SONE

Supporters of Nuclear Energy

NUCLEAR WASTE

WHAT IS NUCLEAR WASTE?

It is material affected by ionising radiation or contaminated by radioactivity in the course of nuclear operations in power stations, hospitals, industry, research establishments and the defence programme. It is NOT so-called “spent” nuclear fuel that has been through a generating cycle in a nuclear power station. This can be processed to recover about 96% of the uranium and a small amount of its plutonium by-product, both of which can recycled in reactors to generate more electricity. To class “spent” fuel as waste would be profligacy on a criminal scale, given the need for safe, cheap and clean power. Nuclear power stations emit next to no greenhouse gases.

HOW IS IT HANDLED?

Nuclear waste falls into three categories – low, intermediate and high level. About 90% by volume is low level – i.e. slightly radioactive – including gloves, packaging, clothing and towels used by workers. Some of it is not much more radioactive than a Brazil nut. It is stored in steel drums in a surface facility at Drigg, near Sellafield.

Intermediate level waste is 1,000 times more radioactive but represents only about 6% of the total volume and only 4% of nuclear waste’s total radioactivity. It exists in liquid and solid form and includes reactor parts, filters, resins, sludges and bulky material from both operations and decommissioning. Large items may be stored whole but the rest is usually immobilised in concrete or bitumen inside steel drums which are held in shielded stores awaiting disposal.

High level waste is 1,000 times more radioactive than intermediate level waste but represents at most only 4% by volume of the total waste. It results mainly from nuclear fission in reactors. It is stored in liquids to allow it to cool and its radioactivity to decay and is then cast into glass blocks to immobilise it, reduce its volume and cool further before final disposal.

HOW MUCH OF THE STUFF IS THERE?

Not a lot. In fact, nuclear waste accounts for only about 0.1% (one thousandth) of the hazardous waste annually produced in Britain. The reactors of today’s typical nuclear power station create only enough waste each year to fill a London bus and the entire industry only enough high level waste to fill a London taxi. The new generation of nuclear reactors being built will produce only about 10% of that from current gas-cooled reactors.

It has been claimed that after 50 years’ of nuclear operations there is enough waste without a place for long term disposal to fill the Royal Albert Hall five times over. In fact, there is enough to fill only one RAH. To get five you have to make assumptions about how much will arise far into the future.

SO WHERE'S THE PROBLEM?

There isn't one. The nuclear industry has been managing its waste for more than 50 years. Its final disposal in a depository presents no scientific, technological or engineering problem. Nor, in spite of the billions of pounds alleged to be required to deal with it, is it a financial headache. Uniquely, nuclear power generators set aside 4% of the price of their electricity to cover decommissioning and waste management costs. The only problem - a political one – has now been partly solved. It is agreed that high level waste should be disposed of in a deep geological depository. Communities have been invited to bid for the right to host such an engineered facility and the benefits that flow from it. Sweden already has an underground depository at Forsmark.

SO WHY ALL THE FUSS?

Anti-nuclear campaigners have sought to close down the nuclear industry by trying to price it out of the market with safety measures and claiming it cannot manage its waste. Their misrepresentation and exaggeration have failed. It is true that some isotopes of uranium produced by power station reactions have radioactive lives lasting millions of years just like uranium dug out of the ground. But the longer their half-life, as it is described, the less radiation they emit. After 500 years in a deep depository they would be no more dangerous than uranium mined in the earth's crust and less dangerous than some elements we have learned to live with. After all, arsenic, mercury and lead, for example, never lose their toxicity.

BUT WHAT ABOUT PLUTONIUM?

Anti-nukes say plutonium is "the deadliest substance known to man". In fact, the Queen was handed a lump – a warm lump because of its radioactivity – in a bag when she visited Harwell research establishment in the 1950s. Its alpha radiation does not penetrate the skin. It is dangerous only if it lodges in the body through breathing or ingestion. It is therefore a hazardous substance but when removed from dismantled nuclear weapons it is a sword awaiting conversion into a ploughshare as a generator of electricity. We should burn it up in nuclear power stations.

AND WHAT ABOUT RADIATION RISKS?

Radiation is a fact of nature. We live in an irradiated environment and 75% of the radiation we absorb comes from radon and thoron gases seeping from the ground, from rocks and soils and from outer space. Another 14%, averaged across the population, comes from X-rays and nuclear medical treatments and 10% comes from radioactive chemicals within our bodies. That leaves at most 1% of which less than 0.1% - one thousandth of the total irradiation of the human body – comes from the entire nuclear industry. In other words, medical treatments create 140 times more radioactivity than nuclear. The British nuclear industry has made such a good job of shielding its workers and the British population from alpha and the more penetrative beta and gamma rays that not a single death has been recorded from a radiation accident in its entire post-war history.

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