



Public Health
England

Protecting and improving the nation's health

Nuclear Emergencies Information for the Public



© Crown copyright and database rights 2011



Introduction

The Radiation (Emergency Preparedness and Public Information) Regulations 2001 (REPPiR) establish a framework for the protection of the public through emergency preparedness for accidents with the potential to affect members of the public. The Regulations require the provision of information to the public in advance in situations where a radiation emergency might arise and during any kind of radiation emergency.

This booklet is intended to support the operators of nuclear sites* in the provision of information to the public by providing background information on radiation and health. It should be noted that further detailed information is provided by the site operator to residents who live within the detailed emergency planning zone (DEPZ) around sites. It is recommended that the contents of this booklet are read together with other local guidance provided by the site operator.

* Nuclear sites can be fixed nuclear plants used (or formerly used) for power generation and research, berths cleared for use by nuclear powered warships, defence nuclear sites or facilities used to store nuclear material or radioactive waste.

Accident consequences

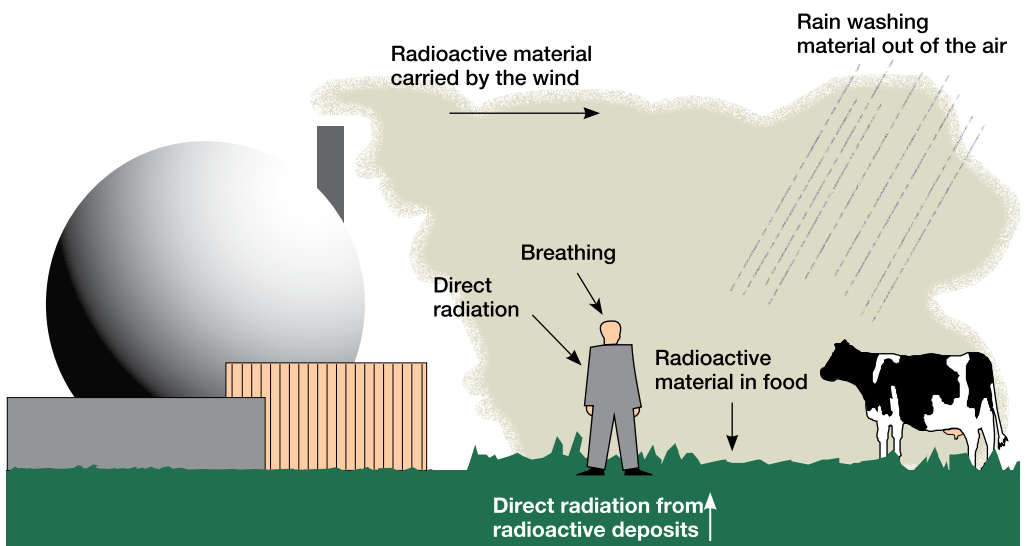
Nuclear sites are designed, built and operated so that the chance of an accident and any release is very low. Accidents have occurred however, notably at Windscale (UK) in 1957, Three Mile Island (US) in 1979, Chernobyl (Ukraine) in 1986 and Fukushima (Japan) in 2011. In the last two cases, radioactivity was released from the site.

Legislation requires operators of nuclear sites to have plans to deal with accidents.

Weather conditions at the time of release are an important factor determining the affected areas as the radioactive material is carried down wind, spreading out and depositing on the ground and other surfaces as it goes.

People may be exposed to radioactivity released during an accident in the following ways:

- by breathing in radioactive materials (inhalation)
- by direct radiation exposure from radioactive materials carried in the air and deposited on surfaces
- by eating and drinking food and water contaminated with radioactive materials (ingestion)





Countermeasures

In the unlikely event of an accident at a nuclear site which results in a release of radioactive material, the following actions could be taken to reduce radiation doses.



Sheltering Staying indoors with doors and windows closed. This provides protection from breathing in radioactive material in the air. It also gives protection from direct radiation from radioactive material on the ground.



Evacuation Evacuation reduces exposure by taking people away from the affected area.

Stable iodine tablets Faults at operating nuclear reactors can release radioactive forms of iodine, which can lead to radiation doses to the thyroid gland. It has been shown that taking stable iodine speeds the removal of radioactive iodine from the body, resulting in a reduced radiation dose. In the UK, potassium iodate tablets are available for this purpose.



Food Radioactive material deposited on soil or grass can find its way into food through crops and animals. It might be necessary to ban milk or other foods containing radioactive material following an accident.



Food advice compared with other countermeasures Where food is contaminated it can lead to an intake of radioactivity over a longer period of time, leading to a build-up of dose. This dose can be reduced by banning the sale of contaminated food. The limits on radioactivity in food are deliberately low to reduce radiation dose to minimal levels. This may result in a wide area being subject to food controls.



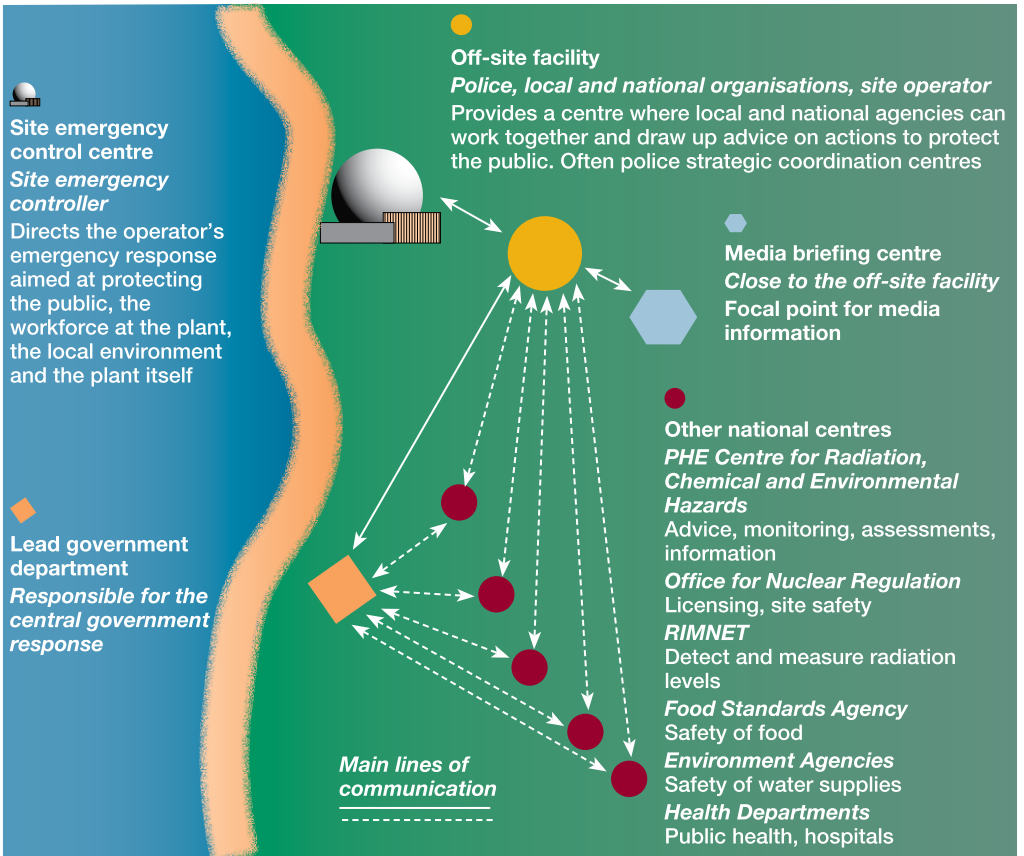
If you are in doubt about what countermeasure action to take, follow the instructions provided by the emergency services.

If you live close to a nuclear site, you should refer to the specific local information provided to you.

Emergency plans

To ensure that there is adequate protection against accidents, legislation requires the operator of a site to conduct a detailed safety assessment of the plant and processes. This assessment assists in identifying circumstances in which an accident may occur. Based on the results of the assessment, working procedures may be changed or additional engineering controls introduced to make the possibility of an accident even more unlikely.

From the assessment, the most serious reasonably foreseeable accident is identified. Each site is required to have emergency plans to deal with the on- and off-site consequences of such an accident. Emergency plans must be sufficiently flexible to deal with any reasonably foreseeable accident and extendable in the event of a more serious, but less likely accident. The plans contain details of arrangements to protect the public and are available to the public through local authority websites and public libraries.



Detection and monitoring

Radioactive material in the environment can be measured in various ways. Many organisations can make such measurements: operators of nuclear sites, Public Health England (CRCE), government departments, local authorities, universities and local medical physics departments.



Following an accident, a wide range of food supplies and drinking water would be checked to see if they contained more radioactive materials than the allowed levels.



Fixed radiation monitors around nuclear sites would detect and measure abnormal radiation levels. By international agreement the UK should receive warning of nuclear accidents abroad. As a back-up, automatic instruments throughout the country form the radioactive incident monitoring network (RIMNET), which would detect and measure abnormal radiation levels.

Detailed and sensitive measurements of radioactive materials in people can be made to assess doses and to check that countermeasures were effective.

Monitoring of the general public living in the vicinity of a nuclear site would be conducted to provide reassurance to the public in the event of an accident. Initial monitoring would be followed-up, if necessary, to assess long-term doses to individuals.



Website links and further reading

Additional and more detailed information is publicly available on the internet. Links to some websites of interest and valid at the time of publication are given below.

Department of Energy and Climate Change – www.gov.uk/decc

Environment Agency – www.gov.uk/environment-agency

Food Standards Agency – www.food.gov.uk

HM Government –

www.gov.uk/preparing-for-and-responding-to-energy-emergencies#civil-nuclear

International Atomic Energy Agency –

www.iaea.org/sites/default/files/ines.pdf

Met Office – www.metoffice.gov.uk/publicsector/emergencies

Ministry of Defence – www.gov.uk/mod

National Resources Wales – www.naturalresourceswales.gov.uk

Office for Nuclear Regulation – www.onr.org.uk

Scottish Environment Protection Agency –

www.sepa.org.uk/regulations/radioactive-substances/

Scottish resilience – www.readyscotland.org/ready-government/resilience-division/

UK nuclear sites

EDF Energy – www.edfenergy.com/energy

Magnox – www.magnoxsites.co.uk

Sellafield Ltd – www.sellafieldsites.com

UK resilience – [www.gov.uk/government/policies/](http://www.gov.uk/government/policies/improving-the-uks-ability-to-absorb-respond-to-and-recover-from-emergencies)

[improving-the-uks-ability-to-absorb-respond-to-and-recover-from-emergencies](http://www.gov.uk/government/policies/improving-the-uks-ability-to-absorb-respond-to-and-recover-from-emergencies)

About Public Health England

Public Health England exists to protect and improve the nation's health and wellbeing, and reduce health inequalities. It does this through world-class science, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. PHE is an operationally autonomous executive agency of the Department of Health.

Public Health England

133–155 Waterloo Road

Wellington House

London SE1 8UG

www.gov.uk/phe

@PHE_uk

PHE has a large network of staff based throughout the UK, including a central office based in London and three major centres at Chilton, Colindale and Porton.

For further information and to find your local PHE office visit the website at

www.gov.uk/contacts-phe-regions-and-local-centres

PHE Centre for Radiation, Chemical and Environmental Hazards

CRCE provides advice and services, and carries out research, to protect the public from hazards resulting from exposure to chemicals and poisons, radiation both ionising and non-ionising, and ultrasound and infrasound. CRCE also leads for PHE on public health effects of climate change and extreme environmental events such as flooding. In a radiation emergency, senior CRCE representatives would provide radiological advice to government and to the local emergency centres dealing with the incident.

PHE CRCE emergency role

- radiological protection advice and information
- radiological assessment
- environmental radiation monitoring
- personal monitoring

CRCE is based at Chilton, Oxfordshire. There are also specialist radiation centres at Leeds and Glasgow.

Contact PHE CRCE

Chilton	Chilton, Didcot, Oxfordshire OX11 0RQ	T: +44 (0)1235 831600
Leeds	Oak Park Lane, Cookridge, Leeds LS16 6RW	T: +44 (0)113 267 9041
Glasgow	155 Hardgate Road, Glasgow G51 4LS	T: +44 (0)141 440 2201