

Office for Nuclear Regulation (ONR)

Site Report for

Rolls-Royce Submarines Limited (RRSL)

Nuclear Fuel Production Plant (NFPP) Raynesway

and

Neptune Reactor Raynesway

Licensed Sites

Report for period 1 July – 31 December 2021

Foreword

This report is issued as part of ONR's commitment to make information about inspection and regulatory activities relating to the above site available to the public. Reports are distributed to members for the RRSL Local Liaison Committee (LLC) and are also available on the ONR website (<http://www.onr.org.uk/llc/>).

Site inspectors from ONR usually attend RRSL LLC meetings where these reports are presented and will respond to any questions raised there. Any person wishing to inquire about matters covered by this report should contact ONR.

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1. Inspections

1.1. Dates of Inspection

The ONR site inspector made inspections on the following dates during the report period:

- 20 & 21 July
- 25 & 26 August
- 23 September
- 27 & 28 October
- 10, 16, 17 & 18 November

For all dates above, an ONR inspector was on-site.

2. Routine Matters

2.1. Inspections

Inspections are undertaken as part of the process for monitoring compliance with:

- the conditions attached by ONR to the nuclear site licence granted under the Nuclear Installations Act 1965 (NIA65) (as amended);
- the Energy Act 2013;
- the Health and Safety at Work Act 1974 (HSWA74); and
- regulations made under HSWA74, for example the Ionising Radiations Regulations 2017 (IRR17) and the Management of Health and Safety at Work Regulations 1999 (MHSWR99).

The inspections entail monitoring licensee's actions on the site in relation to incidents, operations, maintenance, projects, modifications, safety case changes and any other matters that may affect safety. The licensee is required to make and implement adequate arrangements under the conditions attached to the licence in order to ensure legal compliance. Inspections seek to judge both the adequacy of these arrangements and their implementation.

In this period, routine inspections of the Raynesway licensed sites covered the following:

- management of operations including control and supervision;
- modifications to plant, equipment and safety cases;
- emergency preparedness;
- incidents on the site;
- conventional (non-nuclear) health and safety;

During the reporting period, ONR judged the arrangements made and implemented by the site in response to safety requirements to be satisfactory in the areas inspected. Where improvements have been identified, the licensee has made a commitment to address those issues, and ONR inspectors will closely monitor progress during future site inspections. Where necessary, ONR will take formal regulatory enforcement action to ensure that appropriate remedial measures are implemented to reasonably practicable timescales. Members of the public, who would like further information on ONR's inspection activities during the reporting period, can view site Intervention Reports at www.onr.org.uk/intervention-records on our website www.onr.org.uk. Should you have any queries regarding our inspection activities, please email contact@onr.gov.uk.

2.2. Level 1 Demonstration Exercise ‘FOSSA’

In November, three ONR inspectors observed an emergency exercise demonstration¹ at one of RRSL’s Raynesway nuclear licensed sites. ONR considered that RRSL had developed a challenging and diverse scenario for the exercise that involved significant command and control challenges in terms of dealing with the fire, casualty recovery, overall emergency response and associated facility roll calls. Derbyshire Constabulary and Derbyshire Fire & Rescue Service participated in the exercise and as such a coordinated multi-agency response was required.

A number of areas of good practice were noted, including operational situation briefings being clear and concise, with identified focus areas and actions; and the tally count and dosimetry rooms completing their tasks in an expedient and calm manner.

However, ONR considered that the length of time taken to extinguish the fire and recover one of the casualties was longer than necessary, which, in the opinion of the assessment team, was due to a lack of situational awareness in the Emergency Control Centre (ECC), caused by suboptimal information flow within the ECC and over involvement of the ECC controller in the detail of the event.

ONR has raised a regulatory issue that requires RRSL to draw lessons from the exercise, put in place relevant improvements and then redemonstrate the ECC elements of the exercise to ONR.

2.3. Unannounced Inspection – Control of Contractors

In September 2021, ONR performed an unannounced inspection² at the Neptune Reactor nuclear licensed site, with a focus on licence condition 26 (‘Control and Supervision of Operations’) as it related to RRSL’s control over its principal contractor JN Bentley and associated sub-contractors. The inspection was prompted by repeat events on the Neptune refurbishment project.

On the day, ONR observed planning meetings, discussed implemented arrangements with RRSL and JN Bentley staff, as well as observing work on the site itself. We saw sufficient evidence of improvement and learning to have confidence that it is unlikely that JN Bentley will have a repeat of early events that saw the need for significant amounts of rework. The level of RRSL and JN Bentley supervision, alongside the inspection and test plans introduced and the identification of witness points within them, should ensure nuclear safety outcomes are secured and demonstrable.

2.4. Level 1 Regulatory Interface Forum (RIF)

In November 2021, ONR’s Operating Facilities division Director and the Head of Propulsion sub-division attended the level 1 RIF. Topics discussed included the structure of Rolls-Royce and RRSL’s position within that, development of the new PWR3 core for Dreadnought, future capital projects as well as the RRSL

¹ [Rolls Royce Submarines Limited annual demonstration of emergency management capability exercise \(onr.org.uk\)](https://www.onr.org.uk)

² [Control of contractors - unannounced inspection \(onr.org.uk\)](https://www.onr.org.uk)

organisational structure and future changes. Safety improvements and issues outstanding were discussed, including reportable events, the transition to COMAH status, closure of the ONR Improvement Notice and efforts focused on improving RRSL's nuclear safety management arrangements.

2.5. Other Work

In addition to the inspections listed in section 1.1, there were a number of other formally recorded interactions with RRSL, covering a variety of topics, including: organisational change, organisational safety culture, periodic review, radioactive waste, supply chain/quality systems, radiation protection, the Neptune refurbishment project, and the Dreadnought Production Facility project.

The site inspector also held several meetings to progress routine regulatory business, such as regulatory issues database reviews, regulatory interface forums as well as (separate) meetings with site safety representatives and the internal regulatory function. The site inspector continues to hold weekly meetings with senior RRSL management to ensure health and safety matters continue to be addressed appropriately.

When ONR inspectors are on site, COVID-19 controls on the RRSL licensed sites continue to be evaluated. The site inspector considers RRSL's response to COVID throughout the period appropriate, and restrictions have been appropriately tailored according to the prevailing guidance and/or legislation in effect at the time of the visit.

3. Non-Routine Matters

Licensees are required to have arrangements to respond to non-routine matters and events. ONR inspectors judge the adequacy of the licensee's response, including actions taken to implement any necessary improvements.

Matters and events of particular note during the period were:

3.1. Pickle Liquor Drum Substantiation – INF 2021/630

RRSL has identified approximately 600 45l drums of liquors from manufacturing operations in the pickle liquor store that have exceeded their safety case defined five-year life, with some drums having been stored for up to 13 years. RRSL has made a justification to extend the life of these drums, whilst pursuing options to process the liquors.

The ONR site inspector performed an on-site inspection of the drums and determined that the safety significance was low, given that the drums are stored in a weathertight building, generally in a good condition, inspected regularly, and are within a bunded area. The acid content of the drums is also well below the manufacturer's maximum allowable concentrations. The site inspector will monitor the progress made with processing the drums.

3.2. Vacuum Anneal Area Floor Shortfalls – INF 2021/666

RRSL has identified that the mezzanine floor in the vacuum anneal area does not meet the original loading requirements for the cell, in addition to identifying a number of missing floor fixings, the remainder of which do not appear to be seismically qualified. RRSL has ceased operations within the area whilst a justification for continued operation is prepared.

The ONR site inspector has determined that the immediate nuclear safety significance of this event is low, only driven by the building's response in a seismic event. RRSL is taking practical steps to mitigate any design shortfalls.

3.3. Pickle 'T' Bar Fixture – INF-1429

A 'T-bar' fixture was replaced with a newly manufactured item, compliant with the document pack provided with it, including manufacturing drawings. However, operators noted that the fixture arms were longer than the limit specified in the safety case. Overall safety was maintained, however, as the key safety items on the fixture were located correctly, limiting the number of items able to be loaded onto the fixture.

RRSL has identified that the safety case has overly specific performance requirements which led to an error trap in this instance. RRSL has identified corrective actions to be taken to prevent reoccurrence.

3.4. Dissolver Fault Sequence Omission – INF 2020/825

[This event had been previously reported by RRSL in December 2020.] During routine operations, process operators identified a potential fault scenario on a Dissolver that had not been assessed within the current safety case. The potential scenario would involve a failure of a valve identified as important to safety, which could lead to the backflow of fissile liquor to a non-geometrically favourable vessel. This could result in a criticality if the situation was allowed to persist. It must be noted that the valve has not failed at any point, and thus there was no danger to the public.

ONR completed two separate follow up enquiries sessions (January and July 2021) as RRSL's understanding of the event matured and RRSL has completed its investigation into the event. Following discussions with ONR's International Nuclear Event Scale (INES) reporting officer, the event has been assigned a rating of INES 1 'anomaly'. ONR judged it appropriate to issue an enforcement letter to RRSL (see section 4) to highlight the significance of the fault sequence omission. A regulatory issue had already been raised as a result of a previous AMBER rated inspection relating to inadequate control of modifications.

ONR is satisfied that the physical modification that RRSL has made to the facility has removed the potential for the fault to occur. In November 2021, ONR undertook an inspection relating to modifications where RRSL demonstrated considerable improvements to the control of modifications, in both process and training aspects. ONR has since closed the regulatory issue and informed RRSL that no further regulatory action is to be taken in respect of this event.

4. Regulatory Activity

ONR may issue formal documents to ensure compliance with regulatory requirements. Under nuclear site licence conditions, ONR issues regulatory documents, which either permit an activity or require some form of action to be taken; these are usually collectively termed 'Licence Instruments' (LIs) but can take other forms. In addition, inspectors may take a range of enforcement actions, to include issuing an Enforcement Notice.

The following LIs, Enforcement Notices and Enforcement letters have been issued during the period:

- Enforcement Letter, ONR-EL-21-021, 15 September 2021
ONR issued an enforcement letter to RRSL to highlight the significance of the near miss relating to the Oxide Dissolver Fault Sequence event. The letter noted that a relevant existing regulatory issue was already in place and compliance with that issue would resolve the regulatory action (see section 3.4)

Table 1: Licence Instruments and Enforcement Notices Issued by ONR during this period

Date	Type	Ref. No.	Description
15/09/21	Enforcement Letter	ONR-EL-21-021	Oxide Dissolver Fault Sequence Omission

Reports detailing regulatory decisions can be found on the ONR website at <http://www.onr.org.uk/pars/>.

5. News from ONR

For the latest news and information from the Office for Nuclear Regulation, please read and subscribe to our regular email newsletter 'ONR News' at www.onr.org.uk/onrnews

6. Contacts

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