

# Permitting decisions

## Radioactive Substances Regulation (nuclear sites)

We have decided to grant the permit variation for Barrow Shipyards, operated by BAE Systems Marine Ltd (BAESML). The decision is effective from 01/09/2022.

The permit number is EPR/UB3433DW/V005.

We consider in reaching that decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that the appropriate level of environmental protection is provided.

## Purpose of this document

This decision document provides a record of our decision-making process. It summarises the process and shows how we have taken all relevant factors into account in reaching our decision.

Unless the decision document specifies otherwise, we have accepted the applicant's proposals.

The permitting decision needs to be read in conjunction with the environmental permit and supporting Compilation of Environment Agency Requirements (CEAR) document. The introductory note summarises what the permit covers.

## Key issues of the decision

BAESML's application to vary the permit requested an extension of the permit boundary to enable future testing and commissioning of nuclear-powered submarines at Devonshire Dock Quay.

The key issues of the decision were:

- The implications of the extension for the radioactive substances activities which need to be included in the permit, including determination of appropriate limits for those activities

Testing and commissioning activities currently take place at Wet Dock Quay, which is on the Barrow Shipyards Nuclear Licensed Site. Keeping and use of radioactive material and accumulation of radioactive waste are regulated by the Office for Nuclear Regulation (ONR) on a Nuclear Licensed Site, while disposal of radioactive waste is regulated under an environmental permit.

Devonshire Dock Quay is currently under construction. It is not on the Nuclear Licensed Site, but is within Barrow Shipyards and on the MOD Nuclear Authorised Site. There are

no plans to extend the boundary of the Nuclear Licensed Site<sup>1</sup>. Keeping and use of radioactive material and accumulation of radioactive waste at Devonshire Dock Quay and its associated support facilities therefore need to be added to the environmental permit. Standard conditions can be applied for these activities and appropriate limits have been determined (see below).

There are no changes in discharge limits or disposal routes as a result of this variation.

## Confidential information

A claim for commercial or industrial confidentiality has not been made.

## Consultation

The consultation requirements were identified in accordance with the Environmental Permitting Regulations and our statement on public participation, "[Environmental Permits: When and how we consult](#)".

The application was publicised on the GOV.UK website.

A briefing was sent by email to 500 local stakeholders, and the application was made available to the public on our Citizen Space website. Members of the public were able to comment between 23 February and 22 March 2022.

We also consulted the following organisations:

- Department for Business, Energy and Industrial Strategy (BEIS)
- Department for Health and Social Care (DHSC)
- Office for Nuclear Regulation (ONR)
- Defence Nuclear Safety Regulator (DNSR)

The comments received and our responses are summarised in Annex 1.

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<sup>1</sup> ONR's decision on this matter is recorded in project assessment report PAR-18-018

## **Part 1: Variation for the disposal of radioactive waste**

### **Introduction**

Barrow Shipyards are currently the only submarine production facility in the UK, and currently produce both Astute and Dreadnought class nuclear-powered submarines for the Royal Navy. Small volumes of solid, liquid and gaseous radioactive waste are generated during the build, testing and commissioning of the submarine nuclear reactor plant.

Solid radioactive waste arises from use of personal protective equipment and sampling equipment.

Aqueous radioactive waste is generated as a result of flushing of refurbished main coolant pumps<sup>2</sup> during submarine build; from sampling of primary coolant during testing and commissioning; from emptying of the submarine's active drain tank prior to exit of the submarine from Barrow; and from sampling of effluent storage tanks prior to discharge. It is possible that larger volumes of primary circuit coolant may require disposal during testing and commissioning, for example, to enable defect rectification.

Aqueous radioactive waste is discharged to the town's sewer, from where it is transferred to the Salthouse Pool Wastewater Treatment Works (WwTW) and ultimately discharged via a 1,000m long pipeline into Morecambe Bay.

Gaseous discharges can arise during build as a result of argon purges during the build phase, or in the event of a need to de-gas the submarine reactor plant during testing and commissioning.

The application to vary the permit requested an extension to the permitted area to include Devonshire Dock Quay (DDQ).

Testing and commissioning of Astute class submarines currently takes place at Wet Dock Quay (WDQ). In future, testing and commissioning of Dreadnought submarines will take place at Devonshire Dock Quay (DDQ). WDQ is within the boundary of both the Nuclear Licensed Site and the MOD Nuclear Authorised Site, while DDQ is only within the boundary of the MOD Nuclear Authorised Site. The activities which will take place during testing and commissioning will not change, and no changes to discharge limits or disposal routes have been requested.

Keeping and use of radioactive material (in the form of unsealed sources) and accumulation of solid and liquid radioactive waste need to be added to the permit. These activities will be permitted only on the MOD Nuclear Authorised Site. If these activities occur on the Nuclear Licensed Site, they are regulated by the Office for Nuclear Regulation (ONR).

### **Justification (RSR-A, Q11)**

Justification is not required because the radioactive substances activity is carried out by a contractor working on behalf of the Ministry of Defence.

### **Transboundary impact (RSR-C3, Q2c)**

A transboundary impact assessment is not required for this application.

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<sup>2</sup> Refurbished pumps are being used in Astute Boats 4-7 only

### **Operator and operator competence (RSR-A, Q12)**

We have assessed the applicant's competence against our guidance on the definition of legal operator for environmental permits and against our guidance on management arrangements for nuclear site operators.

We are satisfied that the applicant is the person who will have control over the operation of the facility after the grant of the permit.

We have not identified any reasons indicating that the operator is unable to operate in accordance with the permit.

### **Keeping and use of radioactive material**

Radioactive material in the form of unsealed sources will be kept and used in the Nuclear Berth Support (NBS) facility at Devonshire Dock Quay. This includes calibration standards, samples of primary coolant taken during testing and commissioning, and samples of liquid waste taken for activity assessment prior to disposal.

BAESML provided an inventory of calibration standards and an estimate of the maximum activity expected to be present in samples being analysed or stored at any one time. A single limit for total radionuclides of 10 MBq has been determined to be sufficient.

We have carried out an Environment Agency-initiated administrative variation to another permit held by BAESML (EPR/GB3494DF) which permits keeping and use of radioactive material at Barrow Shipyards for other purposes. The site plan in permit EPR/GB3494DF has been updated to exclude the Nuclear Licensed Site and the MOD Nuclear Authorised Site, so it is clear where different permitted activities involving unsealed sources can be carried out.

### **Accumulation of radioactive waste**

In their application, BAESML requested limits for accumulation as follow:

<b>Radionuclide</b>	<b>Activity limit</b>	<b>Volume limit</b>	<b>Period</b>
Total radionuclides	100 MBq	15 m <sup>3</sup> (15 tonnes)	1 month

It was not clear how these limits were derived, and whether they related to aqueous and/or solid waste. We sought additional information from BAESML during the determination of the permit about the waste that will be generated during testing and commissioning activities at Devonshire Dock Quay, off the Nuclear Licensed Site, and the arrangements for managing this waste.

Based on this information, we have decided that a higher activity limit, lower volume limit and a longer period are appropriate for accumulation of aqueous radioactive waste. We propose the following limits:

Radionuclide	Activity limit	Volume limit	Period
Tritium	450 MBq	8 m <sup>3</sup>	2 months
C-14	15 MBq		
Co-60	2 MBq		
Total beta-gamma emitting radionuclides	1 MBq		

The reasons for this are:

- The activity limit of 100 MBq was based on the primary circuit samples that are planned to be taken during a testing and commissioning campaign, with some contingency included. However, BAESML's best available techniques (BAT) review<sup>3</sup> recognises that some reasonably foreseeable faults which can occur during testing and commissioning could generate a larger volume of aqueous waste that may need to be temporarily stored in the Portable Effluent Facility (PEF) at Devonshire Dock Quay. We have included an allowance for such faults in the proposed limits, based on information provided by BAESML in response to our questions. Activity limits have been specified in proportion to the existing discharge limits for aqueous radioactive waste. It should be noted that BAESML are required to apply BAT to minimise the activity of waste generated.
- The volume limit of 15 tonnes was based on the capacity of an existing effluent tank which is used to manage aqueous waste generated during submarine builds in Devonshire Dock Hall. A new, smaller PEF has been manufactured for use during testing and commissioning. This will be used at Wet Dock Quay initially and then transferred to Devonshire Dock Quay. The physical capacity of the new PEF is 8.7m<sup>3</sup>, but it has an operational capacity of 7.8 m<sup>3</sup> so a limit of 8m<sup>3</sup> should be sufficient.
- Testing and commissioning of a submarine reactor typically takes place over a 2-3 month period. To minimise the number of effluent transfers which are required to be made from the PEF to the Waste Treatment Facility (WTF), and therefore minimise resource use, we consider that a longer accumulation period of up to 2 months is appropriate. The design of the PEF incorporates a number of environmental protection features including bunding and leak detection, which should ensure that there is no environmental impact from accumulation of aqueous radioactive waste at Devonshire Dock Quay.

Solid waste arises from the use of personal protective equipment and laboratory equipment. We have reviewed the history of solid waste arisings from previous test and commissioning campaigns, and the history of previous permit limits, and consider that an accumulation limit of 0.5 m<sup>3</sup> is sufficient for solid radioactive waste. Provision is made for accumulation of VLLW and LLW, although in practice the majority of waste generated during testing and commissioning is out of scope of the radioactive substances regulations.

<sup>3</sup> NSRD/R16-007 Best Available Techniques Review and Impact Assessment for Management of Radioactive Waste at the BAE Systems Submarines – Barrow Site

We have discussed these proposed limits with the operator.

### **Disposal of radioactive waste (RSR-C3, Q2d)**

There are no changes to the type of activities which generate radioactive waste, or to the disposal routes or discharge limits. The only change is future relocation of testing and commissioning activities within Barrow Shipyard from Wet Dock Quay to Devonshire Dock Quay, to accommodate the Dreadnought class submarines.

The decision to build Dreadnought submarines at Barrow Shipyard is outside the scope of this permit variation. However, there are environmental objectives for their design which require environmental aspects, impacts and risks to be minimised throughout the product lifecycle (*ie* manufacture, operation, maintenance and disposal).

BAESML provided a Best Available Techniques (BAT) assessment as part of their application, reference NSRD/R16-007 (Issue 2). This explains how the small volumes of radioactive (or potentially radioactive) waste generated during build, test and commissioning of Astute and Dreadnought nuclear-powered submarines at Barrow Shipyard are managed. The BAT assessment includes a number of assumptions relating to the Dreadnought submarines. These are based on performance data and experience from existing testing and commissioning activities, taking into account differences in the submarine reactor design.

Evidence from recent inspections at Barrow Shipyard indicate that BAESML's BAT case is adequately implemented, and that efforts are made to minimise the volume of waste generated which will require subsequent disposal.

### **Disposal routes and limits (RSR-C3, Q2d)**

There are no changes to the disposal routes or limits in the permit.

### **Monitoring (RSR-C3, 2d)**

There are no proposed changes to sampling arrangements, techniques or systems for the measurements and assessment of disposals of radioactive waste.

### **Radiological assessment (RSR-C3, 2d)**

A radiological assessment is not required as there are no changes in discharge limits.

### **Receipt of waste (RSR-C3, 2d)**

The application only considers the management of existing wastes. It does not include any proposals to receive new wastes.

### **Non-radiological issues**

Standard permit condition 2.3.7 is sufficient to control non-radiological impacts associated with the radioactive waste generated as a result of the testing and commissioning of nuclear-powered submarines at Barrow Shipyards.

### **Other**

No additional matters were identified that require assessment before determination of this application.

## **Growth duty**

We have considered our duty to have regard to the desirability of promoting economic growth set out in section 108(1) of the Deregulation Act 2015 and the guidance issued under section 110 of that Act in deciding whether to grant this permit.

Paragraph 1.3 of the guidance says:

“The primary role of regulators, in delivering regulation, is to achieve the regulatory outcomes for which they are responsible. For a number of regulators, these regulatory outcomes include an explicit reference to development or growth. The growth duty establishes economic growth as a factor that all specified regulators should have regard to, alongside the delivery of the protections set out in the relevant legislation.”

We have addressed the legislative requirements and environmental standards to be set for this operation in the body of the decision document above. The guidance is clear at paragraph 1.5 that the growth duty does not legitimise non-compliance and its purpose is not to achieve or pursue economic growth at the expense of necessary protections.

We consider the requirements and standards we have set in this permit are reasonable and necessary to avoid a risk of an unacceptable level of pollution. This also promotes growth amongst legitimate operators because the standards applied to the operator are consistent across businesses in this sector and have been set to achieve the required legislative standards.

## **Decision**

We conclude that that the operator can operate in accordance with the permit conditions to meet statutory requirements and the requirements of Government policy. We therefore grant the application, subject to the conditions of the permit.



## Annex 1: Consultation and advertising responses

The following summarises the responses to consultation with other organisations, our notice on GOV.UK and consultation on Citizen Space for the public, and our local stakeholder briefing. The way in which we have considered these responses in the determination process is also summarised.

### Responses from organisations listed in the consultation section

<b>Response received from</b>
Defence Nuclear Safety Regulator (DNSR)
<b>Brief summary of issues raised</b>
No specific comments on the application.
<b>Summary of actions taken or show how this has been covered</b>
n/a

<b>Response received from</b>
Office for Nuclear Regulation (ONR)
<b>Brief summary of issues raised</b>
No comments on the application.
<b>Summary of actions taken or show how this has been covered</b>
n/a

No response was received from BEIS or DHSC.

### Responses from other organisations

<b>Response received from</b>
COMARE Authorisations Working Group (AWG)
<b>Brief summary of issues raised</b>
No objections to the proposed changes. The AWG recognised that the variation is necessitated by work essential to national security and work activities will be undertaken at the new Devonshire Dock Quay as were undertaken at the Wet Dock Quay, and considered that the variation was very well justified by the supporting documents. Specific comments related to the permit and Nuclear Licensed Site boundary no longer being coincident; evidence to support the assertions that the waste arisings from Dreadnought submarines will be bounded by those for Astute; and whether there is potential for overlap of timetables such that Wet Dock Quay and Devonshire Dock Quay could be in use at the same time.
<b>Summary of actions taken or show how this has been covered</b>
ONR's decision not to extend the Nuclear Licensed Site boundary is summarised in a Project Assessment Report, PAR-18-018 (available <a href="#">here</a> ). Submarine testing and commissioning at Devonshire Dock Quay will be authorised by the Defence Nuclear Safety Regulator (DNSR), and the management of waste arising from these operations will be permitted.



Submarine reactor designs are not owned by BAESML, and are subject to national security considerations. We discussed the assertions regarding waste arisings from Dreadnought with BAESML, and consider that their past experience of testing and commissioning submarine reactors is a reasonable basis for estimating likely future discharges.

We discussed the potential for testing and commissioning activities to take place concurrently at Wet Dock Quay and Devonshire Dock Quay with BAESML, and conclude that there is no likelihood of this happening.

### **Representations from local MP, councillors and parish/town community councils**

None received.

### **Representations from community and other organisations**

None received.

### **Representations from individual members of the public**

One response was received.

<b>Brief summary of issues raised</b>
Unnecessary release of sensitive information Waste of time and money to consult when no increase in risk
<b>Summary of actions taken or show how this has been covered</b>
Advice was provided to BAESML during the application regarding claims for national security and/or commercial confidentiality. The information provided as part of the application did not meet the tests for these claims. It is a statutory requirement under the Environmental Permitting Regulations for us to consult on most applications for permit variations. Consultation on the application was planned and undertaken in line with our operational instruction LIT 12477 <i>Handling and determining applications for radioactive substances activities on nuclear sites</i> (September 2021).