**Disposal beats MOX in US comparison**

21 August 2015

**America is reconsidering how it will dispose of 34 tonnes of plutonium as the previous plan involving a MOX plant has been said to be twice as costly as a dilution and disposal option in a leaked Department of Energy (DOE) report.**

The plutonium arises from a June 2000 nuclear weapons reduction agreement with Russia under which both countries would put 34 tonnes of plutonium beyond military use. Russia opted to use its plutonium as fuel for fast reactors generating power at Beloyarsk.

The USA, meanwhile, decided to build a mixed-oxide (MOX) nuclear fuel plant at Savannah River, where the plutonium would be mixed with uranium and made into fuel for light-water reactors. The design is similar to Areva's Melox facility at Marcoule, but modified to handle metal plutonium 'pits' from US weapons and their conversion from metal to plutonium oxide. It is this part of the process that has been problematic. Construction started in 2007 with an estimated cost of $4.9 billion but work ran into serious trouble before being 'zeroed' in the DOE's 2014 budget, putting development on ice.

The Union of Concerned Scientists yesterday published what it said was an unreleased DOE report that compared the cost of completing the MOX plant to other options. Use in fast reactors was considered briefly, but with this technology not readily available in the near term, the prime comparison was against a 'dilution and disposal' option which would see the plutonium mixed with inert materials and disposed of in the Waste Isolation Pilot Plant, or WIPP, in New Mexico.

Despite being 60% built, the MOX plant still needs some 15 years of construction work, said the leaked report, and then about three years of commissioning. Once in operation the plant would work through the plutonium over about 10 years with this 28-year program to cost $700-800 million per year - a total of $19.6-22.4 billion on top of what has already been spent. Not only is the price tag very high, but the timescale is too long: the report said this would not meet the disposal timeframe agreed with Russia.

The cost of the MOX plant could not be mitigated by income from sales of the MOX fuel because the regulatory process to gain approval to use MOX would be too burdensome for a commercial utility. The report said "it may be unlikely" that even a utility in a regulated market where fuel costs are passed on to consumers would "bear the risk of MOX fuel even if it is free".

Dilution and disposal would cost $400 million per year, said the report, "over a similar duration" as MOX, working out at close to half the cost. Other advantages for dilution and disposal are that it requires no new facilities to be created or decommissioned after use, although the increase in WIPP disposal means "it may eventually become desirable to explore expansion of WIPP's capacity" beyond currently legislated limits. This unique geologic disposal facility was said to be of "tremendous value to both DOE and the State of New Mexico".

*Researched and written
by World Nuclear News*