

Current Status of Spent Nuclear Fuel

ANA Information Sheet

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Spent Nuclear Fuel Inventory

Spent fuel and HLW contain by far the largest radioactivity of the radioactive substances produced by nuclear fission. Globally, there are about 270,000 tonnes of used fuel in storage, much of it at reactor sites. About 90% of this is in storage ponds with the rest in dry storage. Annual arisings of used fuel are about 12,000 tonnes, and 3,000 tonnes of this goes for reprocessing [1]. Total spent fuel in the USA is 71,780 metric tons of uranium as of Dec 2013. If used fuel assemblies were stacked end-to-end and side-by-side, this would cover a US football field about seven yards (6.4 m) deep [2, 3].

A 2007 IAEA report indicates that the ratio of spent fuel mass (MTHM) to volume (m³) to be 2.5 for LWRs, which allows the volume of accumulated spent fuel to be assessed [4]. The amount of spent fuel containing uranium of Australian origin is estimated to be about 15%.

Spent Fuel Disposal Costs and Funding Arrangements.

Globally, several models are used to fund the spent fuel disposal.

The US operates a spent fuel disposal fund which is intended to fund the spent fuel disposal costs, including research, facility construction operation and closure. The US spent fuel disposal fund is currently reported to be at approximately US\$24 billion with around US\$7 billion already spent on the Yucca Mountain facility. In 2014 the US Department of Energy (DOE) stopped collecting nuclear waste fees from US utilities, which netted approximately US\$750 million per year into the fund through a levy of 0.1 cents per kWh of nuclear power [5, 6]. The US has about 99 operable reactors out of 438 worldwide and produces about 25% of the nuclear electricity generated world-wide.

Finnish nuclear operators had set aside a total of US\$2.6 billion by the end of 2014 for waste disposal and decommissioning activities [7]. The French model is for the waste generator (mainly EDF) to retain the ownership of waste and the costs associated with the disposal to be recovered by the operator (ANDRA) from waste produced. For a new French nuclear reactor considered over its entire operating life, the cost of radioactive waste disposal is approximately 1 to 2% of the total cost of electricity production. The estimated cost of constructing, operating and closing the French repository for intermediate and high level waste is estimated to be between US\$14.6 - US\$17.9 billion spread over a period of over 100 years [8].

Based on the estimated costs for managing spent fuel in the US, we estimate the total cost of managing spent fuel from the reactors around the world to be in the range A\$50 billion to A\$100 billion.

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References

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