Australian Government
Australian Submarine Agency

ASA

Environment Protection

Controlled Industrial Facility (HMAS *Stirling*)
ARPANSA Construction Licence
Technical Overview

www.asa.gov.au

Contents

List of Acronyms

ARPANSA	Australian Radiation Protection and Nuclear Safety Agency
ASA	Australian Submarine Agency
AUKUS	The trilateral security partnership between Australia, United Kingdom and the United States of America
CIF	Controlled Industrial Facility
HMAS	His Majesty's Australian Ship

Environment Protection

Section 1 – Introduction

1.1 This Technical Overview provides general information on the ASA's planned environmental management at the Controlled Industrial Facility (CIF) at HMAS *Stirling*, including how the ASA is adhering to best practice for the management of radioactive materials as required to protect the environment.

1.2 This Technical Overview relates to the ASA's and the Department of Defence's obligations under the *Australian Radiation Protection and Nuclear Safety Act 1998* and *Australian Radiation Protection and Nuclear Safety Regulations 2018* to manage protection of the environment during the construction of the CIF. This requirement is consistent with Principle 1 of the International Atomic Energy Agency's (IAEA) *Fundamental Safety Principles* SF-1, which states that "the prime responsibility for safety is with the person or organisation responsible for facilities and activities that give rise to radiation risks".

1.3 This Technical Overview also provides information about planned CIF operations when radioactive material will be present. The operation of the CIF is subject to additional regulatory approvals.

1.4 The site clearing, construction and subsequent operation of the CIF is subject to a process of environmental referral and assessment (*Matters of National Environmental Significance: Significant Impact Guidelines 1.1*), as per the requirements of the *Environment Protection and Biodiversity Conservation Act 1999*. At the time of preparation of this technical overview for *Environment Protection,* the referral was under evaluation through a separate regulatory process.

1.5 This Technical Overview is not a standalone document and is to be read in conjunction with the other ASA technical overviews for the *Safety Analysis Report*, *Radiation Protection,* and *Emergency Management.*

Section 2 – Scope and assumptions

2.1 This Technical Overview outlines analysis of potential radiation exposure pathways to the environment, their possible consequences and subsequent management controls for the protection of the environment during the construction phase of the CIF.

2.2 There are a number of assumptions that underpin this Technical Overview, including:

a. The CIF will be a new freestanding building and will present no nuclear or radiological safety or management implications until it becomes operational (subject to licensing). There will be no radioactive waste arising or stored on site during the construction stage of the CIF. Environmental management during site preparation and construction phases will be limited to conventional environmental management hazards, controls and regulations involved in construction

b. The CIF will be located at HMAS *Stirling*. Work has commenced with the Department of Defence to amend existing Defence environmental management systems to incorporate nuclear safety and radiological protection principles with respect to the environment.

Section 3 – Protection of wildlife

Principles of approach

3.1 Across all stages of the development and operation of the CIF, the ASA will protect people, the public and the environment, and ensuring that risks are managed as low as reasonably achievable, with economic and social factors taken into account.

3.2 Across all stages of the development and operation of the CIF, the ASA will comply with all legislative requirements at the CIF arising from radiation exposures in relation to:

a. Maintenance of biological diversity

b. Conservation of species

c. Health of natural ecosystems.

Characterising Exposure Scenarios

Location

3.3 The CIF is to be located at HMAS *Stirling,* near the Diamantina Pier on Garden Island, Western Australia. The immediate surrounds to the north and south are built environments, consisting of base facilities, buildings, roads and other hard surfaces. To the west and beyond the base limits are natural terrestrial areas. To the east of the site begins Careening Bay, which continues out into the larger Cockburn Sound. Between the site and water will remain a small strip of natural terrestrial vegetation.

Vegetation

3.4 The terrestrial vegetation directly around the site is predominately *Melaleuca lanceolata* sparse low trees over *Acacia rostellifera* and *Acacia cochlearis* scrub. The ground layer and open areas are largely *Austrostipa flavescens* grassland. Recent assessments of the vegetation at the CIF site indicate that the condition of the vegetation on site ranges from ‘good’ to ‘degraded’.

3.5 The marine vegetation directly to the east of the CIF site is predominately a temperate seagrass meadow. The seagrass species are mostly *Posidonia sinuosa* and *Posidonia australis*, with this seagrass meadow covered in heavy epiphyte growth. Macroalgae of the *Sargassum* genus is recorded on rock walls north of Diamantina Pier.

Natural Background Radiation

3.6 A baseline value for natural background radiation is being established at HMAS *Stirling*, through a program of environmental monitoring. This is required to establish the radiation profile of the area prior to the arrival of any radioactive material. The results will also serve as the basis of future environmental and radiological monitoring.

3.7 The ASA are completing this environmental monitoring through an infrastructure consulting firm contracted to undertake an Environmental Baseline Contamination Assessment for the CIF site. This assessment will cover both radiation and other chemical contamination and includes collection of samples from terrestrial soil and sediment, marine waters and sediment, marine invertebrates and seagrasses sampling, and periodic radiation monitoring over a 12-month period.

Environmental Transport Pathways

3.8 In the context of the site characteristics discussed above, mechanisms by which radionuclides released during the hypothetical CIF reference accident may physically move through the environment have been considered. This includes the migration or dispersion pathways through soil, air, water and the various trophic level interchanges of biota consumed successively in the food chain.

3.9 These considerations inform how exposure scenarios may affect the environment and the associated wildlife.

Section 4 – Environmental management systems, tools and procedures

Overview of Defence and Navy Environmental Management Systems and Tools

4.1 The Royal Australian Navy instruction, Australian Naval Publication 2201 – Navy Environment Management System provides high-level policy direction and framework for the implementation and maintenance of the Navy Environmental Management System. This system forms the basis for the provision of environmental management applicable to all Navy activities, and is supplemented by Defence Security and Estate Group's Environmental Management System, which encompasses shore support and sustainment activities undertaken in Australia's naval shore establishments.

4.2 The ASA is working with Defence to integrate the CIF environment protection measures with the Navy Safety (NavySafe) System and the Navy Environmental Management System. Other relevant management systems that the ASA is working with Defence to update include, the Defence Environmental Management System and the Defence Radiological Safety Management System (Radsafe).

Goals and Objectives

4.3 The overarching goals of ASA radioactive environmental management are:

a. Ensure that exposure to sources of low-level radiation around the CIF remain as low as reasonably achievable to the environment, as well as members of the public and workers inside the CIF

b. Ensure all activities are undertaken in accordance with the relevant regulatory requirements

c. Minimise the amount of low-level radioactive waste created through CIF operation

d. Ensure that the low-level radioactive waste handled during CIF operations is characterised, documented, treated, packaged and stored appropriately

e. Ensure accurate, accessible and complete records of all waste activities are maintained for the lifetime of the AUKUS program.

Minimisation of Risk to the Environment and Human Health

4.4 The ASA will implement the principle by which radiation doses to personnel are monitored and controlled and kept as low as reasonably achievable.

a. There is no intention for radioactive material from the CIF to enter the groundwater, and any contamination of the soil/ground would only be as the result of an abnormal or emergency incident. These unlikely incidents will be mitigated by passive design controls of the facility. Plans and procedures are being developed to ensure any design basis accident will be contained and controlled.

Emergency Management

4.5 The ASA's Emergency Preparedness and Response Program will establish the required resources and infrastructure prior to the commencement of CIF operations as outlined in the technical overview for *Emergency Management*.

Environmental Protection Measures

4.6 Non-radiological aspects of environmental protection relating to CIF activities will be addressed. These include noise, light, dust, fuel use, non-radioactive wastes, non-radioactive hazardous wastes, protected flora, fauna and ecological communities. The existing HMAS *Stirling* Environmental Management System and associated processes will be used as the vehicle for the control of these matters of conventional environmental management.

4.7 The design of the CIF incorporates measures preventing uncontrolled or unintentional release of the low-level radioactive materials. Further prevention and mitigation measures include:

a. Security fencing, physical barriers and access controls to exclude both unauthorised personnel and wildlife

b. Separation of radioactive materials and their handling and storage areas from non-radioactive materials

c. Waste cataloguing and tracking controls, through all stages of acceptance, collection, processing, packaging and interim storage

d. Site and waste monitoring procedures and controls

e. Vermin exclusion controls

f. Impermeable liners and floor sealers

g. Spill and leak containment barriers

h. Runoff controls

i. Leak detection systems

j. Contingency and emergency response plans, procedures and equipment.

4.8 An ongoing environmental radiological monitoring program will be established to assess any deviations from background radiation levels. Annual reports featuring the results of this monitoring will be made available to the public.