Document No: 1411017

Environmental Management Plan 2023/24

Submarine Dismantling Project

Initial Dismantling at Rosyth Business Park

Nuclear Licensed Site

Rosyth Royal Dockyard Ltd.

Nuclear Assurance Department

Rosyth Business Park

KY11 2YD

REVISION

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Executive Summary

Consent was granted in October 2014 by the Office for Nuclear Regulation to Rosyth Royal Dockyard Limited to undertake decommissioning (dismantling) of the seven out-of-service defueled submarines at Rosyth Business Park.

The Consent was granted with six Conditions, four of which relate to the required Environmental Management Plan. An annual Environmental Management Plan must be prepared that identifies mitigation measures, reports on their implementation, effectiveness, progress of the decommissioning work and reports on changes to such measures in light of experience. The project shall be carried out in accordance with the Environmental Management Plan.

This document describes the environmental mitigation measures that have been in place for the Stage 1 of the Initial Dismantling of the laid-up submarines Swiftsure, Resolution, Revenge and Repulse.

Authorisation was received from the Scottish Environment Protection Agency on 1st December 2016 for the discharge of radioactive waste from Initial Dismantling at Rosyth Business Park. The Authorisation (now replaced by a Permit under the Environmental Authorisations (Scotland) Regulations 2018) had reduced gaseous and aqueous discharge limits to reflect planned operational requirements, thus reducing the potential maximum (if not actual) radiological discharges to air and water. Following this, Low Level Waste removal from Laid Up Submarine Swiftsure commenced in December 2016, with the removal of in contract scope ship's system equipment through the specialist In-Dock Installation Facility to the dockside. Active waste is sent to the Active Waste Accumulation Facility (AWAF) to allow processing and dispatch, with metallic waste then going to a specialist contractor for recycling or disposal. Further monitoring of "Out of Scope" waste is carried out in the Clearance Monitoring Facility adjacent to the AWAF before dispatch for recycling or disposal.

Low Level Waste removal from Laid Up Submarine Repulse was completed on time and to budget and the boat was returned to afloat storage. Revenge waste is largely consigned except the large low level waste that together with Repulse solid waste is currently being safely stored on site while preparatory work is carried out prior to consignment off-site for final treatment and disposal. The small volume of liquid waste was processed on site in the Portable Effluent Treatment Facility.

Laid Up Submarine Swiftsure is now docked down in the 2 Dock facility for the last time as full dismantling is underway.

Stage 2 activities are currently in the scheme/engineering design phase and are a collaborative effort between Babcock and the MOD. The original concept design was achieved using Cavendish Nuclear as the principal designers. RRDL and Cavendish will progress the project together bringing the relevant expertise from Cavendish Nuclear to the project. The Office for Nuclear Regulation and the Scottish Environment Protection Agency are regularly consulted on the Stage 2 design process and the supporting organisation.

An examination of environmental performance in this eighth year of operation shows the project is being satisfactorily carried out in compliance with its Authorisation and Consent and with lessons learned that are benefiting the dismantling process and will do so in the future. A number of Key Performance Indicators have been identified and show continued benefits and environmental compliance.

There are no significant changes to the mitigation measures that were submitted in 2014 in the Environmental Statement and in subsequent Environmental Management Plans.

A copy of this document will be sent to the Office for Nuclear Regulation and be made available to the public. Copies will be held at Parkgate Library, Parkgate, Dunfermline KY11 2JW and at Babcock Visitor Centre, Rosyth Business Park, Rosyth, Dunfermline KY11 2YD.

Abbreviations/Definitions

Abbreviation	Definition
ALARP	As Low As Reasonably Practicable
AWAF	Active Waste Accumulation Facility
BPM	Best Practicable Means
EAR	Environmental Aspects Register
EASR18	Environmental Authorisations (Scotland) Regulations 2018 *(replaced RSA93 on 1st September 2018)*
EIADR	*Nuclear Reactors* (Environmental Impact Assessment for Decommissioning) Regulations 1999 as amended in 2006 and 2018
EMP	Environmental Management Plan
EMS	Environmental Management System
ES	Environmental Statement
ETC	Effluent Transport Container
GDF	Geological Disposal Facility
H&S	Health and Safety
HECA	Hazard Evaluation & Consequence Assessment
HEPA	High-Efficiency Particulate Air
HGV	Heavy Goods Vehicle
HP	Health Physics
ID	Initial Dismantling
IDI	In-Dock Installation (Facility)
ILW	Intermediate Level (Radioactive) Waste
ISD	In Situ Dismantling
ISO	International Organisation for Standardisation
KPI	Key Performance Indicator

LAM	Large Articles Monitor
LfE	Learning from Experience
LLC	Local Liaison Committee
LLW	Low Level (Radioactive) Waste
LoA	Letter of Approval
LTA	Lost Time Accident
LUSM	Laid Up Submarine
MOD	Ministry of Defence
MoU	Memorandum of Understanding
NERO	Nuclear Emergency Response Organisation
NMP	Nuclear Maintenance Procedure
NTB	Non-Tidal Basin
NVQ	National Vocational Qualification
NWS	Nuclear Waste Services
ONR	Office for Nuclear Regulation
Out of Scope	'Out of scope' of regulation. Effectively, 'out of scope' equates to 'not radioactive' for the purposes of the legislation and not subject to any regulatory requirement.
PETP	Portable Effluent Treatment Plant
PST	Primary Shield Tank
RAMS	Radiation Alarm and Monitoring Systems
RC	Reactor Compartment
RCL	Radiochemistry Laboratory
RIDDOR	Reporting of Injuries, Diseases and Dangerous Occurrences

RPV	Reactor Pressure Vessel
RRDL	Rosyth Royal Dockyard Limited
RSA 93	Radioactive Substances Act 1993 (*now replaced by EASR18)*
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SADP	Survey and Docking Period
SDP	Submarine Dismantling Project
SEPA	Scottish Environment Protection Agency
SME	Subject Matter Expert
SPA	Special Protected Area
SQEP	Suitably Qualified and Experienced Personnel
SRF	Ship Recycling Facility
SSSI	Site of Special Scientific Interest
UNS	Urenco Nuclear Stewardship
VETS	Vessel Equipment Tally System
VOC	Volatile Organic Compounds

1. Introduction

An Environmental Management Plan (EMP) is required following the granting of Consent by the Office for Nuclear Regulation (ONR) to undertake decommissioning (dismantling) of the seven out-of-service defueled submarines at Rosyth Business Park.

Rosyth Royal Dockyard Limited (RRDL) at Rosyth Business Park applied for Consent under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (as amended) (EIADR) [Reference 1]. An Environmental Statement (ES) [Reference 2] was submitted, as is required by the Regulations.

The Consent was granted in October 2014 [Reference 3] with six Conditions, four of which relate to the required EMP. The ONR Decision Report and the Conditions can be viewed on the ONR website.

The EMP is a stand-alone document that reports on the progress of the decommissioning project over a period of time, and which is submitted annually to the ONR. As such, an EMP identifies mitigation measures, reporting on their implementation and effectiveness and any changes to such measures in light of experience.

This, the eleventh EMP, reports on the work undertaken on the Submarine Dismantling Project (SDP) at Rosyth Business Park from September 2023 to August 2024.

2. Scope of the Environmental Management Plan

2.1 Initial Dismantling

Initial Dismantling (ID) forms a part of the Ministry of Defence (MOD) wider SDP. This encompasses the provision of facilities, personnel and processes to dismantle twenty-seven defueled nuclear powered submarines of past and current in-service classes. Its stated aim is to ensure that the implementation of any solution is safe, environmentally responsible, secure, cost-effective and inspires public confidence.

MOD/Babcock have developed a staged approach to ID. The four stages are defined as follows:

- Stage 1, involves the docking of the submarine and removal of the majority of the Low Level radioactive Waste (LLW) primarily within the Reactor Compartment (RC). Stage 1 is generally conducted during the routine docking and maintenance of each laid-up submarine.

- Stage 2, will involve removal of the remaining LLW and the Intermediate Level radioactive Waste (ILW), namely the Reactor Pressure Vessel (RPV) and the Primary Shield Tank in which it is housed.

- Stage 3, will involve radiological clearance of all areas of the LUSM. The process for clearance is based on historical data of radiological events, submarine system functionality and the findings of a working group consisting of ex-operators, employees with experience of refitting history and radiological waste SME.

- Stage 4, will involve total dismantling of the LUSM at Rosyth excluding materials removed in Stages 1 to 3. The work will be done in partnership with a selected shipbreaking subject matter expert organisation to ensure best practice is adopted.

This stage will recycle the majority of non-radioactive waste back into the supply chain under controls that align with the regulatory expectations of ONR and SEPA. This will also provide critical LfE regarding the effectiveness of Stage 3 and security declassification.

The project continually assesses the lessons learned from dismantling each submarine in order to improve the dismantling process and their supporting facilities for the remaining submarines. This demonstration also refines and confirms the rigorous safety and security procedures which are followed in the design and operation of the dismantling facilities, and processes, and refines radiation dose and discharge projections.

2.1.1 Stage 1 ID Programme Overview

On 1st December 2016, two necessary 'permissions' were issued by the Scottish Environment Protection Agency (SEPA). These were;

- The Letter of Approval (LoA) allowing the MOD to dispose of solid and liquid radioactive waste by transfer to RRDL and
- The Authorisation granted to RRDL under the Radioactive Substances Act 1993 (RSA93) [Reference 4], allowing the disposal of LLW in solid, liquid and gaseous form; with limits being set on the discharge of liquid and gaseous wastes to the environment[1].

A new Memorandum of Understanding (MoU) between SEPA and MOD has been agreed. Now that the MoU has been signed, this will enable the new LoA to be issued to MOD under EASR18. This will supersede the current LoA issued under RSA93. RRDL have submitted a variation to their permit to allow ILW to be received from MOD and to request an increase in discharge limits related to Stage 2 dismantling. SEPA has indicated that the MOD will not need to apply for a LoA change but it will be prepared in tandem with the RRDL permit change process. The application has been submitted to SEPA and is expected to be issued in early 2025.

Stage 1 dismantling of the first 'demonstrator' submarine, Laid Up Submarine (LUSM) Swiftsure commenced in December 2016 and has continued on Resolution, Revenge and Repulse. The waste generated was segregated in two separate waste streams, active and non-active (Out of Scope)[2]. The active waste is then disposed of as low level radioactive waste, following treatment to segregate waste which can be recycled. The Out of Scope waste is routed through the Clearance Monitoring Facility into the conventional waste stream.

Active metal waste is transported to the Active Waste Accumulation Facility (AWAF) and is anonymised, packaged and transported to a waste treatment/disposal facility.

Non active waste is identified at source based on the fact that there is no, or minimal, likelihood that it has come into contact with radioactive material or has been activated. This waste is sent to the Clearance Monitoring Facility adjacent to the AWAF to verify it can be disposed or recycled as Out of Scope waste. The verification is completed using the Large Articles Monitor (LAM). Disposal of such material is via conventional means. Recycling or disposal methods follow a best practicable means approach when removing waste from site.

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1 Note that RSA93 legislation has been superseded by the Environmental Authorisations (Scotland) Regulations 2018 (EASR18), [Reference 5] and the Authorisations have been re-issued as Permits with some additions.

2 Out of Scope equates to 'not radioactive' for the purposes of the legislation and not subject to any regulatory requirement.

LLW dismantling of LUSM Swiftsure was completed successfully and completed hull restoration works allowed undocking and her return to her berth in the Non-Tidal Basin (NTB) on 27th August 2018. By March 2019, all Swiftsure solid waste had been consigned off-site for final treatment and disposal and the small volume of liquid waste processed.

LUSM Resolution was docked down on 13th December 2018. Removal of Stage 1 LLW was completed, and she returned to afloat storage on 9th March 2020. Aqueous waste was generated from Resolution and was processed through onsite Portable ETP, then discharged to sea.

To support best practicable means assessments for waste disposal, sampling campaigns were conducted in late 2021. Sampling was carried out on large low level waste items and pipework on Resolution and Revenge and the Resolution samples were sent to an off-site laboratory for analysis. Radioactive waste from Resolution was characterised and waste disposal occurred in early 2023.

LUSM Revenge was docked in March 2020 and Stage 1 LLW removals were completed in June 2021. Large item low level waste removals began in September 2021. Characterisation of Revenge and Large Low Level waste items has been done and disposal of the majority of this waste was completed in Q1 2024. The Large LLW disposal is being arranged through the UK disposal framework with a specialist company being down selected. Arrangements are currently being planned for transportation of large LLW to disposal contractor.

Planning is underway for the removal of historical waste ion exchange resins from Rosyth, and disposal operations are expected to start in 2025.

A new “Out of Scope” Clearance Monitoring Facility has been built on the licensed site at the AWAF. An environmental assessment was carried out to comply with EIADR and there is no significant effect as regards the original project EIADR submission. This facility was completed and has been commissioned and brought into service in late 2023.

The 5 year integrated programme, jointly agreed between Babcock and MOD at Rosyth, for the disposal of 7 boats is finalised and in now in use.

2.1.2 Scope of this Document

The content and format generally follows guidance issued by the ONR and includes a description of management systems and procedures, reporting progress of the dismantling project and the mitigation measures employed. It examines RRDL’s environmental performance, detailing the main impacts of the work and lessons learned. The work planned for the next year is also described.

2.1.3 Matters outside the Current Scope of this EMP 2024

The EMP is updated annually and consequently the detail will change as the project moves through implementation and then to closure. Any changes to the project will be reported.

A high level description of the current Design Phase of Stage 2 is given in Section 5.3. In 2024 Swiftsure will commence the clearance of remaining LLW removal prior to any Stage 2 dismantling.

2.2 Matters outside the Scope of the EMP

Activities out with the RRDL scope of responsibility, beyond ID, are the responsibility of the MOD and not of RRDL and will not feature in the EMP, other than as a brief mention. These include:

- Site selection, construction and operation of the interim ILW store to which the removed RPVs will be transported and stored until the Geological Disposal Facility (GDF) is available for final disposal. The MOD signed a contract in 2017 with Urenco Nuclear Stewardship (UNS) for the storage of the RPVs in an existing facility (to be upgraded) at Capenhurst in Cheshire.

- Design and procurement of an RPV transport container and subsequent transportation to the interim store.

- Final dismantling and recycling of the materials of the radiologically cleared submarine will now be conducted at RRDL for the first LUSM Swiftsure. An independent study commissioned by MOD has demonstrated that this is the preferred option as regards security, safety and radiological safety.

- The dismantling of the 16 submarines at Devonport.

2.3 Geographical Scope

The Plan is centred on the areas of operation within Rosyth Business Park and its immediate environs of the Forth Estuary and the adjacent residential areas. ONR is satisfied that SDP ID at Rosyth is unlikely to have significant environmental effects on other European Economic Area States and thus specific mitigation measures are not required.

2.4 Environmental Assessment Topics included within the EMP

These were assessed in the Environmental Statement (ES) and the mitigation measures then put forward are reviewed and updated and are included as Appendix B.

The topics are:

1. Radioactive Discharges.
2. Air Quality and Climate.
3. Flora and Fauna (Ecology).
4. Landscape and Visual Amenity.
5. Material Assets including Cultural Heritage.
6. Population, Socio-Economics and Health and Wellbeing.
7. Soil, Geology, Hydrogeology and Land Contamination.
8. Water Quality and Resources.
9. Noise, Vibration and Nuisance, including Dust Emissions.
10. Traffic and Transport.
11. Waste Management and Sustainability.
12. Land Use and Materials.
13. Interaction of Project Impacts and other Developments.

3. The Site and Surrounding Areas

3.1 Site Description

Rosyth Business Park is situated at Rosyth near Dunfermline in the county of Fife, Scotland. It is on the north bank of the environmentally and commercially important estuary of the River Forth, about 2km west (upstream) of the Forth Rail Bridge and the two Forth road bridges, the Queensferry Crossing carrying the M90 and the original Forth Road Bridge that now forms the public transport corridor.

Figure 1: General Location Plan

The defueled laid up submarines are berthed on the southern side of the NTB. Dismantling is undertaken within the nuclear licensed site at Dock No. 2, a massive concrete and granite structure, with the entrance from the NTB fitted with a steel caisson. Dock drainage is normally to the NTB. Surface water from the Business Park areas discharges at authorised discharge points to the NTB and to the Forth Estuary.

The AWAF is a purpose built facility for the characterisation, treatment and dispatch of solid LLW in preparation for its disposal and for the safe storage of ILW. The AWAF forms part of the nuclear licensed site but is separate from Dock No. 2 and is within its own secure compound.

Immediately downstream on the eastern side of the Rosyth Business Park are the Port of Rosyth and an area of land zoned for future employment development. Collectively, the area is known as the Rosyth Waterfront.

3.2 Sensitivity of the Receiving Environment

The main settlements nearby are Rosyth and Dunfermline to the north but there is no resident population within 0.5km of the site in any direction. The Heavy Goods Vehicle (HGV) traffic route to and from the Business Park and the M90 follows the lower road through the industrial Rosyth Waterfront and not through residential areas.

Rosyth Business Park is located adjacent to the sensitive environment of the Firth of Forth Special Protected Area (SPA) and Ramsar Wetland of International Importance. The SPA is underpinned by the Firth of Forth Site of Special Scientific Interest (SSSI). Upstream is the Special Area of Conservation (SAC) of the River Teith, a tributary of the River Forth. Radioactive aqueous discharges from RRDL are made to the Forth Estuary, in compliance with the Permit under EASR18.

There is little floral and faunal diversity within the Business Park and all the sites where ID activities take place have hard cover and are in current industrial use. There are no natural streams flowing through the Business Park.

ONR concluded in its Decision Report [Reference 3] that in its opinion, the ES (including evidence) showed overall, the predicted environmental benefits far outweighed any adverse environmental effects of the project.

There were no impacts judged to be significant.

3.3 Stakeholder Engagement

Stakeholder engagement is largely through the Local Liaison Committee (LLC) meetings that are held at Rosyth Business Park. The 2023 meeting of the LLC was held on site on June 13th with local councillors and health officials in attendance. The briefing provides an overview of all site activities whilst delivering a more detailed view of current and planned activities on the licensed site. No significant issues were raised by the attendees and local councillors expressed their thanks for the site visit that had been arranged and the briefing updates. The LLC meeting for 2024 was cancelled due to several major senior management changes. The LLC will resume in 2025. There has been no significant change in onsite operations over the year so the cancellation of the LLC was deemed to be tolerable.

4. Management Arrangements

4.1 RRDL Management System

RRDL has management systems in place to ensure compliance with all health, safety and environmental protection requirements and to secure a high standard of performance in all its undertakings. Contractors working within Rosyth Business Park are required to conduct their operations in the same manner. The overarching Occupational Health and Safety and Environmental Policy Statement [Reference 6] are reproduced as Appendix A.

Documentation supporting and implementing the corporate policy statements follows a tiered system from Company Procedures prescribing the controls for specific subject areas through to working level instructions and procedures.

4.1.1 Quality Assurance

The associated business entities of RRDL, trading as: Babcock International Group - Marine Engineering & Systems, are certified to ISO 9001: 2015 by third party, Det Norske Veritas. (DNV).

4.1.2 Health and Safety Assurance

The associated Health and Safety (H&S) business entities of RRDL are certified to International Organisation for Standardisation's (ISO) ISO 45001 This accreditation was achieved on the 22nd of September 2020.

There was one RIDDOR/Lost Time Accident (LTA) over the period where an operative tripped over a pallet which was securely stored on the dockside. Over 1,000,000 project hours have been executed and recorded between Jan 2018 and Aug 2023 until this event. A number of safety initiatives have been introduced, together with training and workshops for safety culture improvement.

4.1.3 Conventional Environmental Management

The associated business entities of RRDL have been awarded ISO 14001 certification continually since February 2013 and successfully transitioned to the 2015 version in August 2018. Certification confirms its Environmental Management System (EMS) has been approved by DNV; the approval certificate identity number is C577195.

The Rosyth Occupational Health, Safety and Environmental Management Systems Manual HSE(R)-MAN-001 [Reference 7] details the series of environmental management Policy and Procedures documents and is promulgated by a robust education and awareness programme. Conventional environmental issues are managed through the Environmental Aspects Register (EAR) that is the heart of the ISO 14001 certified EMS.

The SDP ID operations have Environmental Aspect Registers (EARs) for activities in Survey and Docking Period (SADP), the AWAF, the Health Physics (HP) Laundry, the Radiochemistry Laboratory (RCL), the Emergency Response Centre, the High Intensity Calibration Centre, and LUSM Maintenance [References 8, 9, 10, 11, 12, 13 14, and 14]. These are each 'owned' by the manager of the relevant operation and record a description of each environmental aspect (activity or process) and the significance of its impact on the environment. It links each aspect to relevant control mechanisms[3], highlighting any environmentally critical control equipment.

RRDL have appointed DNV as ISO external assessors and over the period the site has remained as certified to;

ISO 9001 – Recertification with no major non conformances

ISO 14001 – Two periodic assessments of site with no major non-conformances

ISO 45001 – Two periodic assessments of site with no major non-conformances

With regards to the EARs, these are reviewed on a yearly basis by the owners within the Submarine Dismantling Project to ensure the information contained within is extant and up to date.

Babcock Marine has developed a sustainability charter to align its Environmental, Social and Governance arrangements with 11 of the United Nations Sustainable Development Goals. The strategy moving forward is;

- 2023/2024 –In year there has been Waste, Water, Decarbonisation, Energy and Biodiversity site specific management plans created.

RRDL will align and comply with the corporate strategy.

Babcock Marine Sustainability strategy is progressing well across the group with a number of key initiatives, which focus on environmental, societal and Governance arrangements.

Babcock sustainability mission is to help safeguard our planet and support our people, and communities. There are 6 strategic priorities that all sectors are working collaboratively on:

- Tackling Climate Change
- Managing our resources responsibly
- Protecting the natural environment
- Ensuring the health safety and wellbeing of our people
- Supporting our communities
- Building a diverse, including and resilient workforce.

3 Relevant control measures are local or company policies, procedures, process maps, risk assessments and other engineered control mechanisms and equipment.

These strategic priorities will be delivered through our people, our operations, our products & services, and our partnerships.

Rosyth has a 4-phase road map for achieving Net Zero by 2040, in line with Babcock overarching Plan Zero 40 strategy. This roadmap will drive the decarbonisation programme across Babcock estate, assets and operations. PlanZero40 commits Babcock to ambitious Science Based Targets in line with a 1.5°C limit to global warming and to deliver Net Zero by 2040.

An integrated energy system is currently being explored to generate onsite renewable energy, low carbon technologies including a solar farm and other options are being reviewed to maximise the green energy generated to reduce associated carbon emissions and improve energy efficiencies.

4.1.4 Nuclear and Radiological Safety

A series of Policy and Procedures documents govern nuclear related activities at Rosyth Business Park. The principal Company Procedure is the Nuclear Safety Management Manual [Reference 15] and specific instructions that implement the arrangements described in the Manual are defined in departmental procedures and instructions.

Arrangements for compliance with Licence Conditions are routinely inspected by the ONR. Inspections seek to judge both the adequacy of the arrangements and their implementation. ONR issues quarterly reports [Reference 16] regarding site inspections made and any resultant actions. In the ONR Chief Inspectors Annual Report, [Reference 17], the ONR statement confirmed that RRDL is classed as a routine attention category, which recognises the level of radiological hazard on-site is low. ONR is "satisfied" with RRDL's overall safety performance after carrying out interventions on-site throughout the past year, with no formal enforcement actions having to be taken on-site as a result of RRDL's interaction with them.

RRDL was advised by ONR of a trend in the site business management system whereby they had noted that "The Golden Thread" linking processes and the timely process reviews were not evident.

RRDL has added new processes as the organisation has grown and improved through Learning from Experience (LfE) over the progression of submarine dismantling and although the site governance processes have improved, the linkage of processes that the regulator refers to as "The Golden Thread" has not been maintained in all areas.

RRDL noted this action and has instigated a full review of SDP processes with respect to their applicability and their conformance to the requirements of the ONR Technical Inspection Guides (TIGs), This should complete in early 2025.

No formal SEPA reports were issued over the reporting period, but there were three site inspections over the year focussing on

- In Situ Objects Counting System (ISOCS) and active waste consignment management
- Training of Health Physics Staff
- New HP Laundry and Radiochemistry Laboratory tanks design and sampling processes

SEPA instigated weekly meetings with site following a cyber-attack on SEPA on 24th December 2020, which left SEPA without IT systems. From 2022 these meetings were, and still are, held on a monthly basis.

Upgrades to the liquid effluent storage tanks at the RCL and HP laundry were required to ensure compliance with the conditions in the Permit. These upgrades have now been completed and the SEPA action has been closed. See Section 5.2.

The site emergency response exercise was carried out in September 2024 and assessed as adequate.

4.1.5 Energy Management

Babcock in its Energy and Marine (Rosyth) Occupational Health, Safety and Environmental Policy Statement [Reference 6] commits to maximise utilisation of renewable energy sources. Energy assessment and energy saving identifications are currently being undertaken as part of the Babcock Group response to the Energy Savings Opportunity Scheme.

The heating system at the AWAF has also been overhauled which included recommissioning of a recirculation system to maximise heat transfer and reduce heating cost and energy usage. As the heating system is nearing end of life a study was commissioned to determine the optimum replacement system which assessed all available options. The result was a recommendation of a like for like replacement system. This is not an urgent requirement as the system remains operational but funding of this upgrade will now have to be planned to add this upgrade into the AWAF operation and maintenance.

4.2 Radioactive Waste Management

The Company Procedure Radioactive Waste Management [Reference 20] contains instructions for the management of radioactive waste at Rosyth Business Park.

Radioactive waste is produced in the dismantling of the laid up submarines and from the supporting operations of the Portable Effluent Treatment Plant (PETP), AWAF, RCL and HP Laundry.

The policy of RRDL for the management of radioactive waste is as follows:

a. To ensure that work is planned so as to minimise the production of radioactive waste.

b. To remove radioactive waste from the workplace as soon as practicable.

c. To ensure that exposures to ionising radiation during the handling and processing of radioactive waste are As Low As Reasonably Practicable (ALARP).

d. To ensure that the risks to workers and to members of the public from the management of radioactive waste are ALARP.

e. To make optimum use of authorised disposal routes and to reduce the volume of waste by the Best Practicable Means (BPM).

4.2.1 Waste Hierarchy

It is an underpinning part of RRDL policy for the management of all wastes at Rosyth Business Park (including radioactive waste), that the principles of the Waste Management Hierarchy are applied (see Figure 2 below).

This policy is applied throughout all work from the planning stages onwards.

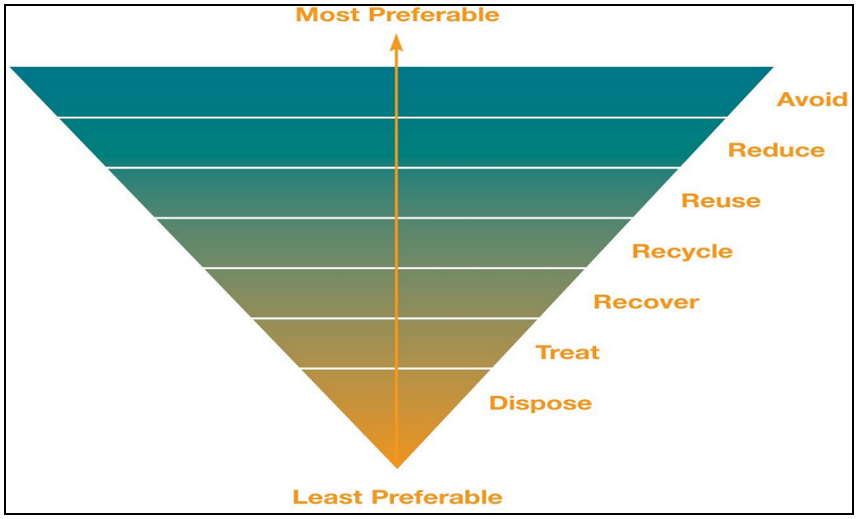

Figure 2: Waste Management Hierarchy (reproduced from Reference 20)

Where characterisation indicates that materials are contaminated rather than activated, treatment and recycling routes are included in the options considered for waste management.

4.2.2 Management Strategy for Wastes from SDP ID

Management of all types of waste envisaged to be produced during Stage 1 ID within the SDP are communicated in the SDP Waste Management Policy Document [Reference 21] and supporting documents.

The activities and processes of the dismantling and removal of waste from the RC are managed by use of Logic Linked Nuclear Procedures. These manage waste segregation in the IDI Facility as LLW or 'Out of Scope' by a combination of provenance and radiological monitoring. Movement to the AWAF or Clearance Monitoring Facility, subsequent further monitoring, treatment and dispatch is all carried out under HP control. Every item removed from the RC bears a unique identification using a Vessel Equipment Tally System (VETS) that is followed and updated through the entire process, recording detailed information about the item. This generates an auditable trail through the waste management streams and subsequent disposal.

Monitoring and mitigation strategies have been described in some detail in Sections 7.2 and 7.3 of the Environmental Management Plan 2017 [Reference 22] and mitigation measures are summarised in Appendix B, Mitigation Measures Minimising Environmental Impacts Learning from Experience

The site waste strategy has undergone improvement as a result of questionable/non-credible data arising from the initial Swiftsure waste recycling campaign.

The investigation concluded that the melt report results related to the mixing of SDP waste with another operator's waste at the third party smelting facility. Nonetheless, the improvements we implemented as a result of the discrepancy has allowed us to make our characterisation and monitoring methods more robust.

A robust "waste fingerprint" now informs characterisation of radioactive waste. Detailed Best Practicable Means (BPM) assessments are produced to ensure that radioactive waste is managed and disposed of in accordance with the requirements of the waste hierarchy. Both ONR and SEPA have been kept appraised of progress in this area.

RRDL is in contract with Nuclear Waste Services waste disposal framework to align with arrangements that are used by most, if not all, nuclear operators in the UK.

The Project has adopted a Leaning from Experience (LfE) system whereby experiences or issues that may be beneficial or problematic to the project are identified – these are captured, assigned an owner and entered in the Register. Each experience or issue is impact assessed and actions taken forward. These matters are discussed regularly, and the lessons learned are promulgated and incorporated into the project methodology.

Also current are the Continuous Improvement Register, Babcock's Accident and Incident Reporting System (Synergi Life) reporting accidents, faults and near misses and the 'That's Not Right' boxes for suggestions. These systems all add to the 'No Blame' culture of encouraging reporting and improvements.

5. The Project Activities, September 2023 to August 2024

5.1 LUSM Revenge, Repulse and Swiftsure Stage 1 Dismantling

Revenge

This LUSM was returned to safe storage in the non-tidal basin in January 2022. Processing of all the low level waste removed has been ongoing in the AWAF over the reporting period with disposal from site to a specialised waste contractor achieved in early 2024.

The large low level waste has remained in temporary storage whilst final transport arrangements are put in place to allow safe transport to the selected recycling contractor.

Repulse

Repulse was brought into 2 Dock on 7th February 2022 and docked down to commence low level waste removal.

Low level waste removal commenced in August 2022 and completed in April 2023.

The waste has undergone characterisation and arrangements will now proceed for disposal to a specialist contractor in 2025.

The hull survey and re-preservation also completed in April 2023 which allowed the LUSM to be returned to safe storage in the non-tidal basin.

The asbestos lagging which was removed whilst submarine was in basin storage was removed from the submarine in 2022/23. The asbestos waste was processed at the AWAF then removed from site by a specialist contractor to be disposed of at Avondale waste facility.

Swiftsure

LUSM Swiftsure returned to 2 Dock in July 2023 and was docked down for the last time, As the demonstrator this LUSM will be the first to undergo full dismantling.

Scheduled work will include;

- Removal of all remaining low level waste from the LUSM
- Removal of large low level waste from the LUSM.
- SDP Stage 2 – removal of reactor pressure vessel and processing ashore.
- SDP Stage 3 – Full radiological clearance of the complete LUSM.
- SDP Stage 4 – Full dismantling of the LUSM for recycling into the conventional waste stream.

5.1.1 Waste Disposal

The site waste disposal processes with respect to radiological and non-radiological waste continue to benefit from the review carried out during Covid. The site continues to process radiological waste and has disposed of 82.6 tonnes of radioactive low level waste to specialist disposal contractors and 84.282 tonnes of non-radioactive waste into the site conventional waste/recycling disposal arrangements.

5.1.2 Asbestos-Contaminated Lagging Disposal

Assessment of the data resulting from a detailed sampling and analysis plan of Repulse asbestos contaminated lagging demonstrated that it required to be classified as radioactive waste. However, the low radioactivity content of the lagging waste made it suitable for disposal in a licensed asbestos disposal site under the standard condition G.3 to RRDL's Environmental Permit under EASR18.

Repulse was de-lagged whilst afloat in the NTB and the waste stored on board until it was brought into No.2 Dock as agreed with SEPA and MOD. The bags of hazardous asbestos lagging waste were removed from Repulse and assayed using the Large Articles Monitor in the AWAF. The bags filled four asbestos skip containers, which were disposed of to the Avondale Authorised Asbestos Disposal Site at Polmont near Falkirk in 2023. At the licensed asbestos disposal site, it was disposed of in a capped asbestos cell which provides an additional and robust layer to protect the environment. The total weight for the consignment was circa 11 tonnes.

There has been no bulk lagging removal in year but there has been several occasions where unexpected asbestos has been found during dismantling. This is unavoidable in vessels of this age but all staff are trained to recognise asbestos and when presence is suspected the site specialised contractor is brought in to deal with the issue under proper controls.

5.2 Other Supporting Works

The RCL successfully achieved re-accreditation in Aug 2022 by UKAS and is able to conduct all routine radiochemical analytical work required to support SDP, the 2nd of 3 annual surveillance visits took place in Aug 24 with no major findings by the surveillance team.

The present underground storage tank that holds the RCL aqueous waste before treatment and disposal was replaced in order to best comply with conditions within the Environmental Permit from SEPA issued under EASR18. Initially it was thought that above ground storage was achievable, however, it was not possible to identify a suitable location for the tank without incurring substantial additional costs remediating ground which is not currently utilised by to the project. Instead, a minimum 2000 litre fully bunded tank with leak detection and filtration installed and commissioned in the present tank location. Control of this system is now undertaken remotely, meaning content agitation, sampling and pumping can be completed with less exposure to the operators.

The HP Laundry aqueous waste is now stored within a 2000 litre fully bunded tank with leak detection and filtration inside the laundry as opposed to the confined space where the old tank is located. The effluent generated from the washing machines will be accumulated, agitated, sampled and once proven to contain no radionuclides, is discharged straight to the grey water sewer as agreed with SEPA.

Discharge rates from this system are recorded using an inline effluent counter. If the effluent is found to contain radionuclides, the tank will be pumped into the Effluent Transport Container and will be treated as active waste and disposed of within that process.

As the AWAF heating system is ageing, a heating consultant was commissioned to carry out a facility assessment with a view to upgrading the system in line with current technology such as the use of heat pumps etc. The study is complete and has shown that the current system remains as the most environmentally efficient and has recommended like for like replacement of the boiler albeit to a more efficient model. This is not an urgent requirement as the system remains operational but funding of this upgrade will now have to be planned to add this upgrade into the AWAF operation and maintenance.

2 Dock infrastructure repair works are now complete with dock bottom surface deterioration investigated and repaired and spalling on dock walls repaired by local external specialists. There is ongoing work to determine the cause of what appears to be either “settling” or minimal subsidence in one of the 2 Dock service ducts.

5.3 Stage 2 Activities

Following a previous customer request to review the way the RPV is removed from the boat the preferred method was finalised in March 2021 which concluded that the best practical method for removal of the RPV is through an aperture cut in the side of the boat. This decision supported the ‘Concept Design’ phase that commenced April 2021. The object of Concept Design is to finalise the dismantling methodology with an expected completion of April 2022. The final design review in December 2021 identified 6 areas where further work was required to fully justify that the concept design would meet the customer requirements. Work on these 6 “studies” is now complete.

Following on from completion of Concept Design, the Scheme/Engineering Design of Stage 2 has progressed over the reporting period. This design and safety work has detailed the following:

- Boat hull cutting and remediation; RPV removal from the boat and transportation of the RPV to the dockside.
- Dockside building together with groundwork requirements.
- Dockside building outfitting including building services and production equipment.
- Handling of the ILW and loading the RPVTC in preparation for road transport.
- Nuclear and conventional waste processing and disposal.

This work will complete late 2024/early 2025 to allow the project to progress into detailed design and construction.

ONR and SEPA are being regularly consulted on the Stage 2 design process and the capability of the supporting organisation.

5.3.1 Further Options for Stage 2

The high-level optioneering process has ended following the completion of Stage 2 Concept Design and agreement that the concept developed by RRDL is in line with MoD’s expectations. Achievement of this significant concept design milestone has allowed RRDL to engage with ONR to identify the hold points throughout the Stage 2 Engineering and Detail Design phases. Further work to develop a hold point control plan to support the ONR permissioning plan will be undertaken in early 2025.

5.4 Planned Project Activities, September 2024 to August 2025

Activities as described above will continue throughout the remainder of 2024 and in 2025. In addition, the following activities are also planned in this period:

- Integration of new operating model to bring Cavendish personnel into the licensed site organisation which enables self-delivery of design and safety case for Stage 2.
- Continuation of engineering design for Resin Disposal.
- Upgrade of existing Radiochemistry laboratory as replacement is currently not deemed cost effective.
- Storage/Processing area for conventional waste removed from LUSM under Stage 4.

6. Environmental Performance, 1st September 2023 to 31st August 2024

All activities are conducted within the governance of RRDL environmental management policies and procedures.

6.1 Environmental Performance of Activities

6.1.1 Activities and Impacts of ID Stage 1 of LUSMs Repulse & Swiftsure

The primary and potentially impacting Activities are (see Sections 5.1):

1. Progressive removal of residual metallic waste materials in the pre-determined order from the RC.
2. Monitoring procedures effecting sentencing of metal wastes to radioactive and 'Out of Scope' waste streams.
3. Disposal of metallic materials for disposal to a Waste Permitted Person (a company permitted under environmental regulations to accept such materials).
4. Disposal of special waste.
5. Docking submarines.
6. Recruitment and training of additional staff.
7. Lessons Learned.

The main Impacts of these activities have been on the following environmental topics:

Radioactive Discharges and Disposals. (See Appendix C, Key Performance Indicators (KPI))

- LLW metallic waste from Repulse ID has been characterised and remains in storage pending disposal decision. A disposal method, which has been demonstrated to be BPM, has been agreed with the NWS framework and disposal will commence in 2025. Approximately 94 tonnes of LLW metallic waste from Repulse ID is safely stored in the AWAF, pending the results of characterisation analysis of samples of the Repulse waste to support identification of the BPM disposal method for this waste.
- Aqueous wastes were generated from work in the Radiochemistry Laboratory and Health Physics Laundry. The majority of the aqueous waste discharged is from the Health Physics Laundry, associated with the laundering of protective clothing such as coveralls worn by workers engaged on ID work. The radioactive content of these discharges is well within the authorised limits for disposal.

- RRDL successfully disposed of circa 23.6 m^3 of soft LLW in 2023/24 using the same specialist UK contractor as in 2022/23. This included some legacy waste as well as that generated from ID LLW removal.
- The following samples were sent to off-site laboratories to inform waste disposal:
  Swiftsure SG – 11 metal samples to GAU
  6 aqueous samples of RPV liquor to Jacobs Analytical Services
- In early 2021, a review was undertaken of monitoring procedures for the Out of Scope waste stream. This review recommended enhancements to improve the level or rigour used for waste sentencing, which will support future boats clearance. The reviewed process has been implemented for the M2 waste stream in 2022. This has been further enhanced by construction of a bespoke facility in the AWAF grounds which was commissioned in early 2023.

Population, Socio-Economic, Health and Wellbeing Characteristics

- There is a team of 57 personnel working as part of the Nuclear Operations industrial team which is composed of:
  The industrial team is made up of different industrial job disciplines, working as part of a composite team. Inclusive of mechanical fitters, electrical fitters, pipe fitters, shipwrights, fabricators, slingers/riggers and skilled labourers. This also includes Health Physics monitors and trainee monitors
- Training hours logged in the year are estimated to circa 2 to 3 days per member of the Nuclear Operations team. This includes mandatory training requirements that ensure a team of SQEP personnel is maintained and specific training that ensures Nuclear Operations team members are able to carry out their tasks. Training is provided by internal and external training providers as appropriate.
- A total of 180 non industrial people work directly for Babcock on SDP, this includes project staff, nuclear specialists, health physics and waste specialists and design and nuclear safety specialists. Mandatory training is provided for all these staff with specialist refresher training provided as mandated by the site training requirements. Some of the funded positions remain to be filled through the company recruitment process as part of normal business caused by attrition and staff movements, promotions etc.
- A total of 15 specialist contractors are employed on the projects.
- No complaints were received from residents or stakeholders pertaining to SDP operations.

Waste Management and Sustainability.

- Wastes are disposed of according to the principles of the waste hierarchy.

6.1.2 Other Supporting Works Related Activities and Impacts

The primary Activities were (see Section 5.2):

1. Upgrade of Nuclear Facility Alarm Monitoring System.
2. Maintenance of accreditation of RCL for analytical/characterisation support to SDP activities.
3. Repairs to dock and infrastructure.

The main Impacts of these activities have been on the following environmental topics:

Radioactive Discharges.

- Improvements to the liquid effluent storage tanks improves RRDL's compliance with SEPA's requirements and reduces risk of unauthorised disposal of radioactive aqueous liquid waste to the environment.
- Waste arisings from improvement works were confirmed to be non-radioactive and were disposed of through the normal business disposal routes, with no radiological consequences.

Population, Socio-Economic, Health and Wellbeing Characteristics

- Local and regional contractors have been used for upgrade/repair work. The purchase of goods and services has been of economic benefit locally and nationally. The RCL can now give routine and timely support to the project.
- No complaints were received from residents or stakeholders.

Waste Management and Sustainability.

- Wastes were disposed of according to the principles of the waste hierarchy.

6.1.3 Stage 2 Related Activities and Impacts

The primary Activities were (see Section 5.3):

- Multi stakeholder involvement in planning for Stage 2 Scheme/Engineering Design, and subsequent commencement of the Stage 2 Scheme/Engineering Design Phase.
- Engagement with a 'prime' contractor (Cavendish Nuclear) and subsequent specialist sub-contractors to support the Scheme/Engineering Design Phase. As a result of continuous review, a new collaborative approach has been adopted for the Design and Safety Case development phase. The Cavendish Nuclear team have been seconded into the licensee organisation to enable self-delivery of the project. The site written arrangements have been amended to facilitate this strategic change and it was the subject of a major organisational change. This means that the seconded Cavendish personnel will have direct accountability to the site duty holder. This collaboration is still the subject of continuous improvement.
- Design work completed in accordance with RRDL Design & Safety Justification process, which details the environmental impact assessment activities required to underpin the proposed Stage 2 Concept Design. The environmental impact assessment of the construction of the Stage 2 facility has been done and will be submitted to ONR in Q1/25.
- Stage 2 – Functional Specification cascades the RRDL Environmental Impact Assessment requirements to the seconded design and safety team.
- The Stage 2 Scheme Design work is circa 90% complete, at the time of reporting.
- Design work taking place in various offices (and homes) around the country.

The main Impacts of these activities have been on the following environmental topics:

Population, Socio-Economic, Health and Wellbeing Characteristics

- This has provided local work to the project team and to the UK based specialist sub-contractors. The purchase of goods and services has been of economic benefit nationally and locally.

- The recruitment and training of SQEP personnel has been of economic benefit nationally and locally.

Waste Management and Sustainability.

The previous waste campaign instigated the following process improvements that have been instigated over the reporting period.

- Continual review, of the M2 clearance process.
- Updated the BPM process using guidance supplied by SEPA which has now been accepted by SEPA and is being used.
- The site continues to use the NWS framework used by most nuclear operators.
- Improved characterisation process to better define our waste fingerprint is ongoing.
- The HP and Waste team resource is now suitably sized to support the waste led project.

6.2 Summary of Employment and Training

Over the past year, the Project team has increased in number from 178 to 237 persons. An ongoing concern that has been addressed is the skills transfer from an ageing workforce, who have many years of experience of refitting and maintaining the submarines and are retiring, to the younger generation that are continuing the work of submarine dismantling.

Apprentices are now employed on rotation in the operations department.

SDP now facilitates a throughput of graduates within the larger Babcock Graduate Programme.

6.3 Lessons Learned

Over the reporting period the Learning From Experience process has addressed 24 suggestions for review. The project continually assesses the lessons learned from each submarine in order to:

- Improve the dismantling process and the supporting facilities for the remaining submarines.
- Refine and confirm the rigorous safety and security procedures which will be followed in the design and operation of the dismantling facilities and processes.
- Validate radiological dose and discharge projections.

The LfE Register is actively maintained, and regular meetings of the team and the MOD ensure lessons are learned. This continues as learning from Repulse was captured and dismantling of LUSM Swiftsure is underway.

6.4 Summary

The stated aim of the Submarine Dismantling Project is to ensure that the implementation of any solution is safe, environmentally responsible, secure, cost-effective and inspires public confidence.

Initial Dismantling of the fourth submarine LUSM Repulse started in September 22. This enabled removal of all the remaining Low Level Waste excluding the Large Low Level Waste. The capability to remove Large Low Level Waste was proven on LUSM Revenge with lessons learned being implemented for final de-planting of LUSM Swiftsure.

The de-planting work on Repulse and the hull inspection and re-preservation completed in April 2023 when the LUSM was undocked and returned to storage in the Non-Tidal Basin.

The dock preparation for Swiftsure began in April 23 and completed in July 23 when Swiftsure was docked down for the last time as she will now be completely dismantled in 2 Dock. The hull wash down to remove marine growth was completed in August 23. Sampling of arisings from washdown is strictly controlled to ensure there is no transfer of noxious materials to the environment.

Stage 2 activities are currently in scheme/engineering design phase and are a collaboration between Babcock and the MOD. ONR and SEPA are regularly consulted on the Stage 2 design process and the supporting organisation.

The ONR Inspector confirmed no enforcement notices had been issued, signifying that safety arrangements were effective [Reference 16], albeit a full internal review of the site written arrangements is nearing completion which has captured numerous improvements. SEPA no longer use its Compliance Assessment Scheme, but the only remaining issue was the ongoing installation of new liquid aqueous waste tanks for the RCL and HP Laundry which has completed in period.

The H&S record is very good – there has been one lost time accident since project inception after a total of over 1,000,000 hours have been worked.

The prime concern of skills transfer from an experienced workforce to the new generation able to continue the work of submarine dismantling is being addressed. There has been further recruitment (mostly local) and training of personnel during this year. The Nuclear Operations team now employs apprentices on rotation.

The project has benefitted the local and national economy with local firms being contracted to undertake infrastructure renovations. Subcontracting work for Stage 2 is being undertaken by UK firms.

Radiological discharges to the environment are well below the radionuclide limits within the SEPA Permit.

The disposal route for soft trash (LLW and solid radioactive waste suitable for disposal in normal refuse) has continued to be utilised over the reporting period.

The internal suspension of radioactive waste disposal from the site has been lifted and LUSM Resolution waste has been processed and consigned to a specialist waste disposal contractor. Disposals were suspended until the internal review of the Swiftsure waste disposal was complete. All the lessons learned from this investigation have been incorporated into site process including the site signing up to the Nuclear Waste Services Framework to align Rosyth with other nuclear operators.

A spreadsheet recording project Key Performance Indicators (KPI) is attached as Appendix C - KPI Record, and is updated each year. For the 12 month period, September 2023 to August 2024, KPIs identified are:

- Radiological Discharges including LLW metallic waste dispatched for recycling.
- Non-radiological materials dispatched for recycling or for landfill.
- Recruitment of Personnel and Training Hours.
- Complaints from general Public and Stakeholders.
- Manhours Worked and Accidents.

7. Changes to the Project and Environmental Management Plan

Excluding those detailed in Section 7.1, there have been no changes to the Project and to the EMP other than the improvements and refinements brought about by the ongoing dismantling process.

There are no significant changes to the mitigation measures that were submitted in the ES [Reference 2] and in the previous EMPs.

The table describing the Environmental Impacts, Mitigation Measures and Actions is given in Appendix B.

7.1 SDP Stages 3 (Radiological Clearance) & 4 (Full LUSM Dismantling)

The SDP strategy was submitted to ONR in 2014 in the Environmental Statement.

The intent of the project was to remove all radioactive material from the LUSMs (Stages 1 & 2) then to radiologically clear the rest of the LUSM (Stage 3) prior to hull reinstatement and transfer to a conventional ship recycling facility for breaking (Stage 4).

The MOD carried out a study to review this strategy and ultimately the approach has been fundamentally changed in that Stage 4 will now be carried out at Rosyth.

This decision is underpinned by an optioneering study that illustrated that the benefits of breaking the demonstrator (Swiftsure) far outweighed the original strategy.

An Environmental Impact Assessment (EIA) is now being undertaken to underpin this decision with respect to potential environmental effects.

Appendix A - Environmental Policy Statement (Rosyth Business Park)

The Organisation shall:

- Ensure there is a commitment to meet the requirements of both ISO 45001:2018 & ISO 14001:2015 certification.
- Commit to providing safe and healthy working conditions for the prevention of work-related injury and ill health that is associated to its operational health and safety risks and opportunities.
- Comply with all applicable legal requirements that relate to our activities including, but not limited to, the responsibilities contained within the Health & Safety at Work Act 1974, the Nuclear Installations Act 1965, the Environmental Protection Act 1990 and any specific Ministry of Defence, customer, interested parties or other requirements to which our organisation subscribes.
- Provide a commitment to fulfil its legal and other compliance obligations.
- Identify and assess hazards arising from our operations and processes and take such steps as necessary, to eliminate or reduce the health, safety and environmental risks so far as is reasonably practicable to employees, visitors, subcontractors and customer personnel whilst at work and who may be affected by their operations.
- Ensure senior management communicate to all persons working under the control of the organisation to ensure they are aware of their health, safety and environmental obligations.
- Ensure senior management recognise their responsibilities to consult with their employees under the Health and Safety (Consultation with Employees) Regulations.
- Provide information, instruction, training and supervision to ensure all our employees understand and embrace the requirements of the Occupational Health Safety and Environmental Management Systems.
- Identify and assess the environmental aspects and the associated impacts arising from our activities and take such steps as necessary, to eliminate or reduce so far as is reasonably practicable the adverse effects on the environment.
- Ensure there is a commitment to identify improvements in the management of energy, resources, emissions and discharges in all activities where economically viable.
- Ensure there is a commitment to address any identified non-conformities within Occupational Health Safety and Environmental Management Systems.
- Ensure there is a commitment to continual improvement and the progressive enhancement of Occupational Health Safety and Environmental Management Systems performance.
- Identifying and setting Occupational Health, Safety and Environmental objectives and providing the framework for measuring and regularly reviewing the objectives and outcome.
- Propagating and developing a proactive Health, Safety and Environmental Just Culture.
- Encourage our colleagues to intervene if we see any unsafe behaviours and encourage others to challenge any unsafe working practices.
- Our organisation recognises that continual improvement in our Occupational Health Safety and Environmental Management Systems has positive benefits to its employees, its customers, the environment and for our company's reputation.

Gareth Hedicker
Chief Operating Officer, Marine
November 2024

Appendix B - Mitigation Measures Minimising Environmental Impacts

Environmental Topic/Sub- Topic	Nature of Impact	Mitigation Measure	Action
1.**Radioactive Discharges**	Aqueous, gaseous and solid radioactive discharges are generated that could cause concern to human health and the environment.	Best Practicable Means (BPM) measures being employed for management of solid, liquid and gaseous radioactive wastes and discharges throughout the design and operation of the Project. Stage 1 ID is being accomplished within lower limits than the previous RRDL discharge limits under EASR18. A submission to SEPA is nearing completion of due process to increase discharge permit limits for SDP Stage 2.	RRDL is required to demonstrate compliance with Site License Conditions 32 and 33 regarding Radioactive Waste Management. See Reference 20. The Head of Radioactive Waste Management and Health Physics has overall responsibility for the provision of a radioactive waste management service.
1a. Radioactive (Aqueous) Liquid Effluent discharges	Discharge is to the internationally designated and environmentally important Forth Estuary.	The cutting processes within the RC and the AWAF are dry and do not generate liquid arisings. The Portable Effluent Treatment Plant (PETP) is used to process effluent (from residual water within the ship's systems and tool decontamination) to minimise discharges to the environment. Stage 1 ID is undertaken within reduced aqueous discharge limits and in accordance with Conditions of the EASR18 Permit.	Engineered measures and administrative controls are employed to minimise volumes and activities of discharges. All discharges are sampled prior to release and records maintained.
1b. Radioactive Potassium Chromate Solution	This is a lightly radioactive oxidising agent with persistent toxic qualities.	The potassium chromate system will remain undisturbed in containment in the RC during Stage 1 until it is removed and disposed of by a specialist contractor in Stage 2. Where residual potassium chromate is found outside the containment of PST, appropriate mitigation actions must be determined to ensure a safe place of work & that no harm can result to the environment. Sampling thus far has shown that this solution is not radioactive.	These procedures have been followed in managing residual contamination in the RC. No contaminated non-active items were disposed of as Special Waste in the reporting period. For Stage 2, BPM will be demonstrated for handling of potassium chromate solution.

Environmental Topic/Sub- Topic	Nature of Impact	Mitigation Measure	Action
			Under no circumstances will this be discharged to the aqueous environment
1c. Radioactive Gaseous Discharges	Gaseous discharges are primarily associated with cutting and size reduction of radiologically contaminated materials.	All work is undertaken in High-Efficiency Particulate Air (HEPA) filtered containments within the RC and the AWAF. Stage 1 ID is undertaken within reduced gaseous discharge limits and in accordance with the EASR18 Permit.	Application of As Low as Reasonably Practicable (ALARP) and BPM.
1d. Solid Radioactive Waste	Solid LLW material will be cut from the submarine RC, characterised, packaged and disposed of appropriately.	All work is undertaken in containment. All solid waste items are uniquely identified to ensure BPM management and disposal/treatment for maximising of recycling and minimising disposal to limited facilities. Waste is accumulated and disposed of in accordance with Conditions stipulated by the EASR18 Permit.	Management of the radioactive waste is the responsibility of the HP & RW Department. Application of ALARP and BPM and in compliance with the Waste Management Hierarchy.
2. Air Quality and Climate			
2a. Non-Radioactive Discharges to Air	Use of fuels and release of other, greenhouse or ozone depleting gases can influence air quality and climate change. There will be local, small impact of plant and vehicle exhausts throughout. Residual amounts of greenhouse and ozone	Plant and vehicle exhaust gases are minimised by good practice and maintenance but are a necessary part of the project. Electrification of plant and vehicles would reduce emissions locally. Any residual gases and liquids within redundant pipework are contained for appropriate disposal. Removal, treatment/disposal	Energy is used efficiently in compliance with the Energy Policy [Reference 19]. Opportunities are being sought for energy savings. The site facilities department have upgraded all their vehicles/ vans to electric power. Special (hazardous) wastes will be identified, and removal and disposal will be

Environmental Topic/Sub- Topic	Nature of Impact	Mitigation Measure	Action
	depleting gases or asbestos may be found within the submarines' systems.	measures for asbestos and asbestos lagging is addressed. Removal will be undertaken by qualified, experienced personnel in containment.	in compliance with Disposal of Special Waste Policy [Reference 23] and/or radioactive waste requirements. Control of asbestos processes are in place on site
2b. Climate Change and Energy Use	Climate changes are influenced by use of fossil fuels and release of greenhouse gases. Extreme weather events will necessitate local restrictions on activities.	See above for Energy Use management. Use is relatively small and cannot measurably influence climate change. Administrative controls and management arrangements ensure that in expectation of extreme weather conditions, certain operations will cease, and additional controls are established i.e., crane operations cease and storm anchors will be fitted.	The safety case defines limits for safe working.
2c. Coastal Change and Flood Risk	There is no new impact on coastal processes. The project will not increase the risk of flooding elsewhere but flooding of the site could occur.	Certain operations will not be carried out when extreme weather conditions are anticipated. See above. A forecast storm surge would result in work being made safe thus minimising risk.	As the project progresses, there may be a need to consider flood risk and provision of flood protection in line with regulatory expectations.

Environmental Topic/Sub- Topic	Nature of Impact	Mitigation Measure	Action
3. Flora and Fauna (Ecology)			
3a. The important habitat of the Forth Estuary	The Forth Estuary is the principal receptor with regard to ecological matters. Pathways for harm to occur are primarily: • By radioactive effluent discharged to the estuary, • By discharge to the licensed dock drainage system and discharge to the NTB. • From leaks and spills	See comment on Radioactive Liquid Effluent Discharges in Section 1a above. The risks of spillage into the dock's drainage systems are minimised by design and operational controls: • Any fuel storage or hydraulic oils required by plant working in the dock bottom (e.g., in cutting and replacement of hull inserts) is in suitable containers on the dockside with management procedures followed to minimise risks of spillage. • Any residual liquids found in the pipe systems are packaged in sealed carboys in the RC, placed within a second container. These are lifted six at a time in a caged pallet to the dockside, thus minimising the risk of dropping into the dock bottom.	Compliance with the Good Housekeeping Policy [Reference 24] is required.

Environmental Topic/Sub- Topic	Nature of Impact	Mitigation Measure	Action
3b. Local impact	The working areas of Rosyth Business Park have hard surfaces and offer minimal habitat. There is negligible impact on natural systems in the Rosyth Business Park. But in 2019, there was potential for detrimental impact on nesting of Schedule 1 birds, a pair of peregrine falcons and their 3 chicks in No.2 Dock.	Materials management, containment and good housekeeping. Potential nesting areas in dock have been netted to prevent return of the birds to the potentially hazardous areas. Note that they nested below flood-up level.	Compliance with the Good Housekeeping Policy [Reference 24 is required. Liaison with the RSPB has suggested the installation of nesting boxes on site. RSPB recommended nesting boxes have been procured and installed on buildings adjacent to the dock. These will not be checked as it may disturb birds if nesting. There has been no indication of return to site.
4. Landscape and Visual Amenity	Where new buildings, large infrastructure or lighting is to be required, there is a potential for impact on landscape and visual amenity.	The new crane is of a height below the established skyline. New modular support buildings are of a similar scale to existing. Any additional lighting is shielded and avoids visual disturbance.	Lighting is used only as required.
5.Material Assets including Cultural Heritage	Unsympathetic work can cause damage to listed buildings or historic sites and artefacts.	No impact is envisaged on the listed buildings in or adjacent to Rosyth Business Park.	Annual review of this assessment by the Project. The historic environment has not been affected by the preliminary works and no impacts are anticipated in 2024/25.

Environmental Topic/Sub- Topic	Nature of Impact	Mitigation Measure	Action
		Only very minor excavations are required and there is negligible chance of finding artefacts.	
6. Population, Socio-economics and Health and Wellbeing			
6a. Socio-Economics	Direct and indirect economic benefits, both local and national.	The maintenance of employment and skills enhancement of an increased and SQEP workforce. Local firms are involved in the infrastructure upgrades and modification and in lagging removal. Specialist UK firms are involved in LLW removal/treatment and in LLW removal/treatment and in Stage 2 planning.	The team has expanded slightly in 2023-24 but further growth is anticipated as SDP progresses through Stage 2. Apprentices and graduates are still employed on rotation in the operations department.
6b. Health and Wellbeing Characteristics	Concern over nature of nuclear related work.	Good communication with local residents; any complaints to be responded to, investigated and action taken where appropriate.	The 2024 LLC meeting was cancelled but communication channels are always open with the local authority.
7. Soil, Geology, Hydrogeology and Land Contamination	Impacts can arise from pollution incidents, when land and water may become contaminated with secondary impacts on people, vegetation and aquatic life.	Potentially contaminating materials are identified, properly stored and disposed of appropriately to avoid land contamination. Secondary bunding and above ground storage is required by SEPA to minimise the risk of loss of aqueous radiologically	Radiologically contaminated asbestos lagging from remaining LUSMs will continue to be disposed to a local Authorised Asbestos Disposal Site. Special waste has been identified and disposed of appropriately. Provision of these tanks is complete. The mitigation measures that were in place in the

Environmental Topic/Sub- Topic	Nature of Impact	Mitigation Measure	Action
		contaminated water from HP laundry and RCL and consequent land contamination.	form of daily inspections have now been discontinued. Compliance is required with the Good Housekeeping Policy [Reference 24] and Disposal of Special Waste Policy [Reference 23].
8.Water Quality and Resources	Discharges/ Spills to the dock and to drainage systems could impact on Forth Estuary.	See Section 1a above. Cutting operations are dry, where possible. Use of water is minimal. See Section 7. Above re replacement of current underground storage for HP laundry and RCL aqueous waste to minimise risk of water pollution. All work with potential for radioactive waste generation is in containment. Residual quantities of oils and other liquids is contained and disposed of appropriately. See Environmental Subtopic 3a and 3b.	See above. Compliance is required with the policy for Radioactive Waste Management [Reference 20], the Good Housekeeping Policy [Reference24] and with Disposal of Special Waste Policy [Reference 23].
9.Noise, Vibration and Nuisance including dust emissions	These have potential for impact on human health both of workers and the general public.	Risk assessments are routinely undertaken as part of work planning, with appropriate mitigation measures incorporated where necessary. Dust production is negligible; levels of noise and vibration are not likely to be greater than the usual levels. For lighting, see Section 4 above.	Noise levels are monitored (when risk assessment requires) to ensure works cause neither damage to health of workers or nuisance to other people in the Rosyth Business Park or nearby residents.

Environmental Topic/Sub- Topic	Nature of Impact	Mitigation Measure	Action
10.Traffic and Transport	Increased traffic can cause problems for local communities or capacity issues for infrastructure.	Security, safety and nuisance avoidance are of great importance. Care is taken in planning of loads and all movements to minimise disturbance and congestion and to carry out transportation of people and materials safely and with the required security. Heavy goods vehicles avoid residential parts of Rosyth and travel on the lower road to the Ferrytoll roundabout and the M90.	With the commencement of Type 31 warship build, vehicular movements in the Business Park have increased. The site Traffic Forum meets regularly to plan for any changes and for example, movement of abnormal loads.
11.Waste Management & Sustainability	Poor waste management can lead to detriment to water quality, health and socio-economics and cause land contamination. Wasting opportunity of reuse and recycling leads to overuse of new materials and reduction of availability for future generations.	Almost all of the waste material taken from the submarine in ID is from the RC and may be radioactive. By proper assessment and characterisation, these materials are segregated to ensure the most appropriate disposal/treatment route, minimising disposal to landfill, specialist disposal sites and the GDF. Data from the Swiftsure recycling campaign resulted in an extended delay to Resolution and Revenge waste leaving site. However, resolution waste has now been consigned with Revenge waste due to leave site in early 2024.	Utilisation of the principles of the Waste Management Hierarchy. Compliance with the policies for Radioactive Waste Management [Reference 20] and Disposal of Special Waste Policy [Reference23] is required.
12.Land Use and Materials	Sustainability issues.	Where appropriate, plant and tools will have potential for re-use at the end of the project.	
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Environmental Topic/Sub- Topic	Nature of Impact	Mitigation Measure	Action
13.Interaction of Project Impacts & Other Development	Further developments within the Rosyth Business Park and Waterfront have some impact.	Good neighbourly communication is recommended in management of potentially impacting activities, such as movements of abnormal loads.	See Section 10, Traffic and Transport above.

Appendix C. Key Performance Indicators Record

		SEPA PERMIT LIMIT	Jan-Aug 16	Sep 16-Aug 17	Sep 17-Aug 18	Sep 18-Aug 19	Sep 19 – Aug 20	Sept 20 – Aug 21	Sep 21 - Aug 22	Sep 22 – Aug 23	Sep 23 – Aug 24
Radiological Discharges from RRDL in 12 month period, September to August											
Radioactive Solid Waste											
Volume (m^3)			64.15	0.00	-	103.25	<25.3**	<15	<15	81	114.9
Weight (Tonnes)				0.00	2.28	55.75	<0.61**	0.76	0.56	71.35	82.6
Type											
	Metallic available for Recycling (Tonnes)			0.00	2.28	52.00	-	-	-	70.68	81.6
	Non-metallic (Tonnes)			0.00	0.00	3.75**	<0.61**	0.76	0.56	0.67	0.99
	Cobalt-60 (MBq)		Total 959.6**	Total 0.00	Total 1.26	604.20	16.05**	5.32	7.1	2388.88	2044.48
	All other radionuclides (MBq)					19,920	182.08**	67.22	12.6	3517.40	2633.14
Liquid Radioactive Waste											
	Volume (m^3)		5.40	*41*	83.55	58.06	60.95	72.4	69.30	34	26.63
	Cobalt-60 (MBq)	**100**	0.71	*3.2*	5.09	0.89	0.23*	0.95	1.42	0.58	0.25
	Tritium (MBq)	**300**	10.80	*56.35***	11.15	31.32	34.5*	25.14	17.19	65.62	7.38
	All other radionuclides (MBq)	**100**	0.51	*3.43*	7.57	3.21	2.81*	3.43	3.19	0.78	0.53
Gaseous Radioactive Waste											
	Volume (m^3)		0.00	0.00	0.00		-	-	-		
	Carbon -14 (MBq)	**50**	0.00	0.00	0.00	5.33E-02*	0.36*	0.34	0.34	0.00178	0.66
	Tritium (MBq)	**10**	0.00	0.00	0.00	2.50E-02*	0.19*	0.18	0.18	0.0502	0.054
	All other radionuclides (MBq)	**0.10**	0.00	0.00	0.00	0.0059	0.045*	0.043	0.046	0.0394	0.041
Radiologically contaminated Asbestos (Tonnes)						11	11.29	-	-	11	0
* Note these include results that are less than the Limit of Detection. ** includes waste not related to SDP ID Figures in Italics for Liquid Radioactive Waste Discharge for 2016/7 are corrected values, about 10% higher than before.											
Non-Radiological materials dispatched for Recycling or for Landfill.								**New Reporting Standard Detailed Below by Project**			
Volume (m^3)				0.00	-						
Weight (Tonnes)				0.00	22.28	22.71	43.61				
Type											

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		SEPA PERMIT LIMIT	Jan-Aug 16	Sep 16-Aug 17	Sep 17-Aug 18	Sep 18-Aug 19	Sep 19 – Aug 20	Sept 20 – Aug 21	Sep 21 - Aug 22	Sep 22 – Aug 23	Sep 23 – Aug 24
	Metallic available for Recycling (Tonnes)			0.00	22.28	22.71	43.61		-		
	Non-metallic (Tonnes)			0.00	0.00	0.00		0.76	5.41		
SDP Personnel* **				**113*** **	**108**	**130**	**141**	**145**	**173**	**197**** **	**212**
*** Note totals in early years allow for retirement of older staff after skills transfer to new recruits **** 197 total comprises 178 staff in post with added 19 specialist contractors											
Training - hours				**8000**	**5000**	**1000+**	**120**	**250**	**250**	**250**	**250**
Reportable Accidents				**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**
Manhours worked in Nuclear Business Unit since April 2015 – Over1,000,000 hours											
Complaints from General Public				**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

M2 Non-Radioactive Waste Category	**Project Tonnage**
	Swiftsure
M2 Non Active Metallic Waste	**52.18**
M2 Non Active Special Waste (Asbestos etc)	**27.38**
Lead	**4.722**
Total	**84.282**

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