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Australian Nuclear Science and Technology Organisation

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UK Approaches ANSTO for Plutonium Waste Solution

State-of-the-art ANSTO* radioactive waste immobilisation technology – better known as synroc – is being sought after by the United Kingdom (UK) in a deal that promises to not only solve waste issues but have major future implications for the international push for the non-proliferation of nuclear weapons.

The deal with Nexia Solutions, a British Nuclear Fuels Group company, will ensure that up to five tonnes of legacy plutonium waste residues currently stored at the Sellafield Site will eventually be permanently locked up in a solid form said ANSTO's Executive Director, Dr Ian Smith.

"The success of this technology will demonstrate to other holders of dangerous wastes that they too can have a tailor-made permanent immobilisation solution," Dr Smith continued. "For the nuclear industry, nuclear materials that could potentially be used for weapons manufacture may be safely immobilised forever.

"Over the past two years, ANSTO has worked to develop a tailor-made glass-ceramic matrix to imprison the Sellafield waste ready for long-term storage and eventual permanent disposal," said Dr Smith. "The matrix is specifically designed for their particular needs, as ANSTO's technology can be adapted for a variety of radioactive waste requirements.

"The product and process to be used in the UK is a further adaptation of synroc technology designed to hold the maximum amount of waste, and have maximum durability to minimise environmental risk."

The program will initially be regarded as a pilot for other plutonium waste initiatives, and its success will not only result in commercial benefits for ANSTO but improved waste disposal options for industry across the board.

Peter Bleasdale, Nexia Solutions Managing Director said they were keen to commence the whole process.

"Currently we are at the design stage of the plant, transferring the ANSTO technologies and building a mock up at the Sellafield site in preparation for the real thing," he said.

"ANSTO will work with Nexia Solutions, giving technical support throughout the construction of the plant and beyond."

The process to be used will be to combine the waste with a glass-ceramic mix which will then be placed in metal cans. A Hot Isostatic Press will compact the waste at high temperature and pressure, significantly reducing volume. The glass-ceramic matrix combines the flexibility of glass and the chemical durability of ceramic, best suited to immobilising nuclear materials such as plutonium.

The synthetic rock "Synroc" was originally invented in 1978 by the late Professor Ted Ringwood of the Australian National University. Over the years, ANSTO has developed and tailored different forms for a wide range of radioactive wastes. A plant to demonstrate the manufacture of non-radioactive synroc was constructed at the ANSTO site. The fine-tuning of the product and process for Nexia Solutions is the result of collaborative work based on the technology developed at ANSTO. For more details go to <http://www.synroc.ansto.com>

**For more information and to arrange an interview please contact:
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*ANSTO is the Australian Nuclear Science and Technology Organisation, the country's national nuclear research and development organisation and the centre of Australian nuclear expertise – over 70 per cent of all radioisotopes used in Australian nuclear medicine are made in ANSTO's reactor