ORE1

Offshore radiation essentials

Breaking containment – naturally occurring radioactive materials (NORM)

Control approach 4

Special advice

This information will help offshore dutyholders (owners, operators and contractors) to comply with the Ionising Radiations Regulations 1999 (IRR), to protect workers' health.

This guidance consolidates good control practice and reinforces existing knowledge with additional information. It will help you carry out IRR risk assessments, review existing assessments, deliver training and in supervising activities involving radioactive substances.

It is aimed at staff whose responsibilities include the management of radioactive substances on offshore installations. (eg occupational health specialists, radiation protection supervisors). It sets out good practice approaches to control exposure. It is also useful for trade union and employee safety representatives.

Following the 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 key principles for removal of NORM in vessels and pipework.

Hazards

✓ NORM can be present in various process streams.

✓ NORM contains uranium and thorium radioactive decay products that emit a range of alpha, beta and gamma radiation.

✓ Exposure to radiation can be detrimental to health.

✓ Health risks include an increased risk of developing cancer and other genetic effects, and toxicity by inhalation, skin contact or swallowing.

✓ The International Atomic Energy Agency (IAEA) rates NORM with an activity above 10 Bq/g as hazardous.

Access

Area designation

✓ The outcome of the risk assessment will determine whether a controlled or supervised area is required.

Controlled area

✓ If there is a significant risk of the spread of contamination from the work area or if access into the area is to be restricted, a controlled area should be designated.

✓ A controlled area should also be designated if it is likely that personal doses exceed 6 mSv per year or the time-averaged dose rate exceeds 7.5 microSv per hour, or if special procedures are required to restrict exposure to radiation.

Supervised area

✓ If the conditions of the area are under review, a supervised area should be designated.

✓ A supervised area should also be designated if it is likely that personal doses could exceed 1 mSv per year, or the area needs to be kept under review of designation.

Equipment and procedures

Planning

✓ Notify HSE of work for the first time with NORM.

✓ Carry out a risk assessment for the job assessing the possible NORM concentrations and form.

✓ Ensure that your employer has written local rules for the job.

✓ Local rules detail the area designation, the task and control measures, ie the 'dos and don'ts', decontamination procedures, and action in an emergency.

✓ Survey for NORM before work begins.

✓ Use the defined monitoring equipment:
  - measure the dose rates before and after breaking containment;
  - measure contamination levels after breaking containment.

Control procedures

✓ Protect surfaces from contamination, eg with plastic sheeting.

✓ Flush and air purge to clean the internal surfaces as much as possible prior to shutdown. Is chemical cleaning possible?

✓ After breaking containment, leave idle for at least four hours. Then assess the contamination levels and external dose rates.

✓ Supervise to check that the local rules are being followed.

✓ Survey areas for radiation during and after the job. Confirm that the area, the tools and the personal protective equipment (PPE) have been decontaminated before leaving the work area.

Personal protective equipment (PPE) – see OCM3

✓ Provide PPE as set out in the local rules.

✓ All PPE must be easy to decontaminate, eg washable.

✓ Ensure that all PPE is compatible.

Maintenance, examination and testing

Examination and testing

✓ Calibrate radiation meters at least once a year and ensure that they are working as intended prior to use.

Records

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

Monitoring

✓ Monitor to show that workers, PPE, equipment and areas are decontaminated to background levels of radiation before leaving the controlled area.

✓ Provide radiation workers with personal dosemeters when appropriate (the outcome of the risk assessment will determine when dosemeters are appropriate).

✓ Keep area radiation monitoring records for at least two years.

Cleaning and housekeeping

✓ Wash all PPE and test to show that it has been decontaminated.

Employee checklist

☐ Is your radiation passbook up to date?

☐ Is the equipment in good condition and working properly?

☐ Is your portable/personal alarm fully charged and working properly?

☐ Is your respirator working properly? Check it every time.

☐ Look for signs of leaks, wear and damage before every job.

☐ Do you have a spill clean-up kit handy?

☐ If you find any problem, get it fixed. Don't just carry on working.

☐ Discard single-use gloves every time you take them off. Discard other gloves at the end of the shift.

☐ Wash hands before eating, drinking or using the lavatory.

Waste

✓ Ensure an appropriate disposal route is used – advice may be required from the radiation protection adviser (RPA).

✓ Each radioactive waste stream must comply with the conditions contained in an appropriate environmental authorisation.

✓ Residues are 'hazardous waste'. Label containers clearly – include a UN number where appropriate. Store and dispose of waste safely.

Personal decontamination and skin care

✓ Instruct workers in how to clean their skin effectively.

✓ Tell workers to wash before every break.

✓ 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

✓ Ask your RPA for help in deciding the workers' classification for ionising radiation work.

✓ Radiation workers must be certified as fit to work with ionising radiation.

✓ Outside workers must have a radiation passbook. Keep this up to date.

Training and supervision

✓ Provide supervision – ensure that safe work procedures are followed.

✓ Check that PPE use follows the requirements contained in the local rules.

✓ You need a trained RPA to supervise the work.

✓ Radiation workers need specific training on materials and procedures.

✓ Explain the dangers of NORM.

✓ Training includes toolbox talks on:
- emergency procedures;
- how to decontaminate effectively; and
- what to do if something goes wrong.

✓ Involve managers and supervisors in health and safety training.

Essential information

OCE0 *Advice for managers*
Radioactive Substances Act 1993

Other hazards

- Process hydrocarbons
- Hydrogen sulphide
- Noise
- Manual handling

Further information

International Atomic Energy Authority (IAEA) Safety Series 15 www.iaea.org/

Work with ionising radiation. The Ionising Radiations Regulations 1999. Approved Code of Practice and guidance L121 HSE Books 2000 ISBN 978 0 7176 1746 3 www.hse.gov.uk/pubns/books/121.htm

Radiation doses: Assessment and recording Ionising Radiation Information Sheet IRIS2(rev) HSE Books 2000 www.hse.gov.uk/radiation/ionising/index.htm

Radiation protection supervisors Ionising Radiation Information Sheet IRIS6 HSE Books 2000 www.hse.gov.uk/radiation/ionising/index.htm

Selection, use and maintenance of portable monitoring instruments Ionising Radiation Information Sheet IRIS7 HSE Books 2001 www.hse.gov.uk/radiation/ionising/index.htm

Control of radioactive substances Ionising Radiation Information Sheet IRIS8 HSE Books 2001 www.hse.gov.uk/radiation/ionising/index.htm

Designation of classified persons www.hse.gov.uk/radiation/ionising/dose/designation.htm

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.