

FACTSHEET:

Wastes from defence activities

Overview

Defence activities produce radioactive wastes that are broadly similar in type to those from civilian nuclear power production. The total amount of waste produced is, however, much less.

The largest volumes of radioactive waste arise within the Royal Navy during operation, maintenance and decommissioning of nuclear powered submarines.

Other radioactive wastes are produced during activities to maintain the UK's strategic nuclear weapons capability, and from clean-up of disused military sites.

Submarine operation

All of the current fleet of Royal Navy submarines are powered by pressurised water nuclear reactors (PWRs). These reactors work in much the same way as a civil nuclear power reactor, but on a smaller scale and using more highly enriched nuclear fuel. These differences are reflected in the wastes that are produced.

Radioactive wastes are produced during normal operations. These include items such as used protective clothing, ion exchange resins used to decontaminate liquids and redundant equipment.

Additional wastes are produced during the periodic refit of the submarines and refuelling of the reactors.



Image: The nuclear-powered submarine HMS Vengeance at Devonport dockyard during a periodic refit and refuelling operation. Source - Ministry of Defence

Submarine decommissioning

Once a submarine has reached the end of its operational lifespan it will need to be decommissioned.

Decommissioning is undertaken in stages, with the first stage being defuelling. Spent fuel from submarines is removed and sent to Sellafield where it is stored in a cooling pond for several years.

The reactor compartments are the only part of the submarine structure to contain radioactive materials. During operations, the metallic parts of the reactor compartment will become radioactive due to neutron activation.

Out of service nuclear powered submarines are kept at the naval dockyards at Rosyth in Fife and Devonport near Plymouth. It is proposed that these submarines will be dismantled and the reactor compartments will be disposed as radioactive waste.

Nuclear deterrent

The manufacture and maintenance of new nuclear weapons and the dismantling of old, redundant ones produces some radioactive wastes.

Some of these wastes are broadly equivalent to the radioactive wastes produced within civilian nuclear operations, but in smaller amounts.

Clean-up of disused military sites

Many old military sites are no longer needed, and so are being cleaned-up so that they can be made available for other uses. Some of these sites are contaminated with radioactive substances, such as radium that was used on luminous dials in aeroplane cockpits. Clean-up of these sites can produce wastes such as contaminated soils.

Radioactive wastes produced by defence activities

Many different radioactive wastes are produced from manufacturing, maintenance, operation and decommissioning of nuclear submarines and nuclear weapons.

Examples include:

- used filters and resins from submarine reactor operations, decontamination of pond water and liquid treatment
- metallic reactor components from development, testing and decommissioning submarine reactors
- depleted uranium ammunitions, contaminated targets and ground from weapons testing
- contaminated land from the clean-up of disused military sites to make them available for reuse