Plutonium Residues Hot Isostatic Press (HIP) Installed in the UK

A range of chemically diverse radioactive wastes containing plutonium exist on the Sellafield site in the UK. These 'plutonium residues' are a legacy of early R&D programmes going back to the 1960s. They are unsuitable for recovery of the plutonium since they are highly impure and variable in composition. Nevertheless these materials will require treatment in order to immobilise the plutonium and ensure its long term isolation from the environment.

The choice of technology to achieve this has to be capable of producing an immobilisation matrix that has very high chemical durability. This is achieved by tailoring the immobilisation matrix (the 'waste form'), along with the optimum processing technology, to suit the unique characteristics of these wastes. ANSTO's synroc glass-ceramic and ceramic waste forms processed in a Hot Isostatic Press (HIP) are being proposed by Nexia Solutions, our customer in the UK, as the technology of choice for treatment of these plutonium-contaminated wastes.

Since 2002 ANSTO has been working with Nexia Solutions under a series of rolling contracts, performing development trials to demonstrate this Australian technology to the major stakeholders in the UK. This has culminated in the recent installation of a customised HIP and inactive process line in the Nexia Solutions labs in the UK to facilitate eventual transfer of ANSTO's technology to a fully active waste treatment facility.

- An inactive demonstration line, using ANSTO’s waste forms and process technology, has been under construction over the last year. The final piece of the puzzle, a bottom loading Hot Isostatic Press (HIP), customized for processing radioactive materials using ANSTO know-how, has just been delivered and installed at the Nexia Solutions facility in the UK.

Configuration of Hot Isostatic Press (HIP)
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- ANSTO worked closely with the HIP system manufacturer (AIP Inc., USA) in customising the HIP system, incorporating novel designs that make the unit applicable for handling radioactive wastes.
- The inactive plutonium-residue line will allow for the optimisation of process conditions and provide engineering data for the active line to be designed and built.

- The synrocANSTO team has been involved in the development of the plutonium-residues process. This inactive facility is a significant milestone in having ANSTO’s technology implemented for the immobilisation of radioactive wastes.
- Sam Moricca of ANSTO’s IMES, who lead the design, installation and commissioning of the HIP unit, stated “the system has run successfully and the customer is extremely satisfied with the end result.”

For further information please visit our website www.synrocansto.com

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