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Hyatt, N.C. (2018) eLetters: Preventing future failure of plutonium disposition strategies. Science, 360 (6390). ISSN: 0036-8075

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Letter: Preventing future failure of plutonium disposition strategies

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Following its decision to terminate the MOX Fuel Fabrication Facility (MFFF) at Savannah River, after a decade of construction activity and expenditure of more than \$7.6 Billion [1], the US Department of Energy plans to “dilute and dispose” of 34 tons of surplus weapons plutonium in the Waste Isolation Pilot Plant (WIPP). Whilst this may present an expedient route to reducing the immediate proliferation risk of this material, the long term safety of this disposition option is uncertain [2,3]. In particular, the original disposal system safety case is challenged by the increase in envisaged plutonium inventory (by a factor of three), increased risk of human intrusion, and lack of sufficiently demanding performance requirements on the plutonium disposal package, due to reliance on geological isolation [3]. The failure of MFFF will also urge further scrutiny of the UK policy to disposition up to 140 tons of separated plutonium as MOX fuel, with no evident appetite for utilisation in commercial reactors [4].

In 1994, the National Academy of Sciences advised the US Government to adopt a “dual-track strategy” for managing surplus plutonium, with parallel development of MOX fuel and immobilisation approaches to de-risk the programme, given the uncertainties in cost and technical implementation, and to achieve earlier completion of the disposition mission [5]. Immobilisation technology has matured considerably over the last two decades and is considered a credible option for disposition of the UK plutonium stockpile [4,6]. Accelerating the development of this technology, to demonstrate pilot and full scale production of a passively safe and proliferation resistant wasteform, in an effective “dual track strategy”, is essential to safeguard against further policy failure in both the UK and USA.

Acknowledgments

We acknowledge support from EPSRC for our research on plutonium management under grants EP/L014041/1 and EP/R511754/1.

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