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| ONR Site Report  Sellafield Ltd – Sellafield SSG Q4 2022 - Q1 2023 |



ONR Site Report

Sellafield Ltd - Sellafield SSG Q4 2022 - Q1 2023

Report for period: 01 October 2022 – 31 March 2023

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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 West Cumbria Sites Stakeholder Group (WCSSG) and are also available on the ONR website (<http://www.onr.org.uk/llc/>).

Site inspectors from ONR usually attend West Cumbria Sites Stakeholder Group (WCSSG) 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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List of abbrevations:

|  |  |
| --- | --- |
| AHF | Active Handling Facility |
| ALARP | As Low As Reasonably Practicable |
| BEP | Box Encapsulation Plant |
| BEPPS/DIF | Box Encapsulation Plant Product Store/Direct Import Facility |
| CA | Competent Authority |
| CDM | Construction (Design and Management) Regulations 2015 |
| CHS | Conventional Health and Safety |
| COMAH | Control Of Major Accident Hazard (Regulations 2015) |
| EA | Environment Agency |
| EOD | (Army) Explosives Ordinance Disposal |
| EPS | Encapsulation Product Store |
| EPS | Encapsulation Product Store |
| FGFL | First Generation Finishing Line |
| FGMSP | First Generation Magnox Storage Pond |
| HALES | Highly Active Liquor Evaporation and Storage |
| HAST | Highly Active Storage Tank |
| HLWP | High Level Waste Plants |
| HSWA74 | Health and Safety at Work Act 1974 |
| ICT | Information and Communications Technology |
| ILW | Intermediate Level Waste |
| INES | International Nuclear Event Scale |
| IRR17 | Ionising Radiations Regulations 2017 |
| ISF | Interim Storage Facility |
| LAEMG | Low Active Effluent Management Group |
| LC | Licence Conditions |
| MDF | Mixed oxide Demonstration Facility |
| MEP | Magnox Encapsulation Plant |
| MER | Magnox East River |
| MHSWR99 | Management of Health and Safety at Work Regulations 1999 |
| MRF | Magnox Reprocessing Facility |
| MSSS | Magnox Swarf Storage Silo |
| NDA | Nuclear Decommissioning Authority |
| NIA65 | Nuclear Installation Act 1965 |
| OFSG | Oxide Fuel Storage Group |
| ONR | Office for Nuclear Regulation |
| OR | Operating Rule |
| PFCS | Pile Fuel Cladding Silo |
| PFSP | Pile Fuel Storage Pond |
| PPP | Programme and Project Partner |
| PSR | Periodic Safety Review |
| REPPIR | Radiation Emergency Preparedness and Public Information Regulations |
| SCIE | Sellafield Compliance, Inspection and Enforcement |
| SEMS | Sellafield Enterprise Management System |
| SEP2 | Silo Emptying Plant No2 |
| SFAIRP | So Far As Is Reasonably Practicable |
| SFM | Spent Fuel Management |
| SL | Sellafield Ltd |
| SLMS | Sellafield Ltd Management System |
| SMF | Silo Maintenance Facility |
| SNM | Special Nuclear Materials |
| SQEP | Suitably Qualified and Experienced Person |
| SSB | Self Shielded Boxes |
| THORP | Thermal Oxide Reprocessing Plant |
| WTR | Waste Transfer Route |
| WVP | Waste Vitrification Plant |

# Inspections

## Date(s) of Inspection

The ONR site inspectors carried out inspections on the following dates during the report period 01 October 2022 – 31 March 2023:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **October 2022** | **November2022** | **December2022** | **January 2023** | **February 2023** | **March 2023** |
| **Special Nuclear Materials (SNM)** | 4 | 8 | - | 10-11 | - | 13-16 |
| **Retrievals** | 18-19 | 22-23 | 6-7 | - | 21-23 | - |
| **Remediation** | - | - | 8 | 18 | 8-9, 26 | 15-16, |
| **Spent Fuel Management (SFM)** | 4-5, 21 | 3-4, 9-10 | 6-8 | 11, 25 | 15 | 8-11 |
| **Site Management** | 4 | 2, 8-9 | - | 10-11 | - | 7-8 |
| **Corporate** | 5-6 | 1, 15, 18 | 2, 7-9, 13 | 17-19, 24, 31 | 7, 15-16 | 1, 8-10, 13-16, 29 |

# Routine Matters

## 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 etc 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 the 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 Sellafield covered the following:

**Special Nuclear Materials Value Stream (SNM)**

During this period within the SNM value stream, we carried out four planned Licence Condition (LC) compliance inspections covering:

* LC 11 – Emergency arrangements
* LC 12 – Duly authorised and other suitably qualified and experienced persons
* LC 26 – Control and supervision of operations
* LC 28 – Examination, inspection, maintenance and testing

The LC 28 inspection specifically covered SNM packages produced from Magnox reprocessing material and stored by the SNM Value Stream.

For the planned LC compliance inspections LC 11, 12 and 26 we judged that compliance with the LC was adequate, and assigned Green (no formal action) inspection ratings.

The LC 28 inspection was assigned an Amber (seek improvement) inspection rating - “specific legal requirements not met, but without prejudice to overall nuclear safety”. We judged as a significant inspection finding that SNM(N) could not demonstrate that those physically undertaking the endoscope inspections in SNM(N) Stores were under the control and supervision of a SQEP appointed for that purpose by the licensee (LC 28(6)(b and d refer). We did see evidence that those undertaking the operations were SQEP for the task, and assurance was provided that a SQEP Technical Specialist was present for all such inspections. Furthermore, sample evidence was seen that the endoscope recordings made were adequate for the SQEP Technical Specialists to evaluate the package condition. We raised a Level 3 Regulatory Issue to have oversight of SNM’s progress to address the shortfall.

**Retrievals Value Stream**

During the reporting period within the Retrievals value stream, we carried out four planned compliance inspections one reactive LC compliance inspection and two System Based Inspection (SBI) covering:

* LC11 – Emergency arrangements
* LC12 – Duly authorised persons and other suitably qualified and experienced persons
* LC 26 – Control and supervision of operations
* SBI – Ventilation system in the Magnox Swarf Storage Silo (MSSS)
* SBI – Essential Services in Pile Fuel Storage Pond (PFSP)
* Ionising Radiations Regulations 2017.

The SBIs were against the standard set of licence conditions for such inspections; LC 10 - training, LC 23 - operating rules, LC 24 - operating instructions, LC 27 - safety mechanisms, devices and circuits, LC 28 - examination, inspection, maintenance and testing, and LC 34 - leakage and escape of radioactive material and radioactive waste.

Pile Fuel Cladding Silo (PFCS)

Two planned compliance inspections were undertaken at the Pile Fuel Cladding Silo (PFCS) on the Sellafield Site. The purpose of these inspections was to confirm Sellafield Ltd’s compliance with its corporate arrangements for LC 12 and LC 26 in PFCS.

For the planned LC compliance inspections, we judged that compliance with the LC met the legal standard and assigned Green (no formal action) inspection ratings.

Pond Fuel Storage Pond (PFSP)

ASBI was undertaken on the essential services in PFSP.

We judged that compliance with all the six standard licence conditions met the legal standard and assigned green (no formal action) inspection ratings. Our overall judgement was that the essential services in PFSP fulfil the requirements of the safety case.

Magnox Swarf Storage Silo (MSSS)

Two planned compliance inspections were undertaken in the Magnox Swarf Storage Silo (MSSS) on the Sellafield Site. The purpose of these inspections was to confirm Sellafield Ltd’s compliance with its corporate arrangements for LC 11 and IRRs in MSSS.

A reactive LC 11 inspection associated with heat management was also undertaken in response to elevated temperatures within the silos and the issue of an enforcement letter (ONR-EL-22-029 SEL77808R). More details on our concerns and this letter in section 3 non-routine matters.

For the LC compliance inspections, we judged that compliance with the LC met the legal standard and assigned Green (no formal action) inspection ratings. We also judged that compliance with the IRRs met the legal standard and assigned a Green (no formal action) inspection rating.

A SBI was also undertaken on the ventilation services in MSSS. We judged that compliance with all the six standard licence conditions met the legal standard and assigned Green (no formal action) inspection ratings. Our overall judgement was that the ventilation system in MSSS fulfils the requirements of the safety case.

**Remediation Value Stream**

During this period, within the Remediation value stream, we carried out 6 planned compliance inspections, covering:

* LC4 – Restrictions on nuclear matter on the site.
* LC7 – Incident on the site.
* LC22 – Modification or experiment on existing plant.
* LC32 – Accumulation of radioactive waste.
* LC 35 – Decommissioning
* SBI – Medium Active Salt Free Evaporator (MASFE) and associated pipe bridge.
* Ionising Radiations Regulations 2017.

Waste Operating Unit - Miscellaneous Beta Gamma Waste Store (MBGWS)

A planned compliance inspection was conducted at MBGWS on the Sellafield site. The purpose of the inspection was to confirm Sellafield Ltd compliance with its corporate arrangements for LC4 and 32.

We judged that compliance with LC 4 and 32, was adequate and assigned a Green (no formal action) inspection rating.

Alpha Operating Unit - Waste Treatment Complex (WTC) and Engineered Drum Stores (EDS)

A planned compliance inspection was conducted on the Sellafield site. The purpose of the inspection was to confirm Sellafield Ltd compliance with its corporate arrangements for LC7.

We judged that compliance with LC7, was adequate and assigned a Green (no formal action) inspection rating.

Beta Gamma Operating Unit

A planned compliance inspection was conducted on the Sellafield site. The purpose of the inspection was to confirm Sellafield Ltd compliance to its corporate arrangements for LC22.

We judged that compliance with LC22, was adequate and assigned a Green (no formal action) inspection rating.

Waste Monitoring And Compaction Plant (WAMAC)

A planned compliance inspection was conducted on the Sellafield site. The purpose of the inspection was to confirm Sellafield Ltd compliance to its corporate arrangements for Ionising Radiations Regulations 2017.

We judged that compliance with Ionising Radiations Regulations 2017, was adequate and assigned a Green (no formal action) inspection rating.

Thermal Oxide Reprocessing Plant (THORP)

Two inspections were undertaken at the Thermal Oxide Reprocessing Plant (THORP) on the Sellafield Site; one a licence condition compliance inspection (LC35), the other a system based inspection (SBI) covering the Medium Active Salt Free Evaporator (MASFE) and associated pipe bridge.

For the planned LC inspection, we judged that compliance with the LC met the legal standard and the assigned rating was Green (no further action).

The SBI was against the standard set of licence conditions for such inspections; LC 10 - Training, LC 23 - Operating rules, LC 24 - Operating instructions, LC 27 - Safety mechanisms, devices and circuits, LC 28 - Examination, inspection, maintenance and testing, and LC 34 - Leakage and escape of radioactive material and radioactive waste. For two of the LCs (LC24 and LC28) we were not satisfied that THORP was compliant with its legal obligations, and judged these as Amber (seek improvement), the remainder were given Green (no formal action) ratings. The shortfalls were primarily compliance based (as opposed to safety), and we were able to conclude that overall the MASFE and pipe bridge are fulfilling the requirements of the safety case. This inspection took place shortly before the end of this reporting period and we are considering our regulatory response to the two Amber ratings. Further detail will be described the next reporting period.

**Spent Fuel Management Value Stream**

Magnox Reprocessing Facility (MRF)

One planned compliance inspection was conducted at the MRF facility on the Sellafield site. The purpose of this inspection was to confirm Sellafield Ltd’s compliance with its corporate arrangements for LC 35. We judged that compliance with the LC met the legal standard and assigned a Green (no formal action) inspection rating.

Highly Active Liquor Evaporation and Storage (HALES)

Two planned inspections were conducted at the Highly Active Liquor Evaporation and Storage (HALES) facility. One of these was a compliance inspection to confirm Sellafield Ltd’s compliance with its corporate arrangements for LCs 12 and 26. The second inspection was a Systems-Based Inspection to confirm the adequate implementation of the safety case for the HALES operational and back-up steam supply systems and to confirm compliance with LCs 10, 12, 23, 24, 28 and 34.

For all the planned LC compliance inspections we judged that Sellafield Ltd had met the legal standard and assigned Green (no formal action) inspection ratings. We also judged that the HALES safety case for its operational and back-up steam supplies had been adequately implemented.

High Level Waste Plants (HLWP)

Two planned inspections were conducted at the High Level Waste Plants (HLWP). One of these was a themed inspection looking at Disciplined Operations and Sellafield Ltd’s compliance with its corporate arrangements for LCs 10, 12, 24 and 26. The second inspection was a Systems-Based Inspection to confirm the adequate implementation of the safety case for the HLWP electrical systems and to confirm compliance with LCs 10, 12, 23, 24 and 28.

During the Disciplined Operations inspection, ONR judged that Sellafield Ltd had shortfalls in the area of procedural use and adherence at HLWP and we assigned a rating of Amber (seek improvement) against LC 24. An enforcement letter was subsequently sent to Sellafield Ltd seeking improvement in this area. A level 3 regulatory issue has also been raised to monitor the resolution of this shortfall, which is ongoing.

For the remaining LCs inspected we judged that Sellafield Ltd had met the legal standard and assigned Green (no formal action) inspection ratings. We also judged that the HLWP safety case for its electrical systems had been adequately implemented.

Spent Fuel Services (SFS)

Six inspections were undertaken at Spent Fuel Services, five LC compliance and one system based inspection (SBI) covering:

* LC26 (Control and supervision of operations)
* LC27 (Safety Mechanisms, devices and circuits)
* LC28 (Examination, inspection, maintenance and testing)
* LC32 (Accumulation of radioactive waste)
* LC36 (Organisational capability)
* Fuel Handling Plant Pond Structure SBI

Four of the planned LC inspections were judged such that compliance with the LC met the legal standard and the assigned ratings were Green (no further action), however for LC32 we judged that SFS had not met its legal obligations and rated the inspection Amber (seek improvement).

The SBI was against the standard set of licence conditions for such inspections; LC 10 - Training, LC 23 - Operating rules, LC 24 - Operating instructions, LC 27 - Safety mechanisms, devices and circuits, LC 28 - Examination, inspection, maintenance and testing, and LC 34 - Leakage and escape of radioactive material and radioactive waste. For one of the LCs (LC23) we were not satisfied that SFS was compliant with its legal obligations, and judged it as Amber (seek improvement), the remainder were given Green (no formal action) ratings. Overall, we judged that SFS was compliant with its safety case. Enforcement Letters were issued with regard to LC23 and LC32 and these are shown in Section 4.

Effluent & Encapsulation Plants

We conducted a system based inspection (SBI) on the nuclear ventilation system in the Magnox Encapsulation Plant (MEP), which sought assurance that MEP has adequately implemented the following Sellafield Licence Condition arrangements:

* LC 10 - training
* LC23 – operating rules
* LC24 – operating instructions
* LC27 - safety mechanisms, devices and circuits
* LC28 - examination, inspection, maintenance and testing
* LC34 - leakage and escape of radioactive material and radioactive waste

On the basis of the evidence sampled at the time of the inspection, ONR judged that the Magnox Encapsulation Plant (MEP) had adequately implemented the safety case for the ventilation system and that the ventilation system currently fulfils its safety function. We judged that an inspection rating of Green (no formal action) was appropriate for compliance with LC10, 23, 24, 27, 28 and 34.

We also conducted a LC26 – control and supervision on the Low Activity Effluent Management Group (LAEMG).

ONR sampled the implementation of arrangements to ensure that operations which may affect safety are carried out under the control and supervision of SQEP appointed for that purpose. On the basis of the evidence sampled at the time of the inspection, we judged that, on balance, LAEMG had adequately implemented Sellafield Ltd's arrangements for LC 26.

**Site Management**

During the reporting period within the site management value stream, we carried out 3 LC compliance inspections including an assessment of the site’s security emergency exercise and one Systems Based Inspection (SBI) covering:

* LC 7 – Incidents on site
* LC 11 – Emergency arrangements
* LC 15 – Periodic review
* SBI – Civil assets and bridges

Infrastructure

The SBI was against the applicable licence conditions for such inspections; LC 10 - training, LC 23 - operating rules, LC 24 - operating instructions and LC 28 - examination, inspection, maintenance. We judged that compliance with LC 10, LC 23 and LC 28 met the legal standard and assigned Green (no formal action) inspection ratings. We judged that improvements were required regarding a specific operating instruction and assigned Amber (seek improvement) for LC 24. Regulatory Issues have been raised to provide oversight of the associated corrective actions. Our overall judgement was that the pipe bridges and road bridges fulfil the requirements of the safety case.

Security and Resilience

The Nuclear Safety Inspector participated in the compliance inspection of the Sellafield Ltd Level 1 security demonstration exercise (Exercise SIERRA LIMA 3). The purpose of this inspection was to observe the on-site emergency response exercise to confirm Sellafield Ltd’s compliance with its corporate arrangements for LC 11.

The purpose of the LC 11 – emergency arrangements and LC 15 – periodic review compliance inspection was to confirm that Sellafield Ltd had undertaken an adequate periodic review of the safety case for emergency management and to confirm that the safety case is adequate.

For the planned LC compliance inspections, we judged that compliance with LC 15 and LC 11 met the legal standard and assigned a Green (no formal action) inspection rating.

Analytical Services

During the reporting period within the Analytical Services, two planned LC compliance inspections were conducted. The purpose of these inspections was to confirm Sellafield Ltd’s compliance with its corporate arrangements for LC 7 and LC 11. For both planned LC compliance inspections, we judged that compliance with the LC was adequate, and assigned Green (no formal action) inspection ratings.

Site Infrastructure - NNL

We conducted two Licence Condition (LC) compliance inspections on the Central Lab (CL) operated by the National Nuclear Laboratory (NNL) in November. These were LC12 – Duly Authorised Person (DAP) and LC26 – control and supervision.

For LC12, we sampled the training records and assessment packs of the duty DAPs in Area 200, 400 and 500. We were content that the DAP’s training certification was all in date. We consider NNL's DAP appointment process suitably challenging and robust. We tested safety case knowledge, plant condition understanding, duties of control and supervision of the Area 400 DAP. From the discussions, ONR was content that the DAP had a good understanding of the plant operational safety case, her role and was able to discharge her responsibilities effectively.

For LC26, we attended the daily Plant Operations Control Centre meeting, observed the subsequent setting to work for Area 400 and 500, and observed an operational activity in Area 400 starting from the pre-job brief. We provided regulatory advice for NNL to consider incorporating the status of Plant Modification Proposals (PMP) and the Operational Decision Making (ODM) into the Nuclear Safety Dashboard (NSD).

On the basis of the evidence sampled at the time of the inspection, we judged that NNL Central Lab had adequately implemented Sellafield Ltd's arrangements for LC 12 and 26 and assigned Green (no formal action) inspection ratings.

Corporate

Our corporate inspection programme for the Sellafield site has two main areas of focus:

* Undertaking a programme of corporate LC inspections to examine the adequacy of the corporate arrangements that Sellafield Ltd has made to comply with its nuclear site licence, and sample the corporate/site-wide implementation of these arrangements; and,
* Overseeing strategic enterprise change at Sellafield, including leadership and culture.

During the reporting period we carried out three planned corporate LC inspections covering:

* LC 5 – Consignment of nuclear matter
* LC 15 – Periodic review
* LC 36 – Organisational capability

The LC 5 and the LC 15 corporate inspections were comprehensive in scope whilst the scope of the LC 36 corporate inspection was targeted at the organisational capability of the Sellafield Ltd Executive Team.

Both the comprehensive LC 5 inspection and the LC 36 inspection targeted at the Sellafield Ltd Executive Team were rated Green (no formal action).

The comprehensive LC15 inspection was rated Amber (seek improvement). ONR’s Enforcement Management Model (EMM) was applied. The outcome in this case being Regulatory Advice which is being monitored by a level 3 Regulatory Issue.

During the reporting period, we also continued to monitor improvement actions being taken by Sellafield Ltd in response to previous corporate LC inspections.

Strategic Enterprise Change

Sellafield Ltd is implementing a portfolio of wide-ranging business change aligned to its enterprise strategy. During the reporting period we have continued to maintain oversight of a number of strategic enterprise changes including: -

* Developing the required organisation capability to deliver the future operating plan.
* Alternative delivery models for group business services and the Procurement of Information, Communications, and Technology Services (PICTS).
* Continued development of Sellafield Ltd’s intelligent customer organisation for the Programme and Project Partners contracts.
* Development of the new Sellafield Enterprise Management System.
* Roll-out of new digital tools to support operations delivery.

In all cases we are satisfied that Sellafield Ltd is controlling the changes in line with legal requirements including LC 36 - Organisational capability.

Over a number of years we have engaged with Sellafield Ltd on trials at PFCS and at HLWP of new arrangements for work delivery. In this period, Sellafield Ltd decided to stop the trials and (with the exception of retaining some minor changes at HLWP) revert to extant site-wide arrangements for work delivery. In response, ONR has closed a level 3 regulatory issue related to the trials at PFCS and at HLWP. We are working with Sellafield Ltd to capture the learning from this project.

During this reporting period, we completed an assessment of the corporate governance of safety at Sellafield Ltd. ONR specialist inspectors reviewed corporate governance arrangements and board papers related to safety, interviewed several board members, and observed a meeting of the Sellafield Ltd board as well as one of its sub-committees. This is one of several planned corporate governance interventions being carried out across Great Britain’s nuclear estate, normally undertaken on a five-yearly cycle for large licensee organisations. ONR’s inspectors concluded that the Sellafield Ltd board fulfils its responsibility for the corporate governance of safety in accordance with relevant good practice outlined in nuclear standards, guidance, and criteria, with a small number of exceptions. Notwithstanding this, regulatory intelligence indicates that improvements are required in conventional safety, fire safety, cyber security and progressing high hazard risk reduction. The corporate governance arrangements provide an adequate framework for the board to challenge, hold to account, and support executive management in making the required improvements.

During this reporting period, we also undertook an assessment of safety leadership at Sellafield Ltd. ONR specialist inspectors reviewed management system arrangements, interviewed several members of staff from the Special Nuclear Materials Value Stream, and observed several operational activities. Safety Leadership is recognised as a key regulatory priority, as outlined in the Chief Nuclear Inspector’s annual report on Great Britain’s nuclear industry, published in October 2022, and therefore this is one of several safety leadership interventions being carried out across Great Britain’s nuclear estate. Further information will be provided in our next report to the WCSSG.

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](http://www.onr.org.uk./intervention-records) on our website [www.onr.org.uk](http://www.onr.org.uk).

Should you have any queries regarding our inspection activities, please email [contact@onr.gov.uk](mailto:contact@onr.gov.uk).

## Other Work

Special Nuclear Materials (SNM)

Through our three Level 1 regulatory issues (highest level of issue) we continue to engage and influence the delivery of hazard and risk reduction activities regarding the Sellafield Ltd SNM facilities. Specifically, this includes asset care improvements on the First Generation Finishing Line (FGFL) facility and the delivery of capabilities to allow continued safe and secure storage of SNM.

With respect to FGFL asset improvements, Sellafield Ltd continues to make satisfactory progress on the electrical and containment upgrade tasks within the SNM (North) complex.

During this period Sellafield Ltd has also continued to make significant progress with regard to the previously permissioned activities for inspection, retrieval and repackaging of acute risk SNM packages.

ONR’s current permissioning focus in this area relates to activities for the retrieval and repackaging of acute risk SNM packages from one of Sellafield Ltd’s SNM legacy stores.

The on-going construction of the Sellafield Product and Residue Store Retreatment Plant (SRP) is fundamental to the success of the future state programme; and forms part of our continued engagement and influence with Sellafield Ltd to ensure the timely implementation of capabilities required for the safe longer-term storage of SNM inventory that has been consolidated from Dounreay to Sellafield.

Remediation Value Stream - Decommissioning Projects

Our regulatory engagements continue with the key remediation projects. We are currently engaging on two demonstrators; the alpha glovebox dismantler and the sort and segregate demonstrator. Sellafield Ltd is implementing the lessons learnt from the skip size reduction active demonstrator, permissioned by ONR in July 2021, onto the new demonstrators.

The glovebox demonstrator is developing an efficient and effective capability to semi-remotely decommission alpha-active gloveboxes using laser cutting technology. The sort and segregate demonstrator will trial an approach to separate the intermediate active wastes from plutonium contaminated material. Both these demonstrators will be subject to formal permissioning by ONR in 2023 / 2024.

Sellafield Ltd has made good progress with demolition of the pile 1 chimney by removing the filter gallery in 2014 and completing the diffuser demolition in 2021. This has resulted in the seismic withstand of the remaining chimney section being similar to that of an existing structure. The next step is the removal of the barrel section of the chimney, which will be carried out by means of a spider crane solution. This will be subject to ONR permission and engagement is currently underway.

We are also continuing our engagements with Sellafield Ltd regarding the approach for floc removal from legacy tanks to longer term storage tanks. This plant modification proposal will be subject to ONR permissioning in 2024.

Highly Active Liquor Evaporation and Storage (HALES) – butex transfer activity

ONR has informed Sellafield Ltd that it requires ONR’s permission to begin its activity to transfer historic ‘butex’ liquors from the ‘old side’ to the ‘new side’ tanks within the HALES facility. This is to ensure that some necessary remediation work and other preparations are properly completely prior to the start of this activity. ONR has engaged with Sellafield Ltd on this work and will be seeking to undertake a visit to site to confirm readiness prior to giving permission. This is expected in the second quarter of 2023.

Magnox Swarf Storage Silo (MSSS) - MSSS radioactive waste retrieval programme

The MSSS is deemed to represent an intolerable risk and retrieval of the radioactive waste stored in its twenty-two silo compartments is a priority for high hazard and risk reduction on site. Sellafield Ltd has adopted a phased approach to waste retrievals, starting with retrieval of intermediate level radioactive miscellaneous beta gamma waste (MBGW) from compartment 10 (C10). Retrieval of bulk waste from MSSS is expected to take several decades to complete.

On 9 April 2022, ONR issued Licence Instrument 540 agreeing to Sellafield Ltd’s request to commence retrieval of MBGW from MSSS C10. Sellafield Ltd commenced MBGW retrievals soon after receiving ONR’s Agreement and have progressed to plan during the 2022/23 financial year.

In November 2022, ONR undertook a post-permissioning inspection of MSSS retrievals operations. Overall, we judged that retrievals operations were progressing well, and no areas of regulatory concern were identified. Start of bulk waste retrievals from MSSS original building and first extension silo compartments is currently due to commence in early 2025. ONR recognises the complexity of delivering hazard and risk reduction in MSSS and continues to engage with Sellafield Ltd to secure regulatory confidence in its delivery plans and that the overall risks to people on and off site remain reduced so far as is reasonably practicable.

MSSS - Original Building leakage

In November 2019, Sellafield Ltd reported falling liquid levels from the MSSS original building (OB) waste storage compartments. The most probable source of the leak is from historic leak paths to ground from cracks within the original MSSS building. There was a leak to ground from the OB in the 1970s, which gradually reduced over the decade to the limit of detection.

The current MSSS OB leakage rate increased with time, from 0.5m3/month to 2.6 m3/day. As of March 2023, the OB liquor loss rate has remained relatively unchanged at around 2.3-2.5m3/day since April 2021. It is possible that the leakage will continue until retrieval of bulk waste from OB silos has been completed in several decades time.

ONR and the Environment Agency issued two joint letters to Sellafield Ltd outlining regulatory expectations for managing the risks arising from the MSSS OB leakage to ground. ONR raised a level two regulatory issue to monitor the company’s progress with managing the risks associated with the leakage. The issue has ten associated actions which Sellafield Ltd is required to address within appropriate timescale.

There are currently no radiological consequences for the public or workforce as a result of this issue. Ground modelling and underpinning research concludes that the higher activity radioactive species are bound close to the facility. Migration of significant contamination through the ground is predicted to take decades and any risk to the environment and public would be very low and over an extended timescale. This exceeds the time it will take to remove and remediate the MSSS facility.

Based on ground modelling and underpinning research, there is judged to be no risk to public water supply resulting from this leak. ONR’s concurs with Sellafield Ltd.’s current judgment on this matter.

The leak was categorised against the International Nuclear and Radiological Event Scale (INES) as a Level 2, incident, event on a seven-point scale. In view of the continued leak to ground, we required Sellafield Ltd. to review the leak INES categorisation to determine if it approached level 3, serious incident. The company concluded that the current rating remains valid with significant margin to level 3. The UK INES officer, an ONR inspector, agrees with Sellafield Ltd.’s judgement. We will continue to monitor Sellafield Ltd’s monitoring of the leak INES rating as part of our routine MSSS OB leak-related engagements.

On 29 July 2022, Sellafield Ltd provided the outstanding responses to ONR’s regulatory concerns, as captured in the level two issue. ONR specialist inspectors have completed assessment of Sellafield Ltd’s responses. The assessments have formed the basis of ONR’s Regulatory Position Statement on the MSSS OB leakage. The statement is currently undergoing acceptance review having been subject to ONR’s enhanced decision-making process. This reflects the complex problem faced in ensuring risks to people on and off site from a leaking intolerable facility continue to be reduced so far as is reasonably practicable.

First Generation Magnox Storage Pond (FGMSP)

The FGMSP still contains significant volumes of historical inventory including various fuels, radioactive sludge and other solid wastes. This inventory presents a significant radiological risk as FGMSP does not meet modern containment standards due to the ageing pond structure and infrastructure obsolescence. FGMSP is deemed to represent an intolerable risk and Sellafield Ltd has therefore developed a programme to reduce this risk systematically and progressively through retrieval of the bulk hazardous radioactive inventory.

Sellafield Ltd’s programme business case is to complete bulk pond retrievals in the range 2033 to 2040.

Some fuels have been retrieved and exported to Fuel Handling Plant (FHP), and a small volume of sludge has been exported to the sludge packaging plant. To date approximately 24% of the fuel inventory and 14% of the sludge inventory has been retrieved from FGMSP. Several Key Decommissioning Milestones (KDMs) have been put in place by the licensee in accordance with its arrangements under LC35 to reduce the remaining inventory from the facility.

The regulatory focus continues to be on the retrieval, removal and export of fuel, intermediate level waste, and bulk sludge from the pond.

A key enabler is the removal of skips of radioactive inventory from the pond to Self-Shielded Boxes (SSBs) for interim storage in a purpose-built Interim Storage Facility (ISF). ONR will be monitoring progress via two regulatory Hold Points (HP); HP 271 for a particular waste stream (zeolites) and HP 406 for legacy fuel.

We are assessing the safety case submission aligned to HP 271. Technical engagements continue to discuss legacy fuel for the ISF (HP 406), and whether modifications are necessary for the additional materials.

Inactive commissioning of FGMSP export facility involving SSBs is planned to recommence in April 2023. Several delays have arisen following an incident in February 2022 involving a clash of an empty skip with an SSB during inactive commissioning trials. The delays have been a result of plant recovery, fault finding and design modifications following the incident, as well as subsequent outages of the FGMSP export facility due to a site power dip, shortfalls in FGMSP’s fire safety arrangements, crane maintenance and gamma monitor replacement. This has meant that Sellafield Ltd’s submission requesting an LI for release of HP 271 has been delayed. As a result of this, and in line with its LC35(1) arrangements, Sellafield Ltd has informed ONR via a change request record that the target dates associated with this KDM (first zeolite skip stored in ISF) will not be achieved. We are considering whether this proposed change sufficiently justifies that Sellafield Ltd are doing all that is reasonably practicable to reduce risks. For example, Sellafield Ltd has continued with sludge removal capability and skip consolidation to manage pond floor space. We are, therefore, maintaining regulatory scrutiny of Sellafield Ltd’s work in this area to ensure it resolves these issues.

Pile Fuel Storage Pond (PFSP)

In accordance with its arrangements made under Licence Condition 22 (1), modification or experiment on existing plant, we granted permission to Sellafield Ltd for underwater divers to access the Pile Fuel Storage Pond (PFSP) following a rigorous series of assessments from a range of different specialisms including fault studies, radiation protection, human factors and conventional health and safety.

The Agreement (under Licence instrument 543) to commence the PFSP Diving Pilot to deploy divers into bays 11 and 12 was granted in December 2022 to remove the remaining fixed in pond items, clear debris and remove sludge.

This is the first-time divers have entered the legacy pond in more than 65 years since the PFSP was constructed in the 1940s and replicates a well-established technique previously carried out internationally and at other UK nuclear sites during their decommissioning phase.

The PFSP was commissioned for operation in the 1950s for the receipt and storage of fuel and isotopes from the Windscale Piles and is one of oldest and most hazardous facilities on the Sellafield site, containing spent fuel, sludge, radioactive and contaminated solids, intermediate level waste and low-level waste, pond water and contaminated concrete.

Significant progress has been made in removing historic waste from the facility with over 75% of the waste safely removed, divers are now needed to extract the remaining quarter of the inventory.

Facilities to support waste retrievals from legacy silos

To support waste retrievals from the legacy silos, MSSS and PFCS, Sellafield Ltd needs to progress the construction of several new build facilities and implement modifications to existing facilities. We continue to maintain regulatory focus in these areas to ensure we have the necessary regulatory confidence that Sellafield Ltd has the key enablers in place to safely store the waste retrieved from the legacy silos and that the overall risks to people on and off site remain reduced so far as is reasonably practicable.

The Box Encapsulation Plant (BEP) is currently under construction and is now due to commence active commissioning in June 2027. This facility is required to support both MSSS and legacy ponds waste retrievals. Sellafield Ltd is continuing to complete installation of plant and equipment to schedule, building regulatory confidence in its delivery plans to ensure the facility is available to deliver the high hazard and risk reduction in MSSS.

Waste retrieved from the legacy silos is placed in stainless steel 3m3 boxes to enable on-site storage. Volume manufacture of the 3m3 box design for MSSS waste is proving challenging, as such ONR continues to engage with Sellafield Ltd to secure regulatory confidence that boxes will be available to support the future MSSS waste retrieval programme and that there is an adequate process to manage any boxes manufactured outside the specification.

Subject to ONR permission, Sellafield Ltd expects Box Encapsulation Plant Product Store and Direct Import Facility (BEPPS-DIF) to be available to support PFCS waste retrievals in June 2023.

BEPPS-DIF is a critical enabler for hazard and risk reduction, storing the filled waste packages retrieved from the Silos and other legacy facilities. The final preparations of the facility to enable the commencement of Active Commissioning are well advanced, subject to ONRs permission, the facility will then be able to receive material from PFCS and the Waste Packaging and Encapsulation Plant (WPEP) via DIF. Transition from active commissioning to active operations and the import of waste packages via Box Encapsulation Plant (BEP) will be the subject of future regulatory hold-points. After a period of Active Commissioning, Sellafield Ltd will seek ONR’s permission to commence Active operations for BEPPS-DIF in early 2024.

Pile Fuel Cladding Silo (PFCS) radioactive waste retrieval programme

PFCS is deemed to represent an intolerable risk and retrieval of the radioactive waste stored in its six silo compartments is a priority to achieve high hazard and risk reduction on the site. Sellafield Ltd has adopted a two-stage approach. The first stage – ‘Early Retrievals’ - involves accessing only compartment 5 of the silo and removing waste through a high-level penetration in the compartment wall above the level of the waste. This first stage will enable Sellafield Ltd to gain sufficient knowledge, experience, and confidence in the waste retrieval approach to implement the second stage – ‘Full Retrievals’ – which will enable waste retrievals from the remaining five compartments.

We previously issued Licence Instrument (LI 536) agreeing to the request from Sellafield Ltd to commence active commissioning and operation of the waste retrievals equipment installed on PFCS compartment 5 in March 2022. Although Sellafield Ltd has commenced active commissioning, operational challenges with the waste retrieval crane have prolonged the active commissioning activities. No waste packages are expected to be produced for export to stores until 2023 Quarter 2 at the earliest.

Our regulatory focus will continue in this area to secure regulatory confidence in Sellafield Ltd’s delivery plans and that the overall risks to people on and off site remain reduced so far as is reasonably practicable.

Site Infrastructure - Analytical Services

We continue to engage with Sellafield Ltd over the need to secure long-term provision of Analytical Services for the Sellafield site. This is necessary to support the safety of ongoing operations and, specifically, hazard and risk reduction activities across the site. The Replacement Analytical Project (RAP) continues to progress the detailed design phase of the project and is working toward securing Government approval for the full business case.

We have also continued to engage with Sellafield Ltd on the asset care improvements and the reduction of legacy waste presently stored within the existing Analytical Services facility. Sellafield Ltd has continued to make significant progress in the asset care improvement work and is currently reviewing its options for repackaging, treatment and disposal of any remaining legacy wastes from within this facility post the cessation of the Magnox Operating Plan (MOP).

Periodic Safety Review (PSR)

We have continued to engage with Sellafield Ltd over identified opportunities for improvements within the PSR programme and to monitor and support the delivery of improvements identified during earlier PSR inspections. An inspection has been carried out against LC15 corporate arrangements.

The “deep dive” assessment of the Advanced Gas-cooled Reactor (AGR) storage pond PSR has continued. The finalisation of the process is expected in the next reporting period.

Reviews have been carried out on Combined Services and Emergency Services PSR. ONR has assessed that Sellafield Ltd has undertaken fit for purpose periodic safety reviews and met our expectations for LC 15 compliance.

Corporate

Our permissioning process continues to monitor Sellafield Ltd’s planned submissions in accordance with its Hold Point Control Plan (HPCP), which forms part of its arrangements made to comply with a number of LCs, such as LC 22 - Modification or experiment on existing plant. This process ensures we have regulatory oversight and control over relevant Sellafield Ltd activities.

Within this reporting period, we have released the following LC 22 hold point:

* HPCP 505: Plutonium Contaminated Material (PCM) Safety Case Implementation at Mixed Oxide Fuel (MOX) Demonstration Facility (MDF)

NOTE

In line with the ONR Guide NS-PER-GD-001 “[The Purpose and Use of Permissioning](https://www.onr.org.uk/operational/assessment/ns-per-gd-001.pdf)”, the release mechanism for this hold point was determined as Enhanced Implementation, Monitoring and Control (EIM&C) and not a Licence Instrument (LI). This matter is therefore not included in the list of LIs and Enforcement Notices issued by ONR which are reported in Section 4 “Regulatory Activity”.

Conventional Health and Safety (CHS) and Life Fire Safety

CHS performance has been variable within the period. We continue to see improvements in electrical safety, but formal enforcement was required across a range of other areas including fire life safety and asbestos management (see Section 4). Following regulatory interventions and a holding to account meeting, Sellafield Ltd has developed and is implementing a fire life safety improvement plan. Sellafield Ltd is also developing an industrial safety improvement plan, which is receiving targeted regulatory oversight. In addition, we are increasing our focus on Sellafield Ltd’s leadership and management for safety and CHS risk profiling.

Control Of Major Accident Hazards (COMAH)

Sellafield Ltd has made adequate progress with the COMAH improvement plan and our regulatory work for quarter 4 of 2022/23 has focussed on ensuring that the improvements are implemented. Human factors actions have been completed and good progress made with the process safety actions.

The COMAH Competent Authority (CA) intervention plan has been developed for FY 23/24, which includes COMAH Safety Report pre-receipt early engagement, in preparation for Safety Report submission at the end of 2024/25.

# 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:

Magnox Swarf Storage Silo (MSSS)

In February 2022, ONR sent an enforcement letter SEL77792R ONR-EL-21-045 raising concerns in respect of the increased temperatures in compartment 18 of MSSS. This required that Sellafield Ltd implement reasonably practicable measures to protect the margin between the temperatures specified in the required Operating Instructions and excursion temperatures. The absolute margin between these temperatures is unknown, however, increased temperatures could lead to overpressure and damage to the silo containment resulting in the leakage and escape of radioactive material and radioactive waste. In response to this, Sellafield Ltd communicated its intent to install and commission a chiller which was planned for July 2022 but in January 2023 slippage in progress and little engineered improvement reached a point where greater regulatory attention was warranted and a second letter was sent (ONR-EL-22-029 SEL77808R).

The letter required that Sellafield Ltd confirm the implementation of the capability to supply chilled water to the Recirculating Cooling Water (RCW) system as part of managing compartment heat within MSSS. This is due for completion at the end of April 2023 and progress continues to be monitored against this. In addition to this, an inspection of emergency arrangements within MSSS associated with heat management was undertaken in February 2023.

First Generation Magnox Storage Pond (FGMSP)

Following a fire safety inspection in FGMSP on 3 November 2022, the shortfalls in the Fire Alarm and Detection System were considered to pose a serious risk to fire life safety and an Enforcement Notice (ONR-EN-22-001) was sent to ensure FGMSP came into compliance with Regulatory Reform (Fire Safety) Order 2005.

Sellafield Ltd. provided a schedule of the improvements required to remedy the compliance shortfalls. Regular and comprehensive updates of the progress made in implementing the necessary corrective actions to address all the areas of non-compliance was received and progress was also reviewed at site, where further particulars were provided by Sellafield Ltd subject matter experts.

We are satisfied that sufficient improvements have been made, and the Enforcement Notice was closed on 9 March 2023.

Magnox Reprocessing Facility (MRF)

We completed an investigation into an incident where a Sellafield employee fell from a scaffolding ladder and injured their back whilst undertaking work in the Low Active Cell at the Magnox Reprocessing Facility. The investigation revealed a series of significant failings to provide a safe system of work and we took the decision to prosecute Sellafield Ltd.  On the 6th March 2023, Sellafield Ltd attended Carlisle Magistrates Court where they pleaded guilty to an offence under Section 2 (1) of the Health and Safety at Work etc Act 1974 and were fined £400,000.

We undertook preliminary enquiries following an incident where there was a potential inhalation of Uranium Trioxide (UO3) powder during the start-up of the Thermal Denitration Plant at MRF. Spillage assessments and Internal dose monitoring were completed with no internal dose being received or recorded on the individual’s dose records. We were therefore satisfied that the ONR criteria for investigation were not met.

Salt Evaporator Medium Active Store (SEMAS)

On 22 February an event occurred in the Salt Evaporator Medium Active Store (SEMAS) where circ. 400 lessing rings were ejected out of the vent pipe from the dis-entrainment column above a nitric acid reagent tank, onto the adjacent building roof. No operators were in the vicinity of the incident, no injuries were sustained and there were no nuclear safety consequences.

It was unclear what caused the over-pressurisation of the nitric acid reagent tank that resulted in the propulsion of the lessing rings. This event had the potential for significant conventional safety consequences as the roof where the lessing rings were found is an operational area requiring operator access. Sellafield Ltd started a Management Investigation during February.

We considered this incident met the criteria for Investigation and commenced our investigation on 31 March. Further detail will be given in the next WCSSG report.

Infrastructure

We undertook preliminary enquiries following an incident caused by the failure of a 132kV Cable Sealing End on a Grid Transformer which caused a momentary voltage disturbance across a wide area of Cumbria. A separate Grid Transformer remained in service throughout so there was no interruption to the continuity of electrical supplies. The voltage disturbance caused the supply breakers to the 415V Essential Services Board (ESB) to trip at the Combined Heat & Power Plant (CHPP) which led to a temporary loss of steam to site. We were satisfied that the ONR criteria for investigation were not met. Regulatory Issues have been raised and ONR will follow up the actions identified by Sellafield Ltd’s investigations.

# 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.

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

|  |  |  |  |
| --- | --- | --- | --- |
| Date | Type | Ref. No. | Description |
| 6 January 2023 | Enforcement Letter | ONR-EL-22-029 SEL77808R | Magnox Swarf Storage Silo (MSSS) Licence Condition 34 (1) |
| 16 November 2022 | Enforcement Notice | ONR-EN-22-001, ONR-EL-22-020  SEL77801 | First Generation Magnox Storage Pond (FGMSP) Regulatory Reform (Fire Safety) Order 2005  Article 30 |
| 06 March 2023 | Prosecution | ONR-EDR-22-027 | Sellafield Ltd – Magnox Reprocessing Facility (MRF) – Prosecution against Section 2 (1) of the Health and Safety at Work etc Act 1974 – Scaffold ladder fall incident |
| 22 November 2022 | Enforcement Letter | ONR-EL-22-019 | Enforcement letter seeking improvement against LC 24 following the Disciplined Operations inspection awarding an AMBER rating against this LC. |
| 14 December 2022 | Agreement | LI 543 | Agreement to Commence the PFSP Diving Pilot – Introduction of Nuclear Divers into Bays 11 and 12. Licence Condition 22 (1) |
| 28 November 2022 | Enforcement Letter | ONR-EL-22-022 | SFS LC23 (Operating rules) |
| 14 February 2023 | Enforcement Letter | ONR-EL-22-035 | SFS LC32 (Accumulation of radioactive waste) |
| 27 March 2023 | Enforcement Letter | ONR-EL-22-043 | Asbestos Management at Sellafield Site |

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

# News from ONR

For the latest news and information from ONR, please read and subscribe to our regular email newsletter ‘ONR News’ at [www.onr.org.uk/onrnews](http://www.onr.org.uk/onrnews).

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