



Australian Government
Nuclear Safety Committee

Reference: D1318428

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Dr Carl-Magnus Larsson
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Nuclear Safety Committee

Advice to the CEO of ARPANSA

Dear Dr Larsson

I refer to your letter dated 18 November 2013 bearing reference D1318427 requesting the Committee provide you with advice on the following matters:

- Safety Implications of Waste Stored in Interim Storage

The Committee's advice is provided in the Appendix to this letter.

Yours Sincerely,

<SIGNED>

Dr Tamie Weaver
Chair of the Nuclear Safety Committee

Appendix

Advice from the NSC to the CEO of ARPANSA

Safety Implications of Waste Stored in Interim Storage

Four aspects pertaining to interim storage of waste were identified and are discussed in greater detail below in Section 1. A number of the documents and reports the Committee referred to in formulating this advice is listed, with a brief summary, in Section 2. As requested, the Committee drew upon the experience and expertise of its Members, considered international best practice and took a broad view of these issues.

Section 1. *The Committee's Advice*

1. Siting

The Committee notes that intermediate level waste (ILW) has been stored at Lucas Heights Science and Technology Centre ('LHSTC') since the mid-1950s, which, when considered with the recent application from ANSTO for an interim waste store (IWS), indicates that ILW storage at LHSTC is extending towards the 50-100 year timeframes discussed in the [REGULATORY GUIDE: Licensing of Radioactive Waste Storage and Disposal Facilities v2](#) ('Waste Guide'). However, the ILW storage activities at LHSTC have been considered as short-term actions. This highlights the need to develop a national long-term storage and disposal facility, rather than to continue to rely on LHSTC for short-term ILW storage. The short-term and interim nature of the IWS at LHSTC should be stressed since there are undoubtedly suitable sites, given Australia's landmass, for establishing a long-term storage or waste disposal facility to house this waste. The Committee notes that a site has already been identified for the proposed national facility.

LHSTC is situated in an already urban area which, based on current trends, will continue to be subject to population growth and development. International best practice points towards the principles of optimisation—reducing the risk to a level being as low as reasonably achievable, economic and social factors being taken into account (ALARA)—taking into account human plans and actions in the vicinity that may affect the safety of the facility over the period of interest.

2. Final Waste Management Prior to Activities Commencing

International best practice points to the need to have in place a policy and infrastructure for final management and ultimate disposal of waste before activities generating waste commence. Currently, there is no infrastructure for final disposal within Australia. New facilities ANSTO proposes to construct at its LHSTC will generate additional waste requiring long-term storage or disposal. Approval may be granted to conduct activities generating waste provided adequate contingencies are in place¹. For example, ANSTO may have sufficient storage on site to accommodate several years' worth of waste before it is moved to a long-term storage and disposal facility. However, a

¹ Indeed, the NSC supports the decision of the former ARPANSA CEO to grant an operating licence to the OPAL reactor despite no waste infrastructure long term waste storage or disposal being in place.

situation may arise in the future whereby waste generated would eventually exceed this extra storage capacity if a long-term storage and disposal facility has still not been established. From a safety, economic and social perspective, such an eventuality may place the CEO of ARPANSA in the situation of potentially needing to use his powers to give directions, or suspend or cancel a licence that had previously been granted. Such an eventuality should be avoided.

The Committee, therefore, recommends that establishing a long-term storage and disposal facility prior to waste-generating activities commencing continues to be considered the preferred option for any licence application.

3. Delay in Disposal

International best practice points towards the preference for long-term storage or final disposal over interim storage. Moreover, Low Level and Intermediate Level Waste stored temporarily in various and multiple locations across Australia is likely to be less safe and secure than waste placed at a single long-term storage and disposal facility that is sited, constructed and operated appropriately. In the absence of this long-term storage and disposal facility, the proposed ILW store at LHSTC provides a temporary measure to store returned spent nuclear fuel waste and waste generated from the proposed new ANSTO facilities (e.g. SyMo).

The Committee is concerned that this temporary measure may indirectly delay or postpone the establishment of a national long-term storage and disposal facility. It should be made clear that an IWS at LHSTC is a temporary measure, acceptable only because no long-term storage and disposal facility is currently available.

The Committee recommends that the CEO should take this issue into consideration when making a licence decision.

4. Transport

The proposed interim store will house the ILW generated from the reprocessing of HIFAR used nuclear fuel before it is transferred permanently to a yet-to-be established long-term storage and disposal facility. The criteria of the [Waste Guide](#) "set out international best practice" (pp. 11); this promotes transport of ILW directly to a final storage or disposal facility rather than to interim storage at another facility, as is currently being proposed for the ILW generated from the reprocessing of HIFAR used nuclear fuel. Thus, while transport of radioactive material has historically proved to have or present very low risks, it would appear that the dual handling and transport process associated with interim storage does not represent international best practice. The Committee notes that the [SAFETY GUIDE: Safe Transport of Radioactive Material 2008 Radiation Protection Series Publication No. 2.1](#) recommends contact time with the waste should be kept short. Dual handling also has implications for security, pursuant to [RPS 11. Code of Practice for the Security of Radioactive Sources \(2007\)](#). The Committee notes that ANSTO already has comprehensive security arrangements in place at its LHSTC site.

Section 2. Documents the Committee Considered

[Report on the ANSTO Application for a Licence to Construct a Replacement Research Reactor Addressing Seismic Analysis and Seismic Design Accident Analysis Spent Fuel and Radioactive Wastes \(February 2002\)](#)

This report flagged concerns the Committee had regarding the availability of an ANSTO contingency plan for the management of Lucas-Heights generated waste. At the time, it was the Committee's opinion that ANSTO might not have a "fall-back should the plans for the National Repository and National Store not eventuate" (pp. 101). It should be noted that the Committee does not view the proposed IWS as a "fall-back" for this eventuality, and understands that ANSTO holds a similar view.

[Report on the ANSTO Application for a Licence to Operate a Replacement Research Reactor Addressing the Plan for Maintaining Effective Control of the Facility and Conduct of Operations Management of Spent Fuel and Radioactive Waste \(September 2005\)](#)

The Committee considered that ANSTO had made significant progress in addressing issues raised in the 2002 report such as: "the effort and resources expended on ensuring that radioactive waste from operations can be stored on-site for many years to allow for the contingency that the Commonwealth Radioactive Waste Management Facility and Commonwealth Store are not available in the future" (pp. 21-22). The Committee does not, however, consider that the proposed IWS at LHSTC removes the requirement for a national long-term storage and disposal facility.

[Draft Regulatory Assessment Report of the proposed Interim Waste Store tabled at the November 2013 meeting.](#)

In April 2013, the CEO of ARPANSA received a siting licence application for an Interim Waste Store (IWS). The IWS is proposed to house intermediate level solid radioactive waste returning from France (which will be immobilised in vitreous or cemented form) and transported/stored in an engineered shielded dual storage TN81 and fibrous cemented transport containers. The IWS will be an above ground facility holding reprocessed HIFAR spent fuel.

[Statement of Reasons: ANSTO Nuclear Medicine Molybdenum-99 \(ANM\) Facility](#)

The CEO of ARPANSA has already granted a siting licence to ANSTO for the ANM Facility to produce Mo-99, a precursor to Tc-99^m used in radiopharmaceutical applications. This facility is intended to replace the radiopharmaceutical production facility already in operation at Lucas Heights.

[SyMo Waste Treatment Facility](#)

ANSTO has submitted a siting and construction licence for a 'SyMo' facility which will be used to treat and process intermediate level liquid wastes arising from current ANSTO Mo-99 production, any future upgraded capacity, and legacy liquid waste at LHSTC. ANSTO will store the processed or conditioned ILW from this proposed facility in Building 27—an existing intermediate level waste store which currently operates under the ANSTO Waste Operations licence F0260. The ultimate destination of this processed or conditioned ILW would likely be a future national facility.

[Australian Nuclear Science and Technology Organisation Act 1987](#)

ANSTO's functions include to condition, manage and store radioactive materials and radioactive waste, which includes its own activities as well as those of other organisations or companies it holds a controlling interest in. Pursuant to subsection 5(1A) and 5(1B) of the *Australian Nuclear Science and Technology Organisation Act 1987*, regulations "must not have the effect of authorising the

premises on which the Lucas Heights Research Laboratories are situated to become a national nuclear waste repository”—it cannot be used for “the storage of nuclear waste with a view to it never being moved to another site”.

[National Radioactive Waste Management Act 2012](#)

Pursuant to section 3, the object of this Act is to “provide for:

(a) the selection of a site for a radioactive waste management facility on voluntarily nominated land in Australia; and

(b) the establishment and operation of such a facility on the selected site;

to ensure that radioactive waste generated, possessed or controlled by the Commonwealth or a Commonwealth entity is safely and securely managed.”

[Australian Radiation Protection and Nuclear Safety Act 1998 \('the Act'\)](#)

As outlined by Beamont J [[FCA 1144, 2002](#)] under the Act, the CEO of ARPANSA is not specifically required to take into consideration the future management or storage of waste if granting a siting or operating licence for an interim waste store. The CEO can give directions to controlled persons (pursuant to Section 41 of the Act) and can also suspend or cancel a licence (Section 38).

[REGULATORY GUIDE: Licensing of Radioactive Waste Storage and Disposal Facilities v2 \('Waste Guide'\)](#)

At the June 2012 meeting, the Committee “agreed that the [[REGULATORY GUIDE: Licensing of Radioactive Waste Storage and Disposal Facilities v2](#)] appropriately addressed the safe management of waste storage and disposal” (Minutes, *pp.* 8). This Guide outlines the overarching statutory requirements and best practice for the full life cycle of a storage or disposal facility for radioactive waste. Specific aspects of this guide taken into consideration include Section 3.3, 3.4, and annex A3 and A4.

[SAFETY GUIDE: Safe Transport of Radioactive Material 2008 Radiation Protection Series Publication No. 2.1](#)

Section 3.2 of the Guide suggests that “Radioactive materials presented for transportation are packaged in accordance with the Transport Code to ensure that they are safe to handle under normal conditions. Nevertheless, to prevent unnecessary exposure to radiation, there are certain basic rules that should be followed...” (*pp.* 13). One of these rules is to “ensure contact time with the package should be kept short” (*pp.* 14).