

2017/86051

**Office for Nuclear Regulation (ONR)
Six Monthly Site Report for
Sellafield, Calder Hall and Windscale West Cumbria
Sites Stakeholder Group (WCSSG)**

Covering the period – 01 October 2016 to 31 March 2017



Foreword

This report is issued as part of ONR's commitment to make information about inspection and other regulatory activities relating to the Sellafield site available to the public. Reports are distributed quarterly to members for the West Cumbria Sites Stakeholder Group 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 Scrutiny Meetings and will respond to any questions raised there. Any person wishing to inquire about matters covered by this report should contact: ONREnquiries@onr.gov.uk

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1 INSPECTIONS

1.1 DATES OF INSPECTION

ONR nuclear safety inspectors made inspections on the following dates during this quarter:

01 October 2016 31 March 2017	October 2016	November 2016	December 2016	January 2017	February 2017	March 2017
Plutonium	Oct 19	Nov 16-17	-	Jan 24	Feb 07- 08	-
Thorp	Oct 26-27	Nov 15-16 23 29	Dec 06- 08	-	-	Mar 08-10
Decommissioning	Oct 04	-	Dec 13	Jan 10	Feb 07- 08	Mar 07- 08 23 29-30
Magnox	Oct 13	Nov 15-16	Dec 01	-	-	Mar 29-30
Operational Waste Facilities	Oct 11-13	Nov 15-17 24-25 29	Dec 07 13-15	Jan 10-11	Feb 21-23	Mar 14-16 27-28
Infrastructure	Oct 11	Nov 08-09	Dec 13	Jan 10	Feb 08	Mar 01 14
Corporate	Oct 11-13 12	Nov 29-30	-	-	Feb 14-16	-
Project Delivery	Oct 12	Nov 09	Dec 31	Jan 24	Feb 10	Mar 22

2 ROUTINE MATTERS

2.1 Inspections

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

- The conditions attached by ONR to nuclear site licences 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 1999 (IRR99) and the Management of Health and Safety at Work Regulations 1999 (MHSWR99).

Inspections entail monitoring the licensee's actions in relation to incidents, operations, maintenance, projects, modifications, safety case changes and any other matters that may affect safety on the site. The licensee, Sellafield Ltd, 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 general, ONR judged the arrangements made and implemented by the site in response to safety requirements to be adequate in the areas inspected. However, where improvements were considered necessary, the licensee made satisfactory commitments to address the issues, and our inspectors will monitor progress during future visits. Where necessary, ONR will take formal regulatory enforcement action to ensure that appropriate remedial measures are implemented to reasonably practicable timescales.

In this period, routine inspections at Sellafield Ltd covered the following:

Sellafield Compliance, Intelligence and Enforcement (SCIE) sub-programme.

The SCIE sub-programme's objective is to seek evidence-based confidence that Sellafield Ltd is complying with its statutory obligations and that workers and the public are protected from the hazards of the site.

Routine Matters - Corporate Inspection Programme

The ONR's corporate inspection programme for the Sellafield site has two main areas of focus:

- Examining the adequacy of the arrangements that Sellafield Ltd has made to comply with its nuclear site licence, securing improvements as necessary; and
- Working with Sellafield Ltd to advise and support its leadership and management for safety activities.

ONR carried out a number of inspections of Sellafield Ltd's nuclear site licence compliance arrangements during the period covered by this report. ONR also continued to monitor and support delivery of the improvements identified during earlier inspections.

Licence compliance arrangements inspections delivered over the period included Licence Conditions 21 (Commissioning), 5 (Consignment of nuclear matter), and 35 (Decommissioning). ONR was satisfied that Sellafield Ltd's arrangements for compliance with Licence Condition 5 are adequate. However in relation to Licence Conditions 21 and 35, ONR's opinion was that there were shortfalls in aspects of Sellafield Ltd's arrangements. In relation to Licence Condition 21, this relates to a lack of systematic verification and validation of operational and human factors requirements deriving from Sellafield Ltd's design and safety case processes. In relation to Licence Condition 35, the shortfall concerns a lack of clarity in the documentation of Sellafield Ltd's decommissioning strategy and supporting arrangements. In both cases ONR has raised regulatory issues to track these compliance gaps to closure.

ONR is continuing to monitor Sellafield Ltd's progress towards closure of a regulatory issue raised in July 2016 concerning Licence Condition 6 (Documents, records, authorities and certificates). ONR is seeking demonstration of compliance with record retention periods and improvements in the record management system.

ONR is continuing to track Sellafield Ltd's progress in addressing four open regulatory issues relating to leadership and management for safety (specifically, consistency of safety leadership, shared understanding of 'fit for purpose' hazard and risk reduction, the design and implementation of the licensee's safety management system, and working level instructions). ONR is satisfied with Sellafield Ltd's progress on two of these issues ('fit for purpose' hazard and risk reduction and the safety management system) but is seeking acceleration of Sellafield Ltd's improvement activities relating to safety leadership and working level instructions.

Routine Matters - Magnox

Within the Magnox Operating Unit (OU), ONR carried out three planned Licence Condition (LC) Compliance Inspections within the wider Magnox OU, and one System Based Inspection (SBI) at the Magnox Reprocessing Facility.

For the planned compliance inspections, ONR judged the licensee to be compliant with LC11; Emergency arrangements, LC28; Examination, inspection, maintenance and testing, and LC36; Organisational capability; all were rated Green (no formal action).

For the SBI of the Recirculated Cooling Water and Boosted Recirculated Cooling Water Systems, ONR judged compliance with all six sampled licence conditions to be adequate. The LCs inspected (a standard set for SBIs: LC10; Training, LC23; Operating rules, LC24; Operating instructions, LC27; Safety mechanisms, devices and circuits, LC 28; Examination, inspection, maintenance and testing, and LC34; Leakage and escape of radioactive material and radioactive waste) were all rated Green (no formal action).

Routine Matters - Infrastructure

During the period ONR inspected arrangements for compliance with LC28; Examination, inspection, maintenance and testing, and LC32; Accumulation of radioactive waste, within the licensee's Active Area Services laundry facility as it provides an important service to facilitate the overall hazard and risk reduction activities on the site.

ONR identified shortfalls during the LC28 inspection important enough to assign an inspection rating of Amber (seek improvement). ONR is tracking return to compliance through a new regulatory issue. ONR considered the licensee's implementation of its site-wide arrangements for LC32 to be adequate, and awarded an inspection rating of Green (no formal action) here.

During the period ONR conducted a System Based Inspection of the National Nuclear Laboratory (NNL) Central Laboratory. NNL is a tenant on the licensed site conducting activities affecting nuclear safety, and so is subject to licence compliance and other relevant inspections.

ONR's inspection targeted NNL's nuclear ventilation systems. These systems are important to nuclear safety as they enhance the confinement of radioactive substances afforded by the equipment and the building, as well as providing a suitable working environment for personnel and equipment.

ONR also looked at interfaces between Sellafield Ltd and NNL. ONR was of the opinion that Sellafield Ltd provided an adequate level of assurance in regard to its management and control of its tenant. In addition, NNL provided an adequate level of assurance regarding its ownership and implementation of its safety case.

However, ONR identified shortfalls regarding LC10 and LC34 compliance, important enough to assign an inspection rating of Amber (seek improvement). ONR is tracking return to compliance via two new regulatory issues. ONR considered the inspection provided an adequate level of assurance and evidence to demonstrate compliance with LC23, LC24, LC27, and LC28. As such, ONR awarded inspection ratings of Green (no formal action) against these four licence conditions.

ONR inspected arrangements for compliance with LC10, and LC28 within the licensee's Utilities Separation Area Ventilation facility. This is important to safety as it enhances the confinement of radioactive substances afforded by a number of donor facilities, their equipment and buildings, as well as assisting in the provision of a suitable environment for personnel and equipment.

ONR identified shortfalls regarding LC10 and LC28 compliance, important enough to assign inspection ratings of Amber (seek improvement). ONR is tracking return to compliance via two new regulatory issues.

ONR inspected arrangements for compliance with LC11, Emergency arrangements, within the licensee's Utilities organisation. This organisation provides a number of important systems (e.g. steam and electricity supply) that are needed to support the safety of operating facilities at the site.

ONR considered the Utilities organisation's implementation of the site's arrangements merited a Green rating (no formal action), and noted some good practice during the inspection, as well as some minor areas for improvement.

ONR inspected arrangements for compliance with LC10 and LC28 within the licensee's Resilience organisation as it is responsible for equipment that forms part of Sellafield Ltd's site-wide emergency arrangements. ONR considered the implementation of the site's LC10 arrangements merited a Green rating (no formal action), and noted some good practice during the inspection, as well as some minor areas for improvement. However, ONR identified shortfalls with LC28 compliance, important enough to assign an inspection rating of Amber (seek improvement). ONR is tracking return to compliance via two new regulatory issues.

During the period ONR also inspected arrangements for compliance with LC35; Decommissioning, and LC36; Organisational capability, within the licensee's Package Management, Roads and Railways organisation, as it provides a number of important roles (e.g. flask maintenance, transportation of radioactive materials) that support the safety of Sellafield Ltd's operating facilities, including its high hazard and risk reduction work.

No significant findings were identified during these inspections. As such ONR considered inspection ratings of Green (no formal action) were merited against these two license conditions. Nevertheless, ONR considered it appropriate to raise a minor regulatory issue to track the licensee's establishment of a formal decommissioning strategy for its Separation Flask Maintenance Facility.

During the period, ONR monitored the licensee's progress against a number of regulatory issues where shortfalls against legal requirements, or other actions, had been identified during previous inspections or other regulatory engagements. ONR has been content with the progress made, and will continue to monitor licensee performance until these matters are resolved.

Routine Matters - Plutonium Management

Within the Plutonium Finishing and Storage Operating Unit (PF&S OU), ONR carried out three planned Licence Condition Compliance Inspections within the wider OU and one System Based Inspection (SBI) within the Plutonium Management Facility (South).

For the planned compliance inspections, ONR judged that licensee compliance with LC11; Emergency arrangements, LC12; Duly authorised and other suitably qualified and experienced persons, and LC 26; Control and supervision of operations, were adequate and awarded Green (no formal action) inspection ratings.

For the SBI which covered the ventilation systems, ONR judged compliance with all six of the standard set of SBI licence conditions to be adequate and awarded Green (no formal action) ratings for each.

Routine Matters - Decommissioning

During this period, ONR undertook four planned Licence Condition Compliance Inspections against LC9; Instructions to persons on site, LC22; Modification or experiment on existing plant, LC28; Examination, inspection, maintenance and testing, and LC36; organisation capability.

The LC9 planned inspection was carried out in the First Generation Magnox Storage Pond. ONR found that the implementation of Sellafield Ltd.'s arrangements did not meet legal standards because Sellafield Ltd 's induction training material did not adequately identify all the risks and hazards associated with working in the Decommissioning Directorate nor an associated facility, and the operations carried out in these locations. ONR therefore awarded an Amber (seek improvement) inspection rating here. ONR will track improvements here through a regulatory issue.

The LC22 inspection focused on the Defector Plate Removal modification at the Pile Fuel Cladding Silo (PFCS). The inspection found evidence of a good standard of implementation of the licensee's arrangements and the inspection was rated as Green (no formal action). Some minor areas for improvement were identified and ONR will be working with the Sellafield Internal Regulator to address these.

The LC28 inspection focused on the instrumentation components of the Red Extraction ventilation system in the Active Handling Facility (a facility managed by NNL on the Sellafield licenced site). ONR found that the implementation of Sellafield Ltd's arrangements did not meet legal standards in regard to NNL's arrangements for responding to alarms, in terms of proximity of the Duly Authorised Person to the facility control room. Further, NNL did not meet legal standards in regard to how it implemented proof tests and maintenance of related components affecting safety. Accordingly, ONR awarded an Amber (seek improvement) inspection rating. We will track improvements here through two regulatory issues.

The LC36 inspection, focused on the organisational capability in the Remediation Operating Unit. The inspection found evidence for a good standard of implementation of the licensee's arrangements and the inspection was rated as Green (no formal action). However, some minor areas for improvement were identified, which will be tracked as routine business.

ONR also undertook an Ionising Radiations Regulations 1999 (IRR99) inspection during this period. This inspection focused on the implementation of Sellafield Ltd's arrangements in the Magnox Swarf Storage Silo (MSSS). The inspection found evidence of a good standard of implementation of the licensee's arrangements and the inspection was rated as Green (no formal action). Some minor areas for improvement were identified and ONR will be working with the facility to ensure these are addressed.

ONR also undertook two System Based Inspections (SBIs) during this period.

The first SBI focused on the containment system serving the Pile Fuel Storage Pond. ONR considered this system meets the requirements of the safety case and awarded a Green (no formal action) inspection rating for four of the six standard SBI licence conditions. However, for LC24; Operating instructions, and LC28; Examination, inspection, maintenance and testing, ONR determined that application of the Sellafield

Ltd arrangements did not meet legal standards and ONR is seeking improvements. ONR has raised two regulatory issues to track the delivery of Sellafield Ltd's action plan to address the identified shortfalls.

The second SBI focused on the bulk sludge retrieval system within the First Generation Magnox Storage Pond (FGMSP). This system was considered to meet the requirements of the safety case and the implementation of Sellafield Ltd's compliance arrangements required no formal action (Green rating) for all six standard SBI licence conditions. ONR nevertheless noted a number of minor shortfalls which will be taken forward as part of routine regulatory business.

ONR attended regular quarterly meetings to review Sellafield Ltd's environmental, safety, health and quality performance. ONR considers that these meetings have provided a good forum for monitoring the performance of the decommissioning organisation and to discuss and agree actions to address any adverse trends in safety. ONR noted some improvements in cross site working to enable movement of retrieved waste packages from legacy ponds to more modern facilities for storage. ONR suggested that the lessons learnt be shared more widely across Sellafield Ltd.

ONR continues to monitor and encourage the control and supervision improvements being implemented within Sellafield Ltd's Decommissioning organisation. These activities are considered to be particularly important as waste retrievals accelerate from the Legacy Ponds and Silo facilities.

Routine Matters – Operational Waste Facilities

Within this reporting period, ONR undertook planned compliance inspections in the High Level Waste Plants (HLWP), and the Highly Active Liquor Evaporation and Storage (HALES), the Encapsulation and Effluent Plants (E&EP), and the Remediation Operating Units (OUs).

Within the HALES OU, ONR undertook planned Licence Condition Compliance Inspections against LC7; Incidents on the site, LC10; Training, LC11; Emergency arrangements, LC12; Duly authorised and other suitably qualified and experienced persons, LC26; Control and supervision of operations, LC32; Accumulation of radioactive waste, and LC36; Organisational capability. For LC 7, LC11, LC12, LC26, LC32 and LC 36 ONR considered that Sellafield Ltd had complied with its legal duties and Green (no formal action) inspection ratings were awarded. A small number of areas for improvement were nevertheless identified associated with the management of emergency arrangements training records, and the timeliness for completing Sellafield Ltd's internal management investigations.

For this OU ONR also undertook a SBI examining the implementation of the steam system safety case. ONR concluded that the steam system safety case had not been adequately implemented and awarded an Amber rating against LC23; Operating rules, due to shortfalls associated with the availability of a back-up steam boiler. Notwithstanding this shortfall, ONR was satisfied that HALES has adequate provision with respect to steam supply for the facility, and if necessary can enter a quiescent state if steam supply is threatened. ONR awarded Green inspection ratings (no formal action) against the remaining four standard SBI LCs, with LC34; Leakage and escape of radioactive material and radioactive waste, being deemed not sufficiently relevant to

the system under consideration. Following this inspection ONR ensured that Sellafield Ltd took prompt action to remedy the identified shortfalls.

Within the HLWP OU, ONR undertook a planned Compliance Inspection against LC11; Emergency arrangements. ONR considered that Sellafield Ltd had complied with its legal duties and awarded a Green (no formal action) inspection rating.

For this OU ONR also undertook a SBI examining the implementation of electrical system safety claims. ONR concluded that the electrical system safety case has been adequately implemented and awarded Green ratings (no formal action) against five standard SBI LCs, with LC34; Leakage and escape of radioactive material and radioactive waste, being deemed not sufficiently relevant to the system under consideration.

For this OU ONR also undertook an inspection against the requirements of the Ionising Radiations Regulations 1999 (IRR99). Following examination of implementation arrangements and plant inspection, ONR concluded that legal duties were being complied with, awarding a Green (no formal action) inspection rating.

Within the E&EP OU, ONR undertook a planned Licence Condition Compliance Inspection against LC22; Modification or experiment on existing plant. ONR considered that Sellafield Ltd had complied with its legal duties and awarded a Green (no formal action) inspection rating. Additionally, ONR continued to examine the progress Sellafield Ltd was making in delivering a self-derived improvement programme against previously identified shortfalls in its management of plant configuration and condition. Following a review of elements of this activity, ONR was satisfied with the implemented improvements, and thereby closed the related Regulatory Issue that had tracked the licensee's performance here.

For this OU ONR also undertook an inspection against the requirements of the Ionising Radiations Regulations 1999 (IRR99). ONR concluded that legal duties were being complied with here, and awarded a Green (no formal action) inspection rating.

Within the Remediation OU ONR undertook planned Licence Condition Compliance Inspections against LC7; Incidents on the site, LC 11; Emergency arrangements, and LC26; Control and supervision of operations. In all three cases ONR considered that Sellafield Ltd had complied with its legal duties and Green (no formal action) inspection ratings were awarded. A small number of areas for improvement were however identified associated with facility emergency signage and the necessity for Sellafield Ltd to complete administrative revisions of documentation following organisational changes.

For this OU ONR also undertook a planned, unannounced Licence Condition Compliance Inspection against LC26; Control and supervision of operations. ONR considered that Sellafield Ltd had complied with its legal duties and awarded a Green (no formal action) inspection rating. ONR identified one area for improvement associated with the implementation of the plant operations control centre methodology which Sellafield Ltd committed to remedy.

Routine Matters - THORP

During the reporting period, ONR undertook planned Licence Condition Compliance inspections against LC12; Duly authorised and other suitably qualified persons, LC26; Control and supervision of operations, LC32; Accumulation of radioactive waste, and LC35; Decommissioning. With the exception of Licence Condition 32, ONR concluded that Sellafield Ltd had demonstrated that it was in compliance with its legal duties, and only identified minor areas for improvement. Hence for these Licence Conditions Green (no formal action) inspection ratings were awarded.

With respect to LC32; Accumulation of radioactive waste, although it was evident that THORP has made good progress with identifying and dealing with a number of legacy wastes, there is still further work required to fully implement the site's arrangements for waste inventory and control of temporary waste stores. As such ONR concluded that an Amber (seek improvement) rating was appropriate and ONR has raised a number of associated regulatory issues to track Sellafield Limited's progress in addressing these shortfalls.

ONR also carried out a routine Ionising Radiation Regulations 1999 (IRR99) inspection which concluded that Sellafield Ltd was compliant with its legal duties, and only identified minor areas for improvement. As such ONR awarded a Green (no formal action) inspection rating.

In addition, ONR undertook System Based Inspections to assess the adequacy of implementation of safety case claims with respect to THORP's solid waste export facility and shield door safety systems. Overall ONR concluded that both systems had adequately implemented their safety case requirements with all applicable Licence Conditions being awarded a Green (no formal action) rating, with the exception of Licence Condition 23; Operating rules, where shortfalls were identified for both systems.

For the solid waste export facility ONR awarded an Amber rating (seek improvement) against Licence Condition 23; Operating rules. This was due to an incoherent picture in regard to the close out of Long Term Periodic Review improvements, poor operating rule documentation and two instances where safety case requirements were not clearly implemented in the associated operating instructions. A regulatory issue has therefore been raised to track Sellafield Ltd's progress in addressing these shortfalls.

For the shield door system, ONR awarded an Amber rating (seek improvement) against Licence Condition 23; Operating rules. This was due to similar issues as those found in the solid waste export facility. Specifically ONR found an incoherent picture in regard to the close out of Long Term Periodic Review improvements, poor operating rule documentation and the implementation of revised interlock key lock-out arrangements which had not been appropriately substantiated. A regulatory issue has been raised to track Sellafield Ltd's progress in addressing these shortfalls.

2.2 Other work

Project Delivery sub-programme

The ONR Project Delivery sub-programme regulates the programmes, projects and activities, associated with the delivery of high hazard and risk reduction on the Sellafield site. This includes projects in the legacy ponds, legacy silos, decommissioning, high level waste and infrastructure areas of the site. In addition to regulating these areas, the sub-programme also has a number of improvement themes, aimed at encouraging Sellafield Ltd to accelerate risk and hazard reduction, namely;

- Prioritisation
- Use of resources
- Removal of blockers
- Removal of diversions and distractions
- Incentivisation
- Fit for purpose solutions.
- Risk Appetite
- Communications

Key points from ONR's interventions with the licensee during this reporting period – 01 October 2016 to 31 March 2017 are:-

Strategic Improvement Themes

ONR continues to engage with Sellafield Ltd across a wide variety of areas to improve its processes for delivering projects on site. The key regulatory foci over the past reporting period have been influencing Sellafield Ltd to develop a fully integrated plan to improve the performance of its supply chain to expedite hazard and risk reduction activities on site, and in developing fit for purpose engineering solutions and safety cases.

Legacy Ponds

ONR remains particularly encouraged with the progress that Sellafield Ltd continues to make on risk and hazard reduction at the legacy ponds. The following aspects are of note:

Pile Fuel Storage Pond (PFSP)

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

ONR completed an assessment of Sellafield Ltd's request to commence active commissioning of the PFSP sludge transfer route. Following this, ONR issued

Licence Instrument 906, agreeing to active commissioning of the PFSP sludge export stream. Sellafield Ltd has since completed a number of routine sludge retrievals and exported this for encapsulation in drums prior to safe interim storage on site. The transfer of the sludge has enabled Sellafield Ltd to demonstrate that the associated Licence Condition 35 Key Decommissioning Milestone has been met.

With respect to the export of intermediate level waste, ONR has continued to engage and influence Sellafield Ltd to progress this work stream. Sellafield Ltd has continued intermediate level waste exports to an existing site storage facility.

Additionally, ONR released a regulatory hold point allowing Sellafield Ltd to carry out trials for pond de-watering and decontamination of the pond walls. This activity will inform the Sellafield Ltd's strategy for decontamination and the interim end-states for the pond once the inventory and water have been removed.

First Generation Magnox Storage Pond (FGMSP)

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

Within this period Sellafield Ltd has made progress in all of the ONR key areas of focus. Specifically Sellafield Ltd has;

- Exported 40 tonnes of fuel to more suitable modern facility thereby ensuring safer interim storage. This has enabled the export facility to enter full operational mode.
- Commissioned the bulk sludge retrieval tool to enable retrieval of sludge to the Sludge Packaging Plant 1. This has enabled the improved transfer of sludge to the buffer facility.
- Completed the final isolations of the redundant pond penetrations. This programme of work improves the resilience of the ponds by isolating potential leak paths.

Furthermore Sellafield Ltd met the 2016/2017 ONR Chief Nuclear Inspector milestone in relation to export of fuel from FGMSP. This milestone, and three further Licence Condition 35 key decommissioning milestones were all safely and securely met ahead of the declared milestone dates.

Legacy Silos

ONR recognises the progress that Sellafield Ltd continues to make on risk and hazard reduction at the legacy silos. The following aspects are of note:

Magnox Swarf Storage Silo (MSSS)

Sellafield Ltd has completed installation of the Silo Emptying Plant (SEP2) at MSSS and is preparing for inactive commissioning. ONR is encouraged by delivery of this key project in line with Sellafield Ltd's planned schedule. During installation of SEP2, Sellafield Ltd has recognised a number of items need to be remedied prior to entering inactive commissioning, which is now expected to commence in summer 2017. The overall schedule for availability of SEP2 is aligned with the expected availability of waste handling facilities being built or modified to accept MSSS retrieved waste. ONR

recognises the complexity of SEP2 and is engaging with Sellafield Ltd to secure regulatory confidence in the licensee's delivery plans.

Sellafield Ltd has a number of improvement and enabling projects that are due to commence or have commenced and regulatory confidence is improving in this area.

In October 2016 ONR issued Licence Instrument 909, agreeing to Sellafield Ltd's request to commence installation of quiescent passive ventilation (QPV) on all silo compartments. Sellafield Ltd has now completed this activity. This provides a significant risk reduction and resilience improvement to MSSS and completes, ahead of schedule, a Licence Condition 35 Key Decommissioning Milestone.

ONR continues to engage with Sellafield Ltd on the detail of the improvements its is proposing and its overall delivery plans for retrievals, regulating to ensure the licensee achieves safe, secure and sustained hazard and risk reduction at the site.

Pile Fuel Cladding Silo (PFCS)

Following a detailed assessment of the safety case, a visit to a full-scale demonstration of the technology at Rosyth, and having undertaken a readiness inspection on the Sellafield site, ONR issued Licence Instrument 912 in March 2017 agreeing to the start of work to cut the retrievals access penetrations in the side of PFCS. Sellafield Ltd has now started cutting holes beneath the six containment doors that were successfully installed in autumn 2016. This is another significant milestone in the programme of work to access the silo and to retrieve its waste. Hole cutting, which will take at least six months to complete, will take place in parallel with the continuing work to remove the deflector plates within the silo. This work is around 50% complete; Sellafield Ltd having made steady progress since starting in September 2016. ONR will continue to monitor these projects to ensure that progress is timely, safe and secure.

ONR has commenced engagement with Sellafield Ltd on the detailed design and evolving safety case for the waste retrievals capability. Installation of the associated plant and equipment next to the silo will begin later in 2017, subject to agreement from ONR.

Waste Handling Facilities

Sellafield Ltd is progressing a number of new build and existing facility modification activities that will directly support waste retrievals from MSSS and PFCS. ONR has engaged with Sellafield Ltd to gain regulatory confidence that these facilities can be delivered in time to meet the overall programme for timely, safe waste retrievals from the silos. In particular, ONR has focused on the Box Encapsulation Plant (BEP), Box Encapsulation Plant Product Store/Direct Import Facility (BEPPS/DIF), Silos Maintenance Facility (SMF), Alternative Intermediate Level Waste Approach (AILWA) implementation, and other significant storage and handling facilities. ONR's regulatory focus will continue in this area until we have the necessary regulatory confidence in these aspects of Sellafield Ltd's hazard and risk reduction programmes.

Decommissioning

The completion of active commissioning of the Separation Area Ventilation Plant has allowed preparations for demolition of legacy chimneys on the site. Specifically, after several months of monitoring the commissioning of the plant, in December 2016 ONR gave permission for the plant to be accepted into normal operations.

In November 2016 ONR issued Licence Instrument 910, agreeing to Sellafield Ltd's request to commence the demolition of one of these chimneys, the First Generation Magnox Reprocessing plant stack. A self-climbing platform is now ascending to the top of the stack (a process that will take many months) and once there will be re-configured to commence demolition. ONR has stressed the importance of safe and secure, timely delivery of this project. ONR continues to maintain regulatory focus in this area and placed a regulatory issue to monitor the platform's climb and reconfiguration phases.

ONR continues to monitor closely the progress of work related to removal of redundant equipment from a legacy processing facility as part of hazard and risk reduction at the site. The work entails the removal and packaging of redundant equipment to safe, modern standards storage, as well as enabling Sellafield Ltd to deliver post operational clean out of this facility. Sellafield Ltd has requested a change to the associated Licence Condition 35 Key Decommissioning Milestone which ONR has agreed to.

High Level Waste Plants

Sellafield Ltd has complied with its operating rule for Highly Active Liquor (HAL) stock reduction, which requires a (financial) year-on-year reduction in the HAL stocks held on the site. Sellafield Ltd has reduced the legacy HAL stocks significantly over recent years and the High Level Waste Plants are now operating in steady state mode (i.e. vitrification throughput is approximately the same as the site's planned fuel reprocessing throughput). Importantly, the potential to reduce HAL stocks further is therefore limited until reprocessing operations are concluded. Consequently, ONR's focus in this area has shifted from regulating year-on-year reductions in stock levels to regulating the timely and safe termination of the site's reprocessing activities. ONR considers that continuing to manage HAL stocks according to year-on-year reductions has the potential to drive behaviours that are not in the best interests of safety / minimise risks to as low as reasonably practicable. Therefore ONR has requested that Sellafield Ltd develops a new control system for HAL stocks to be implemented during the 2017/18 financial year. Implementing these new arrangements requires ONR's permission; our permissioning decision and its basis will be documented in a Project Assessment Report to be published on our website.

More generally, ONR continues to regulate Sellafield Ltd's preparations for active commissioning of Evaporator D, which is needed to complete the site's HAL stocks remediation activities.

Infrastructure

ONR continues to remain focussed on Sellafield Ltd's work to secure improved long term resilience of the site's electricity, steam, compressed air, and water utility systems. Over the reporting period ONR has commenced early engagement to influence 'fit for purpose' solutions for new major electrical and steam improvement projects needed to meet the long term requirements of the site. ONR has observed adequate progress in line with the declared Sellafield Ltd plans here.

ONR continues 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 across the site. ONR has also continued to engage with Sellafield Ltd to regulate the reduction of legacy waste presently stored within the Analytical Services facility. ONR has been encouraged that regulatory milestones for the removal of legacy wastes (both aqueous and solvent) have been met by Sellafield Ltd during 2016/17 financial year.

Magnox Reprocessing Separation Plant

The Magnox Reprocessing Separation Plant (MRSP) will have an important role within the UK nuclear industry until circa 2020, as it supports a number of UK national risk and hazard reduction programmes, including the UK Magnox Operating Programme (UK MOP). If MRSP is not available to reprocess spent Magnox fuel, there would be significant knock-on effects, both in terms of safety and security, and the UK's international treaty obligations. Continuing operation of MRSP is therefore important, both at Sellafield and nationally.

In June 2015, ONR issued an Improvement Notice (IN) in relation to Licence Condition 24; Operating instructions, following alleged breaches related to events at the plant over the previous 14 months. Following the IN, ONR instigated a revised regulatory strategy for MRSP which recognises the strategic importance of the plant, its age and design, and that events such as those that led to ONR's IN may continue to occur until the wider improvements Sellafield Ltd is making have become properly embedded. The strategy places the plant under enhanced regulatory supervision. ONR has noted that Sellafield Ltd has continued to make good progress towards making the improvements sought under this programme and is on track to meet the requirements of the regulatory issue that has been placed in relation to this matter.

Plutonium Management Facilities Projects and Dounreay Materials Consolidation Project

Through ONR's two Level 1 regulatory issues (i.e. ONR's highest level of issue) we continue to engage and influence the delivery of hazard and risk reduction activities on the Plutonium Facilities. Specifically, this includes asset care improvements on the First Generation Finishing Line (FGFL) facility and the delivery of future capabilities to allow safe continued storage of plutonium. Currently we are assessing Sellafield Ltd's proposal to upgrade the FGFL facility extract fans.

The UK Government / Nuclear Decommissioning Authority policy is to consolidate the UK's Special Nuclear Materials (SNM) in one location. As part of this initiative, SNM from Dounreay is planned to be transferred to Sellafield. With respect to the consolidation of Special Nuclear Materials from Dounreay to Sellafield, ONR has

issued Licence Instrument 907, agreeing to Sellafield Ltd's request to receive certain material shipments.

Essential Operations Inspections

ONR's regulatory strategy for Sellafield Ltd is focussed on stimulating, facilitating, and expediting safe and secure hazard and risk reduction. ONR has a number of planned interventions in place to ensure these activities are delivered safely and securely. There are also a number of supporting functions at the site that play a key role in delivering this hazard and risk reduction. ONR is keen that such functions have sufficient reliability and resilience such that they can appropriately support these activities. ONR therefore undertakes interventions, termed Essential Operations Inspections, to gain regulatory confidence that such supporting functions can safely and adequately facilitate sustained hazard and risk reduction activities.

During this reporting period ONR undertook three Essential Operations Inspections in relation to: Active Area Services that provides site support in terms of personal protective equipment provision and access support for radiological entries; the Inactive Tank Farm that supports a number of key site operations; and the supporting functions to the Magnox Reprocessing Separation Plant and the Magnox Operating Programme (MOP). Overall ONR gained confidence in relation to the availability and reliability of these supporting functions and noted how Sellafield Ltd has actively sought opportunities to improve its resilience.

ONR identified minor areas for improvement during these inspections: for instance relating to the management of system health reports in the Magnox Encapsulation Plant and the subsequent implementation of recommendations therein; and the timely delivery of improvement plans associated with process and equipment resilience. ONR will monitor progress against these findings via regulatory issues.

3 NON-ROUTINE MATTERS

Non-Routine Matters - Conventional Health & safety

On 5 September 2016 ONR served an Improvement Notice on Sellafield Ltd in respect of the stand-by cooling tower at the HALES facility. The improvement notice requires Sellafield Ltd to improve its management and control of legionella in the cooling tower. Following a request from Sellafield Ltd, in January 2017 ONR extended the Notice until 19 May 2017. The decision was taken after careful consideration of the progress made, recognising the technical challenges that came to light in completing the required improvements. The extension was published on ONR's website on 27 January 2017. ONR considers that the extension allows the further necessary improvements to be completed in a safe and sustainable manner to secure long-term, effective risk control.

ONR is undertaking a further investigation to determine the underlying causes surrounding the failure to meet the required legal standards in this instance.

Non-Routine Matters – Infrastructure

During this period an ONR team of inspectors assessed the annual security demonstration exercise on the licensed site, which is conducted as part of the licensee's arrangements to comply with LC11; Emergency arrangements, and aspects of the site's counter terrorist contingency arrangements.

In preparation for this demonstration, ONR conducted a number of engagements with the licensee regarding the scope and detail of the exercise scenario, to ensure it was sufficiently challenging, and would demonstrate aspects relating to recent improvements in security capability for the site. ONR accepted the chosen scenario.

The exercise was conducted 29 November 2016. ONR concluded that the licensee had provided an adequate demonstration, and would have coped if this had been a real event. ONR identified some minor areas for improvement, and these have been progressed with the licensee as part of normal regulatory business.

Through regulatory engagement, Sellafield Ltd undertook to close all of its open recommendations, findings and considerations with regard to completing the first phase of its post-Fukushima resilience improvements. ONR is now satisfied that Sellafield Ltd has provided sufficient evidence for all these recommendations, findings and considerations to be closed.

Non-Routine Matters – Corporate

In March 2017, ONR's Chief Nuclear Inspector signed a new licence for a single Sellafield licensed site, combining the former Windscale and Sellafield sites. The new licence came into force on 1 April 2017. The single site (nuclear site licence No. 103) was created by amalgamation of the two existing nuclear site licences, No. 31G - Sellafield (Windscale Works and Calder Works) and No. 83 - Windscale. The relicensing does not affect the external boundary of the Sellafield site, but it will lead to a simplification in administrative processes.

During this period, ONR closed a regulatory issue relating to a non-compliance by Sellafield Ltd with Licence Condition 13 (Nuclear Safety Committee). This concerned a failure by Sellafield Ltd to seek ONR's approval for changes to the committee's terms of reference in 2016, for which ONR issued a verbal warning to the licensee in January 2017, in accordance with our Enforcement Management Model. New terms of reference have now been approved by ONR, and Sellafield Ltd has updated its arrangements for change management here.

During this period, ONR carried out an inspection of the site's Contractor's Control Room. This identified that arrangements for compliance with Licence Conditions 11 (Emergency arrangements) and 36 (Organisational Capability) were good in many areas but had some vulnerabilities. ONR has raised a regulatory issue to track the expected improvements.

Non-Routine Matters – Plutonium Management Facilities (PMF)

During the period of this report a personnel contamination event took place within PMF (South). ONR is now carrying out follow-up enquires to determine the causes and to ascertain the adequacy of the licensee's response.

Non-Routine Matters – Periodic Review of Safety

Sellafield Ltd's Periodic Safety Review (PSR) programme is generally on schedule and the licensee's new arrangements continue to bed-in well. These arrangements are resulting in better attention being applied to those improvements which have the greatest impact on nuclear safety. During this period ONR has reviewed the PSR submissions for the Analytical Services Process Facility and the Encapsulated Product Store 2.

We are working closely with Sellafield Ltd to prepare for the 3rd cycle PSRs which will see several facilities undergoing Post Operational Clean Out (POCO), and moving into care and surveillance, or decommissioning.

Non-Routine Matters – THORP

In relation to an event regarding an individual who had exited the radiologically controlled area whilst carrying low levels of contamination, ONR is near to concluding its investigation and is in the process of considering what enforcement action is appropriate.

In addition, in October 2016 Sellafield Ltd advised ONR of an event where the speed of the operator response to indications of degraded cooling water performance at THORP was not to expected standards. ONR's enquiries into the event concluded that although there was no significant nuclear safety risk from the event, Sellafield Ltd failed to adequately comply with Licence Condition 24 - Operating instructions. This led to ONR issuing a verbal warning to Sellafield Ltd.

Non-Routine Matters – Operational Waste Facilities

In August 2016, Sellafield Ltd notified ONR of an incident that occurred in HALES where a small number of radioactive sealed sources, used for the calibration of radiation detection instruments, were not controlled and stored adequately. The sealed sources were promptly recovered and correctly stored during the following shift. ONR has completed follow-up inquiries and is determining whether this event warrants formal enforcement by applying our Enforcement Management Model.

On the 5 January 2017, Sellafield Ltd notified ONR of a loss of electrical power incident that occurred within the HLWP. The incident did not result in any radiological consequences and ONR was satisfied, once follow up enquiries were concluded, that no further investigation was necessary.

Non-Routine Matters – Decommissioning

ONR completed its proactive assessment of the Windscale Pile 1 criticality safety case during the period, and concluded it is acceptable and that Sellafield Ltd has shown that risks are being kept as low as is reasonably practicable here.

ONR is investigating an event related to radiography at the Sellafield redundant solvent treatment and purification plant that was reported to ONR in August 2016. The individuals involved in the incident did not receive any significant radiation dose, and there was no release of radioactivity. Although we were satisfied with Sellafield's initial response to the event, our early enquiries have highlighted a number of concerns relating to Sellafield Ltd's radiography processes. In consequence we have now begun an investigation into this event.

Non-Routine Matters – Magnox

As part of normal daily shift routines within the Magnox Reprocessing Facility, a senior member of the plant staff takes samples to confirm that the plant's processes are within expected parameters (for product quality, nuclear materials accountancy and safety purposes). Such sample-taking is a routine daily activity.

On 8 January 2017 the person who undertook one of these samples that day, upon leaving and using the radiation monitors, found themselves to be contaminated. The licensee's initial response was in accordance with its formal arrangements, and the contamination was removed using the standard procedures. The event was reported by the licensee in accordance with the LC7; Incidents on site, process.

The licensee has completed an internal investigation into the event, and has put additional measures in place to control this risk. The licensee has also confirmed that its finalised dose estimate for the affected employee exceeds the Ionising Radiation Regulations 1999 annual limit of 500 mSv for an external skin exposure.

ONR has initiated a formal investigation into this event. As part of this investigation, ONR is pursuing a number of lines of enquiry relating to the actions of the individuals involved in the sampling activity, the role of the licensee in controlling that activity, and the identification of evidence in support of potential and apparent breaches of law.

During the period ONR was satisfied that Sellafield Ltd has now satisfactorily completed the necessary improvements to comply with the Improvement Notice issued in respect of Licence Condition 24, within Magnox Reprocessing.

Non-Routine Matters – Permissioning

During the period ONR wrote an enforcement letter to the National Nuclear Laboratory Limited (NNL) regarding the adequacy of its human resource capability and capacity to deliver reasonably practicable improvements affecting safety in appropriate timescales. NNL is a tenant on the licensed site with responsibility for operating a number of important facilities. ONR is monitoring the situation here going forwards.

LI 908

This licence instrument gave ONR's 'Approval' to alteration of Sellafield Limited's On-site Emergency Plan. ONR conducted a specialist assessment of the licensee's submission, looking in detail at Sellafield Limited's revised operator emergency plan and whether ONR's suggested improvements with respect to previous issues of the above plan had been adequately addressed. The emergency plan was judged to satisfy the requirements of Licence Condition 11.

LI 540

This licence instrument gave ONR's 'Agreement' to a supplemental lease of parts of the Flask Handling Unit on the licensed site. ONR judged that the supplemental lease had no direct nuclear safety relevance and met ONR's guidance requirements.

LI 541

This licence instrument gave ONR's 'Agreement' to implement the Active Handling Facility's new Operational Safety Case. The Active Handling Facility has received significant regulatory attention in past years, particularly in relation to the quality of its Operation Safety Cases and Long Term Periodic Reviews. The new Operational Safety Case represents the culmination of a process to implement an adequate safety case for the whole facility that began in 2004.

ONR judged that whilst the submitted case contains a number of shortfalls (and thus requires further work to clearly demonstrate that the risk to workers is as low as reasonably practicable), the new Operational Safety Case provides an overall safety benefit to the facility. Regulatory scrutiny of the facility (and thus of the improvements required) will be maintained by means of continued engagements by the site inspector in matters of compliance and the permissioning lead in matters of future permissioning activities, including examination of the next Short Term Periodic Review.

4 REGULATORY ACTIVITIES

Licence Instruments and Enforcement Notices Issued by ONR during this period

Date	Type	Ref No	Description
02/12/16	Agreement	LI 906 Site Licence 31G	Agreement to commence active commissioning of the Pile Fuel Storage Pond Sludge Export Stream
23/02/17	Agreement	LI 907 Site Licence 31G	Agreement to receive low power cans (3.5 W) from Dounreay into the Dounreay Exotics Storage Facility
05 /12/16	11(3)	LI 908 Site Licence 31G	Sellafield and Windscale Sites Emergency Arrangements; Revised Operator Emergency Plan
25/10/16	Agreement	LI 909 Site Licence 31G	Agreement to progressing Quiescent Passive Venting at the Magnox Swarf Storage Silo
14/11/16	Agreement	LI 910 Site Licence 31G	Agreement to commence the demolition of the First Generation Magnox Reprocessing plant stack.
10/02/16	Agreement	LI 912 Site Licence 31G	Agreement to commence retrievals access penetrations operations at the Pile Fuel Cladding Silo
21/10/16	Agreement	LI 540 Site Licence 83	Agreement to the supplemental lease required (of part of the Flask Handling Unit) relating to East Rear Court, East forecourts and East Access Garage, Plenum Fan room and East Air Duct
13/03/17	Agreement	LI 541 Site Licence 83	Agreement to Implement the Active Handling Facility's New Operational Safety Case
28/03/17	Approval	LI 500 Site Licence 103	Approval of new Nuclear Safety Terms of Reference under LC13(2)
28/03/17	Approval	LI 501 Site Licence 103	Approval of new Nuclear Safety Terms of Reference under LC13(11)

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

5 NEWS FROM ONR

On 1 November 2016, ONR held its Industry Conference in London, which brought together senior leaders from across the nuclear sector. We were pleased to welcome Baroness Neville-Rolfe DBE CMG, Minister of State at the Department for Business, Energy and Industrial Strategy (BEIS) to this year's conference who delivered the keynote speech. A special edition of Regulation Matters has been published following the conference, which provides a summary of how the day unfolded. As part of our commitment to engage regularly with all our stakeholder groups, we were pleased to welcome 17 representatives from a number of organisations to our ONR / NGO forum on 30 November in London. The event provided an opportunity for NGO representatives to meet with a number of senior ONR leaders, including our Chief Executive and Chief Nuclear Inspector, to discuss a number of priority issues.

Insight into ONR's work as an independent regulator of the nuclear industry can be found in ONR's Regulation Matters. The online publication (<http://www.onr.org.uk/regulation-matters.htm>) reports on the key themes and developments in each of ONR's regulatory programmes and provides an update about the ongoing changes at ONR. <http://www.onr.org.uk/index.htm>.

For the latest news and updates from ONR visit the website and sign up for our ebulletin (<http://www.onr.org.uk/ebulletin/index.htm>).

New reactors update:

- ONR received a request from Government to begin the Generic Design Assessment process for the UK HPR1000 in January. The reactor is now in Step 1 of the GDA process.
- On 30 March, ONR issued Design Acceptance Confirmation for the AP1000@nuclear reactor, designed by Westinghouse. The regulators required 51 GDA issues to be resolved before confirming suitability of the design.
- ONR granted its first consent for the start of construction at Hinkley Point C licensed site. The consent covers the placement of the structural concrete for the first nuclear safety-related structure at the site.
- On 31 March, Horizon Nuclear Power submitted its application for a nuclear site licence to build and operate two UK Advanced Boiling Water Reactors at Wylfa Newydd on Anglesey.

Quarterly statement of civil incidents

ONR published its quarterly statement of civil incidents reporting on the period October-December 2016. There was one incident which met ministerial reportable criteria at Dounreay involving contamination of workers' clothing. There was no detectable intake of radioactive material by any of the people involved in the incident.

6 CONTACTS

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