Vermont Legislative Research Shop

Nuclear Waste

Nuclear power has recently been receiving much attention as an emissions-free alternative energy source. This is in part due to the acknowledgement of the global warming crisis by the government and the general public of the United States. However, despite its environmentally friendly appearance, nuclear power raises several important concerns including high overhead costs and safety issues related to the transportation and disposal of nuclear waste.[1] Nuclear waste is of particular importance because it poses a danger to human health and because facilities for its disposal are limited or non-existent. This report introduces the different types of nuclear waste, explores the waste policies of several states, and looks at how some states have attempted to control the production of nuclear waste.

Types of Nuclear Waste

Nuclear waste consists of the leftovers and by-products of radioactive materials used to generate electricity, carry out certain healthcarehealtTf0Tc1rg/TT31Tf0.0001Tc0.2250l4.0006Tc0.22501526a0T

contaminated by radiation such as: protective clothing and covers, rags and mops, filters, and other objects. LLW is divided into three levels—Class A, Class B, and Class C—that represent from lowest to highest the degree of radioactivity of the waste. In general, LLW is much less radioactive than HLW, meaning that it decays in tens or hundreds of years rather than hundreds of thousands; however, it still represents a danger and so must be safely controlled and stored until the radioactivity has dissipated. Some LLW is stored on-site at the place it is produced, but official policy prefers that it be disposed of in an official disposal location off-site.[5] Throughout the U.S., about 4 million cubic feet of LLW was disposed of in 2005.[6] That is enough to fill the volume of about 16 large hot air balloons.[7]

Regulations Affecting Disposal

The U.S. Nuclear Regulatory Commission (NRC) is responsible for the licensing and regulation of all commercially produced radioactive waste.[8] The NRC in turn can negotiate agreements with state governments to allow them to license and regulate the storage and disposal of LLW within their boundaries. Thirty-two states, called "Agreement States", have arranged this type of agreement with the NRC. As of 2002 there were more than 20,000 licenses for the possession of radioactive materials.[9]

The Nuclear Waste Policy Act of 1980 specified that it is the responsibility of the Federal Government to provide a safe storage location for HLW, while states were given the responsibility for disposing of LLW. The law also specifies that until the Federal Government has created a permanent storage location, the producers of HLW are responsible for the safe storage of their HLW. Establishing a permanent storage location has, however, proved very difficult for the US government. [10] And, the US is not alone in facing such difficulties—no disposal site for HLW exists anywhere in the world today, despite the fact that there are more than 440 nuclear reactors in 30 countries.[11]

The Low-Level Radioactive Waste Policy Act of 1980 confirmed the responsibility of each state for the disposal of its LLW and further suggested that states create regional agreements, or compacts, in order to establish a regional LLW disposal center. As a result, 10 compacts were created with all but eight states in a compact. For example, a compact known as the Southwestern Low-Level Radioactive Waste Disposal Compact exists between the states of

---

[5] U.S. Nuclear Regulatory Commission, May 2002.
[6] U.S. Nuclear Regulatory Commission, "Low-level Waste Disposal Statistics," 21 March 2007. Retrieved 3 February 2009 from http://www.nrc.gov/waste/llw-disposal/statistics.html
[7] Large hot air balloons have a volume of approximately 240,000 cubic feet.
[8] As distinct from government waste associated with military research and operations.
[9] U.S. Nuclear Regulatory Commission, May 2002.
[10] For further information, see Yucca Mountain section and the Office of Civilian Radioactive Waste Management on storage of high-level nuclear waste. http://www.ocrwm.doe.gov
[11] World Nuclear Association, "Nuclear Power in the World Today," June 2007. Retrieved 3 February 2009 from http://www.world-nuclear.org/info/inf01.html.

is also prepared to construct dry fuel storage facilities if necessary.[18] Dry storage facilities are used only after waste has been stored in a cooling pool for at least one year, and they consist of steel containers, called casks, filled with inert gas. The casks are further shielded by concrete or steel to protect from radiation and stored in a concrete vault.[19] Dry storage facilc(1s0Td(a)Tj/C2_01Tf0.480Td2

shorter.[23] Research is also being conducted in several countries to improve the efficiency and efficacy of reprocessing technologies. The United States abandoned efforts to reprocess nuclear fuel under President Carter due to fear that recycling would result in proliferation of materials for nuclear weapons.[24]

State Policies Restricting the Expansion of Nuclear Power

In the wake of the partial meltdown at the Three Mile Island nuclear power plant in Pennsylvania in 1979, many states passed laws limiting the construction of new nuclear power facilities. In fact, no new nuclear plants have been built in the United States since 1979. To date, twenty different states have created nuclear moratoriums or statutes banning the building of new nuclear power sites.

States have created these policies in a variety of different ways. For example, California, Illinois, Kentucky, and Connecticut require that the federal government has means, or has approved the means to dispose of high-level nuclear waste. Both Maine and Massachusetts require that a HLW facility already exists before they lift their moratorium. Other states, such as West Virginia, are even more specific and state that the HLW disposal site must have been successfully operated for 2 years. Both Montana and New Jersey aim for the standard that disposal of nuclear waste will be not a threat to human life. In California the process for building a nuclear power plant requires the California Utilities Commission to bring a report to the California legislature regarding nuclear waste disposal technology. The legislature is then given 100 days to act upon the report; if the legislature does not approach a decision within that time period, the Commission may move forward with construction. [25]

Compiled in response to a request from Representative Sarah Edwards by Hannah Fjeld and Jameson Halnon under the supervision of Professor Anthony Gierzynski on February 5, 2009.

Disclaimer: This report has been compiled by undergraduate students at the University of Vermont under the supervision of Professor Anthony Gierzynski. The material contained in the report does not reflect the official policy of the University of Vermont.

---

[23] J. Lake, R. Bennet, and J. Kotek, "Next Generation Nuclear Power." *Scientific American Online,* 26 January 2009. Retrieved 4 February 2009 from http://www.sciam.com/article.cfm?id=next-generation-nuclear.
[24] A. Andrews, "Nuclear Fuel Reprocessing: U.S. Policy Development." CRS Report for Congress, 27 March 2008.
[25] David Lovell, "Memo to the member of the Special Committee on Nuclear Power, RE: State Laws Limiting the Construction of Nuclear Power Plants," 29 November 2006. Retrieved

About the sources:

The Office of Civilian Radioactive