

Q&A on Nuclear Waste

(1) The nuclear industry says it has developed the necessary technologies for the disposal of nuclear waste. All that remains is to ensure that the proposed solutions are acceptable to the public. Don't environmentalists object to deep disposal simply to damage its public acceptability and prevent the nuclear industry expanding?

<http://www.world-nuclear.org/info/inf103.html>

Although the nuclear industry claims it can 'dispose' of its nuclear wastes by burying them deep underground, it does not claim to be able to isolate them from the environment forever as you might expect. It relies on diluting and dispersing the waste throughout the environment as it leaks from the dump. The industry hopes its predictions about geology and how the waste will behave over very long time-scales – millions of years – will come true. [1] But our scientific understanding is not sufficiently advanced to be able to predict the impact of underground nuclear waste dumping on human health or the environment that far into the future. Environmentalists believe it would be more responsible to manage existing waste in monitorable and retrievable stores above ground, so that if a problem arises it can more easily be fixed.

(2) Low and intermediate level waste are disposed of securely in near-surface repositories in many countries, and high-level waste is safely stored, and, in fact the amount is small in relation to other industry sectors. Wouldn't environmentalists be better focussing on other industries?

In Normandy, France, the Centre Stockage de la Manche (CSM) was used from 1967 to 1994 to dispose of LLW and ILW. Radioactive contamination from this dump is leaking into groundwater, used by local farmers for their dairy cattle. [2] France now dumps waste at a new site in eastern France at Soulaire – the Centre Stockage l'Aube (CSA). CSA is in the Champagne region and has already begun to contaminate groundwater. [3]

No country in the world has a solution for high-level waste. This hazardous waste comes in the form of spent fuel removed from nuclear reactors, or, in some countries where this spent fuel is reprocessed by dissolving it in nitric acid, in the form of a highly radioactive liquid waste. There are about 270,000 tonnes of spent nuclear waste fuel in storage, much of it at nuclear reactor sites. Spent fuel is accumulating at around 12,000 tonnes per year, with around a quarter of that going for reprocessing. [4] Environmentalists campaign against the production of all sorts of toxic waste, but nuclear waste is particularly hazardous, difficult to manage, and represents a potential terrorist target.

(3) Deep geological disposal is a widely accepted solution, and repository projects are well advanced in some countries, such as Finland [5], Sweden [6] and the USA. Couldn't other countries follow their lead? Hasn't it been demonstrated in Finland, Sweden and the USA that political and public acceptance issues, at community and national level, can be resolved?

None of the countries mentioned has an operating HLW, spent fuel nuclear waste dump acts as a barrier to the construction of new nuclear reactors. In Finland nuclear waste company, Posiva, has permission to build a Rock Characterisation Facility (RCF), but does not intend to submit an application to build the final disposal facility until the end of 2012, with final disposal of spent nuclear fuel beginning in 2020. [7] Sweden does not even have a site for HLW – only a concept. The Swedish waste agency, SKB, is investigating two sites wants to be able to suggest a site around 2007. [8] The US has a site at Yucca Mountain in Nevada. But plans to start burying waste in 2010 have been abandoned after a string of problems, including a federal court ruling in 2004 that invalidated a repository safety standard. The US Department of Energy (DoE) now hopes to open the 'repository' in 2017 – 19 years after the original target date of 1998. [9]

(4) Don't we have a duty to future generations to deal with the nuclear waste that we have created by placing it out of harms way in a deep geological repository?

Ownership of the UK's waste agency, Nirex, was transferred to the Nuclear Decommissioning Authority on 1st December 2006. [10] However, Nirex previously argued that we should seek to minimise the burdens imposed on future generations for the management of radioactive waste. It uses the Sustainable Development Principle to argue that, since it is the present generation, which has benefited from nuclear power, we should be the ones to deal with the waste. [11] Environmentalists believe it would be more responsible to bequeath future generations a well-managed, monitorable retrievable waste store than a waste dump from which radioactive materials will eventually leak. A nuclear waste dump with all its potential problems is not a way to protect future generations from problems arising with radioactive wastes. The most sensible way to reduce further burdens on present and future generations would be to stop creating more nuclear waste now by closing existing facilities as soon as possible.

(5) Why do environmentalists say we should not build more reactors until the waste issue is resolved? Given the environmental advantages over burning fossil fuels and the fact that the technology exists to dispose of waste, why wait?

As part of its campaign to build new nuclear stations around the globe, the nuclear industry often claims that any problems associated with burying nuclear waste in a deep underground "repository" are to do with public acceptability rather than being technical in nature. But, as we have seen, nuclear dumping proposals in Finland, Sweden or the United States do not represent a solution to the nuclear waste problem. There is no operating HLW, spent fuel nuclear waste dump, anywhere in the world.

The UK's Committee of Radioactive Waste Management (CoRWM), says taking a deliberate decision to create new nuclear wastes by building new reactors raises different political and ethical issues to those related to dealing with existing waste. In other words, we should certainly not assume that because we are going to be forced to find a solution for waste we have already created that this make it all right to make even more. [12]

(6) Nuclear materials have been transported safely for around fifty years ago. Packages that store waste during transportation are designed to ensure shielding from radiation and containment of waste, even under the most extreme accident conditions. Aren't objections to waste transports just scare-mongering?

Just because there hasn't been a serious accident for 50 years doesn't mean there never will be one. Nuclear engineer, Dr John Large, says nuclear waste transports are a potential target for terrorists. A rocket-propelled grenade could easily penetrate the flasks containing spent fuel rods. If a flask were penetrated it would cause radiation to spread over a wide area. The contents are intensely radioactive. [13]

(7) Nuclear waste may be hazardous for thousands of years, but other industries produce wastes (e.g. heavy metals such as cadmium and mercury), which remain hazardous indefinitely. Shouldn't green groups focus on those industries instead?

Two wrongs, don't make a right. We should be endeavouring to phase out all industrial processes, which produce toxic waste – they are not compatible with a sustainable economic system designed to protect ecosystems. Environmentalists argue for the idea of 'clean production', which fulfils our need for products in a sustainable way using renewable non-hazardous materials and producing non-toxic minimal waste which can be re-used or recycled. [14]

(8) Geological repositories for HLW are designed to ensure that harmful radiation would not reach the surface even with severe earthquakes or the passage of time. Surely that provides adequate containment?

In fact the idea that nuclear dumps are designed to stop harmful radiation reaching the surface is misleading. The International Atomic Energy Agency (IAEA) says the goal of radioactive waste disposal is to avoid

“undue exposure to radiation of humans or the environment” and keeping any potential hazard to human health “acceptably low” over required periods of time. The industry relies on being able to predict what will happen inside the dump over millions of years, in order to be able to prove that radiation doses to humans in the distant future will be kept acceptably low. Computer models designed to carry out the necessary calculations are extremely complex. So any predictions made will be subject to huge uncertainty. The risk that something might go wrong is too great. Once waste is buried underground it would be very difficult to retrieve if it started to leak faster than expected. Macfarlane and Ewing say: “there are substantial uncertainties in projecting the performance of a geological repository far into the future. There is simply no way to guarantee that a repository will not release radionuclides into the environment at some point in the future, and it is difficult to predict when and how such a release will occur.”[15]

[1] See for example: IAEA Safety Series “Siting of Geological Disposal Facilities” IAEA 1994

http://www-pub.iaea.org/MTCD/publications/PDF/Pub952e_web.pdf

[2] Greenpeace International Press Release 29th May 2006

<http://www.greenpeace.org/international/press/releases/illegal-french-nuclear-waste-d>

[3] FT 1st June 2006

<http://news.ft.com/cms/s/173fce30-ef7-11da-b80e-0000779e2340.html>

View London 31st May 2006

http://news.viewlondon.co.uk/Radiation_fear_in_Champagne_region_17129617.html

Greenpeace International Press Release 30th May 2006

<http://www.greenpeace.org/international/press/releases/radioactive-waste-leaking-into>

[4] Waste Management in the Nuclear Fuel Cycle, World Nuclear Association, Information and Issue Brief, February 2006.

<http://www.world-nuclear.org/info/inf04.html>

[5] Nuclear Energy in Finland, World Nuclear Association Information Paper, September 2005,

<http://www.world-nuclear.org/info/inf76.html>

[6] Nuclear Energy in Sweden, World Nuclear Association Information Papers, August 2006,

<http://www.world-nuclear.org/info/inf42.html>

[7] See Underground Characterisation Facility or ONKALO, Posiva website.

Overview: http://www.posiva.fi/englanti/tutkimus_esittely.html

Construction Schedule: http://www.posiva.fi/englanti/tutkimus_aikataulu.html

Virtual Repository, Enviros website http://www.enviros.com/vrepository/not_subscribed/country/finland/index.cfm

[8] http://www.enviros.com/vrepository/not_subscribed/country/sweden/index.cfm

[9] Platts Nuclear News Flashes 19th July 2006

Las Vegas Review-Journal 19th July 2006

http://www.reviewjournal.com/lvrj_home/2006/Jul-19-Wed-2006/news/8571904.html

[10] The NDA as implementing body for deep geological disposal, and the transfer of Nirex functions to the NDA,

NDA Press Release 1st December 2006. [http://www.nda.gov.uk/News_\(42\).aspx?pg=42](http://www.nda.gov.uk/News_(42).aspx?pg=42)

[11] See Nirex’s sustainability principles in Nirex (December 2000) Managing Radioactive Waste.

Or Nirex Environment Policy, September 2001, http://www.nirex.co.uk/foi/policies/environmental_policy.pdf The UK Government (see <http://www.sustainable-development.gov.uk/what/index.htm>) defines sustainable development as development which meets the needs of the present without compromising the ability of future generations to meet their own needs and that of environmental protection.

[12] See CoRWM press release <http://www.corwm.org.uk/content-1038>

Draft Recommendations

<http://www.corwm.org/pdf/None%20-%20CoRWMS%20Draft%20Recommendations%2027%20April.pdf>

New Scientist 26th April 2006

<http://www.newscientisttech.com/article/dn9060-bury-your-nuclear-waste-uk-advised.html>

[13] Risks and Hazards Arising in the Transportation of Irradiated Fuel and Nuclear Fuel Materials in the United Kingdom, by Large and Associates, Greenpeace UK 27th March 2006

<http://www.greenpeace.org.uk/MultimediaFiles/Live/FullReport/7487.pdf>

[14] See for example “The Natural Step’s” four rules.

<http://www.forumforthefuture.org.uk/docs/page/4/83/The%20Natural%20Step.pdf>

[15] See Allison Macfarlane and Rodney Ewing, Uncertainty Underground, MIT Press 2006.

<http://www.no2nuclearpower.org.uk/reviews/index.php>