



GE Hitachi (GEH) has a new generation of nuclear new build for a fiscally responsible solution to manage the UK's soon to be 140 tonne plutonium stockpile at Sellafield.

GEH has developed PRISM, an efficient, clean, cost-effective way to rapidly manage the UK's stockpile, whilst also generating low-carbon electricity.

Evolution of PRISM

After 30 years of development, PRISM is ready to be commercialised and can be operational within a timeframe comparable to other potential plutonium reuse options.

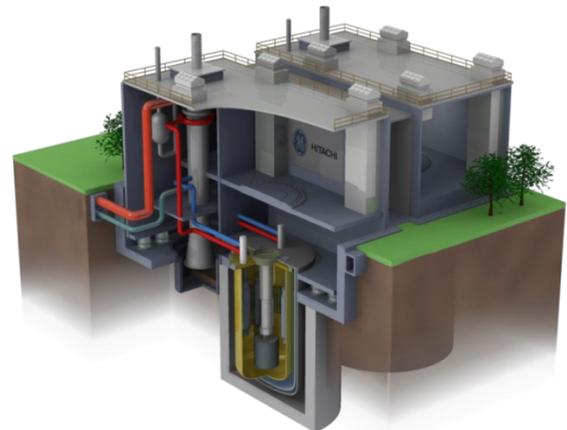
GEH has been at the forefront of world-leading programmes to develop sodium cooled fast reactors since 1951. PRISM is based on a proven, established technology, embodied in the EBR-II reactor, which operated successfully for 30 years. It incorporates a number of innovative features (including built-in passive safety systems which eliminate the possibility of a loss of coolant accident) making it the ideal vehicle for plutonium reuse in the UK.

How PRISM works

PRISM brings together a series of proven, safe and mature technologies to create an innovative solution to the UK's plutonium and anti-proliferation challenge.

Sodium-cooled reactors have safely operated at many sites around the world. The PRISM's coolant, liquid sodium, allows the neutrons in the reactor to remain at a higher energy (or speed, hence the common reference of 'fast reactor'). This process renders the plutonium unusable for proliferation purposes. The reaction also produces heat energy which is then converted into electrical energy in a conventional steam turbine.

Over its 60-year design life, PRISM is capable of processing the entire UK plutonium stockpile. It could also process other nuclear materials the UK Government wishes to dispose of, including reprocessed uranium and unused fuel for past nuclear reactor programmes.



The potential exists for PRISM to evolve even further. Future options could deliver complete recycling of plutonium and other nuclear materials for a more compact repository with greatly reduced long-term risk.

Benefits of PRISM

- **Highly cost-competitive** compared to alternative technology options, due to its unique fuels design that enables a highly efficient fuel manufacturing process. deliverable through a range of commercial models, with a guaranteed market for the by-product (electricity)
- **Most secure option** for managing the UK's plutonium
- **Generates 622MW low carbon energy**, equivalent to powering 60,000 homes
- **Designed to process plutonium in larger quantities** within the fuel (therefore much faster) than any other technology, and is the only technology capable of processing up to 99 percent of the UK stockpile, and other by-products and unused fuel
- **No need for complex chemical pre-clean up** with large-scale chemical solutions and therefore minimal environmental impact
- **Would represent a multi-billion pound investment** in the UK, regional and local economy, with as many as 1,400 construction jobs and 900 permanent jobs at Sellafield
- **Likely to reaffirm Cumbria as a global centre of engineering excellence** and a driver of low carbon innovation

Where we are today

An independent assessment commissioned jointly by the Nuclear Decommissioning Authority (NDA) and GEH in 2012 found PRISM presents “no fundamental impediment(s)” to licensing in the UK. The merits of using PRISM technology in the UK, along with the other alternatives to plutonium reuse, were then reviewed by the NDA who shared with DECC their recommendations on 1st August 2013.

NDA has now publicly confirmed that it considers PRISM technology to be credible and will be undertaking a further assessment of PRISM’s capability to be successfully deployed in the UK in the near future.

What people are saying about PRISM and plutonium reuse

Liz Keenaghan-Clark, Head of Waste Management Policy, DECC

‘Govt is aware that we cannot leave this for the next generation to sort out...This is a priority Government programme, the Government wants to make sure we progress this as quickly as we can.’

(Sellafield Workers Campaign event on recycling plutonium, November, 2013)

Adrian Simper, Director of Strategy, NDA

‘Our current approach is the safe and secure storage of plutonium at Sellafield, however this is not a satisfactory end point; we must find a solution for dealing with this material...We are looking for an industrial solution here. We have significantly enhanced our understanding of the pros and cons of the different systems of disposing of UK plutonium, however it’s too early to choose yet – this is a marathon not a sprint.’

(Sellafield Workers Campaign event on recycling plutonium, November, 2013)

Edward Davey MP, Secretary of State for Energy and Climate Change:

‘There are a number of options. Clearly there are discussions about whether one of the options should be procuring a new MOX. Some people argue that MOX is a very credible, mature technology and would be the way to go. But you mention alternatives, and, of course we should and will consider the alternatives.’

(ECC Select Committee evidence session Hansard, 23rd January 2013)

Simon Virley, Director General for the Energy Markets and Infrastructure Group, DECC:

‘We will of course publish the evidence behind any decision that is taken on which direction to go in. As the Secretary of State said, we have a policy direction, which is to move to reuse. Obviously, the short-term priority is the safety and security of the plutonium that is currently stored, and it will be a long-term programme. The business case is being looked at, in terms of different routes to achieve the policy objective of reuse, and nothing is ruled out at this stage.’

(ECC Select Committee evidence session Hansard, 23rd January 2013)

Leading environmentalists and journalists George Monbiot, Mark Lynas, Stephen Tyndale, Fred Pearce and Michael Hanlon:

‘Some of us have already written about the PRISM reactor offered by GE-Hitachi, a fourth-generation fast reactor design which can generate zero-carbon power by consuming our plutonium and spent fuel stockpiles, thereby tackling both the nuclear waste and climate problems simultaneously; it is currently under consideration by the Nuclear Decommissioning Authority as a promising alternative to Areva’s MOX fuel for plutonium management.’

(Joint letter to David Cameron, 15th March 2012)

Cllr Elaine Woodburn, Leader of Copeland Council:

‘We have known for a long time that re-use of plutonium could hold the key to future nuclear development in West Cumbria. Prism seems to tick the boxes. It’s well known we have been campaigning for a second Sellafield MOX plant but if the global market demand doesn’t exist for MOX then this could be the next best option in terms of safeguarding highly skilled well-paid jobs in Copeland.’

(The Whitehaven News, High hopes for world’s first PRISM fast reactor at Sellafield, 12th July 2012)