Australian Government

Australian Radiation Protection and Nuclear Safety Agency

Statement of Reasons

Decision by the CEO of ARPANSA on Facility Licence Application A0277 from the Australian Nuclear Science and Technology Organisation (ANSTO) to Prepare a Site for the

ANSTO Interim Waste Store (IWS) at Lucas Heights Science and Technology Centre

Decision by the CEO of ARPANSA on Facility Licence Application A0279 from the Australian Nuclear Science and Technology Organisation (ANSTO) to Construct the

ANSTO Interim Waste Store (IWS) at Lucas Heights Science and Technology Centre

29 November 2013

This Statement of Reasons does not form part of Facility Licences F0277 or F0279 and in the event of any inconsistency between the Licences and this Statement, Facility Licences F0277 or F0279 will prevail.

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1 The Licence Decisions

On 29 November 2013, I decided to issue a licence under section 32 of the *Australian Radiation Protection and Nuclear Safety Act 1998* (the Act), to the Australian Nuclear Science and Technology Organisation (ANSTO), to *prepare a site* for a controlled facility at the ANSTO Lucas Heights Science and Technology Centre (LHSTC), namely, the ANSTO Interim Waste Store (referred to as the *IWS Facility* in this Statement of Reasons). The licence application, signed by the Chief Executive Officer (CEO) of ANSTO, Dr Adrian Paterson, is dated 15 April 2013 and replaced a previous application dated 26 September 2012. Under regulation 7 of the Australian Radiation Protection and Nuclear Safety Regulations 1999 (the Regulations), the proposed facility is a *nuclear installation*. The licence authorises ANSTO to prepare a site for the *IWS Facility* for the sole purpose of temporary storage of radioactive waste from the reprocessing of spent nuclear fuel from the operations of the High Flux Australian Reactor (HIFAR[1]). Under section 35 of the Act I have included a standard condition of licence relating to quarterly reporting. The licence remains in force until it is cancelled or suspended under section 38 of the Act or until such time as it is surrendered under section 39 of the Act.

On the same day I decided to issue a licence to ANSTO under section 32 of the Act to *construct* the *IWS Facility* at the site identified in the application to prepare a site for the *IWS Facility.* The licence authorises ANSTO to construct the *IWS Facility* for the sole purpose of temporary storage of radioactive waste from reprocessing of spent nuclear fuel used in the operations of HIFAR. The licence application, signed by the Chief Executive Officer (CEO) of ANSTO, Dr Adrian Paterson, is dated 15 April 2013 and replaced a previous application dated 26 September 2012. Under section 35 of the Act I have included a standard condition of licence relating to quarterly reporting. The licence remains in force until it is cancelled or suspended under section 38 of the Act or until such time as it is surrendered under section 39 of the Act.

2 Reaching the Decisions

This Statement of Reasons outlines my considerations in relation to both applications, i.e. the application to *prepare a site* for a controlled facility and to *construct* a controlled facility, namely, the *IWS Facility*.

2.1 The documentary evidence

The documentation submitted by ANSTO in support of the applications including supplementary documentation requested by ARPANSA regulatory officers is listed in the Regulatory Assessment Reports (RARs) R13/05519[2,3] (siting) and R13/06576[4,5] (construction).

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[1] The High Flux Australian Reactor, or HIFAR, operated between 1958 and 2007. It is now permanently shut down and is covered by a possess and control licence issued by ARPANSA.

[2] Lead reviewer was Mr Jim Scott, Manager, Licensing and Compliance Section, Regulatory Services Branch. Staff from ARPANSA's Regulatory Services Branch, Radiation Health Services Branch and Legal Office contributed to the assessment and advice.

[3] http://www.arpansa.gov.au/pubs/regulatory/ansto/RAR_Siting-IWS.pdf

[4] Lead reviewer was Mr Jim Scott, Manager, Licensing and Compliance Section, Regulatory Services Branch. Staff from ARPANSA's Regulatory Services Branch, Radiation Health Services Branch and Legal Office contributed to the assessment and advice.

[5] http://www.arpansa.gov.au/pubs/regulatory/ansto/RAR_construction-IWS.pdf

The primary evidence before me was the application, the supplementary documentation and the following:

a. the RARs referred to above;
b. international guidance relevant to international best practice (IBP);
c. regulatory guidance material, developed for applicants and for ARPANSA assessors, as referred to in the RARs and in this Statement of Reasons;
d. correspondence in relation to the decision of the former Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) that the proposed *ILW Facility* is not a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (the EBPC Act);
e. the Radiation Protection Series suite of publications developed to support and promote national uniformity in radiation protection and nuclear safety across Australian jurisdictions;
f. discussions and correspondence on the subject held with the Nuclear Safety Committee (NSC[6]). Summaries of NSC meetings are available on the ARPANSA website[7]; and
g. submissions received during the public consultation period including issues raised during the community information session organised by ARPANSA at the Engadine Community Centre, Sutherland Shire, on 16 May 2013. Transcripts are available on ARPANSA's website[8].

2.2 Matters the CEO must take into account when issuing a facility licence

The Act stipulates that the CEO, in issuing a facility licence, must take into account international best practice (IBP) in radiation protection and nuclear safety as it relates to the application, and any matter specified in the Regulations. In addition, the Regulations specify information that *may* be requested by the CEO.

2.2.1 International best practice

Sub-section 32(3) of the Act mandates consideration of IBP but the Act does not provide a definition of IBP. The question of what constitutes IBP was discussed by the then CEO of ARPANSA, Dr John Loy in his Statement of Reasons[9] underpinning the decision to licence ANSTO to operate the Open Pool Australian Lightwater reactor (OPAL). Building on Dr Loy's reasoning and broadening it to cover also nuclear installations other than reactors, I consider taking IBP into account involves the following:

a. the radiation protection and nuclear safety objectives included as a part of the siting, design, operation and decommissioning, including management of decommissioning waste and final management of the site, compared with those laid out in the international safety framework that I consider to be international best practice in radiation protection and nuclear safety;
b. the specific safety features of the site, design, operations and decommissioning, compared to those recommended in the international safety framework and most successfully applied

[6] The Nuclear Safety Committee is established under the Act and provides the CEO of ARPANSA with advice on nuclear safety and safety of controlled facilities. The Chair of the Committee is Dr Tamie Weaver. RAR R13/05519 was discussed at the NSC meeting at 1 November 2012. Mature drafts of the RARs were reviewed by the NSC member Mr Don Macnab. More about function and membership can be found at http://www.arpansa.gov.au/AboutUs/Committees/nsc.cfm
[7] http://www.arpansa.gov.au/AboutUs/Committees/nscmt.cfm
[8] http://www.arpansa.gov.au/Regulation/Branch/consultation.cfm
[9] http://www.arpansa.gov.au/pubs/regulatory/opal/op/oplic_reasons.pdf - 764 kb - [pdf] - 19 Jul 2006

in recently licensed facilities comparable to the one outlined in the licence application under regulatory consideration;

c. the management of the siting, design and construction projects, and the codes and standards applied to the design and construction of systems important to safety, compared with management approaches to the codes and standards used for similar systems in comparable facilities in other countries with best practice safety systems; and
d. the design outcomes for occupational radiation doses, discharges to the environment and consequent radiation doses to the public and to the environment, the likelihood of accidents and their consequences, waste management and issues surrounding remediation, compared with those achieved in recent comparable facilities in countries with best practice systems.

I have considered IBP, as relevant to different elements of my decision, in this Statement of Reasons.

2.2.2 The Regulations

Sub-regulation 41(3) of the Regulations stipulates matters the CEO must take into account in deciding whether to issue a facility licence. These are:

a. whether the application includes the information asked for by the CEO;
b. whether the information establishes that the proposed conduct can be carried out without undue risk to the health and safety of people, and to the environment;
c. whether the applicant has shown that there is a net benefit from carrying out the conduct relating to the controlled facility;
d. whether the applicant has shown the magnitude of individual doses, the number of people exposed, and the likelihood that exposure will happen, are as low as reasonably achievable, having regard to economic and social factors;
e. whether the applicant has shown a capacity for complying with these regulations and the licence conditions that would be imposed under section 35 of the Act;
f. whether the application has been signed by an office holder of the applicant, or a person authorised by the office holder of the applicant; and
g. if the application is for a facility licence for a nuclear installation – the content of any submissions made by members of the public about the application.

I have taken the above matters into account in making my decisions and my reasons for issuing the two licences are set out in this Statement of Reasons.

2.2.3 Other matters

Schedule 3, Part 1 of the Regulations specifies information that may be requested by the CEO – and that, if submitted, will be considered by the CEO when making a decision. ARPANSA has issued guidance on specific matters to consider when submitting such information, as referred to in the RARs and in this Statement of Reasons.

I have considered matters referred to in Schedule 3, Part 1 of the Regulations in this Statement of Reasons.

I may under section 35 of the Act issue conditions of licence. I have included a standard condition related to quarterly reporting in both licences.

In section 4 of this Statement of Reasons I have outlined matters that I expect ANSTO to consider ahead of, or as part of, an application to *operate* the *IWS Facility*. These are not formal conditions of licence; however, evidence provided by ANSTO in relation to these matters will inform my decision on an application to *operate* the *IWS Facility* which I anticipate ANSTO will submit in the near future.

My decision is further informed by ARPANSA's ongoing licensing activities and compliance monitoring of activities at the ANSTO LHSTC. I recently reviewed the systems and practices at ANSTO as part of my decision to grant ANSTO a licence to prepare a site for the ANSTO Nuclear Medicine Mo-99 Facility (the *ANM Facility*)[10]. While not being part of the information provided in support of the current applications and on which my decisions covered in this Statement of Reasons are based, any such information that I am aware of may improve my understanding of matters of general importance to, and my confidence in, the safety of operations at ANSTO and at the LHSTC. Mention of such factors, where relevant, has been made in this Statement of Reasons.

For the purpose of my Statement of Reasons, *health* and *safety* refers to all factors that contribute to *protection of people and the environment from the harmful effects of ionising radiation*, which includes radiation protection and safety, nuclear safety, waste safety, transport safety, physical protection and security and emergency preparedness and response; unless any such factor is referred to specifically. Consideration of safety as it relates to other matters, *e.g.* as covered in the work health and safety legislation, is outside my mandate.

3 Reasons for my decision

In this section, I summarise my considerations in relation to the evidence before me against the provisions set out in the Act and the Regulations. I deal with the issues specified in sub-regulation 41 (3) of the Regulations in sections 3.1 to 3.6. Consideration is given to IBP and to other matters detailed in Schedule 3, Part 1 of the Regulations, as and where relevant.

3.1 Does the information include information asked for by the CEO?

In this section I consider in more detail five aspects that relate to the information submitted in support of the application; *viz*. the implications of a staged licensing process; the purpose of the facility; the information submitted on site characteristics; the information submitted on construction of the facility; and, whether sufficient information has been submitted for the purpose of reaching a decision on authorisation to *prepare a site* and to *construct* the controlled facility.

3.1.1 Implications of a staged licensing process

It is implicit in the Act and the Regulations that the licensing of a facility will go through a number of stages, each covered by a licence. Schedule 3, Part 1 of the Regulations lists the general information that may be required to be submitted for all facility licence applications and the specific information that may be required to be submitted when applying for each of the licences listed below, namely to:

a. prepare a site for a controlled facility;
b. construct a controlled facility;
c. possess or control a controlled facility;
d. operate a controlled facility;

[10] http://www.arpansa.gov.au/News/MediaReleases/mr1_041013.cfm

e. decommission a controlled facility; and
f. abandon a controlled facility.

An application may, depending on the nature of the facility, combine information related to more than one stage; however, separate licences will normally be issued. The applications submitted by ANSTO are separately seeking authorisation to *prepare a site* for a controlled facility, and to *construct* a controlled facility.

The staged licensing process is aligned with frameworks typically used to manage major projects. A staged project development and licensing process, which involves sequential regulatory reviews, mitigates problems arising from potentially important issues overlooked at the onset of the project or which by their nature only become apparent as the various stages are undertaken. I consider the staged approach to completion of major projects to be IBP.

The issue of a staged licensing process has been discussed by ARPANSA in the Regulatory Guide: *Licensing of Radioactive Waste Storage and Disposal Facilities v2*, released in 2013[11]. It was concluded that, notwithstanding the fact that breaking up the licensing process into stages can be considered IBP, it is still necessary for the applicant to provide, at the time of submission of a licence application for a particular stage in the life-cycle of a facility, enough information about the specific stage covered in the application *and* about subsequent stages to allow the CEO to form a view of the feasibility of the overall concept and the safety implications for the lifetime of the facility. The questions to be answered in relation to the two applications before me are thus:

a. do the applications provide necessary and sufficient information about the purpose of the facility and about the stages subsequent to siting and construction, to allow an informed decision of whether the site and the design of the facility are suitable for the proposed conduct (section 3.1.2);
b. with respect to the siting aspect *per se*, does the application to prepare a site for the *IWS Facility* provide necessary and sufficient information (section 3.1.3); and
c. with respect to the construction aspect *per se*, does the application to construct the *IWS Facility* provide necessary and sufficient information (section 3.1.4)?

3.1.2 Purpose of the facility and general aspects of submitted information

3.1.2.1 Purpose

The purpose of the *IWS Facility*, as defined in the applications, is to store radioactive waste resulting from reprocessing of fuel that was used in the now permanently shut down High Flux Australian Reactor (HIFAR). The applications concern spent fuel that was shipped to France (La Hague) and to the UK (Dounreay) under agreements with AREVA[12] and UKAEA[13] to reprocess the fuel and to return the radioactive waste resulting from the reprocessing (i.e. residual fission products after separation of fissile material from the fuel) and secondary waste resulting from the reprocessing operations; the secondary waste, referred to as 'technological waste', includes mechanical components such as piping, valves, pumps and protective clothing such as gloves that have been contaminated during the reprocessing.

[11] http://www.arpansa.gov.au/Regulation/wasteguide.cfm
[12] AREVA SA is a French public multinational industrial conglomerate.
[13] United Kingdom Atomic Energy Authority

The purpose is further to store the waste *temporarily*. The intention is to eventually transport the waste to the planned National Radioactive Waste Management Facility (NRWMF). The role of the *IWS Facility* within the Australian framework for managing radioactive waste is discussed in section 3.3 of this Statement of Reasons.

No other purpose has been stated by the applicant or is considered in ARPANSA's review of the licence applications.

3.1.2.2 General characteristics of the returned waste

The material to be returned will be of equal character in terms of radionuclide composition (allowing for the decay of fission products and with the fissile material removed) and hazardous properties, compared to the radioactive material that left Australia as spent fuel; however it will not be absolutely identical on an atom for atom basis and may contain radionuclides that were not present originally in similar amounts. This is because it is not technically feasible to retrieve exactly the same radioactive substances at the back end of the process as went in at the front end. Such substitution is not uncommon in arrangements of this kind and does not deviate from IBP if the material is well defined and of comparable character (from the risk and waste management perspective in the short and the long term) to the original material.

The fission products to be returned from France are contained in an inert matrix following vitrification of the liquid waste generated during the reprocessing. The vitrified waste is contained in a modified transport/storage cask known as TN81. The technological waste to be returned from France comprises approximately 7 m^3 of waste cemented within steel drums and placed in concrete shielded transport/storage overpacks.

In addition, it is stated in the application that the waste to be returned from the UK may be required to be stored temporarily at the *IWS Facility* if the NRWMF is not available when the waste is returned, which is planned to take place around the year 2020. Since the form of the waste returning from the UK is not yet certain, it is for the purposes of the design of the *IWS Facility* assumed to be in the most demanding form, which is 51 cemented drums.

The waste to be returned from France contains about five times more activity than the material to be returned from the UK. The absolutely dominating fraction (approaching 99.9%) of the activity of the waste returned from France will be contained in the TN81 cask. The total activity of beta emitters is in the order of 15 petabecquerel (PBq)[14], dominated by strontium-90/yttrium-90 in secular equilibrium and caesium-137. The best estimate residual decay heat of the material contained in the TN81 cask is estimated to be about or less than 1.5 kW. The exact inventory for the technological waste is not specifically stated but is bounded (i.e. the technological waste *plus* the waste in the TN81 cask) by the inventory stated for the TN81 cask.

The waste classification scheme adopted in Australia[15] specifies different classes of radioactive waste mainly on the basis of which disposal option provides the adequate level of safety. The waste to be returned from both France and the UK is classified as intermediate level waste (ILW). This classification means that the waste contains long lived radionuclides in quantities that need a

[14] One petabecquerel (PBq) = 10^{15} Bq. An activity of 1 Bq corresponds to one atomic disintegration per second.
[15] Classification of Radioactive Waste. Radiation Protection Series No.20, ARPANSA, April 2010
http://www.arpansa.gov.au/Publications/Codes/rps20.cfm

greater degree of containment and isolation from the biosphere than that provided by near surface disposal.

Though the vitrified waste contains low amounts of fissile material it potentially does not come under the nuclear safeguards framework considering the chemical proliferation barrier provided by the waste matrix containing fission products. However, this issue is outside of ARPANSA's remit and is under the jurisdiction of the Australian Safeguards and Non-Proliferation Office, ASNO.

3.1.2.3 General aspects of the facility and subsequent licensing stages

The RARs developed by the ARPANSA assessors have considered the documentation submitted by ANSTO in support of the applications. The RARs go into some detail relating to both the general and specific aspects of safety at the site. Both R13/05519 and R13/06576 review general information (section 2.1 of the respective RARs), plans and arrangements for managing safety (section 2.2 of the respective RARs), site characteristics (R13/05519 section 2.3) and construction (R13/06576, section 2.3), and assessment against ARPANSA's Regulatory Guide: *Licensing of Radioactive Waste Storage and Disposal Facilities v2* (see footnote 11; sections 2.4 of the respective RARs). A summary safety case[16] as well as a preliminary safety analysis report (PSAR) has been supplied with the application to *construct* the *IWS Facility*.

For all the aspects mentioned above, the ARPANSA assessors concluded – with some qualifications - that sufficient information is provided. I agree with this general conclusion.

With regard to subsequent stages of the licensing process, the plans and arrangements for managing safety largely apply to operations as well. Decommissioning has been considered. The inherent safety of the TN81 cask and the waste matrix itself, whether the waste is vitrified or cemented, makes any significant contamination of the *IWS Facility* unlikely and its decommissioning would in all likelihood be of minor radiological concern and generate minimal amounts of radioactive waste, if any. ANSTO has stated that a more elaborate decommissioning plan will be submitted to ARPANSA prior to the transfer of the wastes to the NRWMF.

I consider ANSTO has submitted sufficient information to proceed with reaching a decision to *prepare a site* for, and to *construct*, the *IWS Facility*.

3.1.3 The site

For the purpose of an authorisation to *prepare a site* for a controlled facility, I may request (as specified in Schedule 3, Part 1 of the Regulations) *a detailed site evaluation establishing the suitability of the site*; and information on *the characteristics of the site, including the extent to which the site may be affected by natural and man-made events*.

The site evaluation should consider:

a. the effects of external events occurring in the region of the particular site;
b. the implication on relevant safety elements when multiple facilities are co-located on the same site (specifically, the co-location of a new facility at an existing site);

[16] A collection of arguments and evidence in support of the safety of a facility or activity. Where the safety case relates to a given stage of development, it should acknowledge the existence of any unresolved issues and should provide guidance for work to resolve these issues in future development stages.

c. the characteristics of the site and its environment that could influence the transfer to persons and the environment of radioactive material that has been released; and
d. the population density and population distribution and other characteristics of the external zone in so far as they may affect the possibility of implementing emergency measures and the need to evaluate the risks to individuals and the population.

Section 2.3 of the RAR, R13/05519, concerns the characteristics of the site. The ARPANSA assessors have reviewed the information submitted and consider it satisfactory. I agree with the ARPANSA assessors. The issue of alternative sites is dealt with in section 3.3; the specifics of accidents as they relate to the site under section 3.4. I also note, as did the assessors, that a detailed analysis of the characteristics of the site was performed during the process of licensing the OPAL reactor, and that the site characteristics again were assessed in relation to ARPANSA's review of the application by ANSTO to *prepare a site* for the *ANM Facility* (see footnote 10 for reference).

I consider the totality of site information available for the LHSTC, and for the specific location of the proposed facility, provided by ANSTO to be sufficient to proceed with reaching a decision on authorisation to *prepare a site* for the *IWS Facility*.

3.1.4 Construction

The *IWS Facility* provides shelter and necessary amenities for handling of the waste, which essentially involves receiving the waste and unloading it, and ultimately loading it and shipping it to the NRWMF. No handling is foreseen while the waste is being stored other than routine monitoring and inspection. It also delineates the area where the waste is stored for security purposes.

The RAR, R13/06576, reviews the information submitted by ANSTO; it concludes that the facility as such is appropriately designed with regard to its specific features; *inter alia* strength of the concrete slab, necessary space for operations associated with the receipt and eventual removal of the waste, including for a crane, area monitoring, alarms, fire alarm and fire extinguishing, and access control.

The main safety features of the facility are the physical barriers of the containers holding the waste, the waste matrix itself and the shielding and other protection offered by the waste containers and other engineered barriers.

The TN81 cask is a certified Type B(U) package under the IAEA requirements for safe transport[17] and the ARPANSA Transport Code[18]. It is designed to be capable of holding spent nuclear fuel, i.e. material with considerably higher activity and heat generation than the ILW it is intended to hold in the case of waste returned from France. It is used in advanced facilities internationally for storage of radioactive material/waste, e.g. the Central Interim Storage Facility for radioactive waste in Switzerland (ZWILAG) and the La Hague reprocessing facility in France (AREVA). A separate certificate will have to be issued by ARPANSA for the intended use (transport and storage) of the TN81 cask, in accordance with the ARPANSA Transport Code.

[17] Regulations for the Safe Transport of Radioactive Material - 2012 Edition. IAEA Specific Safety Requirements SSR-6
[18] Code of Practice for the Safe Transport of Radioactive Material, Radiation Protection Series No 2, ARPANSA 2008. This Code implements the earlier IAEA Safety Requirements laid out in IAEA TS-R-1; RPS 2.1 is currently updated to include the provisions of SSR-6. Update to be completed in 2014.

I agree with the ARPANSA assessors that sufficient information has been provided by ANSTO as regards design and construction of the *IWS Facility*. The safety features of the facility are mainly passive and require a minimum of maintenance and manual surveillance.

3.1.5 Considerations and conclusion

In relation to the licence decisions, I consider it reasonable that ANSTO constructs the *IWS Facility* with dimensions to accommodate both the waste returned from France and - if there is no other option available - the waste to be returned at a later time from the UK. An updated radionuclide inventory needs to be submitted to ARPANSA ahead of, or as part of, an application for a licence to *operate* the *IWS Facility*. This inventory should specify the inventory of the TN81 cask as well as the inventory of the technological waste returned from France, together with an analysis of 'equity' with the spent fuel (minus fissile material) that was shipped to France for reprocessing. The analysis should consider the inventory as such and any radiological risks associated with alterations to the inventory during the treatment of the material in France.

I consider it possible on the basis of the available information on the nature of the waste being returned from the UK that it can be stored at the *IWS Facility*. However, there are significant uncertainties with regard to both amount and form at the present. A radionuclide inventory as well as an analysis of equity needs to be submitted in order to inform a decision on whether a licence to *operate* the *IWS Facility* can be issued that accommodates storage of the waste returned from the UK at the *IWS Facility*.

Depending on timing and adequacy of submission of information to ARPANSA, a potential licence to *operate* the *IWS Facility* may be formulated in a number of ways, *inter alia*: a licence to operate the *IWS Facility* that covers the waste returned from both France and the UK; or, only in the first instance the waste returned from France. Should, in the latter case, storage at the *IWS Facility* of the reprocessing waste returned from the UK become the preferred option, i.e. if the planned NRWMF is still not available at the time the waste is returned and all other solutions are deemed unreasonable or not feasible, different options are available. These include submission of an application for a relevant change with significant implications for safety, i.e. an application under regulation 51 of the Regulations, for the approval of the CEO of ARPANSA, prior to accepting waste returned from the UK at the *IWS Facility*.

No other use of the *IWS Facility* than storage of waste resulting from reprocessing of HIFAR fuel is covered under the respective licences. Any future modification or addition to the purpose, except for what has already been dealt with above, would need to be considered under the Regulations; potentially, such changes have significant implications for safety and would in accordance with regulation 51 require prior approval of the CEO of ARPANSA.

I am satisfied that the evidence before me, including the RARs and the supplementary material requested and received from ANSTO during the course of the review, provide sufficient information as regards the siting and construction aspects of the applications, to proceed with reaching a decision on authorisation to *prepare a site* for, and to *construct*, the *IWS Facility*.

I note that DSEWPaC determined that the establishment of the proposed facility does not constitute a controlled action under the EPBC Act[19].

With regard to whether the information provided in the applications includes information asked for by the CEO:

I conclude that the purpose of the *IWS Facility* has been satisfactorily stated; that sufficient evidence is before me regarding the basic elements of its siting, construction and operations to understand, broadly, the safety implications of the conduct; and that sufficient evidence is before me regarding the characteristics of the site on which it is planned to be constructed, and regarding its construction, to enable me to proceed with reaching a decision on authorisation *to prepare a site* for, and to *construct*, a controlled facility.

3.2 Does the information establish that the proposed conduct can be carried out without undue risk to health and safety of people, and to the environment?

The issue here is whether the proponent has demonstrated that there are systems in place to control and limit the risks associated with the proposed conduct, to allow me to conclude that the proposed conduct can be carried out without undue safety risks.

I consider the systems for control and limitation of risks below; the health and environmental implications of the proposed conduct are considered in section 3.4.

3.2.1 Plans and arrangements for managing safety and other safety-related information

In accordance with schedule 3 part 1 of the Regulations, the CEO may request information on plans and arrangements for safety when reviewing an application for a facility licence. The plans and arrangements outline how the proponent intends to plan and operate the facility whilst achieving satisfactory safety outcomes. ARPANSA has issued comprehensive guidelines in this area[20].

The way the safety measures are implemented, in accordance with the plans and arrangements for managing safety, is important as the inventory of radioactive substances in the waste is significant, in the order of 15 PBq (see section 3.1.2.2). The waste in the *IWS Facility* will increase by several-fold the inventory of similar category radioactive waste at the LHSTC. However, it should also be noted that the material was originally stored on site in the form of spent fuel (note, however, the discussion on equity in section 3.1.2.2). The waste to be returned is hazardous but immobilised in a matrix that will effectively exclude or limit any credible exposure scenarios, as detailed in the submission from ANSTO and discussed in the RARs. Nevertheless, proper *management* of safety is of vital importance in order to eliminate and/or mitigate the radiation risks associated with storage of the waste in the *IWS Facility*. The RARs consider the arrangements in relation to the guidelines referred to previously (footnote 20) and the relevant regulatory assessment principles laid out in the *Regulatory Assessment Principles for Controlled Facilities*[21]. The RARs assess, *inter alia*, the safety management plan (RAR section 2.2.2), the radiation protection plan (RAR section 2.2.3), the

[19] Referral decision of 29 October 2012; see Appendix 1 of RAR R13/05519 (see footnote 3)
[20] Plans and arrangements for managing safety v4 January 2013; http://www.arpansa.gov.au/Regulation/guides.cfm
[21] Regulatory assessment principles for controlled facilities; http://www.arpansa.gov.au/Regulation/guides.cfm

radioactive waste management plan (RAR section 2.2.4), the security plan (RAR section 2.2.5) and the emergency plan (RAR section 2.2.6).

It should be noted that the plans and arrangements are to a substantial extent already applied across the LHSTC and are monitored by ARPANSA as part of the Agency's compliance monitoring of ANSTO. The plans and arrangements for managing safety were also considered in relation to the recently issued licence for ANSTO to *prepare a site* for the *ANM Facility* (see footnote 10).

The Siting and Construction Security Plan details the ANSTO-wide security plans as they apply to the *IWS Facility*. The security arrangements have been assessed by ARPANSA's security advisers who consider that the plan demonstrates adequate level of protection for personnel, information and physical assets surrounding the proposed site and facility.

With regard to transport, the Radiation Protection Plan submitted by ANSTO contains information relevant to transport and movement of radioactive materials. Waste arriving at, or leaving, the *IWS Facility* will be transported in accordance with the previously mentioned Transport Code (see footnote 18). It is likely that the waste returning from France will arrive as one consignment. Any material returned from the UK and destined for the *IWS Facility* is likely to be limited to one consignment as well. Transport from the *IWS Facility* to the planned NRWMF is according to ANSTO likely to be a single consignment, even if this shipment was to include the waste returned from the UK.

A PSAR has been submitted that addresses, *inter alia*, the safety issues associated with different phases of the facility, and review of operational experience. A safety case (see footnote 16) has been submitted which reviews the arguments in support of safety of the *IWS Facility*. It is expected that the PSAR will mature to a full SAR accompanying the application to *operate* the *IWS Facility*, and that the safety case will evolve as more information becomes available and is analysed. The ARPANSA assessors consider that both the PSAR and the safety case meet the requirements at this stage of the licensing process.

3.2.2 Considerations and conclusion

The RARs conclude that the applications before me have included information that establishes acceptable controls for the proposed conduct. This includes but is not limited to information on measures to limit and monitor exposures of the workforce, the public and the environment; information on security provisions; information on transport; and a PSAR and safety case. I agree with the conclusions reached by the ARPANSA assessors. Based on evidence submitted in support of the applications, I consider I can proceed with reaching a decision on ANSTO's application for an authorisation to *prepare a site* for, and to *construct*, the *IWS Facility*.

With regard to whether the information establishes that the proposed conduct can be carried out without undue risk to health and safety of people, and to the environment:

I conclude that enough evidence is before me regarding safety-related controls relevant to the proposed *IWS Facility*, to enable me to proceed with reaching a decision on authorisation to *prepare a site* for, and to *construct*, a controlled facility.

3.3 Has the applicant shown that there is a net benefit from carrying out the conduct relating to the controlled facility?

The issue of net benefit relates to the principle of *justification* in the international framework for safety. The basic elements of the framework as such are laid out in the IAEA Safety Fundamentals[22], in the 2007 Recommendations of the International Commission on Radiological Protection (ICRP)[23] and in the international guidelines on nuclear security[24]. This framework can be considered IBP.

3.3.1 Net benefit of the conduct

In relation to the *benefit* of the conduct, it has to be borne in mind what the purpose is; as reviewed in section 3.1.2.1 the sole purpose of the facility is to *temporarily store radioactive waste resulting from the reprocessing of HIFAR fuel*. There is no net benefit from this conduct *per se* as it relates to material that is waste and for which no further use is foreseen[25]. The ICRP has considered the issue of justification of waste management and reiterated its position in its most recent publication on waste management[26] as follows:

The Commission has previously stated (ICRP, 1997b[27]) that radioactive waste management and disposal operations are an integral part of the practice generating the waste. It is wrong to regard them as a free standing practice that needs its own justification. Therefore, justification of the practice should include the management options of the waste generated, e.g. geological disposal. The justification of a practice should be reviewed over the lifetime of that practice whenever new and important information becomes available: such information may arise for societal, technical and scientific reasons. If the management of waste was not considered in the justification of a practice that is no longer into operation, the Commission recommends to optimize the protection of humans and the environment independently of considering the justification of such practice.

Thus, waste management and disposal options have to be considered in relation to the benefit of the 'practice' generating the waste, over the entire life-cycle. The benefit was associated with the operation of the HIFAR over approximately five decades, providing medical and industrial radioisotopes, neutrons for neutron beam research and opportunities for education and training.

ANSTO has demonstrated, as reviewed in the RARs and referred to in section 3.2.1 of this Statement of Reasons, that adequate plans and arrangements for managing safety are in place. As further elaborated on in section 3.4, the radiation risks associated with the operation and decommissioning of the *IWS Facility* are very small (and non-existent in the siting and construction phase); the impact of the *IWS Facility* for *temporary storage* of waste on the radiation risks over the life cycle of the

[22] IAEA Safety Standards: Fundamental Safety Principles. Safety Fundamentals SF-1. International Atomic Energy Agency, Vienna, 2006.
[23] The 2007 Recommendations of the International Commission on Radiological Protection. ICRP Publication 103. Ann. ICRP 37 (2-4) 2007.
[24] Objective and Essential Elements of a State's Nuclear Security Regime. IAEA Nuclear Security Series No. 20 http://www-ns.iaea.org/security/nss-publications.asp?s=5&l=35
[25] The ARPANS Act does not define nuclear, or radioactive, waste. ARPANSA considers radioactive waste as "waste that contains, or is contaminated with, radionuclides at concentrations or activities greater than the clearance levels established by the regulatory authority" and as "material for which no further use is foreseen: see Regulatory Guide: Licensing of radioactive waste storage and disposal facilities v 2 (footnote 11)
[26] Radiological protection in geological disposal of long-lived solid radioactive waste. ICRP Publication 122. Ann. ICRP 42(3).
[27] Radiological protection policy for the disposal of radioactive waste. ICRP Publication 77. Ann. ICRP 27 (suppl.) 1997.

HIFAR Reactor is, therefore, in all likelihood minor and not likely to alter any assessment of the net benefit of the practice.

3.3.2 Position of the *IWS Facility* within the national system for management of radioactive waste

The Australian policy for management of the nation's radioactive waste was described in the most recent report under the terms of the Joint Convention[28], which was submitted in 2011[29]. It was stated that

"……Australia's radioactive waste management policy requires that all radioactive waste generated within Australia be stored or disposed of in Australia at suitably sited facilities after being categorised in accordance with the national classification scheme and consistent with agreed international practice."

This policy is aligned with the principles of the Joint Convention:

"Radioactive waste should, as far as is compatible with the safety of the management of such material, be disposed of in the State in which it was generated."

The view of the ARPANSA officers who have represented Australia in the four review meetings under the terms of the Joint Convention is that most countries adhere to this principle unless specific circumstances make disposal within the country not feasible. Australia's national policy is in this regard well aligned with this principle, which I consider represents IBP.

The national policy also envisages the establishment of a centralised storage (for ILW) and disposal (for low-level waste, LLW) facility, the NRWMF referred to previously. Centralised storage and disposal facilities are in use internationally in countries with advanced regulatory infrastructure, including infrastructure for managing waste and spent fuel arising from the operation of nuclear facilities such as power reactors. Whilst centralised storage/disposal will not eliminate waste holdings at the site of production, it will enable the waste holdings to be limited, through regular shipment of waste to the centralised waste management facility.

Enabling legislation (the National Radioactive Waste Management Act 2012, NRWM Act30) is in place that governs the establishment of the NRWMF. The NRWM Act states that only land volunteered by its owners can be considered as a site for a potential facility. Two volunteer nomination processes are available under the NRWM Act. The first allows an Aboriginal Land Council in the Northern Territory to volunteer Aboriginal land on behalf of Traditional Owners. The second provides for a nation-wide volunteer site selection process in the event that the government considers it unlikely that a facility will be able to be constructed and operated on a volunteered site on Aboriginal land in the Northern Territory. A site in the Northern Territory is being considered. However, even if this or any other site goes ahead for the purpose of establishing the NRWMF, it is now clear that the NRWMF will not be able to receive waste at the time the reprocessing waste is

[28] Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, http://www-ns.iaea.org/conventions/jc-documents.asp?s=6&l=40
[29] 4th National Report of the Commonwealth of Australia, submitted October 2011 and reviewed at the Review Meeting under the Terms of the Convention in 2012, http://www.arpansa.gov.au/Regulation/collaborations/jointconv.cfm
[30] Available at http://www.comlaw.gov.au/Series/C2012A00029

being returned from France. It remains to be seen whether it is ready for accommodating the waste to be returned from the UK in due course. I do not speculate with regard to any such date; suffice to conclude that it will not be ready for the waste being returned from France (and potentially from the UK), which is the reason for now considering the need for temporary storage at the IWS Facility.

The national policy for management of radioactive waste does not at this point in time include plans for disposal of ILW; it is currently limited to storage of ILW at the planned NRWMF. While this is acceptable during the development of a strategy for the final management of the ILW, I agree with the view expressed by the Radiation Health and Safety Advisory Council[31] in its report[32] to me in 2010 on radioactive waste management in Australia. Council stated as follows with reference to the IAEA Specific Safety Requirements, SSR-5[33]:

"……. SSR-5 includes concepts relating to disposal (and storage) of radioactive waste. SSR-5 defines 'disposal' as the emplacement of radioactive waste into a facility or a location with no intention of retrieving the waste. The term disposal implies that retrieval is not intended; it does not mean that retrieval is not possible. By contrast, 'storage' refers to the retention of radioactive waste in a facility or a location with the intention of retrieving the waste. SSR-5 identifies the important difference that storage is a temporary measure following which some future action is planned. This may include further conditioning or packaging of the waste, and ultimately its disposal.

Hence, the overall picture of international best practice is that countries should have a policy and strategy for management of radioactive waste, in which storage has a legitimate temporary role provided there is a further strategy for ultimate disposal of the waste. This also leads to the conclusion that Australia's current policy of indefinite storage for intermediate level waste does not appear to be consistent with international best practice."

I have expressed similar views to the then Department of Resources, Energy and Tourism, now the Department of Industry, in correspondence dated 14 June 2013[34]. A similar view has also recently been expressed by the NSC in correspondence[35] to me dated 22 November 2013.

While there was no consideration of alternative sites for the *IWS Facility* in the applications before me, ANSTO has in separate communications on request by ARPANSA stated that in its view, there is no other site or facility in Australia that has the necessary infrastructure to deal with the ILW returned from reprocessing of the HIFAR fuel. I believe this is a reasonable position; any location in Australia other than LHSTC would in all likelihood have required ANSTO staff to be highly involved, and potentially required a considerably larger investment in infrastructure for what may at best be a marginal increase in safety.

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[31] The Radiation Health and Safety Advisory Councils is established under the ARPANS Act and perform analysis on radiation and nuclear issues and provides advice to the CEO of ARPANSA. Chair is Ms Sylvia Kidziak, AM. For functions and membership, see http://www.arpansa.gov.au/AboutUs/Committees/rhsac.cfm

[32] Scoping review of issues related to the management of intermediate level radioactive waste in Australia. Report of the Radiation Health and Advisory Council to the CEO of ARPANSA, April 2010; http://www.arpansa.gov.au/Publications/RHSAC/rhsac_stat.cfm#rad

[33] Disposal of Radioactive Waste, Specific Safety Requirements, IAEA Safety Standards Series SSR-5 http://www-pub.iaea.org/books/IAEABooks/8420/Disposal-of-Radioactive-Waste-Specific-Safety-Requirements

[34] ARPANSA Reference R13/06206

[35] ARPANSA Reference D1318428 http://www.arpansa.gov.au/AboutUs/Committees/nscrpts.cfm

From the reasoning above I conclude that in general terms Australia has a policy for management of radioactive waste that is aligned with IBP, as well as with policies and systems in countries with considerably larger nuclear programmes. Storage has a legitimate role in radioactive waste management. Whilst originally the NRWMF was envisaged to fulfil this role, circumstances are now such that the *IWS Facility* is needed for temporary storage until the NRWMF is established. I consider, under the circumstances, that the *IWS Facility* has a legitimate role in the national system for radioactive waste management and that LHSTC has the necessary infrastructure in terms of supporting structures, staffing, competence, experience and systems. The issue of ultimate disposal of the ILW, while relevant for the national system for management of radioactive waste, is not relevant for the establishment of the *IWS Facility per se*. However, should the development of the NRWMF not go ahead as planned, this will have implications for contingency planning. I turn to this issue below.

3.3.3 Contingencies

The *IWS Facility* is in itself the result of contingency planning (referring to the fact that the NRWMF is still not established). However, the issue of contingency planning also relates to the fact the *IWS Facility* is intended for *temporary storage* of radioactive waste. Storage cannot be indefinite as this would effectively equal disposal and would not be aligned with IBP as discussed earlier, as safety in storage cannot be maintained indefinitely. I note that the fact the waste has to be *transported* to a central facility gives rise to issues that have to be resolved, and concern over transport has led to discussions as to whether the LHSTC should be the preferred final site[36]. However, under the current legislation (subsections 5(1A) and (1B)) of the *Australian Nuclear Science and Technology Organisation Act 1987*, ANSTO cannot dispose of waste at the site, other than in the form of regulated emissions to the atmosphere and discharges to the sewer. In relation to suitability of the LHSTC as a disposal site I have stated in correspondence (see footnote 34) to the then Department of Resources Energy and Tourism as follows:

"……. Even if this [disposal on site] *was not prohibited by law, it would* prima facie *seem that disposal on site would pose problems over decades to come from a demographic and socio-economic perspective. This would not preclude that a waste facility can be built that provides adequate safety and security for both health and the environment in an urban environment, and that such a facility in itself may provide economic opportunities; nor does it mean that a waste facility has to be located in a remote area. The considerations are mainly based on the need to avoid long-term impediment (over many decades) to population growth and economic diversification in an already urban area."*

The Nuclear Safety Committee has expressed similar views in recent advice to me (see footnote 35).

Considering the purpose of the *IWS Facility* is *temporary storage*, and that disposal on site is prohibited by law, two questions arise;

- what length of time can reasonably be covered under the term *temporary*; and
- what are the contingencies in case there are further delays or even cancellation of the plans to establish the NRWMF?

[36] Parliament of New South Wales; Joint Select Committee on the Transportation and Storage of Nuclear Waste. Report No. 53/01 – February 2004

With regard to the first point, ANSTO has stated that a recertification of the TN81 cask would be sought at regular time intervals. In relation to the second point, ANSTO does not in their submission analyse contingencies in case of significant delays (or cancellation) of the establishment of the NRWMF (and has not analysed contingencies should the *IWS Facility* not be licenced at all).

The long lead time in establishing the NRWMF has been a concern for many years locally in Sutherland Shire; concern over increased waste holdings at the LHSTC was expressed in communications to ARPANSA during the period of public consultation on the applications before me; it was also a consideration of mine in relation to my recent decision to issue a licence to *prepare a site* for the *ANM Facility* (for reference see footnote 10; see also section 3.6 of this Statement of Reasons).

On the basis of the above I conclude that contingency plans for management of the waste under temporary storage at the *IWS Facility* need to be developed ahead of, or as part of, an application to *operate* the *IWS Facility*. These should consider reprocessing waste returned from France. Should ANSTO also pursue the plans to store reprocessing waste returned from the UK at the *IWS Facility*, similar considerations apply. The contingency plans should also consider specified time frames. In relation to this I refer to the previously quoted Regulatory Guide*: Licensing of Radioactive Waste Storage and Disposal Facilities v2* (see footnote 11):

"Based on international best practice, a guiding principle of the CEO is that an applicant for a licence to prepare a site for, construct, operate or decommission a storage facility shall provide a strategy (such as a reasonably practicable disposal option) for safe management of the waste in storage when the period of safe storage concludes. Such a period will be predicated on the safety case which will indicate not just the time of safe storage for waste in its current form, but the probable costs and technological challenges in maintaining storage beyond that period."

Finally, in relation to the need for certainty in the establishment of the NRWMF, I adopt the words of my predecessor Dr John Loy, in relation to his considerations surrounding his decision to issue a licence to operate the OPAL reactor:

"…… with regard to the ILW store, there would need to be substantial and evident progress – such as the features of the design settled, siting criteria established and a strategy and timetable in place for a site(s) – that was moving forward with clear paths to its future establishment and I could be satisfied a store WILL exist."

Maintained and tangible progress in realisation of the plans for the establishment of the NRWMF remains a priority, for the system for radioactive waste management in Australia in general, and for the operation of the *IWS Facility* as a *temporary store* in particular.

3.3.4 Considerations and conclusion

Based on the reasoning above I conclude as follows:

With regard to whether the applicant has shown that there is a net benefit from carrying out the conduct relating to the controlled facility:

I conclude that enough information is before me regarding the safety significance of the *IWS Facility* to conclude that, if properly managed and making use of the infrastructure available at LHSTC, the safety impact is minor and would not in any substantial way affect considerations of the net benefit from the past operation of HIFAR. The *IWS Facility* has, under the present circumstances, a justifiable role in the Australian framework for management of radioactive waste in anticipation of the NRWMF. I thus consider enough evidence is before me to enable me to proceed with reaching a decision on authorisation to *prepare a site* for, and to *construct*, a controlled facility.

3.4 Has the applicant shown that the magnitude of individual doses, the number of people exposed, and the likelihood that exposure will happen, are as low as reasonably achievable, having regard to economic and social factors?

The issue considered under this heading relates to the two principles of radiation protection that have to be considered once a conduct involving radiation has been deemed justified; the principle of *optimisation* and the principle of *dose limitation*. They rest on the international framework for safety referred to in section 3.3.

The *optimisation* principle in essence means that all reasonable effort (from cost and societal perspectives) should be made to reduce doses, the number of people exposed and the likelihood of exposure; exposures should be *as low as reasonably achievable* (ALARA). In order to mitigate any negative consequences for individuals, doses must be maintained within dose limits. To further guide protection, a *dose constraint* can be derived that is lower than the dose limit by an appropriate margin; it would be considered unacceptable to *plan* a conduct so that the constraint is exceeded.

Optimisation applies to all exposed categories of people. Limits and – when defined – constraints, are different for workers and members of the public. For wildlife, ICRP has defined *derived consideration reference levels* that may guide efforts to optimise protection[37]; these and elements of other international frameworks for protection of wildlife have been considered in ARPANSA's Regulatory Guide on waste facilities (see footnote 11).

The principles of radiological protection are considered by ANSTO in the radiation protection plan. ANSTO's commitment to the constraints and objectives stated in the radiation protection plan relate to the impact of all activities within the LHSTC. They are in agreement with the international framework for radiation protection as laid out by the ICRP.

Optimisation is considered here as relevant to *workers*, and to the *public and the environment*, and to the *exposure from accidents*.

[37] Environmental Protection: the Concept and Use of Reference Animals and Plants. ICRP Publication 108. Annals of the ICRP Volume 38 Nos. 4-6, 2008

3.4.1 Workers

The Regulatory Guide on waste facilities (see footnote 11) states that a constraint for a storage facility would not be expected to exceed 5 mSv. ANSTO has indicated that this is entirely feasible and is well within the statutory dose limit of 20 mSv annually as an average over five consequtive years.

The *IWS Facility* is a passive facility and staff would not need to be present other than for inspection and limited maintenance work. The TN81 cask is shielded and a very small elevation of the ambient dose rate is expected in its vicinity. The surface dose rate of the cemented waste is expected to range up to 2 mSv h^{-1}. As part of the optimisation, shielding may be considered. ANSTO is expected to provide more detailed information on this issue as part of an application to *operate* the *IWS Facility*.

Exposure of workers engaged when the *IWS Facility* receives the waste, and subsequently during the operational phase of the facility, and finally when the waste is shipped to the planned NRWMF, are expected to be very small.

3.4.2 The public and the environment

In my correspondence[38] to the then Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC), I stated with regard to exposure of the public and the environment from the operations at the *IWS Facility*:

"In considering the potential for off-site contamination of the environment and potential for radiological exposure to humans and to non-human biota, we are mindful of the treatment, shielding and packaging of the material. At this stage of our evaluation, and subject to outcomes from our further review, we consider the proposed arrangements – if appropriately implemented – are likely to provide adequate safety and protection of people and the environment."

The referral decision of DSEWPaC of 29 October 2012, informed by my letter referred to above, was that the establishment of the proposed facility was not a controlled action if undertaken in the manner set out in the decision (see footnote 19).

ARPANSA's further assessment has indicated that there is no credible scenario leading to exposure of the public or the environment under normal operation.

3.4.3 Exposures from accidents

The possibility of an accident, whether during transport or during storage, and whether caused by a natural event with safety implications, or through negligence, deliberate side-stepping of safety procedures or by an act with malicious intent, cannot be dismissed. The probability for an event is low; considering the design of the transport cask, the cemented waste and the waste matrices that prevent major spread of the material, consequences associated with any such event are likely to be limited.

3.4.4 Considerations and conclusion

Based on submitted information and ARPANSA's assessment, I consider that the exposures of workers would be very small; and that exposure of the public or the environment under normal

[38] Letter dated 12 October 2012; ARPANSA ref D 12015154

operations would be extremely low. Radiation risks associated with accidents are considered to be small.

With regard to whether the applicant has shown that the magnitude of individual doses, the number of people exposed, and the likelihood that exposure will happen, are as low as reasonably achievable, having regard to economic and social factors:

I conclude that enough evidence is before me regarding on-site and off-site radiological consequences of the proposed *IWS Facility* under normal operations, and that the information as such provides sufficient reassurance of adequate protection of people and the environment from the harmful effects of radiation; that accident probabilities are low and associated consequences limited; and that the evidence before me at this stage enables me to proceed with reaching a decision on authorisation to *prepare a site* for, and to *construct*, a controlled facility.

3.5 Has the applicant shown capacity for complying with these regulations and the licence conditions that would be imposed under section 35 of the Act; whether the application has been signed by an office holder of the applicant, or a person authorised by an office holder of the applicant?

The capability of ANSTO, being the only nuclear operator in Australia and under ARPANSA's surveillance with regard to its compliance with the Act and the Regulations and all licence conditions imposed by ARPANSA, is assessed in the RARs as satisfactory; ANSTO has the necessary resources, staffing, competence, experience, systems and infrastructure that are required to carry out the establishment of the *IWS Facility*, and to operate it safely. I thus have little doubt that ANSTO is capable of complying with the Regulations and with the licence conditions that I may impose under section 35 of the Act for the conduct specified in the licence application before me.

The application was signed by the CEO of ANSTO, Dr Adrian Paterson.

3.5.1 Considerations and conclusion

Whether the applicant has shown capacity for complying with these regulations and the licence conditions that would be imposed under section 35 of the Act; and whether the application has been signed by an office holder of the applicant, or a person authorised by an office holder of the applicant:

I conclude that enough evidence is before me with regard to the capability of ANSTO, represented by the CEO for the purpose of this application, of carrying out the conduct defined in the application in a manner that is compliant with the Regulations and with these licence conditions I may impose, to enable me to proceed with reaching a decision on authorisation to *prepare a site* for, and to *construct*, a controlled facility.

3.6 The content of submissions made by members of the public about the application

3.6.1 Process

Regulation 40 requires the CEO of ARPANSA to advertise receipt of a licence application for a nuclear installation and to invite submissions.

The public was advised of the application, and submissions were invited in the following ways:

a. through a notice published in the Australian Government Gazette on 8 May 2013;
b. by posting information on the ARPANSA website from 8 May 2013;
c. through an advertisement in The Australian newspaper on 8 May 2013;
d. through an advertisement in the St George and Sutherland Shire Leader and the Liverpool Leader on 8 May 2013 (and further advertisements in the St George and Sutherland Shire Leader); and
e. at a community information session held at the Engadine Community Centre (Sutherland Shire) on 16 May 2013 (attended by approximately 40 community participants).

Copies of the licence application submitted by ANSTO were made available to the public, along with the advice as to how and when submissions could be made. The consultation covered the application for the *IWS Facility*, and applications to *prepare a site* for a radiopharmaceuticals production facility (the *ANM Facility*), and the application to *prepare a site* for, and to *construct*, a waste treatment facility (the S*yMo Facility*). A licence to *prepare a site* for the *ANM Facility* has been issued (see footnote 10). The application for the *SyMo Facility* is currently under regulatory review.

In making a decision on the licence application, paragraph 41(3)(g) of the Regulations requires the CEO of ARPANSA to take into account any submissions received from the public about the application. Section 3.6.1 below summarises the questions/comments raised in written submissions and during the community information session, and the responses from ANSTO and/or ARPANSA. In view of the relatively small number of submissions and that no fundamentally new or previously unknown issue was raised, I decided to *not* organise another public forum to discuss the application(s) in the light of submissions received.

3.6.2 Responses to the submissions

The submissions often covered more than one, sometimes all three, facilities subject to regulatory review by ARPANSA at the time during which submissions were invited. The issues raised in the submissions, ANSTO's responses and comments from the ARPANSA assessors have been posted on ARPANSA's website[39]. The numbering below refers to the numbering of the questions/comments posted on ARPANSA's website.

I review below the submissions grouped in categories and in relation to the three applications, with some emphasis on the submissions that relate to waste management (including the *IWS Facility*).

a. **Alternative techniques for Mo-99 production, or for medical procedures (question /comment 2, 6, 14, 18):** I consider ANSTO's responses satisfactory. Alternatives (importation, production technique, and location of production facility) were discussed in relation to my decision on the *ANM Facility* where I reached the conclusion that there is net benefit from the proposed conduct, considering the small risks associated with the *ANM Facility* and the benefit from sustained radiopharmaceutical production to the Australian, and global, population. Submission 14 does not consider alternatives directly but the cost of the facilities, which is *one* consideration in establishing net benefit of a conduct.

[39] http://www.arpansa.gov.au/Regulation/Branch/consultation.cfm

b. **Generation of waste, particularly plutonium, and its implications for nuclear proliferation; waste returned from reprocessing of spent fuel overseas; and the SynRoc technique for waste management (question/comment 1, 3, 4, 5, 7, 8, 9, 10, 13, 19, 20, 22, 24, 26, 27, 28, 29):** Many of the questions raised on waste management relate to the return of ILW from France and the UK, which is the issue considered in this Statement of Reasons. The review of the applications to *prepare a site* for, and to *construct*, the *IWS Facility* lead to the conclusion that – while it is still possible to issue the relevant licences – there is a need to provide further information on the exact radionuclide inventory, its distribution to different packages, and its equity with the material that was shipped from ANSTO for reprocessing overseas. There is also a need to establish contingency plans considering the *IWS Facility* is intended for *temporary* storage; this would entail elaboration on the progress in establishing the NRWMF foreshadowed in the national policy for management of radioactive waste. These requests for further information and onward planning resonate with the content and sentiment in many of the submissions received during the consultation.

   Management of waste arising from operation of the *ANM Facility* was discussed in the Statement of Reasons regarding the *ANM Facility* (see footnote 10). I have there stated that improved contingency plans need to be developed ahead of, or as part of, an application to construct the *ANM Facility*. I have also requested further information on decommissioning and management of decommissioning waste arising from the *ANM Facility*.

c. **Security (question/comment 16):** I consider ANSTO's response satisfactory.
d. **Transport, emergencies and liabilities (question/comment 11, 12, 15, 17, 25):** I consider ANSTO's responses satisfactory. With regard to the *ANM Facility*, I expect to again consider the emergency arrangements following further analysis of the reference accident, ahead of or as part of an application to *construct* the facility.
e. **General aspect of the site, such as population density and risk for bushfires (question/comment 21, 22, 23, 30):** I consider ANSTO's responses satisfactory; however, with regard to the *ANM Facility* I expect further consideration of demographic factors being part of the further analysis of the reference accident, as stated under (d) above.

3.6.3 Considerations and conclusion

I consider that the public submissions (verbally during the community information session and those received in writing) have raised issues that correspond to issues identified in the regulatory review. No fundamentally new or previously unknown issue has been identified.

With regard to the content of submissions made by members of the public about the application:

I conclude that the public consultation has identified issues associated with the application for the proposed *IWS Facility* that correspond to issues identified during the regulatory review, and that the public consultation reinforces their importance. These issues need further consideration in subsequent licensing stages but are not critical to the stages covered by these applications; I may thus proceed with reaching a decision on authorisation to *prepare a site* for, and to *construct*, a controlled facility.

4 Further considerations

4.1 Conditions of licence

Conditions of licence as specified in the Regulations apply and need not be reiterated here. Apart from issuing a standard condition of licence related to quarterly reporting, I have not considered it necessary to issue any additional conditions of licence under section 35 of the Regulations.

4.2 Matters for ANSTO to consider

Ahead of, or as part of, an application for a licence to *operate* the *IWS Facility*, I request ANSTO to consider the following, based on my considerations in this Statement of Reasons.

4.2.1 Radionuclide inventory

An updated radionuclide inventory needs to be submitted to ARPANSA ahead of, or as part of, an application for a licence to *operate* the *IWS Facility*. This inventory should specify the inventory of the TN81 cask as well as the inventory of the technological waste returned from France, together with an analysis of equity with the spent fuel (minus fissile material) that was shipped to France for reprocessing. The analysis should consider the inventory as such and any radiological risks associated with alterations to the inventory during the treatment of the material in France.

As indicated in the Regulatory Guide: Licensing of Radioactive Waste Storage and Disposal Facilities v2 (see footnote 11), the safety assessment which forms part of the safety case is based on the inventory, and this should be updated with any update of the inventory.

I consider it possible on the basis of the available information on the nature of the waste being returned from the UK that it can be stored at the *IWS Facility*. However, there are significant uncertainties with regard to both amount and form at the present. A radionuclide inventory as well as an analysis of equity needs to be submitted in order to inform a decision on whether a licence to *operate* the *IWS Facility* can be issued that accommodates storage of the waste returned from the UK at the *IWS Facility*.

4.2.2 Contingency planning

On the basis of this Statement of Reasons, I conclude that contingency plans for management of the waste under temporary storage at the *IWS Facility* need to be developed ahead of, or as part of, an application to *operate* the *IWS Facility*. These should consider reprocessing waste returned from France. Should ANSTO also pursue the plans to store reprocessing waste returned from the UK, similar considerations apply. The contingency plans should also consider specified time frames. In relation to this I refer to the previously quoted Regulatory Guide*: Licensing of Radioactive Waste Storage and Disposal Facilities v2* (see footnote 11):

"Based on international best practice, a guiding principle of the CEO is that an applicant for a licence to prepare a site for, construct, operate or decommission a storage facility shall provide a strategy (such as a reasonably practicable disposal option) for safe management of the waste in storage when the period of safe storage concludes. Such a period will be predicated on the safety case which will indicate not just the time of safe storage for waste in its current form, but the probable costs and technological challenges in maintaining storage beyond that period."

4.2.3 The Safety Case

Flowing from section 4.2.2 above, I request ANSTO to further develop the safety case for the *IWS Facility*. The ARPANSA Regulatory Guide: *Licensing of Radioactive Waste Storage and Disposal Facilities v2* (footnote 11) states:

"Based on international best practice requirements, the CEO expects that the applicant shall demonstrate that any proposed radioactive waste storage or disposal facility will meet the required level of protection by carrying out and presenting a safety case that draws upon the organisational and technical arrangements put in place, the nature of the waste to be accepted, the characteristics of the site, the design of the facility, including any engineered safety barriers, and the arrangements for its construction and operation."

Further guidance can be obtained from the Regulatory Guide referred to above.

It is acknowledged that in the present case of the *IWS Facility*, the safety case is heavily based on the safety case for the TN81 transport/storage cask. Nevertheless, there are additional elements, particularly related to transport, maintenance, demographic issues and the timeline for safe storage, and further handling of the waste post the life-time of the *IWS Facility*, which should be developed in the safety case presented in an application to *operate* the *IWS Facility*.

Sydney, 29 November 2013

Carl-Magnus Larsson
CEO of ARPANSA