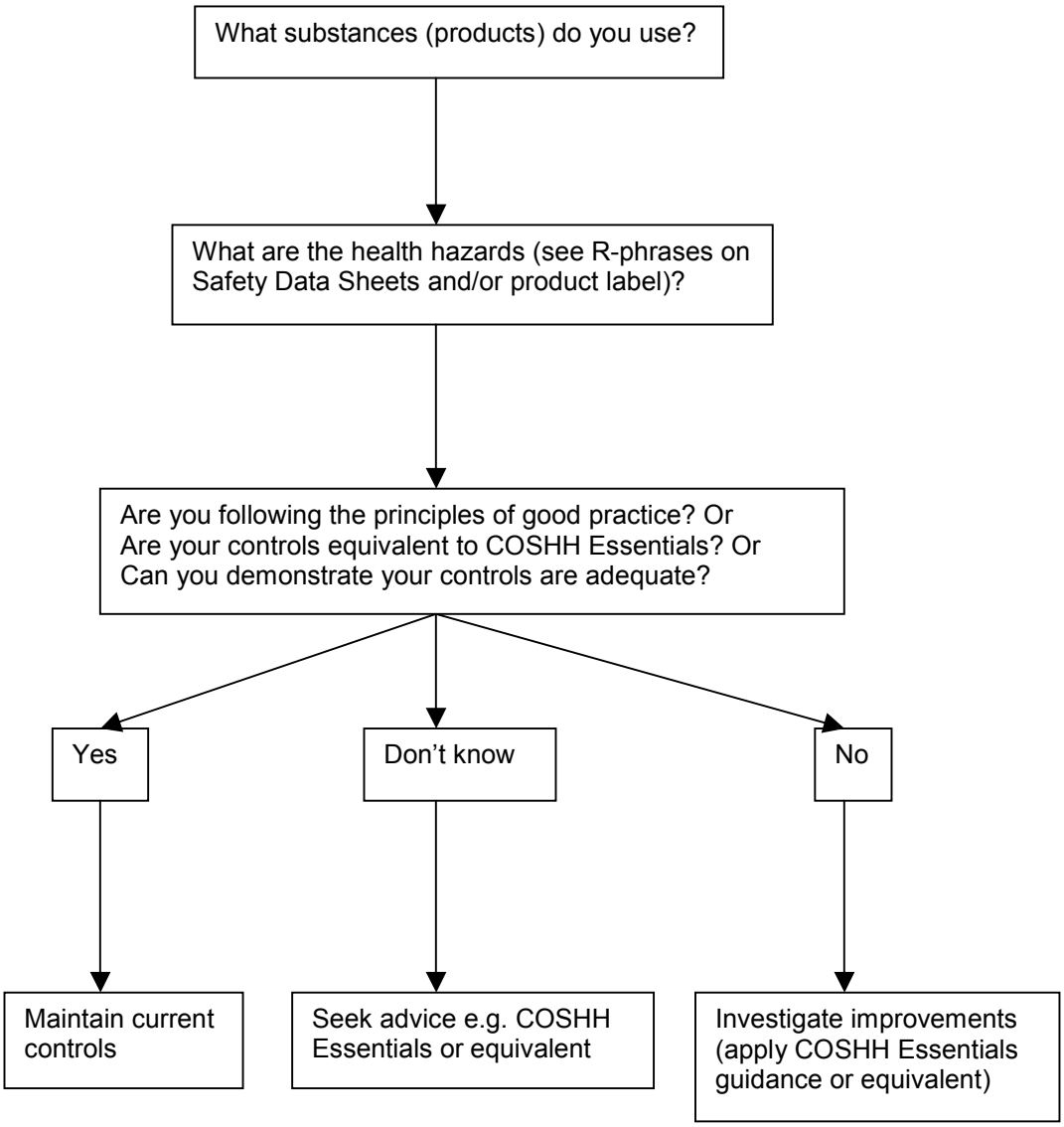
Prevention or control of exposure to substances hazardous to health (regulation 7)

12 Exposure to substances with the potential to cause occupational asthma should be prevented. If that is not reasonably practicable, the objective should be to control exposure so as to prevent employees and others who may be exposed from developing occupational asthma as a result of exposure to those substances. Limited scientific knowledge on levels below which substances will not cause asthma means that it will ~~normally~~ be necessary to reduce exposure so far as is reasonably practicable. This will involve considering the potential for short-term peaks of exposure as well as longer-term time-weighted averages.

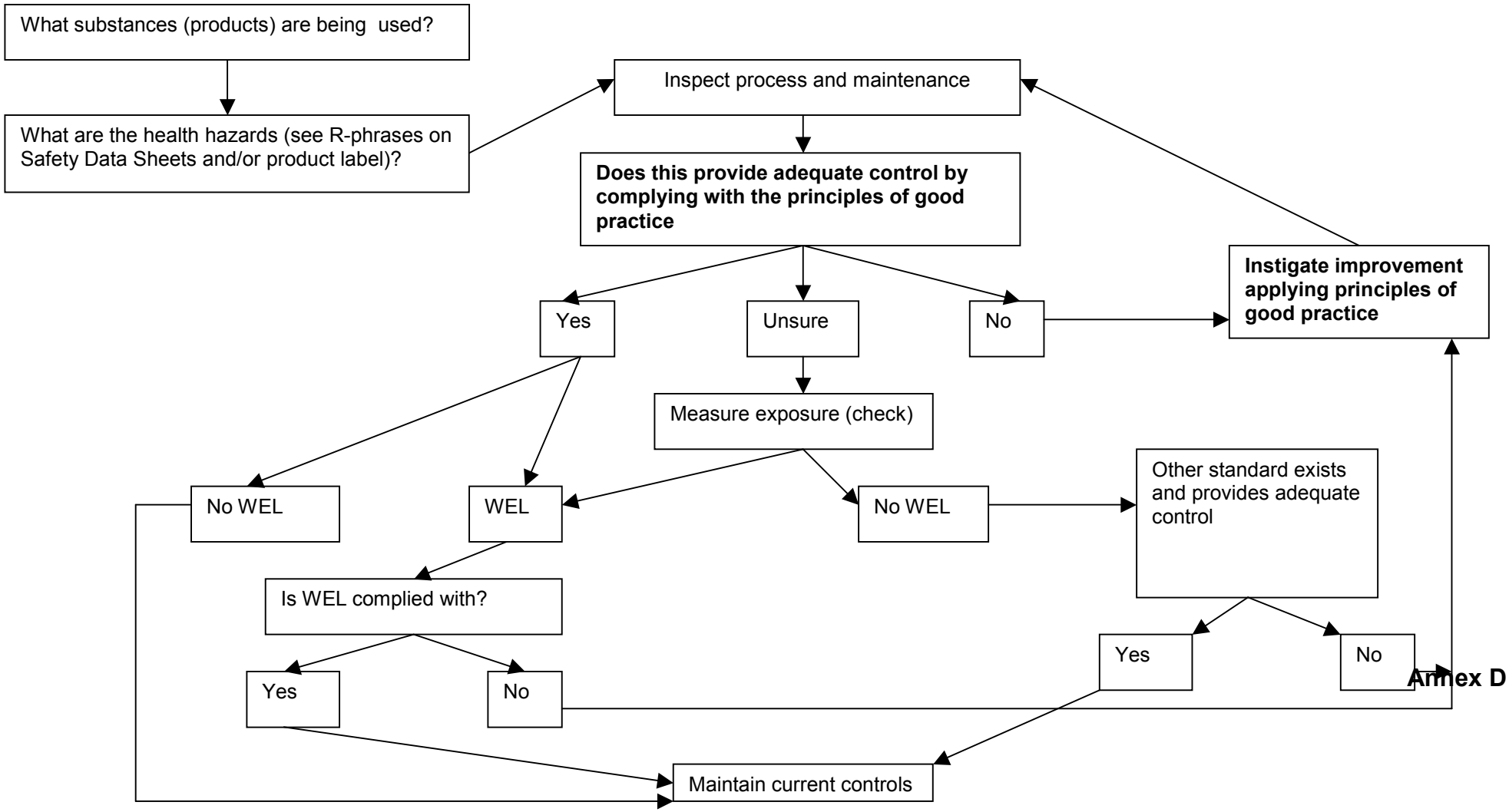
Figure 1

The law requires exposure to hazardous substances encountered in the workplace to be ~~adequately~~ controlled adequately. To achieve adequate control involves applying what is called "good control practice", which is a consensus view of the hardware, systems of work and other measures~~so on~~ that need to be put in place to control the risk. There is more than one route by which advice on good control practice can be obtained. The flow-diagrams that follow illustrate two such routes: one of these is most suitable for the non-expert and the other for health and safety professionals such as occupational hygienists.

Route Map for Adequate Control for SMEs/Non-Experts



Route map for adequate control for health and safety professionals such as occupational hygienists



Annex D

Guidance to Support the Principles of Good Practice for the Control of Exposure to Substances Hazardous to Health

Schedule 2A Guidance
April 2004

Consultative Document CD189 'Proposals to introduce a new occupational exposure limits (OEL) framework' proposed to replace COSHH regulation 7 (7) and (8) by a new 7(7) as follows:

Reg 7(7) Without prejudice to the generality of paragraph (1), where there is exposure to a substance hazardous to health, control of that exposure shall only be treated as being adequate if –

a) the principles of good practice for the control of exposure to substances hazardous to health set out in Schedule 2A are applied;
b) any workplace exposure limit approved for that substance is not exceeded; and
c) for a substance which carries the risk phrase R45, R46 or R49[6] or for a substance or process which is listed in Schedule 1, the level of exposure is reduced so far as is reasonably practicable.

The proposal is that COSHH Regulation 7 will require employers to apply the principles and comply with any workplace exposure limit (WEL). These principles were generally welcomed by those who responded to the CD, and Mark Piney and I have been working to produce some guidance to flesh out these generic principles. The principles from the proposed Schedule 2A have been reproduced below as headings. We would be grateful for your comments on the guidance.

Principles of good control practice

The objective of the COSHH Regulations is to prevent, or adequately control, exposures to substances hazardous to health so as to prevent ill health.

A management programme that:

- identifies hazards and potential exposure;
- takes action to prevent and control risk; and
- keeps control measures under regular review

will include effective control of exposure to substances hazardous to health.

To be effective in the long-term, controls must be practical, workable and sustainable. When it comes to the hardware in exposure control measures the rules governing the choice of control will include those in an extensive Standard, BS 5304

[6] R45 Substances that may cause cancer;
R46 substances that may cause heritable genetic damage;
R49 substances that may cause cancer by inhalation.

"Safe Use of Machinery". Although this standard is mainly concerned with controlling mechanical risks, it is relevant to engineering measures applied to control exposure.

Good practice in the control of substances hazardous to health can be encapsulated in eight generic principles, all of which must be applied to obtain effective and reliable control (See Schedule 2a). The principles overlap in their application. The following guidance explains how they may be applied in practice.

Principle (a). Design and operate processes and activities to minimise emission, release and spread of substances hazardous to health.

It is more effective, and usually cheaper, to reduce the emission of a contaminant at source rather than to develop ways of removing the contaminant from the workplace once it has been released and dispersed. Sources should be reduced in number, size, emission or release rate, as much as possible. It is often not possible to obtain adequate and reliable control unless this is done. Both the processes and procedures need to be considered. When identifying how people get exposed during work activities, it is essential to recognise the principal sources and how the contaminant is transferred within the workplace, in order to identify how people get exposed during work activities. It is easy to miss significant sources and causes of exposure.

Processes and activities can lead to the emission and release of contaminants. The way they do this and the degree of emission and release needs to be understood. Once this assessment is available, alterations can be developed to minimise emissions, release and spread of contaminants. It is best to do this at the design stage, but it may well be possible to make useful and relatively low-cost changes to existing processes. Identify and control the worst sources first. In practice, improvements to production and quality can often be a useful additional benefit from such re-examinations

If emissions from a process or activity are high and difficult to control then those directly involved will need to wear appropriate PPE. In these circumstances people working nearby may be significantly exposed although those directly involved are protected. An effective way of protecting people not directly involved in such processes is by physical segregation. It may be that such segregation is needed to have any realistic chance of controlling the exposure of those people not directly involved in the process or activity.

Once the number and size of sources have been **minimised**, consider **reducing** emissions from the remainder by enclosure or other means. Where enclosures are used, they should be big enough and robust enough to cope with the processes, and the energy of contaminant emission involved. In the case of airborne contaminants, use exhaust ventilation applied to the enclosure if there is a risk of leakage into the workplace.

Design work methods and organisation to minimise exposure. This normally requires clearly defined and described work methods. **Organise** the work to minimise the number of people exposed and their exposure time. For example, natural ventilation may sometimes be relied upon to disperse aerosol and vapour from the spray painting of large objects. This would be best done at the end of a shift, when fewer people will be present.

Local Exhaust Ventilation (LEV) is an important exposure control option. LEV systems consist of an airmover (usually a fan), an aircleaner, ductwork, and inlet hoods or terminals. Most designers and guidance concentrate on the airmover, aircleaner and ductwork. There is a strong tendency to treat the hood design as a minor matter. Yet, if the airborne contaminant is not drawn into, or contained within, the LEV hood, exposure is likely be poorly controlled. The hood size, shape, layout and airflow requirements should be considered first. It will define the airflow requirements for the other elements of the system such as ductwork, fans and aircleaners. The hood should be designed to cope with the way the process emits airborne contaminants. So, for instance, if the source is large or emits contaminant-laden air at high velocity a small "captor" type hood will not be effective. Apart from considering the process to be controlled, the LEV should be designed so that it is easy to use correctly. LEV hood design should take account of the requirement of the system of work and the operator's requirements, such as lighting and heating. LEV hoods, and the working methods needed to get the best out of them, should be designed ergonomically.

In addition to identifying significant sources, it is essential to identify and consider **all** work-groups that may be exposed. It is easy to miss or underestimate the exposure of those engaged in non-routine activities such as maintenance personnel and contractors. Also, be aware of, and have contingency plans for dealing with, failures of containment and emergencies. In many instances it is possible to predict those parts of a production process that are likely to fail suddenly and modify or maintain them appropriately.

Control measures, at the outset, should be designed for ease of use and maintenance. If they include working methods that are difficult to follow or involve hardware that is difficult to repair, the control measures will probably not be maintained or sustained. Their effectiveness will inevitably fall, and exposure will rise.

Principle (b). Take into account all relevant routes of exposure – inhalation, skin and ingestion – when developing control measures.

The most appropriate control measures should be selected that are proportionate to the risks to health that may arise from the work activity. Significant exposure is needed for substances to cause adverse health effects. 'Exposure' can occur through:

- inhalation,
- skin contact,
- ingestion.

The physical and chemical properties of a substance, in the circumstances of use, have a great bearing on which route of exposure, or combination of routes, is most important. If there is no exposure, there is no risk to health. But usage nearly always leads to some exposure. So, consider:

- the health effects that the substances can cause,
- the way the substances are used,
- the degree of exposure and
- how exposure occurs.

An adequate risk assessment considers all routes by which the substance might enter the body and, in the case of direct contact, how a substance might affect the skin.

In some cases it might be immediately obvious that not all routes apply. For example, for people exposed to crystalline silica, the only relevant route of entry is by inhalation of airborne dust. Whereas, for work at room temperature with a low volatility substance, such as dimethyl formamide, the primary route of entry will be through the skin.

Therefore:

- **Identify** all sources and routes of exposure and
- **Rank** these routes in order of importance.

Where inhalation is the most relevant route, the main focus for control will be sources of emission to air. Where the main concern is ingestion or effects on, or as a result of penetration through, the skin, then the main focus for control will be sources of contamination of surfaces or clothing.

Exposure assessments should identify and, if at all possible, grade or rank the contribution of all routes of exposure (inhalation, skin absorption and ingestion) to total exposure. In this way control effort can be directed at the main sources and causes of exposure.

Avoid skin contact if possible where contamination may lead to skin absorption, ingestion or direct health effects on the skin. Regularly **clean** all surfaces that may come into contact with the skin. The frequency of cleaning should be based on the rate at which the surfaces become contaminated and how often skin is likely to come into contact with them. Touching the outside of contaminated protective gloves is common. **Train workers in the correct techniques** for putting on and taking off their gloves. Ensure all surfaces, which need to be cleaned, are made of materials that are easily cleaned. For instance, use work surfaces, which are impermeable and smooth so that they are easy to wipe clean and easy to test by surface sampling, if necessary

If the workroom is likely to become contaminated, and this contamination may contribute to exposure, people should not increase their exposure by activities such as:

- eating

- drinking
- smoking or
- using cosmetics

in the workplace.

Before permitting these activities in the workplace, make sure that there is no risk of contamination of surfaces with substances hazardous to health. If the workroom is liable to be contaminated make sure people have clean areas to rest, eat and drink.

In all workplaces, particularly where skin contact is an issue:

- Have adequate and accessible **welfare facilities** for washing and changing.
- Have adequate and accessible toilet facilities.
- **Launder work-wear, or replace,** regularly – how often depends on how contaminated it gets and how hazardous the substance is.
- **Have separate storage** for day-wear and work-wear.
- Keep the facilities **clean**.
- Consider one-way, so-called "clean" – "dirty" washing and changing facilities if the risk of contamination is severe.

It is good practice to keep workplaces clean; the cleaning should be done by methods that generate only low levels of contaminant spread or emission. Define what "clean" means and check against this standard.

Where dust exposure from contaminated work clothing could be significant, use clothing made from a low dust-retention and low dust-release fabric.

Where a contaminant may enter the body by **more than one route** there will be a need to minimise all significant sources whether airborne, surface or direct contact. An example would be a process where cadmium dust and fume is generated. In order to be effective, control measures will need to control significant cadmium-in-air and surface contamination levels. Important sources may include those that emit airborne cadmium dust and/or fume and those that create skin contamination by direct or indirect contact with contaminated surfaces, including work-wear.

Principle (c). Control exposure by measures that are proportionate to the health risk.

The control measures should be **enough** to control exposure adequately; they should be proportionate to the risk. Sometimes, it may be cheap and easy to provide more protection than is strictly necessary and this is acceptable as long as it does not inconvenience production or staff.

The **effectiveness** of the control measures should be matched to the potential for exposure and the risk to health. Some substances have Workplace Exposure Limits (WEL) or other benchmark exposure standards. If people are potentially exposed to, say, 100 times the appropriate benchmark standard then the effectiveness and reliability of the control measures will need to be much greater than if the potential exposure was only twice the benchmark. This principle is the basis of the control approaches built into COSHH Essentials (COSHH ACOP and Guidance, paragraphs 105 – 106).

If the **health effects** arising from exposure are serious (such as cancer or asthma or allergic dermatitis) and if there is not enough information to establish a no-effect level, then exposure will need to be reduced to low levels. This might be expensive in time, effort and cost. Where the health effects are less serious (such as simple irritation) and are likely to cause no long-term effects, it may be sufficient to reduce exposure by simple measures such as replacing lids on vessels or cleaning work areas regularly. It is unnecessary to go to great expense to reduce the risk even further. Control measures should be kept under **review**. In time, it may be viable to make changes that reduce exposure although at present they are not practicable. Knowledge and understanding of the potential health risks from substances may also change.

Where sufficient **information** about the health risks has not been made available, employers have a duty to find it. Chemical Hazard Information and Packaging for Supply (CHIP) Regulations (1993) require suppliers to provide sufficient information to enable the employer to come to a decision on appropriate control measures. In practice, suppliers or specialist advisers should be able to guide employers towards the appropriate control measures for their particular circumstances.

Even where there is little information on the specific toxic properties of the substance or material it is still possible to make decisions, for instance, based on the properties of similar substances or materials.

Principle (d). Choose the most effective and reliable control options that minimise the escape and spread of substances hazardous to health.

Some control options are inherently more **reliable** and **effective** than others. For example, the extent of protection afforded by personal protective equipment (PPE) is dependent upon good fit and attention to detail. In contrast a very reliable form of control is changing the process so that less of the hazardous substance is emitted.

Choose the most effective and reliable control options for the circumstances and direct these at the main sources and causes of exposure. There is much good advice on the engineering control side of control measures in BS 5304:2000, particularly sections 3.3 and 10.

There is a broad **hierarchy** of control options available, based on inherent reliability and likely effectiveness. COSHH Regulation 7 refers to many of these options. They include:

- Elimination of the hazardous substance.
- Modification of the substance, process and/or workplace
- Applying controls **to** the process, such as enclosures and local exhaust ventilation (LEV).
- Ways of working which minimise exposure and
- Equipment or devices worn by exposed individuals.

The key message is that there is a **hierarchy of reliability** of control options and this is often linked to their **effectiveness**.

Eliminating the substance means there can not be any exposure. Always consider elimination first. If this is not possible a reliable form of control is to **change the process** so that it releases less substance. Controls applied to the process might be as effective, but will require maintenance and are unlikely to be as reliable.

For example, the effectiveness of an LEV hood, used to contain and remove contaminant-laden air, requires that

- the system supplying the suction to the hood is maintained regularly and
- the person using the hood works in a specific way

to get the best performance out of it.

These, and other factors, mean that LEV will not usually provide protection which is as reliable as changing the process. Even though both control methods might, in theory, be equally effective.

Achieving a reliable, defined, sustained reduction in exposure using respiratory protection can be even more difficult and offers no protection to others working nearby not wearing respiratoy protection.

Giving people PPE such as gloves or respirators may appear to be the quick, cheap and easy option. In practice, it is likely to be the least reliable and effective option and may not actually be the cheapest if PPE is compared like-for-like with the cost of providing other control options.

Develop a **set** of integrated control measures that are **effective** and **reliable enough** to control exposure adequately. Take care not to see the 'hierarchy' of reliability and effectiveness so rigidly that some control options are viewed as automatically 'good'

while others are seen as ‘bad’. This good-bad view can get in the way of developing what is needed – effective, reliable, practicable and workable control measures.

There is a large range of control options available. Each will have its own characteristics as to **when** it can be applied, **how much** it can reduce exposure, and **how reliable** it is likely to be. As a matter of principle, the aim should be to select from the most reliable control options first. Having said this, it is important not to be too fixed as, in many cases, an effective set of control measures will turn out to be a mix of options - some more reliable than others.

Whoever designs control measures needs appropriate knowledge, skills and experience. The competencies needed will depend on the scope and complexity of the exposure problems to be addressed and solved. If a set of control measures is already in place, but the local exhaust ventilation (LEV) system is not performing well, then the solution may be purely a matter of ventilation engineering. But, if controls are minimal or inadequate, and it is not clear how overexposure is occurring, analysis of exposure and development of effective control measures will be necessary and may require the competencies, skills and knowledge of a professional occupational hygienist. He or she should be able to specify the hood design of any LEV system (if one is needed) but may well require the services of a ventilation engineer to design, fabricate and install the system. Or, it may be that changing the process is an option, in which case the skills and knowledge of a process engineer may be required. The individual or team involved need the right mix of knowledge, skills and experience.

Principle (e). Where adequate control of exposure cannot be achieved by other means, provide, in combination with other control measures, suitable personal protective equipment.

Effective control measures usually consist of a mixture of process and/or workplace modifications, applied controls (such as local exhaust ventilation) and methods of working that minimise exposure and make the best use of controls. Sometimes the mix includes (PPE) such as respirators, work-wear or gloves.

Giving people PPE may appear to be the quick, cheap and easy option. But PPE tends to be less effective and reliable than other control options, because it:

- has to be selected for the individual
- has to fit the individual and not interfere with their work or other PPE worn at the same time
- has to be put on correctly every time it is worn
- has to remain properly fitted all the time the individual is exposed
- has to be properly stored, checked and maintained
- tends to be delicate and relatively easily damaged

The possibility of failure at each of the steps needed for successful use of PPE makes it difficult to get sustained and effective exposure control across a population of people. Even if a reliable, defined, sustained reduction in exposure using PPE is achieved, it offers no protection to others working nearby not wearing respiratory protection.

Control options, such as change of process or applied controls, are likely to be more effective and reliable than PPE and will probably be cheaper long-term, but it may take longer to plan and organise them. It is important not to rely solely on PPE as the only control option and believe exposure is adequately, effectively and reliably controlled. Unless, that is, PPE really is the only current control option. Normally, PPE should be used to secure adequate control **in addition to** the application of process, operational or engineering measures, and where adequate control of exposure cannot be achieved straight away, or solely by application or use of these other measures.

Where PPE is an essential element in a set of control measures, a programme to organise and manage this element will be required. PPE, including RPE, requires proper:

- selection,
- fitting,
- use,
- storage and
- checking and maintenance.

A PPE programme involves the **careful, routine and trained behaviour** of people, including wearers and supervisors. If used, it must be set-up carefully, managed properly and checked regularly.

PPE should be both adequate and suitable. **Adequate**, in this context, means technically capable of providing the required degree of protection; appropriate selection will be very important. **Suitable** means correctly matched to the needs of the wearer, the job and the work environment. Choice, comfort, user-trials and supervision will all be important.

Sometimes the PPE chosen may be more than adequate but is chosen for its suitability , for instance, an airline hood may be more acceptable than a full-face filter mask even though the additional protection is not needed.

As with gloves, shoes and clothing, one size of respirator will not fit everyone. People must be offered a choice of device. This is especially the case for half-mask devices which need a good and complete fit against the face of the wearer to work effectively. Check the fit of RPE using the proper test method (see COSHH ACoP and Guidance, paragraphs 147 – 151. See also, HSG 53 and HSG 206 for further guidance on PPE).

Train workers and supervisors in the use, storage, checking and maintenance of PPE including RPE.

Principle (f). Check and review regularly all elements of control measures for their continuing effectiveness.

Once an effective set of workable control measures have been devised they need to be put in place and managed. This includes training all relevant people in the use and maintenance of the control measures. The requirement for maintenance covers **all** elements of the measures in order to get effective and sustained control of exposure (see also BS 5304:2000). These include any defined methods of working, supervisory actions, record keeping etc (i.e. the "software" of control as well as the "hardware" of control). Certainly whatever hardware is involved must be checked and must continue to function as intended. But a similar approach needs to be taken to check the actions people must take and the methods of working they adopt. These need checking and correcting, if necessary, too.

The **effectiveness** of control measures should be checked regularly. Which checks, and how often, will depend on the particular control measures. Elements of the control measures that are likely to deteriorate relatively quickly, and where a failure would produce the most serious risks of exposure, will require more frequent checks. Process changes are likely to be more stable and reliable than, say, LEV that in turn is likely to be more stable and reliable than controls that rely on routine human behaviour. In practice it is necessary to draw up a simple practical programme for checking essential elements, in each set of control measure. For instance, it may be necessary to check every week that people are still adopting the correct methods of working, while checking on the working of the LEV every month and checking the continuing effectiveness of the process changes may only be needed every six months. But it is important not to miss the basic checks. It may be very obvious that an important element of a set of control measures, for instance LEV, has failed and the employee may well be in the best position to spot this.

Initially, checks may be needed quite frequently. After this baseline period, the records should show the pattern of deterioration or sustained effectiveness. Check frequencies can then be adjusted to what is needed keep the control measures effective. There is nothing more likely to cause people to ignore or not take seriously checks than routinely measuring and recording "No change" over long periods of time. Checks have to have some purpose and meaning.

Exactly what checks should be done will depend on

- the control measures in use,
- how reliably they control exposure and
- how well characterised they are.

If the effectiveness and reliability of a set of control measures are well defined and validated, then the checks can focus on key elements of the measures. If not, it may be necessary assess their effectiveness by assessing or measuring people's exposure. It may be that an experienced person, competent in occupational hygiene assessment techniques, can make such assessments using skill, knowledge of the

processes and simple tests. But it may also be necessary to measure exposure in a direct way, by air sampling or biological monitoring and comparing it with any WEL or similar exposure benchmark. Other quantitative tests might be needed, for instance, surface wipe measurements to measure the spread and accumulation of contamination. Once control measures are shown to be effective, then the focus should be on checking all the critical elements of them.

Principle (g). Inform and train all employees on the hazards and risks from substances with which they work, and the use of control measures developed to minimise the risks.

For control measures to be effective, people need to know how to use them properly. Most importantly, people need to know why they should be bothered to work in a certain way and use the controls as specified; they need to be motivated.

Motivation comes from understanding what the health risks are and, therefore, why the control measures are important. It is also comes from the user having confidence in the control measures and believing that they will protect his or her health. If the health risk is serious, for example silicosis or cancer or asthma or allergic dermatitis, and is chronic or latent in nature, a good appreciation of the risk is especially important. With latent or delayed risks, exposure can often be excessive with no short-term warning, such as smell or irritation, to indicate that anything is amiss. The people potentially exposed need to be told, clearly and honestly, why they should use the control measures, and what the risk is if they don't.

People need to know how control measures work in order to use them correctly, and to recognise when they are not working properly. This means training operators directly involved, and also supervisors and some managers, so that all can identify when controls are being used in ways that reduce their effectiveness. It is important to know whether the individual is working in a way that reduces the effectiveness of control measures because

(a) there is no other way of doing the job or
(b) because he or she does not know any better.

If the control measures are difficult to use or get in the way of doing the job then they will need redesigning. If the control measures are well designed and tested but are still misused, then the individual needs retraining and motivating.

Most control measures involve methods of working which means, at the design stage, it is essential to ask workers and supervisors for their views on how best to do the work, so that exposure is minimised. They should be asked whether a proposed method of working is practical and how to get the best out of the proposed control measures. People who are actively involved in the development of control measures are more likely to "own" them and respond positively to new ways of working that may be required. Easily followed, convenient and simple procedures, which minimise exposure, that are built-in to the working method, are more likely to be followed.

Principle (h). Ensure that the introduction of measures to control exposure does not increase the overall risk to health and safety.

Process changes, enclosures, ventilation, new methods of working, PPE and other changes to control exposure can introduce other risks. For instance, process changes might mean that equipment cannot be fully decontaminated before maintenance staff are given repairs to do. Enclosures might create an explosion risk if they could contain potentially explosible aerosols. New methods of working may create risks of musculo-skeletal injury. LEV has to be maintained, introducing possible risks of access and manual handling of heavy parts. PPE can restrict movement, feel and vision. And some controls may increase environmental emissions.

People designing control measures should look for these 'new' risks and minimise them. They must not have tunnel vision and only focus on the risk from substances hazardous to health. A good solution is one which minimises the health risk, while reducing maintenance burdens, being fairly fool-proof, and not introducing other risks (see Regulation 3 of the Management of Health and Safety at Work Regulations 1999).

The options for the transfer of OESs **Annex E**

The table below was Table 3a in the Consultative Document (CD). The proposal in the CD was to delete all of the substances in this table as *COSHH Essentials* can be used to select appropriate control measures. The HSE members of the OEL Working Group met to consider the options for the transfer of OELs and now propose that only those substances in the following categories should not have OESs transferred into the new system as WELs:

- of concern / widely used
- of concern / scarcely used
- of concern / banned / not in use

- uncertain / scarcely used
- uncertain / banned / not in use

The new proposal would mean that 170 of the 205 substances listed in the table below, that the CD proposed should be deleted, would now be transferred to the new system as WELs.

Substance	Transfer/Delete
1,1,1,2-Tetrachloro-2, 2-difluoroethane	Delete OES
1,1,2,2-Tetrabromoethane	Transfer OES into new system as WEL
1,2,3-Trichloropropane	Delete OES
1,2-Dichloroethylene, cis:trans isomers 60:40	Transfer OES into new system as WEL
1,3-Dichloro-5, 5-dimethyl-hydantoin	Transfer OES into new system as WEL
1,4-Dioxane, tech. grade	Transfer OES into new system as WEL
1-Chloro-4-nitrobenzene	Transfer OES into new system as WEL
1-Nitropropane	Delete OES
2,2'-Iminodi(ethylamine)	Transfer OES into new system as WEL
2,2'-Iminodiethanol	Delete OES
2,2'-Oxydiethanol	Transfer OES into new system as WEL
2,4,6-Trinitrotoluene	Transfer OES into new system as WEL
2,4-D (ISO)	Transfer OES into new system as WEL
2,6-Dimethylheptan-4-one	Transfer OES into new system as WEL
2,6-Di-tert-butyl-p-cresol	Transfer OES into new system as WEL
2-Aminoethanol	Transfer OES into new system as WEL
2-Chloro-6-(trichloromethyl)pyridine	Delete OES
2-Chlorobuta-1, 3-diene	Transfer OES into new system as WEL
2-Chloroethanol	Transfer OES into new system as WEL
2-Chlorotoluene	Delete OES
2-Diethylaminoethanol	Delete OES
2-Ethylhexyl chloroformate	Transfer OES into new system as WEL
2-Methylcyclohexanone	Transfer OES into new system as WEL
2-Methylpropan-1-ol	Transfer OES into new system as WEL

2-Methylpropan-2-ol	Transfer OES into new system as WEL
2-sec-Butylphenol	Transfer OES into new system as WEL
3,5,5-trimethylcyclohex-2-enone	Transfer OES into new system as WEL
3-Methylbutan-1-ol	Transfer OES into new system as WEL
4-Methylpent-3-en-2-one	Delete OES
4-Methylpentan-2-ol	Transfer OES into new system as WEL
4-Nitroaniline	Delete OES
6,6'-Di-tert-butyl-4, 4'-thiodi-m-cresol	Transfer OES into new system as WEL
Acetic acid	Delete OES
Acetonitrile	Transfer OES into new system as WEL
Acrylaldehyde (Acrolein)	Transfer OES into new system as WEL
Acrylic acid	Delete OES
Aluminium alkyl compounds	Transfer OES into new system as WEL
Aluminium salts, soluble	Transfer OES into new system as WEL
Ammonium sulphamidate	Transfer OES into new system as WEL
Barium compounds, soluble (as Ba)	Transfer OES into new system as WEL
Benomyl (ISO)	Delete OES
Benzyl butyl phthalate	Transfer OES into new system as WEL
Bis(2-ethylhexyl) phthalate	Transfer OES into new system as WEL
Bornan-2-one	Transfer OES into new system as WEL
Boron tribromide	Transfer OES into new system as WEL
Bromacil (ISO)	Transfer OES into new system as WEL
Butan-1-ol	Transfer OES into new system as WEL
Butan-2-ol	Transfer OES into new system as WEL
Butyl acetate	Transfer OES into new system as WEL
Butyl lactate	Transfer OES into new system as WEL
Caesium hydroxide	Transfer OES into new system as WEL
Calcium carbonate	Transfer OES into new system as WEL
Calcium cyanamide	Transfer OES into new system as WEL
Calcium hydroxide	Transfer OES into new system as WEL
Calcium oxide	Transfer OES into new system as WEL
Calcium silicate	Transfer OES into new system as WEL
Captan (ISO)	Transfer OES into new system as WEL
Carbon black	Transfer OES into new system as WEL
Cellulose (pure)	Transfer OES into new system as WEL
Chloroacetaldehyde	Transfer OES into new system as WEL
Chlorosulphonic acid	Transfer OES into new system as WEL
Chlorpyrifos (ISO)	Transfer OES into new system as WEL
Cresols, all isomers	Delete OES
Cyanamide	Transfer OES into new system as WEL
Cyanides, except HCN, cyanogen & cyanogen chloride	Transfer OES into new system as WEL
Cyclohexanol	Transfer OES into new system as WEL
Cyclohexylamine	Transfer OES into new system as WEL
Diallyl phthalate	Transfer OES into new system as WEL
Diammonium peroxodisulphate (measured as $[S_2O_8]$)	Delete OES
Diatomaceous earth, natural, respirable	Transfer OES into new system as WEL

dust	
Dibenzoyl peroxide	Transfer OES into new system as WEL
Dibismuth tritelluride	Transfer OES into new system as WEL
Diboron trioxide	Transfer OES into new system as WEL
Dibutyl hydrogen phosphate	Transfer OES into new system as WEL
Dibutyl phthalate	Transfer OES into new system as WEL
Dicyclohexyl phthalate	Transfer OES into new system as WEL
Dicyclopentadiene	Transfer OES into new system as WEL
Diethyl phthalate	Transfer OES into new system as WEL
Diethylamine	Transfer OES into new system as WEL
Diisobutyl phthalate	Transfer OES into new system as WEL
Diisononyl phthalate	Transfer OES into new system as WEL
Diisooctyl phthalate	Transfer OES into new system as WEL
Diisopropyl ether	Transfer OES into new system as WEL
Diisopropylamine	Transfer OES into new system as WEL
Dimethoxymethane	Transfer OES into new system as WEL
Dimethyl phthalate	Transfer OES into new system as WEL
Dimethylformamide	Transfer OES into new system as WEL
Dinitrobenzene, all isomers	Transfer OES into new system as WEL
Dinonyl phthalate	Transfer OES into new system as WEL
Diphenylamine	Transfer OES into new system as WEL
Dipotassium peroxodisulphate (measured as S_2O_8)	Delete OES
Diquat dibromide (ISO)	Transfer OES into new system as WEL
Disodium disulphite	Transfer OES into new system as WEL
Disulphur dichloride	Transfer OES into new system as WEL
Diuron (ISO)	Transfer OES into new system as WEL
Emery, total inhalable dust	Transfer OES into new system as WEL
Endosulfan (ISO)	Transfer OES into new system as WEL
Ethanol	Transfer OES into new system as WEL
Ethyl acrylate	Transfer OES into new system as WEL
Ethyl chloroformate	Transfer OES into new system as WEL
Ethyl formate	Transfer OES into new system as WEL
Ferrocene	Delete OES
Formamide	Transfer OES into new system as WEL
Formic acid	Transfer OES into new system as WEL
Graphite	Transfer OES into new system as WEL
Gypsum	Transfer OES into new system as WEL
Hexachloroethane	Delete OES
Hexahydro-1, 3, 5-trinitro-1,3,5-triazine	Delete OES
Hydrogen peroxide	Transfer OES into new system as WEL
Indium and compounds (as In)	Transfer OES into new system as WEL
Iron salts (as Fe)	Transfer OES into new system as WEL
Isobutyl acetate	Transfer OES into new system as WEL
Isooctyl alcohol (mixed isomers)	Transfer OES into new system as WEL
Isopropyl acetate	Transfer OES into new system as WEL
Limestone	Transfer OES into new system as WEL

Lithium hydride	Transfer OES into new system as WEL
Lithium hydroxide	Transfer OES into new system as WEL
Magnesite	Transfer OES into new system as WEL
Malathion (ISO)	Transfer OES into new system as WEL
Marble	Transfer OES into new system as WEL
Mequinol (INN)	Delete OES
Mercaptoacetic acid	Transfer OES into new system as WEL
Mercury & its inorganic divalent compounds	Delete OES
Mercury alkyls (as Hg)	Delete OES
Methacrylic acid	Transfer OES into new system as WEL
Methacrylonitrile	Transfer OES into new system as WEL
Methanol	Transfer OES into new system as WEL
Methyl acetate	Transfer OES into new system as WEL
Methyl acrylate	Delete OES
Methyl formate	Delete OES
Methylcyclohexanol	Transfer OES into new system as WEL
Methylstyrenes, all isomers except a-methylstyrene	Delete OES
Molybdenum compounds (as Mo)	Transfer OES into new system as WEL
Morpholine	Transfer OES into new system as WEL
N,N-Dimethylaniline	Transfer OES into new system as WEL
N,N-Dimethylethylamine	Transfer OES into new system as WEL
n-Butyl chloroformate	Transfer OES into new system as WEL
n-Butylamine	Delete OES
Nicotine	Transfer OES into new system as WEL
Nitric acid	Transfer OES into new system as WEL
Nitrobenzene	Transfer OES into new system as WEL
Nitroethane	Delete OES
Nitromethane	Transfer OES into new system as WEL
Nitrotoluene, all isomers	Transfer OES into new system as WEL
N-Methyl-N, 2, 4, 6-tetranitroaniline	Delete OES
n-Propyl acetate	Transfer OES into new system as WEL
o-Acetylsalicylic acid	Transfer OES into new system as WEL
Osmium tetraoxide (as Os)	Transfer OES into new system as WEL
Oxalic acid	Transfer OES into new system as WEL
Oxalonitrile	Delete OES
Paraquat dichloride (ISO), respirable dust	Transfer OES into new system as WEL
Pentacarbonyliron (as Fe)	Transfer OES into new system as WEL
Pentaerythritol	Transfer OES into new system as WEL
Pentan-2-one	Transfer OES into new system as WEL
Pentan-3-one	Transfer OES into new system as WEL
Phorate (ISO)	Transfer OES into new system as WEL
Picric acid	Transfer OES into new system as WEL
Piperidine	Transfer OES into new system as WEL
Plaster of Paris	Transfer OES into new system as WEL
Polyvinyl chloride	Transfer OES into new system as WEL
Potassium hydroxide	Transfer OES into new system as WEL

Prop-2-yn-1-ol	Transfer OES into new system as WEL
Propan-1-ol	Transfer OES into new system as WEL
Propan-2-ol	Transfer OES into new system as WEL
Propoxur (ISO)	Transfer OES into new system as WEL
p-Toluene sulphonyl chloride	Transfer OES into new system as WEL
Pyrethrins (ISO)	Transfer OES into new system as WEL
Resorcinol	Transfer OES into new system as WEL
Rotenone (ISO)	Transfer OES into new system as WEL
Rouge	Transfer OES into new system as WEL
sec-Butyl acetate	Transfer OES into new system as WEL
Selenium and compounds, except hydrogen selenide (as Se)	Transfer OES into new system as WEL
Silica, amorphous	Transfer OES into new system as WEL
Silica, fused respirable dust	Transfer OES into new system as WEL
Silicon	Transfer OES into new system as WEL
Silicon carbide (not whiskers)	Transfer OES into new system as WEL
Sodium fluoroacetate	Delete OES
Sodium hydrogen sulphite	Transfer OES into new system as WEL
Sodium hydroxide	Transfer OES into new system as WEL
Starch	Transfer OES into new system as WEL
Strychnine	Delete OES
Sucrose	Transfer OES into new system as WEL
Tantalum	Transfer OES into new system as WEL
Tellurium & compounds, except hydrogen telluride, (as Te)	Transfer OES into new system as WEL
tert-Butyl acetate	Transfer OES into new system as WEL
Tetracarbonyl nickel	Transfer OES into new system as WEL
Tetraethyl orthosilicate	Delete OES
Tetrasodium pyrophosphate	Transfer OES into new system as WEL
Thallium, soluble compounds (as Tl)	Transfer OES into new system as WEL
Thionyl chloride	Transfer OES into new system as WEL
Thiram (ISO)	Delete OES
Tin compounds, inorganic, except SnH4, (as Sn)	Transfer OES into new system as WEL
Titanium dioxide	Transfer OES into new system as WEL
Tributyl phosphate, all isomers	Transfer OES into new system as WEL
Trichloronitromethane	Transfer OES into new system as WEL
Trimethyl phosphite	Transfer OES into new system as WEL
Tri-o-tolyl phosphate	Transfer OES into new system as WEL
Triphenyl phosphate	Transfer OES into new system as WEL
Tungsten & compounds (as W)	Transfer OES into new system as WEL
Turpentine	Transfer OES into new system as WEL
Uranium compounds, natural, soluble (as U)	Delete OES
Warfarin (ISO)	Delete OES
Xylidine, all isomers	Delete OES
Zinc distearate	Transfer OES into new system as WEL
Zirconium compounds (as Zr)	Transfer OES into new system as WEL

The table below was Table 3b in the CD. The substances in this table are all gases. The new proposal would mean that 18 of the 31 OESs for the substances listed in the table below, would now be transferred to the new system as WELs. HSE will produce COSHH Essentials type generic guidance on control of health risks from gases for the 13 substances that would have their OESs deleted.

Substance	Transfer/Delete
Arsine	Transfer OES into new system as WEL
Boron trifluoride	Delete the OES and produce COSHH Essentials type generic guidance on control of health risks from gases
Bromine	Transfer OES into new system as WEL
Bromomethane	Transfer OES into new system as WEL
Bromotrifluoromethane	Delete the OES and produce COSHH Essentials type generic guidance on control of health risks from gases
Butane	Transfer OES into new system as WEL
Carbon dioxide	Transfer OES into new system as WEL
Chlorine	Transfer OES into new system as WEL
Chlorine trifluoride	Delete the OES and produce COSHH Essentials type generic guidance on control of health risks from gases
Chloromethane	Transfer OES into new system as WEL
Chloropentafluoroethane	Delete the OES and produce COSHH Essentials type generic guidance on control of health risks from gases
Cryofluorane (INN)	Transfer OES into new system as WEL
Cyanogen chloride	Transfer OES into new system as WEL
Diborane	Delete the OES and produce COSHH Essentials type generic guidance on control of health risks from gases
Dibromodifluoromethane	Delete the OES and produce COSHH Essentials type generic guidance on control of health risks from gases
Dichlorofluoromethane	Transfer OES into new system as WEL
Germane	Transfer OES into new system as WEL
Ketene	Transfer OES into new system as WEL
Liquefied petroleum gas	Transfer OES into new system as WEL
Methanethiol	Transfer OES into new system as WEL
Methylamine	Delete the OES and produce COSHH Essentials type generic guidance on control of health risks from gases
Nitrogen trifluoride	Delete the OES and produce COSHH Essentials type generic guidance on control of health risks from gases
Perchloryl fluoride	Delete the OES and produce COSHH Essentials type generic guidance on control of health risks from gases

Phosphine	Transfer OES into new system as WEL
Silane	Transfer OES into new system as WEL
Stibine	Delete the OES and produce COSHH Essentials type generic guidance on control of health risks from gases
Sulphur hexafluoride	Transfer OES into new system as WEL
Sulphur tetrafluoride	Delete the OES and produce COSHH Essentials type generic guidance on control of health risks from gases
Sulphuryl difluoride	Transfer OES into new system as WEL
Trichlorofluoromethane	Delete the OES and produce COSHH Essentials type generic guidance on control of health risks from gases
Trimethylamine	Delete the OES and produce COSHH Essentials type generic guidance on control of health risks from gases

The table below was Table 3c in the CD. The substances in this table are all process-generated dusts, mists or fumes. The new proposal would mean that 10 of the 15 OESs for the substances listed in the table below, would now be transferred to the new system as WELs. HSE will produce COSHH Essentials control guidance sheets for the 5 substances that would have their OESs deleted.

Substance	Transfer/Delete
Ammonium chloride, fume	Transfer OES into new system as WEL
Asphalt, petroleum fumes	Transfer OES into new system as WEL
Coal dust, respirable dust	Delete OES and produce a specific COSHH Essentials control guidance sheet.
Copper	Transfer OES into new system as WEL
Dichloroacetylene	Transfer OES into new system as WEL
Diphenyl ether (vapour)	Transfer OES into new system as WEL
Glycerol, mist	Transfer OES into new system as WEL
Hydrazoic acid	Delete OES and produce a specific COSHH Essentials control guidance sheet.
Iron oxide, fume (as Fe)	Transfer OES into new system as WEL
Oil mist, mineral	Delete OES and produce a specific COSHH Essentials control guidance sheet.
Paraffin wax, fume	Transfer OES into new system as WEL
Rhodium (as Rh)	Transfer OES into new system as WEL
Welding fume	Delete OES and produce a specific COSHH Essentials control guidance sheet.
Zinc chloride, fume	Transfer OES into new system as WEL
Zinc oxide, fume	Delete OES and produce a specific COSHH Essentials control guidance sheet.

The table below was Table 3d in the Consultative Document (CD). The new proposal would mean that 34 of the 56 substances listed in the table below, would now be transferred to the new system. The remaining 22 OESs would be deleted and Chemical Hazard Alert Notices (CHANs) produced for 2 of them.

Substance	Transfer/Delete
1,1,2,2-Tetrachloro-1,2-difluoroethane	Delete OES
1,3-Dimethylbutyl acetate	Delete OES
2-Chloroacetophenone	Transfer OES into new system as WEL
2-Hydroxypropyl acrylate	Transfer OES into new system as WEL
2-Methylpentane-2,4-diol	Transfer OES into new system as WEL
2-Pyridylamine	Transfer OES into new system as WEL
4-Ethylmorpholine	Transfer OES into new system as WEL
4-Hydroxy-4-methylpentan-2-one	Transfer OES into new system as WEL
Benzenethiol	Delete OES
Biphenyl	Delete OES
Bromine pentafluoride	Delete OES
Bromoform	Delete OES
Carbon tetrabromide	Delete OES
Chromium	Transfer OES into new system as WEL
Chromium (II) compounds (as Cr)	Transfer OES into new system as WEL
Chromium (III) compounds (as Cr)	Transfer OES into new system as WEL
Cyclohexene	Delete OES
Dialkyl 79 phthalate	Transfer OES into new system as WEL
Diazinon (ISO)	Delete OES
Dibismuth tritelluride, selenium doped	Delete OES
Diisodecyl phthalate	Transfer OES into new system as WEL
Disodium peroxodisulphate (measured as [S_2O_8))	Delete OES and produce a CHAN
Disodium tetraborate, anhydrous	Transfer OES into new system as WEL
Disodium tetraborate, decahydrate	Transfer OES into new system as WEL
Disodium tetraborate, pentahydrate	Transfer OES into new system as WEL
Disulphur decafluoride	Delete OES
Ethanethiol	Transfer OES into new system as WEL
Hafnium	Delete OES
Indene	Transfer OES into new system as WEL
Iodine	Transfer OES into new system as WEL
Iodoform	Transfer OES into new system as WEL
Isopropyl chloroformate	Transfer OES into new system as WEL
Methyl ethyl ketone peroxides (MEKP)	Transfer OES into new system as WEL
Mica	Transfer OES into new system as WEL
Monochloroacetic acid	Transfer OES into new system as WEL
Nickel, organic compounds (as Ni)	Delete OES. There will not be a generic CHAN for all organic nickel compounds. There may be CHANs for specific compounds.
N-Methylaniline	Transfer OES into new system as WEL
Octachloronaphthalene	Delete OES

p-Benzoquinone	Delete OES
Phosphorus, yellow	Transfer OES into new system as WEL
Picloram (ISO)	Transfer OES into new system as WEL
Platinum compds, soluble except certain halogeno-Pt compds	Transfer OES into new system as WEL
Platinum metal	Transfer OES into new system as WEL
Pyridine	Transfer OES into new system as WEL
Pyrocatechol	Transfer OES into new system as WEL
Silver compounds (as Ag)	Transfer OES into new system as WEL
Sodium 2-(2,4-dichlorophenoxy) ethyl sulphate	Transfer OES into new system as WEL
Terphenyls, all isomers	Transfer OES into new system as WEL
Tetrachloronaphthalenes, all isomers	Delete OES
Tetramethyl orthosilicate	Delete OES
Tetramethyl succinonitrile	Delete OES
Tin compounds, organic, except Cyhexatin (ISO), (as Sn)	Transfer OES into new system as WEL
Tricarbonyl(eta-cyclopentadienyl) manganese (as Mn)	Delete OES
Tricarbonyl(methylcyclopentadienyl) manganese (as Mn)	Delete OES
Vinyl acetate	Delete OES and produce a CHAN
Yttrium	Transfer OES into new system as WEL

The table below was Table 3e in the CD. The revised proposal does not differ from the original proposal with regard to these substances. The 25 substances in this table are either biocides no longer authorised for use or substances subject to the Montreal protocol. Occupational exposure is likely to be non-existent or very minimal. It is not proposed to provide advice on the control of these substances

Substance	Transfer/Delete
1,1,1-Trichlorobis(chlorophenyl)ethane	Delete the OES for all the substances listed in this table
1,1,2-Trichlorotrifluoroethane	
2,4,5-T (ISO)	
2-Methyl-4,6-dinitrophenol	
Aldrin (ISO)	
Azinphos-methyl (ISO)	
Captafol (ISO)	
Carbofuran (ISO)	
Cyhexatin (ISO)	
Dichlorodifluoromethane	
Dieldrin (ISO)	
Dioxathion (ISO)	
Disulfoton (ISO)	
Endrin (ISO)	
Fenchlorphos (ISO)	
Ferbam (ISO)	
Lindane	
Methomyl (ISO)	
Methoxychlor (ISO)	
Mevinphos (ISO)	
Naled (ISO)	
Parathion (ISO)	
Parathion-methyl (ISO)	
Pentachlorophenol	
TEPP (ISO)	

Annex F

How the proposed new system meets the objectives for a new approach

Key Objective 1 - OELs should control risks to health: OELs should provide standards which can be used, along with other information on a substance, to decide on appropriate control measures and to assess the adequacy of measures in place.	Yes – the requirement is to follow good practice and not exceed the OEL and for substances which cause asthma and cancer to reduce exposure so far as is reasonably practicable.
Key Objective 2 - OELs should be readily understood/accessible: The OEL framework must be based on a clear and coherent set of concepts which employers and employees will understand. But OELs require skilled understanding to put them in proper context in COSHH and therefore the application in the workplace may need professional input. The presentation of the OELs and other substance data pertinent to control under COSHH must take advantage of the opportunities offered by electronic media but also be available to those without IT access.	Yes – replacing OESs and MELs with WELs simplifies the system. A single limit which must not be exceeded is the simplest possible system.
Key Objective 3 - OELs should be legally enforceable: OELs must be considered as an integral part of the COSHH hierarchy of control measures for health protection. They should provide legally enforceable standards for adequacy of control by inhalation. They are for use when prevention of exposure is not reasonably practicable.	Yes – it will be easier to enforce good practice than compliance with a number. Compliance will also be easier for duty holders.
Key Objective 4 - OELs should be comprehensive: The OEL framework must be comprehensive i.e. capable of application to all substances. It should be capable of application to generic groups of substances. It must be developed and presented in a way that will not encourage employers to use substances without OELs and which have not been adequately evaluated for the potential to cause adverse effects.	Yes – the limit setting criteria is designed to cover all substances.

Key Objective 5 - OELs should comply with EC legislation: OELs must be compatible with the EC IOELVs and BOELVs such that the EC limits can be readily incorporated into Great Britain legislation without necessarily undergoing detailed re-assessment.	Yes – the new system will make it easier to comply with EC legislation.
Key Objective 6 - OELs should be flexible and able to take on board new developments in science and technology: The framework must be sufficiently flexible to incorporate developments in hazard and exposure assessment e.g. rapidly updating guidance with changes in technology.	Yes – it will be easy to update control advice as control technologies improve. It may not always be necessary to revise the limit in the light of new data as duty holders have to apply good practice.
Key Objective 7 - OELs should provide incentives to reduce exposure: As set out under objective 3, OELs must be seen as an integral part of the COSHH hierarchy of control measures for health protection. They should provide incentives for continuous improvement.	Yes – OELs are clearly linked to other COSHH duties.