

OCE6

Offshore COSHH essentials



This information will help offshore dutyholders (owners, operators and contractors) to comply with the Control of Substances Hazardous to Health Regulations 2002 (COSHH), as amended, to protect workers' health.

This guidance consolidates good control practice and reinforces existing knowledge with additional information.

It will help you carry out COSHH assessments, review existing assessments, deliver training and in supervising activities involving substances hazardous to health.

It is aimed at staff whose responsibilities include the management of substances hazardous to health on offshore installations (eg occupational health specialists, COSHH assessors, supervisors etc). It is also useful for trade union and employee safety representatives.

Following this guidance is not compulsory and you are free to take other action. But if you do follow this guidance, you will normally be doing enough to comply with the law. Health and safety inspectors seek to secure compliance with the law and may refer to this guidance as illustrating good practice.

Also see essential information on the back of the sheet.

Hydrogen sulphide

Control approach R

Respiratory protective equipment

What this sheet covers

This sheet describes good practice for work in areas where hydrogen sulphide may arise. It covers the key points you need to follow to help reduce exposure to an acceptable level, as part of your COSHH assessment.

Hazards

- ✓ Hydrogen sulphide (H_2S) may be present in hydrocarbon process systems, particularly when reservoirs begin to mature and water out.
- ✓ In addition to process plant, H_2S may arise in well fluids, drilling muds, sewage, etc
- ✓ H_2S is a very toxic, flammable gas. It is pungent (rotten egg odour) and irritates the eyes, nose and throat. It rapidly destroys the sense of smell and can cause unconsciousness and death.
- ✓ It is heavier than air and may accumulate in low-lying areas.
- ✓ The workplace exposure limits (WELs), for H_2S are 5 ppm (8-hour time-weighted average (TWA)) and 10 ppm (15-minute TWA).

Caution: Odour is unreliable as a means of detecting H_2S .

Access

- ✓ Restrict access to areas where H_2S is known or suspected.
- ✓ Post H_2S warning notices at points of access to Category 0 and Category 1 areas.
- ✓ Fit air direction and air movement indicators or windsocks in areas that rely on natural ventilation for H_2S control.

Equipment and procedures

Planning

- ✓ Label and colour-code plant and equipment that may contain H_2S .
- ✓ Classify areas and decide the use of fixed/portable H_2S detectors. See below and Offshore Information sheet 6/2009 – see 'Further information'.
- ✓ Prepare a contingency plan that covers H_2S emergencies.
- ✓ Mark up site plans with H_2S and safe areas.

Area classification

- Category 0: H_2S is present during normal operations, eg in vessels and confined spaces.
- Category 1: H_2S may be present during normal operations, eg mud tanks and shale shaker areas.

- Category 2: Area is normally free of H₂S, but breach of containment or leaks may create risk:
- Category 2A: Less than 500 ppm H₂S in the process stream.
- Category 2B: More than 500 ppm H₂S in the process stream.

Control

- ✓ Remove H₂S through chemical treatment methods, eg H₂S scavengers, use of biocides to prevent growth of sulphate reducing bacteria.
- ✓ Isolate and depressurise enclosed systems before breaking containment.
- ✓ Purge residues and ventilate to remove H₂S.
- ✓ Provide forced ventilation, eg on air blower where there is no through draught.
- ✓ Respiratory protective equipment is normally required
- ✓ Provide detection and alarms
 - Category 0 area: Portable/personal H₂S detectors
 - Category 1 area: Fixed H₂S detectors and portable/personal H₂S detectors for entry.
 - Category 2A area: Fixed hydrocarbon detectors and portable/personal H₂S detectors for breaking containment.
 - Category 2B area: Fixed H₂S detectors and portable/personal detectors for breaking containment.

Emergency procedures

- ✓ Store protective and emergency equipment in safe areas.
- ✓ Provide positive pressure emergency breathing apparatus (BA) sets wherever there is a risk of H₂S gas release.
- ✓ Establish and train emergency rescue teams (ERT). Hold regular practices.
- ✓ Include resuscitation of H₂S victims in first aid training.
- ✓ See *Face fitting for emergency BA* SPC 2000/5.

Personal protective equipment (PPE) – see OCM3

- ✓ Ensure that all items of PPE are compatible.
- ✓ RPE will be required for work in all areas where H₂S concentrations exceed the WEL.

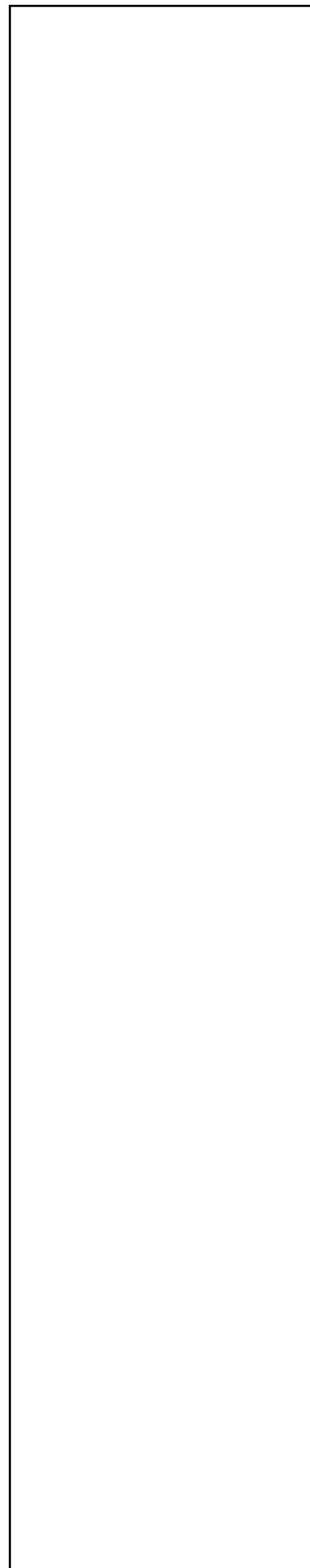
Respiratory protective equipment (RPE) – see OCM4

- ✓ Provide CE-marked positive pressure BA with an assigned protection factor of at least 40.

Maintenance, examination and testing

Checking and maintenance

- ✓ Before use, check the air lines for supplied-air BA.
- ✓ Before each use, check that portable/personal gas monitors are fully charged and working properly.
- ✓ Follow the planned maintenance regime (PMR)
- ✓ Ensure that fixed H₂S detectors and alarms are working properly and fail to the 'alarm' state.
- ✓ Keep this information in your testing logbook.



Examination and testing – RPE

- ✓ Examine and test RPE thoroughly at least monthly and for infrequently used RPE at least three monthly. Replace worn parts.
- ✓ Check the airflow and air quality to air-fed RPE at least once every three months, or before use. Check in-line filters.
- ✓ Ensure that breathable air compressors take in clean air.

Records

- ✓ Keep records of all examinations and tests for at least five years

Cleaning and housekeeping

- ✓ Clean the area after the task, or as specified in working procedures.

Personal decontamination and skin care

- ✓ Provide warm water, mild skin cleansers, nailbrushes, and soft paper, fabric towels or hot air for drying. Avoid abrasive cleansers.

Training and supervision

- ✓ Provide supervision – ensure that safe work procedures are followed.
- ✓ Explain the dangers of H₂S.
- ✓ Supervise the use of control measures for H₂S work.
- ✓ Training includes toolbox talks on:
 - how to use the right safe working procedures;
 - how to react to alarms and evacuate safely;
 - how to use RPE in particular correct donning procedures;
 - check that it is working; and
 - what to do if something goes wrong.
- ✓ Involve managers and supervisors in health and safety training

Essential information

OCE0 *Advice for managers*
 OCM3 *Personal protective equipment (PPE)*
 OCM4 *Respiratory protective equipment (RPE)*
 OCM5 *Emergency planning*
 OCE14 if mercury is present
 ORE1 if NORM is present.

Employee checklist

- Is your portable/ personal alarm fully charged and working properly?
- Is your respirator working properly? Check it every time.
- Look for signs of wear and damage to equipment.
- If you find any problem, get it fixed. Don't just carry on working.

Further information

Respiratory protective equipment at work: A practical guide HSG53 (Third edition)
 HSE Books 2005
 ISBN 978 0 7176 2904 6
www.hse.gov.uk/pubns/books/hsg53.htm

Workplace exposure limits EH40
www.hse.gov.uk/coshh/table1.pdf

Face fitting for emergency BA
 SPC 2000/05 HSE

Managing hydrogen sulphide detection offshore Offshore Information Sheet 6/2009 HSE
www.hse.gov.uk/offshore/infosheets/is6-2009.htm

Fit testing of respiratory protective equipment facepieces
 OC 282/28 HSE

You can find the full Offshore COSHH essentials series at www.hse.gov.uk/coshh/index.htm

This guidance was developed by representatives from the UK offshore oil and gas industry and trade unions, with HSE.