

Senate Standing Committee on Environment, Communications and the Arts

**Inquiry into the Commonwealth Radioactive Waste Management (Repeal and
Consequential Amendment) Bill 2008**

Introduction

The Australian Nuclear Science and Technology Organisation (ANSTO) is Australia's national nuclear science and technology organisation and the centre of Australian nuclear expertise. ANSTO staff have extensive skills and expertise in nuclear technology and its applications, and in particular in the handling of radioactive materials.

ANSTO's nuclear infrastructure includes the research reactor OPAL, particle accelerators, radiopharmaceutical production facilities, and a range of other unique research facilities. OPAL is used to produce radioactive products, particularly those used in nuclear medicine. It is also a source of neutron beams for scientific research, and it is also used to irradiate various substances, including silicon for semiconductor applications. These activities deliver considerable benefits to all Australians. ANSTO has an active waste minimisation program, but the operation of ANSTO's facilities necessarily produces small amounts of radioactive waste, which are managed in accordance with national and international standards.

That waste has been safely managed at Lucas Heights for many decades, and ANSTO has the capacity to safely manage it for years to come. However, the Commonwealth Radioactive Waste Management Facility is not intended to be used only for ANSTO's waste. We understand that waste destined for the Facility is currently held at around 30 locations within Australia. Any decision on the safe long-term management of radioactive waste needs to recognise that indefinite storage of radioactive waste by small holders is not consistent with international best practice. Evolving international best practice involves the provision of central disposal facilities or stores by government so that the risks of unwanted radioactive materials – particularly radioactive sources – becoming “orphaned” are minimised. Such facilities currently exist in Western Australia and Queensland. Criteria developed for similar facilities overseas will be applied in the design and construction of any facility developed under the Act, in order to ensure that it is consistent with international best practice.

After the initial campaign for the disposal of 50 years' production of radioactive waste, the transport of radioactive waste to the facility will be an infrequent event. ANSTO generates about one truckload (about one standard size shipping container) of such waste a year. This means that, if the facility is opened once every five years for a disposal campaign, only five trucks will travel from ANSTO during that year.

Overseas experience

The Commonwealth's total current holdings of Low Level Waste (LLW) and short-lived intermediate level waste (SLILW) amount to approximately 3,820 m³. ANSTO's share of that is approximately 1,600 m³ (around 40%) – a volume which will be reduced further by supercompaction of existing drums before transport to any Commonwealth facility. By comparison, the French government has disposed of a total of 651,000 m³ of similar wastes in near-surface repositories - 527,000 m³ in the now closed Manche repository in Brittany and 124,000 m³ in the operating repository at Aube, Champagne. Australia's total holdings of LLW and SLILW are a small fraction of the annual production of LLW and SLILW in countries such as Britain or France (about 25,000 cubic metres per year). The United States has transported and disposed of almost four million m³ of low-level waste. Many other countries operate low-level waste repositories – for example, such a repository was inaugurated in Hungary in early October. The operation of those facilities has had no impact upon surrounding areas, and the transport of waste to them has not caused any significant exposures to people or the

environment. This overseas experience would indicate that a similar facility in Australia would not pose significant threats to human health or the environment.

As for long-lived intermediate level waste, the Commonwealth Department of Resources, Energy and Tourism has indicated that the Commonwealth's total current holdings of this category of waste amount to approximately 400 m³, of which ANSTO holds the great majority. In addition, the wastes arising from the reprocessing of HIFAR spent fuel will amount to around 132 m³. By comparison, France produces 930 m³ of this class of waste every year, together with another 155 m³ of high-level waste (which Australia does not produce at all). Again, the storage and transport of that material has not caused any significant exposures to people or the environment.

In contrast to the strong safety record of national waste management facilities, there have been a number of serious accidents involving disused radioactive sources in circumstances where such facilities were unavailable or not used. Those accidents have caused a number of deaths and serious injuries, and significant economic loss¹. In recent years, concerns about the security of radioactive materials have also increased, and ANSTO and other organisations have worked nationally and internationally to secure disused high activity sources and remove them from vulnerable facilities. Suggestions that holders of radioactive waste in Australia should be required to retain that material indefinitely could therefore best be characterised as international worst practice.

Transport of waste to the facility

Radioactive materials are transported around Australia every day for a variety of purposes. These include:

- radiopharmaceuticals used in nuclear medicine procedures;
- sterilisation of medical equipment, blood and products such as cosmetics;
- industrial radiography of welds;
- quality control processes for materials and slurries;
- element analysis in borehole logging;
- road repairs and resurfacing; and
- research applications that involve the use of radioactive tracers to allow biological processes to be followed in the test tube, a living organism or the environment.

ANSTO is the main supplier of radioisotopes for use in nuclear medicine in Australia. In the past year, about 31,000 packages containing radioisotopes were dispatched from ANSTO by road and air to destinations around Australia and overseas. ANSTO understands that a larger number of movements of radioactive materials would have taken place under licence from state and territory regulatory authorities. Most of the 31,000 packages despatched by ANSTO contained radioisotopes for use in nuclear medicine, where they benefited around half a million Australians. Indeed, on average, at present levels of usage, every Australian will need a radioisotope for medical purposes during their lifetime.

¹ See, for example, the report on an accident in Brazil in 1987 at http://www-pub.iaea.org/MTCD/publications/PDF/Pub815_web.pdf.

All shipments of radioactive materials in Australia, including any shipments of radioactive waste, are required to be transported in accordance with the Australian Code of Practice for the Safe Transport of Radioactive Material (2008)². This Code is based on guidelines developed by the International Atomic Energy Agency, and is administered by competent authorities in Australia, such as ARPANSA and the various state and territory regulators. The Code ensures that the level of packaging is appropriate for the level of radioactivity in the material being transported – whether or not that material is waste.

The transportation of radioactive materials has a remarkable safety record. Over several decades, tens of millions of packages of radioactive material, including packages of radioactive waste, have been transported around the world each year. In all those transports, there has never been an in-transit accident with serious human health, economic or environmental consequences attributable to the radioactive nature of the goods.

All radioactive waste to be transported to the facility will have to meet stringent waste acceptance criteria. In particular, such waste will be in solid form, and in the extremely unlikely event of an accident would not release radioactivity into the environment.

The road transport of hazardous materials such as petrol, other flammable liquids, flammable gases and toxic chemicals is a common event throughout Australia. When vehicles carrying such (non-radioactive) goods are involved in accidents, a wide area can be affected. Occasionally, lives are lost as a direct result of the hazardous nature of the load. Experience demonstrates that the risks associated with the transport of radioactive waste are much lower than the risks associated with the transport of many other hazardous materials classified as dangerous goods.

Conclusion

The current situation in Australia whereby there are limited facilities for the disposal or long-term storage of radioactive waste forces holders of that material to store it in facilities which may be unsafe or insecure. That is not conducive to the safety and security of that material. The construction of a central radioactive waste management facility, which would obviously be designed and constructed only for that purpose, would be consistent with international best practice. Many such facilities exist overseas, and their operation – and the transport of waste to them – has an exemplary safety record.

² <http://www.arpansa.gov.au/Publications/codes/rps2.cfm>.