

The Return of South Africa's Highly Enriched Uranium to the US in Context

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On 17 August 2011, the National Nuclear Security Administration (NNSA) of the United States issued a press release announcing that the South African government, through the Nuclear Energy Corporation (Necsa), had returned 6,3kg of highly enriched uranium (HEU) spent fuel to the US for safe storage and ultimately for destruction. NNSA is a semi-autonomous agency within the US Department of Energy (DOE) responsible among other things for maintaining and enhancing the safety, security, reliability and performance of the US nuclear weapons stockpile. The shipment arrived at Savannah River Site (SRS) on 16 August. The SRS is a key DOE industrial complex dedicated to nuclear weapons stockpile stewardship and nuclear materials destruction in support of the US nuclear non-proliferation efforts. It is situated 20 miles south of Aiken, South Carolina.

Subsequent press reports and releases by mainly US-based academics and NGOs lauded this development as a significant step in 'reducing and securing **vulnerable** [emphasis added] radioactive materials held at civilian sites around the world' and stated that it represents an important effort to 'strengthen the world's defences against nuclear terrorism'.

While at first reading these may seem reasonable assertions, a number of important caveats need to be highlighted.

Firstly, 'spent fuel' is defined as fuel whose elements have been removed from the reactor because the fissionable material they contain has been depleted to a level near where it can no longer sustain a chain reaction. The high concentration of radioactive fission products in spent power-reactor fuel creates a gamma-radiation field, which at a distance of a metre would be lethal. South Africa, or more accurately Necsa, no longer has any use for this material.

Secondly, the US and South Africa have been working constructively for a number of years on various peaceful use applications of nuclear material and in particular on the need to minimise the use of HEU. Examples of such co-operation are the conversion of South Africa's SAFARI-1 reactor to low enriched uranium (LEU) fuel as well as training in medical responses to nuclear and radiological emergencies. Indeed, today South Africa is leading the transition to produce the medical isotope molybdenum-99 (Mo-99) with LEU rather than HEU.

This joint work was given impetus by South African President Jacob Zuma's attendance, in 2010, at the Nuclear Security Summit. Zuma was one of only five African Heads of State or government invited to develop concrete measures towards ensuring that nuclear materials under their control are not stolen or diverted (the others being Algeria, Egypt, Morocco and Nigeria). They pledged to improve security as changing conditions may require, and to exchange best practices and practical solutions for doing so. The Summit's final communiqué also highlighted the fact that 'highly enriched uranium and separated plutonium require special precautions'.

Thirdly, the return is not unique. The repatriation of used and unused HEU fuel to its country of origin – either the US or Russia – has been an international goal since the early 1980s. Some 1,249kg of US-origin highly enriched uranium from sites around the world have already been returned, including from Chile in April 2010 just after the earthquake the previous February.

Finally, and perhaps most importantly, the spent fuel storage facility at Necsa is not, and has never been, '*vulnerable*' – in the sense of being in danger of being accessed by organisations or persons with criminal intent or worse, with terrorist ideologies.

South Africa is fully aware of its obligations and is totally committed to the safety and security of such materials and sources. The nuclear material democratic South Africa holds, including the HEU from the Apartheid state's nuclear weapons programme, is under constant and real-time surveillance and will never again be used, wittingly or unwittingly, to produce a nuclear weapon. This HEU does not pose 'a potential security vulnerability', as one academic alleges.

Given the developmental benefits of nuclear and other radioactive materials for Africa, there is a clear need to ensure the continued delivery of the benefits that nuclear materials and related applications provide, such as radionuclides intended for use in life-saving medical applications.