

Radioactive Waste

Background

- The UK has been using nuclear technology for electricity generation as well as medical, military and research applications since the mid 1950s.
- As such radioactive waste comes not only from the operation of nuclear plant and power stations but from 7,000 or so other premises in the UK licensed to handle radioactive materials.
- Radioactive waste is a tiny proportion of the total waste (0.02%) and less than 1% of the toxic wastes produced in the UK. Despite this the special characteristics of this waste make its careful management extremely important.

What is it? How does it work?

- Nuclear waste is generally classified under three headings: Low Level Waste (LLW), Intermediate Level Waste (ILW) and High Level Waste (HLW). Spent nuclear fuel is not classified as a waste since it has resource potential (reprocessing), however, unprocessed spent fuel will require disposal in a similar way to HLW.

Low-level waste

- Low-level waste makes up 80-90% of all radioactive wastes. Anything which could have been contaminated by radioactive substances has to be treated as low-level waste. Examples of LLW are waste paper and discarded protective clothing from nuclear power stations and radioactive sources from hospitals and industry. This means that much LLW is not very radioactive at all, presents little or no risk and can be handled safely by workers wearing normal industrial protective clothing.
- LLW that is suitable is treated and sent for disposal to the shallow repository operated by BNFL at Drigg in Cumbria. Since 1988 it has been concrete lined and LLW for disposal has to be packed in special containers. The remainder is stored on site pending a final disposal solution.
- Each of our stations produces, on average, 250m³ of LLW each year. This includes the contribution from decommissioning wastes, which comprise about 80% of the total.

Intermediate-level waste

- ILW is defined by the amount of radioactivity it contains per unit weight. In simple terms, it is radioactive material which falls between LLW and HLW. It is sufficiently radioactive to require shielding and containment and special arrangements for its handling. Examples of ILW include sludges and resins arising from the treatment of radioactive liquids, filters from active ventilation systems and parts of spent fuel elements removed before or during reprocessing. It can generally be handled safely using remote tools, cranes or shielding. Nevertheless the radioactivity may be long-lived and ILW will need to be disposed of in a way which prevents the radioactivity returning to the environment for a long time into the future.

- At present there is no facility in the UK for the disposal of ILW. It is currently stored on site pending the identification of a long term disposal solution.
- Each of our stations produces, on average, 77m³ of LLW each year. This includes the contribution from decommissioning wastes, which comprise about 80% of the total.

High-level waste

- High-level waste comes from reprocessing and is sufficiently radioactive that it is heat generating. It is generally in liquid form and as such is more difficult to handle and store. HLW contains over 95% of all the activity in waste produced by nuclear power generation.
- High-level waste can be converted into a glass form, a process called vitrification. This enables the waste to be stored and handled with greater ease.
- There are at present no plans for the disposal of HLW in the UK. HLW produced from reprocessing in the UK is stored in continuously cooled stainless steel tanks at Sellafield. Work has started to vitrify the stored HLW.

Spent nuclear fuel

- Spent nuclear fuel is measured as tonnes of uranium fuel (teU). Each of our stations produces about 30teU per year. Historically much of this has been reprocessed at Sellafield. However, British Energy's most recent contracts with BNFL are for the management of spent fuel without being prescriptive of whether it is reprocessed or stored. BNFL alone will decide on their judgement of a range of economic and environmental issues towards the end of THORP life as to what proportion of fuel is reprocessed and what is being long term stored.

British Energy's position

- Our nuclear waste arisings are stored and managed in safe, monitored and retrievable form, on licensed sites. It can continue to be stored safely for many decades.
- In the longer-term a solution for final disposal will be required. Such a solution is technically achievable (as evidenced by progress in other countries, such as Finland), but requires political will.
- CORWM (Committee for Radioactive Waste Management) has been established by the UK Government to identify the preferred final disposal option (or options).