Senate Standing Committee on Economics
ANSWERS TO QUESTIONS ON NOTICE
Innovation, Industry, Science and Research Portfolio
Additional Estimates Hearing 2010-11
23 February 2011

AGENCY/DEPARTMENT: AUSTRALIAN NUCLEAR SCIENCE AND TECHNOLOGY ORGANISATION

TOPIC: Nuclear waste management

REFERENCE: Written Question – Senator Colbeck

QUESTION No.: AI-56

Can you tell us about recent progress at ANSTO on sourcing any commercial opportunities in nuclear waste management?

ANSWER

Please see response to May Budget Estimates 2010-11 question BI-42 (**Attachment A**) for a description of *Synroc* and the Hot Isostatic Pressing (HIP) technology developed by ANSTO for radioactive waste treatment.

There are currently potential commercial opportunities for ANSTO's *Synroc* waste treatment technology in the United States of America and United Kingdom:

United States of America
In December 2009, the United States Department of Energy (US-DOE) selected HIP as their preferred technology for treating high-level radioactive waste calcines located in Idaho, USA ("Idaho calcines"). The selection of this technology followed trial demonstrations by ANSTO of its *Synroc* waste treatment technology. ANSTO is the world expert in, and custodian of, the *Synroc* HIP process for treatment of radioactive waste, having had a continuous development programme for the technology over many years. Therefore, it is ideally placed to offer commercial services to the US-DOE in the implementation of the technology for the safe treatment of the "Idaho calcines".

The US-DOE verified that by using HIP technology, volumes could be reduced by up to 50 per cent, creating savings to the transport and disposal costs of billions of dollars, as compared to the baseline technology of vitrification.

ANSTO anticipates that a formal call for tenders for the HIP technology will be made by the US-DOE by the middle of the year. ANSTO intends to partner in a submission.

United Kingdom
ANSTO is seeking to implement the HIP technology for treatment of plutonium residues at Sellafield Ltd, a nuclear processing facility located in the United Kingdom. The proposal is to build an active demonstration line to treat up to one (1) tonne of legacy plutonium wastes. The current plan is to accelerate the building of this plant to be operational in the next five years.

ATTACHMENT A

Senate Standing Committee on Economics
ANSWERS TO QUESTIONS ON NOTICE
Innovation, Industry, Science and Research Portfolio
Budget Estimates Hearing 2010-11
31 May 2010

AGENCY/DEPARTMENT: AUSTRALIAN NUCLEAR SCIENCE AND TECHNOLOGY ORGANISATION

TOPIC: Synroc

REFERENCE: Written Question – Senator Eggleston

QUESTION No.: BI-42

Can the Department explain the hot isostatic pressing process that has been mooted as a new method of storing radioactive waste? (*Sydney Morning Herald* 16/4/2010, *The Age* 16/4/2010, *Canberra Times* 16/4/2010)

ANSWER

ANSTO has developed a material for radioactive waste encapsulation called *Synroc* which uses a technology called hot isostatic pressing.

The hot isostatic pressing process involves applying high pressure (by means of inert gas or elevated temperature) to a composition of minerals and radioactive waste that has been sealed in metal containers of a special design. This process reduces the volume of waste by over half and produces a synthetic rock material that safely "locks-up" the radioactive waste in a way that mimics natural rocks. By comparison with competing technologies, the ANSTO process has advantages in both the level of volume reduction and the chemical stability of the final waste form, especially for intractable nuclear waste.

This technology has the potential to ensure the long-term safety of radioactive waste storage and disposal, and reduce waste volumes significantly. The net savings for a number of candidate nuclear wastes have been independently estimated to be in the order of billions of dollars.