



Australian Government



Nuclear-based science benefiting all Australians

UNCLASSIFIED

Interim Waste Store Operating Licence Application

Document IWS-O-LA-D2

INTERIM WASTE STORE OPERATING LICENCE SAFETY MANAGEMENT PLAN

(rev. 1)


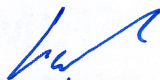
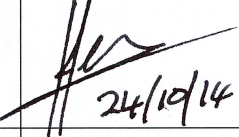
**Prepared By
Australian Nuclear Science and Technology Organisation**

October 2014

UNCLASSIFIED

UNCLASSIFIED

Australian Nuclear Science & Technology Organisation
Interim Waste Store Operating Safety Management Plan

REVISION SHEET		Document IWS-O-LA-D2		
Print name, date and sign or initial				
Revision Number	Description of Revision	Prepared	Checked/ Reviewed	Approved
0	Original issue	Alamgir Kabir	Steve Wilson	Hefin Griffiths
1	Revised the document to incorporate comments from the SAC.	Alamgir Kabir  23/10/14	Steve Wilson  23/10/14	Hefin Griffiths  24/10/14

UNCLASSIFIED

Australian Nuclear Science & Technology Organisation
Interim Waste Store Operating Safety Management Plan

CONTENTS

1	PURPOSE AND SCOPE	4
2	SAFETY CULTURE	4
3	ADMINISTRATIVE ARRANGEMENTS	5
4	SAFE PREMISES, BUILDING AND EQUIPMENT	6
5	COMPETENCY, TRAINING AND SUPERVISION	6
6	VISITORS, CONTRACTORS AND OTHER PERSONS	7
7	CONTROL OF HAZARDS	7
8	DEVIATIONS, ANOMALIES, INCIDENTS AND ACCIDENTS	8
9	AUDITS AND REVIEW	8
10	RECORDS AND REPORTING	9
11	REFERENCES	9

1 PURPOSE AND SCOPE

The purpose of this *Safety Management Plan* is to outline the safety management arrangements that are in place within ANSTO for the purpose of operation (including hot commissioning) of a radioactive waste store, called the *Interim Waste Store (IWS)*, at Lucas Heights Science and Technology Centre (LHSTC). The scope of this plan is all safety and licensing issues in accordance with the ARPANS legislation [1, 2] and the ANSTO safety arrangements. It specifically covers the issues referred to in the ARPANSA licensing guidelines relating to the review of plans and arrangements [3].

This plan should be read in conjunction with the other plans and supporting documents comprising the construction licence, specifically IWS-O-LA-D3 *Radiation Protection Plan* and IWS-O-LA-D6 *Emergency Plan*.

2 SAFETY CULTURE

The ANSTO strategic directions emphasise the goal of ensuring that ANSTO facilities and activities are safe. ANSTO is responsible for the safety of its workers and the public as outlined in the *Work Health & Safety and Environment Policy* [4]. During the operation of the IWS, the ANSTO Waste Operation (WO) group, which is a part of Nuclear Services section, will formulate and execute all the routine activities in accordance with the WO approved procedures and also in compliance with ANSTO Work Health and Safety Management System (WHSMS) which implements the safety requirements of the strategic plan and safety policy. The safety policy and safety arrangements are readily available to and accessed by staff on the ANSTO intranet and are subject to regular review.

An aspect important to safety culture is that people have a questioning attitude and adopt a rigorous and prudent approach to work incorporating conservative decision making. Appropriate training and awareness instilled by safety briefings, toolbox talks, safety inspections and use of the STAR (Stop, Think, Act, Review) principle- all help to engender such an approach to work.

Another aspect important to safety culture is that the implementation of the safety requirements are not subject to inappropriate commercial pressures. In ANSTO the funding and safety approval processes are clearly separated. The funding for the routine operation and maintenance of the facility is approved through the ANSTO budget process. The funding for any capital works required for the facility is approved by the Investment Review Committee (IRC) and Portfolio Review Committee (PRC) and the safety approvals are given by the separate Safety Assurance Committee (SAC) which has an external member.

The ANSTO WHSMS has several layers of protection for staff, contractors and the environment. The ANSTO standard AS2310 *Radiation Safety* [5] has defence in depth as a main strategy. Some general examples of this approach are discussed below.

All the routine operating and maintenance tasks in the IWS will be performed in accordance with the Work Health and Safety Act 2011 [6] and Work Health and Safety Regulations 2011 [7] which includes extensive consultation and communication with workers.

As part of the operating licence application package, risk assessment [8] of various hazardous scenarios has been performed following the risk ANSTO Risk Analysis guide [9]. This assessment concluded that the operation of IWS does not have any negative features which cannot be overcome by the high standard and quality of activities that are undertaken by ANSTO.

Good communication and consultation are central to providing a good safety culture. At the ANSTO organisational level, the CEO holds regular forums for all staff and promotes a safety theme. The Nuclear Operations Division and Nuclear Service group hold a regular forum at which safety is discussed first. There is significant provision for consultation with workers including staff and contractors in aspects of safety, including the Central Safety Consultative Forum (CSCF), the Health and Safety Committees (HSC) and the Health and Safety Representatives. Also, the *Executive Committee – Work Health and Safety & Environment* provide oversight and set direction on behalf of ANSTO Executive for safety and environment strategies, initiatives, events, event management processes, targets.

UNCLASSIFIED

Australian Nuclear Science & Technology Organisation Interim Waste Store Operating Safety Management Plan

The CSCF and HSCs mentioned in this document have terms of reference set out in the ANSTO WHS Management System.

According to the Nuclear Services Business and Compliance Management System (B&CMS) [10], the WO group collects data and analyse them for measuring key performance indicators and monitoring the achievement of set objectives and targets [10].

The Facility Officer (i.e. WO Manager) for the IWS has the responsibility to develop a comprehensive plan including Safe Work Method and Environmental Statements (SWMES) for any non-routine activities to be undertaken in the facility. The ANSTO safety approval process [11], as per the WHS Management System [12], will be followed prior to such works. ANSTO will initiate works using Safety Management System permits including Safe Working Permit, Excavations and Penetration Permit, etc., and review documentation where required. This process reduces the likelihood and potential consequences of any human errors.

All safety related events/incidents are reported and investigated following AG2372 *Event Management Process* [13]. This process also captures actions for improvements. The Nuclear Services group contractor will manage their own incidents internally and co report to ANSTO via the Head, Nuclear Services or facility officer. ANSTO reports all reportable incidents to ComCare.

Safety inspections of the IWS will be carried out and together with toolbox talks, which are used to identify, discuss and resolve any potential safety concerns anticipated in upcoming work.

Safety issues and lessons learnt are discussed and communicated in meetings at all levels from the Board meeting through to the Executive meetings, Divisional/Institute Management meetings down to Toolbox talks. Toolbox talks are the main forum for the construction work only. Feedback to Nuclear Operations management will occur through the IWS Facility Officer and Head Nuclear Services. The WO Licensing Officer will liaise with the Regulatory Affairs Officer to monitor issues relating to the ARPANSA licence submission, and report to the Nominee, who is the Head Nuclear Services.

At the organisation level, ANSTO conducts periodic surveys on safety culture. The most recent was in 2012 by external consultants engaged by the Work, Health and Safety (WHS) group within Human Resources and Workplace Health Safety Division.

3 ADMINISTRATIVE ARRANGEMENTS

The safety regime towards the strategic directions and the safety policy is expanded principally in the *WHS Management System*. These are supplemented where needed by divisional arrangements.

All the tasks carried out in the IWS during the operating phase of the facility will be undertaken in accordance with the WO approved procedures and work instructions under the B&CMS. Any non-routine works required for the facility will go through the proper planning process, i.e. preparation of SWMES or risk assessment, approval from the line management or from the SAC in accordance with the ANSTO WHSMS. Regulatory approval will be obtained if necessary according to the ANSTO guide on Radiological and Nuclear Safety Significance [14].

Safety requirements are disseminated to staff and contractors, principally through the training arrangements discussed later in this plan. This includes appropriate induction training and safety specific training including radiation safety training for radiation workers (where applicable). During the operation of the facility, the safety requirements will be reinforced by the IWS facility Officer and in routine toolbox safety talks.

The control of visitors is described later in this plan. General information is given in Section 6.4 of AG-1028- *ANSTO Security Manual* [15] and this is supplemented by the ANSTO staff member controlling their access.

The arrangements for radiation protection and radiation safety are given in AS-2310 *Radiation Safety* [16] and supporting practices which together form a comprehensive suite of documents consistent with international best practice. In this licence application, arrangements for the planning and control of exposure to radiation are covered in IWS-O-LA-D3 *Radiation Protection Plan* which relies heavily on the general ANSTO Work Health and Safety Management System (WHSMS) together with local arrangements.

UNCLASSIFIED

Australian Nuclear Science & Technology Organisation
Interim Waste Store Operating Safety Management Plan

4 SAFE PREMISES, BUILDING AND EQUIPMENT

All the routine activities undertaken during the operation of the facility, safety will be managed in compliance with the WHS Act [6] and WHS Regulations [7], and in conformance to the ANSTO WHS Management System [12] and the WO Procedures and Work Instructions.

ANSTO will ensure that the operational activities conform to the relevant IAEA safety requirements and guidelines, i.e. Storage of Radioactive Waste [17]. Relevant ARPANSA Regulatory Guides will also be followed, including Regulatory Guidance for Radioactive Waste Management Facilities [18]; Near Surface Disposal and Storage Facilities [19] and Regulatory Assessment Principles for Controlled Facilities [20].

The first part of the safety approval for the operating stage of the facility is formal approval by the Safety Assurance Committee (SAC) as set out in the Submissions to the Safety Assurance Committee [11]. This ensures a thorough assessment and review prior to any activities at the facility. A Radiation Protection Adviser, Work Health & Safety Adviser and Systems Safety & Reliability Adviser will be involved in the review and assessment under the SAC process.

A comprehensive hazard identification and risk assessment [8] has been performed as part of the operating licence application, which is assessed and approved by the SAC. These assessments cover the all the activities to be undertaken during the operating phase of the facility.

The building and equipment of the IWS will be routinely inspected by the ANSTO Support Services and carry out maintenance works necessary to operate safely. Where appropriate, the Safe Work Permit system will be used to control all tasks, including hot works, excavation, and electrical isolations. All electrical equipment is tested and tagged following Electrical Equipment Guide [21].

The security provisions, including safe entry and exit from the IWS, are discussed later in this report and in the IWS-O-LA-D5 *Security Plan* [22]. The responses required in the event of an emergency during operating phase of the facility are discussed in the IWS-O-LA-D6 *Emergency Plan*. [23].

During the operating phase of the IWS, access to the facility using the controlled card reader will be limited by the Facility Officer and ANSTO Security and Safeguards to those staff who have a need to access.

The bounding accident (see *Safety Analysis Report*) demonstrates that it is not credible for any significant exposure to occur to people inside the facility, nor to people outside or offsite. On this basis, the preliminary hazard category is assessed as F1.

5 COMPETENCY, TRAINING AND SUPERVISION

ANSTO has comprehensive processes which collectively ensure that potentially hazardous work is performed and supervised by properly authorised and qualified staff. This starts with the recruitment process for staff and long-term contractors where the selection is based on the technical and personal selection criteria for the role. These criteria include the qualifications, knowledge and experience appropriate for the work.

ANSTO workers, including the Nuclear Services staff, have significant experience in radiation hazards. They are given specific Radiation Protection (RP) trainings such as 1-day Radiation Protection Workshop, Laser Safety training, OPAL Radiation Safety training etc. [24]. All workers are given basic induction training, which includes basic knowledge about radiation protection, and the use of Personal Protective Equipment required for entry to a radiologically classified area. Workers requiring enrolment onto the ANSTO Dosimetry Service are required to undergo RP training and also undertake Radiation Safety Refresher course after a period specified in the WHS guide [24]. An overview is given in ANSTO WHS *Training Handbook* [24]. The full list of courses and the retraining period requirements is given in *Work Health and Safety Training Needs Analysis* [25]. Any workers required to do specialised tasks will be provided with task-specific training prior to their assignment to the job. A record of the training is maintained in the ANSTO training management system.

Radiation Protection Services staff in Nuclear Services (NS) group within the Nuclear Operations division will play an important safety role during the operational phase. The Radiation Protection

UNCLASSIFIED

Australian Nuclear Science & Technology Organisation Interim Waste Store Operating Safety Management Plan

Advisers (RPAs) are recruited with the necessary knowledge, skills and experience or are trained and authorised within ANSTO. The Health Physics Surveyors (HPS) are given comprehensive theoretical and practical training and are authorised within ANSTO.

Work Health and Safety (WHS) provide ,WHS related information, assessments training as well as developing, managing and maintaining the ANSTO WHS Management System. WHS coordinate, manage and maintain all WHS related courses onsite including all inductions required for staff and contractor access.

6 VISITORS, CONTRACTORS AND OTHER PERSONS

ANSTO recognises that it has a duty of care for the safety of all workers not only employees, e.g. contractors and visitors. As noted earlier, Agency contractors are treated as ANSTO staff in terms of safety training and requirements. Under the WHS Act 2011, contractors are identified as workers and are therefore subject to the same Duty Of Care as ANSTO workers. The provisions for access to Radiologically classified areas or facilities is described in the Security Plan. In addition there are special arrangements for visitors.

Access to the IWS will be controlled by the Facility Officer and ANSTO Security subject to the provisions and expectations of ANSTO and any specific legislative direction e.g. Work Health and Safety Regulations. Only staff and contractors who are required to access the facility and with the appropriate safety training and supervision will be given access. All of the general personal protective equipment (PPE) needed for work in the store will be provided by the WO. These PPE will be available at a suitable location near the entry to the store. Within the work areas there is signage specifying the PPE needed for each area.

The radiation safety requirements for routine tasks during the operational phase of the IWS facility are described in IWS-O-LA-D3 *Radiation Protection Plan*. The procedures for escorting a visitor into the work areas include the requirement to carry an Electronic Personal Dosimeter (EPD) to monitor the dose to the visitors if radiation is present when a visit takes place.

As referred to earlier in this plan, there are comprehensive safety training requirements in place for workers and these are included in AG2364 Work Health and Safety Training Needs Analysis [25]. All contractors (if engaged) are required to complete the Contractor Safety Induction as part of the ANSTO Identification Badge issue and renewals; Completion of the ANSTO Basic Radiation Safety course is required to enrol on the ANSTO Dosimetry Service for work in Radiologically classified areas; and participation in the ANSTO contractor monthly Site Safety Toolbox Talks when the subject matter relates to their work or work area as determined by their Contractor Supervisor. Prior to doing the work, contractors demonstrate their knowledge of the hazards and safety controls by their involvement in the preparation of the SWMES and their sign-off of these documents. Contractors demonstrate their knowledge of the general hazards in the area and the safety controls by their sign-off of the SWP before work.

7 CONTROL OF HAZARDS

The WO management will have the responsibility for control of the hazards during the operational phase of the facility. The ANSTO processes for the control of hazards that will apply during all works performed in the IWS. These include the Safety Assurance Committee (SAC) process which reviews the overall project safety approach, through to the SWMES process which identifies hazards and controls for individual tasks.

At this stage, the only time that a minor level of radiation hazard (i.e., 0.1 -1 mSv) will exist during the operational phase is during the routine inspection of the technological waste packages (i.e. CFBC-2 cemented wastes). A comprehensive safety assessment of the CFBC-2 package storage has been undertaken [26] and it shows that the risk of radiation exposure is very low during routine inspection. Necessary controls will be implemented (i.e. additional shielding and administrative procedures) to further minimise the exposure. Only an outline of the controls is given here and a full description is given in the *Radiation Protection Plan*. The overall approach to radiation protection is given in AS-2310 *Radiation Safety*. General control of access to the radiation work areas will be through the use of a temporary radiation barrier when the radiation hazard is present.

UNCLASSIFIED

Australian Nuclear Science & Technology Organisation Interim Waste Store Operating Safety Management Plan

The SWMES process ensures that staff and contractors know of the radiation and other hazards and controls. The SWP process ensures that contractors (if engaged) know of and accept the controls for general hazards in the area. This will be reinforced by the toolbox safety talks with the work groups prior to the task.

All of the working level arrangements for the control of hazards during the operational phase are assessed and supplemented by the SAC review and approval process. An overview of this process is given in AG-1094 *Operation of the Safety Assurance Committee (SAC)* [11]. For this operational phase of the facility, all documents in the licence application were included in the submission to the SAC.

The assessment process conducted on behalf of the SAC includes a review of the submission to ensure that the ANSTO WHS requirements have been followed including AG-2407 *Hierarchy of Risk Control* [27].

8 DEVIATIONS, ANOMALIES, INCIDENTS AND ACCIDENTS

There are several arrangements in place to deal with deviations, incidents and accidents during operational phase of the facility. These range from the reporting of potentially unsafe work conditions to the emergency response and follow-up for significant accidents.

The risk assessment contained in the *Safety Analysis Report* [8,26] identifies foreseeable incidents and the controls given there describe the means for coping with these incidents. In the unlikely event that unsafe conditions are reported or found during safety inspections, these will be managed by supervisory staff. Any minor incidents will be managed by the work group and supervisors with support from Health Physics as needed.

The ANSTO event reporting system is described in AG-2372 *Event Management Process (Guide)* [28] and this captures safety near hits, deviations, incidents and accidents. The follow-up process involves an initial investigation by supervisory staff and a later review by the line manager or investigator with sign off by the division General Manager. All event reports are reviewed and recorded in the ANSTO system which is managed by the WHS section. Outstanding event reports are monitored by key performance indicators prepared by the WHS section and reviewed in Nuclear Services management meetings.

In the worst case of an accident or injury, the emergency arrangements described in the IWS-O-LA-D6 *Emergency Plan* would be invoked. These provide for the initial response by ANSTO Emergency Response Team (ERT) with progressive support by radiation and safety specialists and, if required, the external emergency services. The reporting and follow-up is through the ANSTO event reporting process.

During the construction and commissioning, the normal process for reporting to ARPANSA described in AG-2376 *Reporting to ARPANSA* [29] will operate. This requires reporting of any radiological accidents involving a significant failure in the safety provisions within 24 hours and a written investigation report within 14 days.

The arrangements described here to deal with deviations, accidents and incidents during the operational phase of the facility are detailed in the ANSTO WHS Management System which is maintained under an ISO 9001:2008 certification.

9 AUDITS AND REVIEW

All activities of the ANSTO WO and other units under the Nuclear Services group are covered under the B&CMS [10] which is based on the AS/NZS ISO 9001 - Quality Management System Standard, the AS/NZS ISO 14001 - Environment Management System. The WO group conducts internal audits to determine the effective implementation and maintenance of its B&CMS to assess the WHS practices; and to measure the conformity of the WO products and services against the planned arrangements. The planning and conducting of audits follow ANSTO Internal Audit Process and are carried out by trained auditors who are independent of the area being audited. Audit findings are documented in the audit report. Actions are taken without delay to eliminate detected nonconformities and their causes [10]

UNCLASSIFIED

Australian Nuclear Science & Technology Organisation Interim Waste Store Operating Safety Management Plan

There are arrangements in place to audit and review both the safety system and the implementation of the system in the work areas of IWS. The safety requirements, including those for radiation safety, are in the WHS Management System.

The radiation protection arrangements for the construction and cold commissioning are described in the IWS-O-LA-D3 *Radiation Protection Plan*. The effectiveness of this plan will be monitored by the RPA, the Project Manager and the Construction Supervisor, taking into account dose and contamination, survey results, dosimetry results, workplace inspections and any incident reports.

The plans and arrangements of the IWS will be reviewed and revised regularly to maintain safety as required by the ARPANS regulation. The IWS operating procedures and work instructions will be audited and revised in compliance with the Nuclear Services B&CMS.

10 RECORDS AND REPORTING

The IWS information and documentation is stored on ANSTO computer servers and in relevant ANSTO paper files. WO staff have the appropriate access to this information.

The ANSTO safety arrangements are within the ANSTO certified ISO 9001:2008 systems and this is important to ensure there is appropriate reporting and storage of records. The requirements for safety records and reporting are described in the Human Resources and Work Health Safety document *S-QM Quality Manual* [30] and supporting documents. General requirements for safety records are given in *S-P-003 Control of Records* [31] which details the storage locations, retention periods and responsibilities for maintaining the records. The specific requirements for radiation safety records are given in *S-ROH-G-002 Radiation Protection Services Records Management* [32]. This includes the requirements for dosimetry records, including retention for the required periods and for Health Physics records, including survey results, log books and stack sampling results. For radiation workers, dose records are available on termination of employment.

The safety assessments for the construction and commissioning including the submission to SAC and the supporting Safety Assessment report will be stored in an ANSTO SAC file for the project and in project records.

The safety training arrangements are described earlier in this plan. The training records are maintained by the WHS Training Officer following *AG-2363 Work Health and Safety Training* [24, 32]. These are maintained in a database management system called Pathlore and this facilitates record retrieval and usage.

The event reporting arrangements are described earlier in this plan. Event reports and records are maintained by the WHS section in Human Resources and Workplace Health Safety division. These records contain information on the incident, the follow-up investigation reports and summary information on any injuries. Summary information on each incident is entered into a database to facilitate retrieval of details, follow-up and closure.

Medical records associated with any injuries are maintained confidentially by the Registered Nurse and Rehabilitation Case Manager in ANSTO Health Centre. The requirements for more severe injuries are given in *S-MED-P-002 Workers Compensation and Rehabilitation* [33] and include reporting to the WHS regulator Comcare.

11 REFERENCES

- 1 Australian Radiation Protection and Nuclear Safety (ARPANS) Act 1998
- 2 Australian Radiation Protection and Nuclear Safety (ARPANS) Regulations 1999
- 3 ARPANSA Regulatory Guide: Plans and Arrangements for Managing Safety, v4
- 4 ANSTO Work Health & Safety and Environment Policy - APOL 2.1, March 2010
- 5 ANSTO AS-2310 *Radiation Safety Standard*, August 2009
- 6 Work Health and Safety Act 2011

UNCLASSIFIED

Australian Nuclear Science & Technology Organisation Interim Waste Store Operating Safety Management Plan

- 7 Work Health and Safety Regulations 2011
- 8 Interim Waste Store Safety Analysis Report, IWS-O-LA-SAR, April 2014.
- 9 AG-2395, Risk Analysis Matrix, September 2013.
- 10 ANSTO WO G-5248, Nuclear Services Business & Compliance Manual
- 11 ANSTO AG-1094- Operation of the Safety Assurance Committee, November 2013.
- 12 ANSTO Work, Health and Safety Management System.
- 13 ANSTO AG-2372 Event Management Process Guide, July 2011
- 14 ANSTO Guide AG-2434- Guidance for determination of nuclear and radiological safety, March 2013.
- 15 ANSTO AG-1028- *ANSTO Security Manual Section 6.4, July 2012*
- 16 ANSTO AS-2310 *Radiation Safety Standard*, August 2009
- 17 IAEA Safety Guide WS-G-6.1, Storage of Radioactive Waste. Vienna 2006.
- 18 ARPANSA Regulatory Guidance for Radioactive Waste Management Facilities V2, OS-LA-SUP-240L, March 2013.
- 19 ARPANSA, Near Surface Disposal and Storage Facilities, December 2006.
- 20 ARPANSA Regulatory Assessment Principles for Controlled Facilities, Regulatory Branch, RB-STD-42-00 Rev 1, October 2001
- 21 ANSTO WHS Guide: Isolations and Lockout/ Tagout, AG 2409, November 2012,
- 22 Interim Waste Store, Operating Licence, Security Plan, IWS-O-LA-D5, April 2014
- 23 Interim Waste Store, Operating Licence, Emergency Plan, IWS-O-LA-D6, April 2014.
- 24 ANSTO, Work Health & Safety Training Guide, AG-2363, April 2013
- 25 ANSTO Work Health and Safety Training Needs Analysis, AG-2364, January 2012
- 26 Safety Assessment of the Interim Waste Store at Lucas Heights, ANSTO/T/TN/2012-03 rev 3, ANSTO Systems Safety & Reliability, May 2014.
- 27 ANSTO AG-2407 *Hierarchy of Risk Control Flowchart*, September 2006
- 28 ANSTO AG-2372 *Event Management Process Guide*, July 2011.
- 29 ANSTO AG-2376 *Routine Reporting to ARPANSA Guide*, August 2012
- 30 ANSTO SERA S-QM *Quality Manual*, August 2009
- 31 ANSTO SERA S-P-003 *Control of Records*, August 2009
- 32 ANSTO SERA S-ROH-G-002 Radiation Protection Services Records Management, February 2008
- 33 ANSTO SERA S-MED-P-002 Workers Compensation and Rehabilitation, April 2005.