



British Energy Group plc

Working in radiation protection

Routine measurement of radiation levels close to Heysham nuclear power station, Lancashire, UK.

Radiation protection is a specialised area of health and safety. It deals with the protection of workers, patients, the general public, organisations and the environment. It is concerned with the use of two types of radiation:

- **ionising radiation** (e.g. X-ray machines, radioactive materials)
- **non-ionising radiation** (e.g. lasers, ultraviolet light and electromagnetic fields).

Radiation Protection Practitioners, often known as health physicists, give advice, provide guidance and offer a wide variety of support services including:

- Measuring levels of radiation in the workplace or the environment.
- Investigating incidents or accidents.
- Managing the disposal of radioactive waste.
- Advising of the safety of facilities and work practices.
- Assessing radiation doses to people.
- Handling the security and safe transport of radioactive materials.
- Ensuring organisations and people comply with all the radiation laws.
- Specialist training.
- Liaising with, or acting as, Government radiation inspectors or regulators producing legislation.

Radiation check

The Big Picture on pages 10-11 of this issue of CATALYST shows three French scientists checking for environmental contamination by radioactive materials which may escape in small quantities from nuclear power stations, through escapes of gas from the reactors or leaks of contaminated cooling water. Fortunately, ionising radiation can be detected at very low levels. Each click of a Geiger counter indicates that a single radioactive atom has undergone decay, emitting either alpha or beta radiation, along with a gamma ray.

In the photograph ...

- The scientist on the left is using a meter to check the conductivity of the river water. The meter's sensor has two electrodes which pass an electric current through the water. Ionising radiation increases the number of charged particles in the water, so that its conductivity increases.
- The researcher on the right has collected samples of a dark-coloured moss and is about to check them with a Geiger counter. Some plants take up radioactive substances and accumulate them in their leaves.
- The third scientist is using a pipette to collect a precise volume of river water for analysis back in the lab.



Greenpeace

This type of radiation detector can tell which radioactive elements are present by measuring the exact energy of the gamma rays they emit.



It isn't only nuclear radiation that needs monitoring. This detector measures the levels of electromagnetic fields near an electricity sub-station.



Researchers check for possible radioactive contamination along the banks of the Tinée river in SE France.

Catalyst

www.sep.org.uk/catalyst





The traditional radiation hazard warning sign (top) has 3 black 'blades' (representing radiation spreading out from a source) on a yellow background. You may also come across the alternative sign (lower) which has been designed to be more comprehensible to the general public.

Potential employers

Many health physicists work in the health service e.g. in the NHS for diagnosis and radiotherapy, or in related industries such as pharmaceuticals and radioisotope manufacture. Others work in the nuclear power industry for firms such as British Energy, or for the Nuclear Decommissioning Agency, the body responsible for the decommissioning of nuclear reactors when they reach the end of their useful lives.

There is also potential employment in the public sector, including regulatory bodies such as the Health and Safety Executive and the Nuclear Installations Inspectorate, and in universities and research establishments such as CERN.



A technician manipulates radioactive materials using remote handling tools; he is protected by lead glass.

All of the major employers have a good career structure and most are keen to support your studies, if necessary up to degree level or beyond. Job responsibility can come at an early stage in your career, with consequent promotion opportunities. There is a fair degree of interchange between major employers. Some people choose to specialise in one field, such as dosimetry, instrumentation, environmental management or radiochemical analysis. In other cases promotion from radiation protection managerial posts to higher general managerial posts is also possible. Formal appointment as a Radiation Protection Adviser, as required by the Ionising Radiations Regulations, is a likely target for those involved in operational radiation protection.



Controlling a hospital X-ray machine from a safe distance.

Qualifications and training

You can commence a career in radiation protection with GCSE and A-level qualifications in scientific (or numerate) subjects, but in all cases you will require additional specialist training. Courses are run at a number Further Education colleges and universities.

At the full professional level you will normally require a degree in a science subject, most commonly physics, chemistry or biology. There is a structured training programme for graduate trainees entering the radiation protection profession, for example, in the medical field and the nuclear industry.



A film badge, worn by radiation workers, records their exposure to ionising radiation.

Careers in radiation protection are extremely stimulating, and offer tremendous opportunities for varied and flexible work. The rewards, both financial and intellectual, can be significant. There is always a high demand for well-trained people with radiation protection skills. It is worth noting that as the current crop of nuclear reactors is being decommissioned and the UK gears up for a new phase of nuclear power a career in radiation protection is likely to offer you the security of a job for life.



The Society for Radiological Protection (SRP)

The SRP is the professional body for anyone concerned with radiation protection. Its membership exceeds 1400, comprising Fellows, Members, Graduates, Associates, Students and Affiliates. It is a Chartered Society and its objective is to promote the science and art of radiation protection and allied fields for the public benefit. It achieves this by means of meetings, conferences, lectures and publications.

The Society has an official publication, *The Journal of Radiological Protection*, which is published quarterly. The SRP members communicate with each other through a newsletter, networking and email discussion groups.

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