HSE
Health and Safety Executive

OCE15 Potable water and legionella control

Offshore COSHH essentials

Control approach 4

Specialist advice

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) and the water safety element of the Offshore Installations and Pipeline Works (Management and Administration) Regulations 1995, 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.

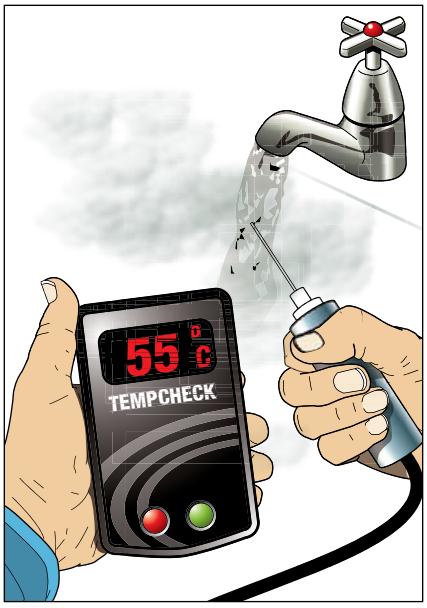
It is aimed at staff whose responsibilities include the management of substances hazardous to health on offshore installations (eg occupational health specialists, COSHH assessors, supervisors etc). It is also useful for trade union and employee safety representatives.

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.

What this sheet covers

This sheet describes good practice for storage, maintenance and distribution of potable water. The water may be bunkered or made on board the offshore installation. It covers the key points you need to follow to help prevent exposure to legionella as part of your COSHH assessment.



Hazards

- ✓ Potable water that is contaminated with chemicals, viruses or bacteria (including legionella pneumophila) is hazardous to health.
- ✓ The health risks are by ingestion. Legionella in inhaled water droplets can cause legionnaires' disease.
- ✓ Water contamination can arise from the water source, in transit, in tank storage, or via backflow from secondary potable or non-potable water systems.
- ✓ Water systems may become contaminated when exposed or opened during maintenance or other invasive work.
- ✓ Water treatment and tank cleaning chemicals may also be hazardous.
- ✓ Chlorine-releasing chemicals can produce toxic gas.
- ✓ Tank inspection/cleaning may involve confined space work.

Potable water standards

- Nil coliforms, E. coli, Pseudomonas, enterococci or Clostridium perfringens.
- Legionella less than 100 cfu/litre.
- Total viable count (TVC) standard is 'no abnormal change'. A TVC @ 37° of 10 cfu/ml and a TVC @ 22° of 100 cfu/ml are recommended as upper limits at which investigation/disinfection should be carried out.
- Chloride: less than 250 mg/litre (from seawater contamination).
- Nil hydrocarbons (fuel or oil contamination).
- Standards for other chemical contaminants are available in the EC Directive 80/788.

Access

✓ The tasks of dosing and tank cleaning require permits-to-work. Restrict access to the water management system to those who are trained for the task and are competent.

Chemical storage

✓ Provide a well-ventilated, flameproof store with spill containment and spill clean-up kits.
✓ Label tote tanks, containers and lines clearly.
✓ Segregate incompatible materials.
✓ Display clearly the labels on chemical containers.

Planning and equipment

Planning

✓ Appoint a competent person to prepare and implement a potable water/legionella management plan.
✓ With regard to the design and construction of the potable water system, you should:
- keep an up-to-date schematic of the potable water system;
- ensure that construction materials are suitable for potable water;
- remove dead-legs and redundant lines where water can remain standing for long periods;
- provide access for inspection, maintenance and testing;
- site the cold water system in a suitable location and protect it from light to ensure that the maximum cold storage temperature does not exceed 20 °C;
- store hot water at 60 °C and distribute it to ensure that it reaches a temperature of 50 °C within 1 minute at outlets; and
- if used fit UV sterilisers with a failure indicator.

Equipment

✓ Ensure appropriate standards of interface segregation between domestic potable water supply (drinking ,washing and hygiene) and process equipment consumers, ie sources of non-potable fluids such as diesel, methanol, sewage treatment (see Information sheet 4/2010)
✓ You should also provide the following:
- water sampling equipment;
- water temperature probe; and
- a comparator for pH measurement.

Control procedures

✓ Work with potable water requires scrupulous personal hygiene to prevent contamination of the water system.

Bunkering

✓ Flush bunkering hoses with fresh water before bunkering. After use, the hose should be drained and capped.
✓ Disinfect bunkering hoses at six-month intervals (three-monthly intervals if bunkering infrequently) and replace in accordance with manufacturers' recommendations.

Disinfection

- ✓ Provide a continuous biocide dosage regime to prevent microbial growth.
- ✓ Follow manufacturers' schedules and methods for system dosing and disinfection.
- ✓ Use automated dosing system.
- ✓ Clean up spills immediately. This may need personal protective equipment (PPE).

Maintenance

- ✓ Care must be taken in cleaning water systems to prevent inhalation of potentially contaminated aerosols, eg use of appropriate respiratory protective equipment (RPE).

Personal protective equipment (PPE) – see OCM3

- ✓ Ensure that all items of PPE are compatible.

Respiratory protective equipment (RPE) – see OCM4

- ✓ Provide air-fed CE-marked RPE with an assigned protection factor of at least 40 for tank cleaning, or cylinder breathing apparatus (BA) if oxygen levels could be depleted.
- ✓ Where necessary, provide CE-marked RPE with an assigned protection factor of at least 10 and a chlorine filter, for work with hypochlorite.

Other protective equipment

- ✓ Provide protective coveralls, gauntlets and goggles for cleaning and for work with hypochlorite. Ensure coveralls have fire retardant properties.
- ✓ Dispose of used coveralls before every break.

Maintenance, examination and testing

Checking and maintenance

- ✓ Before use, check the air lines for supplied-air BA.
- ✓ Competent technicians familiar with potable water equipment should make checks in accordance with manufacturers' instructions.

Examination and testing

Monitoring potable water

- On arrival: bunkered water (biocide concentration 0.2–0.5 ppm).
- Daily: biocide levels in accommodation (at least two samples concentration 0.2–0.5 ppm).
- Monthly: water temperatures at sentinel taps (cold – below 20 °C after 2 minutes; hot – above 50 °C within 1 minute).
- Monthly: calorifier flow and return water temperatures (flow at least 60 °C and return at least 50 °C).
- Biannually: cold water storage temperatures (preferably always below 20 °C).
- Quarterly: bacteriological analysis.
- Quarterly: chemical analysis.
- Annually: visual inspection of cold water storage tanks.
- Microbiological monitoring for legionella bacteria (in accordance with L8 Legionella ACOP).

- ✓ Keep this information in your testing logbook.
- ✓ Carry out all actions arising from monitoring results.

RPE

- ✓ Examine and test RPE thoroughly at least monthly and 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

- ✓ Follow the defined procedures and schedules for cleaning and disinfecting the potable water system. Include any UV sterilising equipment.
- ✓ Clear up spills immediately. Use protective gloves. You may also need RPE.

Personal decontamination and skin care

- ✓ Provide mild skin cleansers, nailbrushes, gloves and soft paper towels for drying. Avoid abrasive cleansers.
- ✓ Replace nailbrushes regularly.
- ✓ Instruct workers in how to clean their skin effectively.
- ✓ Report all illnesses.
- ✓ Provide pre-work skin creams, which will make it easier to wash dirt from the skin, and after-work creams to replace skin oils.

Health surveillance

- ✓ Conduct low-level health surveillance for dermatitis involving skin checks by suitably trained responsible person.

Training and supervision

- ✓ Provide supervision – ensure that safe work procedures are followed.
- ✓ Tell workers, including maintenance workers, what the hazards and risks are.
- ✓ Training includes toolbox talks on:
  - following safe working procedures
  - how to use equipment properly;
  - how to use RPE and check that it is working;
  - personal hygiene; and
  - what to do if something goes wrong.
- ✓ Involve managers and supervisors in health and safety training.

Essential information

OCE0 *Advice for managers*
OCM1 *Confined spaces*
OCM3 *Personal protective equipment (PPE)*
OCM4 *Respiratory protective equipment (RPE)*

Employee checklist

- ☐ **Are you sure about safe work procedures?**
- ☐ **Are you clear about the procedures for doing the job?**
- ☐ **Is the equipment in good condition and working properly?**
- ☐ **Is your respirator working properly? Check it every time.**
- ☐ **If you find any problem, get it fixed. Don't just carry on working.**
- ☐ **Co-operate with health surveillance.**
- ☐ **Report all illnesses to your supervisor.**
- ☐ **Wash hands before starting the job, and before eating, drinking or using the lavatory.**

Other legislation

Offshore Installation and Pipeline Works etc Regulations 1995, regulations 17 and 18

Other hazards

- Noise
- Work at height
- Substances harmful to the marine environment

Further information

Legionnaires' disease. The control of legionella bacteria in water systems. Approved Code of Practice and guidance L8 (Third edition) HSE Books 2000 ISBN 978 0 7176 1772 2 www.hse.gov.uk/pubns/books/l8.htm

Guidelines for Environmental Health on Offshore Installations Oil and Gas UK

Legionellosis risk management and Legionella control. Guidance for oil and gas facilities, offshore platforms and refineries Energy Institute

Managing the segregation and isolation of potable water systems on offshore installations Offshore Information Sheet 4/2010 HSE

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

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.

Published by the Health and Safety Executive 07/11