



**HM NUCLEAR INSTALLATIONS INSPECTORATE  
SELLAFIELD, CALDER HALL AND WINDSCALE  
WEST CUMBRIA SITES STAKEHOLDER GROUP**

**QUARTERLY REPORT FOR 1 October 2008 – 31 December 2008**

**FOREWORD**

This report is issued as part of the Health and Safety Executive's commitment to make information about inspection and regulatory activities relating to the above sites available to the public. It is for distribution to members of the West Cumbria Sites Stakeholder Group (WCSSG) and covers activities associated with the regulation of safety at Sellafield, Calder Hall and Windscale.

These reports are distributed quarterly and will be available on the Internet. Site Inspectors of HM Nuclear Installations Inspectorate (NII) attend WCSSG meetings and will be happy to respond to any questions raised there. Any other person wishing to inquire about matters covered by this report should contact HSE, Nuclear Safety Directorate Information Centre on 0151 951 4103.

This report will be put onto the HSE Website at <http://www.hse.gov/nsd/nsdhome.htm> under "Local Liaison Committee Reports"

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The format and contents of this report for the WCSSG is dictated by the range and scope of plants on licensed sites reported therein and is structured along the following lines:

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**4. SELLAFIELD LTD – WINDSCALE**

## **1 INTRODUCTION**

NII Inspectors made a total of 75 visits to the Sellafield, Calder Hall and Windscale sites during the quarter. This involved a total of 238 days on site (see Table 1 for details). The more significant issues identified during these inspections are summarised below.

## **2 SELLAFIELD LTD**

### **2.1 GENERAL MATTERS**

#### **2.1.1 Sellafield Ltd PBO Transition**

Share transfer to Nuclear Management Partners Ltd, the new PBO, was successfully completed on the 24<sup>th</sup> November, which led to the appointment of a new Sellafield Executive made up of secondees from the new PBO. Prior to this the licensee completed two planned readiness reviews and NII ensured that outstanding actions from these reviews with a direct bearing on transition were completed before share transfer.

NII completed a number of its own activities to gain assurance regarding the transition to the new PBO, which have been mentioned in previous reports to the stakeholder group. Latterly these included direct engagement with the prospective NMPL secondees to provide them with an insight into current regulatory issues and a review of the Management of Change (MoC) submission from the licensee. As part of the submission the licensee provided a justification for the revised approach to transition regarding the wholesale replacement of the previous Sellafield Ltd Executive at share transfer. We were satisfied that the MoC submission demonstrated a considered approach and provided an acceptable justification for transition. Licence Instruments (Agreements) were subsequently issued to Sellafield and Windscale on the 20<sup>th</sup> November to allow the transition to take place.

NII will continue to engage with the new Executive Directors of Sellafield Ltd to ensure that continued safety remains paramount, as they look to explore what changes they wish to make on the site, and we expect any further changes to the organisational structure to be considered in accordance with the licensee's LC36 MoC arrangements.

#### **2.1.2 Licensed Sites – Leasing Arrangements**

In the previous report we indicated we had received a formal request from Sellafield Ltd for Consent under Licence Condition 3 for leasing of the Sellafield Site from the Nuclear Decommissioning Agency, Consent was subsequently issued on the 12<sup>th</sup> November. A similar request was received for the Windscale site, for which Consent was also issued.

#### **2.1.3 Lifetime Plan**

Sellafield Ltd, NDA and the various regulatory bodies continue to engage on the

topic of the Lifetime Plan and funding. The regulatory expectations have been made very clear to the licensee and NDA regarding the content of the plan as it is developed and NII's basic requirement continues to be the justification of ongoing safety on the licensed site.

As a result of regulatory influence, Sellafield Ltd has initiated a fundamental review of its high hazard projects to fully examine the implications of the currently proposed Lifetime Plan for the site. If this review indicates that the plan could lead to a position where an adequate justification of safety is not practical then the project strategy will be reviewed, remedial measures agreed and a revised plan produced.

#### **2.1.4 Sellafield Level 1 Emergency Exercise Heron**

Level 1 Emergency Exercise 'Heron' was carried out on the 27<sup>th</sup> November 2008 to demonstrate the Sellafield Limited (SL) response under the Emergency Plan to an incident associated within Sellafield High Level Waste Plants (HLWP). A team of NII inspectors observed the exercise from a variety of locations on the day and judged the exercise to be an acceptable demonstration of Sellafield Ltd's emergency preparedness.

During the course of emergency exercise Heron particularly strong performances were observed by the SECC, the ICC, Sellafield's Fire & Rescue Service and Sellafield Surgery staff. The NII team also identified areas for improvement related to the operation and control of the ACP, the functioning of the ERC, the adequacy of the surgery facilities for dealing with contaminated persons and the facilities provided to enable emergency cooling water supplies to be taken from the River Calder.

NII has commented in the past about the degree of challenge presented by scenarios that Sellafield Ltd has developed to drive the Level 1 emergency exercises. It was recognised by the inspectors who observed the emergency exercise that the level of challenge from the HLWP scenario was significant and placed a great deal of demand on many areas of the Sellafield response organisation, which can take credit for dealing with one of the more onerous exercise scenarios adopted by the licensee.

#### **2.1.5 Management of Contractors Intervention**

During November a team of HSE inspectors, which included 4 from NII, undertook an inspection of Sellafield Ltd's arrangements for the management and control of contractors working on the licensed site. The NII inspectors focused primarily on the adequacy of the arrangements to protect against the risks associated with working with ionising radiations. We intend to continue with this intervention over the coming months to gather more information in this area, to inform our discussions with Sellafield Ltd and the contractors it employs. A number of areas for improvement were identified including supervision and oversight, communication and dose management arrangements.

#### **2.1.6 NDA Plutonium Options Report**

Sellafield is of strategic importance in relation to the UK's stockpile of separated Plutonium and this is reflected in the NDA's draft Plutonium Options Report, which is due to be formally published in January 2009. NII provided significant levels of advice and comment on the report and NII inspectors have attended a number of public stakeholder interactions on the topic during the quarter. It is NDA's intention that the report and the responses from HSE will eventually be made available on the NDA website.

NII's interaction and discussion will continue as the NDA seeks to develop a strategy for the disposition of the UK's Plutonium stockpile.

### **2.1.7 Nuclear Directorate interactions with CoRWM and the CoRWM Reports**

The Committee on Radioactive Waste management (CoRWM) has been tasked to provide independent scrutiny and advice to the Government on the long term management, including storage and disposal, of radioactive wastes; including nuclear matter that may become waste in the future. NII has engaged in discussions with CoRWM on the information it has been compiling from the licensee's and NDA on Higher Activity Waste and Spent Fuel, Plutonium and Uranium. We have provided an open and transparent response to their questions about the conditions of storage, the strategies for dealing with nuclear matter and the joint working with other regulators and CoRWM is now drafting a report on the results of its work.

## **2.2 INCIDENTS**

### **2.2.1 WVP Line 3 Shield Door Event**

A short verbal report of this incident was provided to the last scrutinised meeting of the WCSSG held in October 2008. The opportunity has been taken to provide further details here. On 18<sup>th</sup> September 2008 a fault occurred on the Waste Vitrification Plant (WVP) Line 3 shield door interlock system. No one was injured or received any inadvertent exposure to radiation.

During a planned changeover of hydraulic supply in Line 3, an uncontrolled movement of two shielded trap doors and other hydraulic components was observed. These components protect against the inadvertent exposure of workers to radiation and so are designated Safety Mechanisms. The radiation dose rate from a container of vitrified waste is very high and hence the incident had the potential to cause a significant worker exposure. NII has undertaken an initial investigation, which concurs with the Sellafield Limited Board of Inquiry report conclusion that the likely cause of the event was inadvertent pressurisation of the hydraulic system ring main return line.

NII is aware of two events concerning shield doors at WVP (in 1991 and 1998). NII has written to Sellafield Ltd asking for information regarding the underlying cause of the event and the reasons why the lessons learned from the earlier events do not appear to have been applied fully to the design of the Line 3 hydraulic system.

Line 3 is essential for the timely reduction of Highly Active Liquor stocks and NII is working with Sellafield Ltd to ensure a robust safety case is developed to ensure a timely resumption of operations. During the quarter NII accepted that the embargo on the use of shield doors that licensee implemented immediately after the event could be released for limited operations and under strict control, pending the availability of a safety case for return to service.

### **2.2.2 B30 Movement of Gantry Refurbishment System (GRS)**

On the 20<sup>th</sup> November 2008, the B30 GRS was found to have inadvertently moved approximately 2.5m along the pond overhead rail system. There were no persons hurt during the incident and no release of activity occurred, but the event has served to highlight a loss of control of the plant by the licensee. Sellafield Ltd is conducting its own full investigation and has embargoed the use of the GRS. NII is also following up the incident to determine whether any further regulatory action is necessary.

### **2.2.3 THORP Flask Incident**

At the end of the quarter the investigation by HSE into this event, which occurred on 10 April 08, was still ongoing but is expected to come to a close shortly.

## **2.3 MAGNOX REPROCESSING OPERATIONS**

### **2.3.1 General**

The quarter was taken up by the planned outage of several plants in this Operations Unit, to allow an extensive programme of inspection and maintenance. As the year ended, most plants had completed their outage work and NII had given permission for fuel to be fed to the dissolver in the B205 Separation Plant, thus allowing them to return to normal operations. As in previous outages, we inspected and assessed some of the work, either because of its hazard potential or because of its importance if the plants are to fulfil their task of completing the reprocessing of the UK's Magnox fuel.

### **2.3.2 Magnox Product Finishing and Storage Facility (Magnox PF&S)**

#### Stores Inventory Retrieval Project (SIRP)

SIRP has experienced delays since March 2008 following the identification of a fault scenario that had not been addressed during production of the safety case. This omission has been addressed and additional engineered interlocks have been installed on equipment involved in the transfer process. NII received a Plant Modification Proposal from Sellafield Ltd during November 2008 for consideration and formal Acknowledgement before transfers could resumed. The submission had been delayed while a number of technical issues were addressed by the licensee and NII assessment of the proposal is expected to be completed early in the New Year.

#### B209 Continued Operation Safety Report

NII completed an inspection during the previous reporting period to confirm the

extent of the implementation of the plant operational safety case (COSR), which had fallen significantly behind programme. Sellafield Ltd believes that the delays have predominantly been due to a shortage of resource, as a result of the need to direct staff towards higher priority issues. NII confirmed that the majority of the recommendations would be implemented within a few months of the inspection, the exceptions were those less significant recommendations that the licensee no longer planned to implement as part of the COSR. NII has continued to monitor Sellafield Ltd's progress in this area, and a further inspection of progress against the B209 COSR implementation programme will be carried out early in the New Year.

#### B209 Filter boxes

Whilst producing a Continued Operations Safety Case Sellafield Ltd found that the box used for transferring used square HEPA filters could not be substantiated because the filter frame could easily pierce the PVC bags intended to provide primary containment for plutonium. Following redesign, the package is now more resilient but the Decontamination Factor still falls short of the claims made in the original HAZANS. NII has given permission for routine use of the improved filter boxes on ALARP grounds to transfer a backlog of filters and future arisings to the waste processing facility.

#### **2.3.3 Magnox East River**

We are continuing with our assessment of the licensee's safety case for safety systems that prevent exposure of workers to high dose rates, and for improvements to some of those systems.

#### **2.3.4 Reprocessing Operations**

During the reporting period, Licence Instrument No 723 (Agreement) was issued to permit changes to some of the chemical process that separates dissolved fuel into its constituent uranium, plutonium and fission-product streams. This followed our assessment of the criticality and chemical engineering elements of the licensee's safety case for the changes.

Topics inspected during the outage included the refurbishment of the equipment that feeds fuel to the dissolver, control of dose to workers, the use of mobile cranes, and the removal of accumulated waste from the plant and the arrangements for disposing of it. In connection with the latter, Licence Instrument No 719 (Acknowledgement) was issued allowing the licensee to remove further accumulations of used radioactive air filters from the plant, for long-term storage.

Two incidents during the outage merited particular inspection. First, an overhead crane (without a load) collided with a temporary scaffold inside the B205 Separation Plant. Had the scaffold been in use workers might have been injured. All lifting operations in the Operations Unit were embargoed by the licensee until the control of crane movements had been examined and improved where necessary. We were satisfied with the measures taken by the licensee to address this matter.

Second, two workers who seem not to have been wearing the requisite protective equipment each received small, unplanned exposure to radiation when dismantling

a temporary structure erected to allow intrusive work in a glovebox. Our inspection of this incident continues.

## **2.4 THORP OPERATIONS**

### **2.4.1 THORP Restart**

Sellafield Ltd resumed the shearing of the BWR fuel campaign in early October and completed the work in early November. The sheared fuel was dissolved and held in the HEP/SEP buffer tanks, which were full at the end of the quarter (around 45 te fuel) awaiting the resumption of reprocessing.

The reprocessing plant remained shutdown during the quarter as work continued on the replacement and commissioning of the medium active salt free evaporator (MASFE).

The processing of plutonium nitrate liquor, held in tanks from the previous reprocessing campaign, was suspended following the suspected failure of some mechanical seals. Work continued during the quarter to address this problem; Sellafield Ltd believes that the issue has been resolved and hopes to resume plant operations early in January.

During this reporting period, the Caesium removal skip continued to reduce Caesium levels within the receipt and storage ponds, the Caesium was due to AGR fuel failures resulting from the ingress of chloride that occurred after the roof failure in 2005. However, in October high levels of chloride were again reported. Sellafield Ltd investigated the event and discovered other leakage paths from the roof that had led to further chloride ingress during poor weather. Sellafield Ltd is taking steps to repair these.

In November, after consultation with NII, the Environment Agency issued a temporary Variation Notice to raise the permitted discharges of Caesium from the plant for a 6 month period. This notice has permitted greater purging of B560 with the aim of reducing chloride levels. Sellafield Ltd has instigated more thorough chloride monitoring and is looking at other potential routes for chloride ingress. Sellafield Ltd has also continued to investigate the available options to deal with AGR fuel corrosion.

NII has continued to progress matters, concerning claims made by the licensee on the integrity of pond structures, during the quarter.

### **2.4.2 Multi-Element Bottle Export Facility (MEBXF)**

Active commissioning of the facility continued and at the end of December, Sellafield Ltd had exported 42 MEBs and placed them in the MEBIS (MEB Interim Store). The licensee found higher than expected residual activity within the MEBs and needs to determine the safe operating envelop for MEB removal. More information is needed for this and Sellafield Ltd applied in December 08 to extend the active commissioning from 50 to 150 MEBs. This application is currently being processed by NII.

### **2.4.3 Replacement Of Medium Active Salt Free Evaporator**

Sellafield Ltd commenced trace active commissioning during the quarter, during which some unexplained noises were heard on plant. Sellafield Ltd is investigating the problem and hopes to resolve this issue soon, to enable active commissioning to begin in January 09.

### **2.4.4 Oxide Operating Strategy Regulatory Forum (OOSRF)**

The fourth meeting was held in November where further discussions were held on the oxide fuel strategy being developed by NDA. NII believes this strategy is important to ensure that spent AGR fuel and other oxide fuels are dealt with appropriately, either stored safely or reprocessed, taking into account the ongoing arising of spent AGR fuel from power generation. The Forum discussed the removal of MEBs, together with the need to pursue associated disposal routes. Contingencies associated with fuel storage were also covered. It was agreed that future meetings would be chaired by NDA.

### **2.4.5. Western European Regulators' Association (WENRA)**

A WENRA benchmarking exercise for B560 was undertaken as part of the UK's 2008 contribution to WENRA on spent fuel storage. During late September inspections were undertaken with Sellafield Ltd, against the WENRA Safety Reference levels for waste and spent fuel storage, and a submission produced. The UK's submission was very favourably received by WENRA.

## **2.5 HIGH ACTIVE LIQUOR WASTE PLANTS**

### **2.5.1 Highly Active Liquor evaporative capacity**

#### Existing HA Evaporative Capacity: Evaporators A, B and C

Three evaporators within HALES (referred to as Evaporators A, B and C) are used to evaporate High Active (HA) raffinate produced during reprocessing and to process effluent from WVP. Once concentrated through evaporation, the raffinate is called Highly Active Liquor (HAL). HAL is stored in the HALES facility prior to feeding to WVP for vitrification, which immobilises the waste for long term storage and eventual disposal. The status of the evaporators towards the end of 2008 was:

- **Evaporator A:** shut down but available for use on HALES/WVP effluents and Magnox raffinates at low throughput rates since the only heating surface available is the base jacket.
- **Evaporator B:** permissioned for use on HALES/WVP effluents and Magnox raffinates following the issue of a Licence Instrument in July. Evaporator B restarted the processing of Magnox raffinates mid January 2009.
- **Evaporator C:** permissioned for use on Magnox and Thorp raffinates and also effluent from WVP, but currently shut down. The thickness of the upper and lower coils has recently been measured using the latest development of the endoscope. The data will be analysed over the next few months to provide an improved understanding of process side corrosion rates.

Sellafield Ltd proposes to repeat these inspections in mid 2009.

#### New HA Evaporative Capacity: Evaporator D

NII is working closely with Sellafield Ltd, the Environment Agency and the Nuclear Decommissioning Authority to ensure that the strategic safety drivers for Evaporator D are understood and are pushing for prompt decision making to ensure that the project momentum continues. NII wrote to NDA regarding delays in funding decisions for key strategic projects involving the future replacement of the Sellafield Highly Active Storage Tanks and associated evaporators, and requesting urgent explanations, justifications and plans for recovery of the situation. NDA responded positively and provided the necessary information and reassurances. NDA has since provided the funding necessary to allow the relevant projects to progress at the necessary pace, and this important work is now progressing.

NII received the pre-construction safety case for Evaporator D in December 2008 and is assessing the document. In parallel, the Evaporator D project is looking at a modification that can be made to the design of Evaporator D to enhance its solids-handling capability for post-operational clean out: a decision will need to be made shortly on the viability of these modifications and whether they are deliverable within the existing timescale.

#### **2.5.2 HAL Stocks**

An NII Specification has been in place since 2001 to limit the amount of Highly Active Liquor (HAL) that can be stored at any time and to promote HAL stocks reduction. A revised Specification (No 679), replacing Specification 343, was issued on 29<sup>th</sup> October 2007 to lock in gains arising from the unplanned shutdown of thorp, following the Feed Clarification Cell event, which is available on HSE's HAL Storage web page (<http://www.hse.gov.uk/nuclear/halstorage.htm>).

The latest (2008) biennial review of HAL stocks is nearing completion. In this review, NII is considering, among other things, whether the long-term steady state (post 2015) limits used in the Specification are appropriate. The review is also assessing evidence from Sellafield Limited that this aspect of the Specification is set too tightly to allow HALES to operate efficiently. Early indications are that some loosening of this aspect of the Specification may be necessary in order to maximise the rate at which HAL can be vitrified.

The review is also considering, in the light of Sellafield Limited's operational experience working with the new Specification, whether the forms of limit used therein can be improved upon in the interests of safety. Specifically, the review is considering adopting limits based on the mass of uranium in the unprocessed fuel from which the HAL was derived (as per the Oxide limit in Specification 679) rather than limiting the volume of HAL. Changing the Specification in this manner will facilitate the Post Operations Clean Out (POCO) of redundant Highly Active Storage Tanks (HASTs) since the wash-out liquors necessary for clean-out (predominantly water and acid), which currently make a significant contribution to the volume of HAL, contain very little uranium. Early progress with POCO will allow blending of the wash-out liquors with HAL, which should minimise the ultimate volume of vitrified waste.

Any changes to Specification 679 proposed by our 2008 biennial review will require further supporting technical analysis by Sellafield Limited to confirm that complying with the revised limits is reasonably practicable. In consequence, no change to the Specification will likely be made until the second half of 2009.

Sellafield Limited continues to provide NII with monthly reports summarising the quantities of HAL contained in the HASTs. These figures, supported by our inspection activities, are used by NII to confirm that Sellafield Limited is complying with the HAL Stocks Specification.

#### **2.5.4 Highly Active Storage Tanks (HAST)**

Previous NII reports have indicated that HAST cooling components have suffered over the years from corrosion. A number of cooling coils have been declared failed. A failure causes a breakthrough of activity into the cooling water circuits which if not properly managed could lead to a radioactive release. HAST cooling coil failure rates and (specifically) the location of the most recent failed coils has led to uncertainties over the ability of the newer HASTs to continue to service the needs of the HAL stocks strategy. If the HASTs start to deteriorate more quickly, then the ability of HALES to receive raffinates will be prejudiced (with important knock-on consequences). The rates of failure of cooling coils will determine the volumetric capacity of HASTs to store HAL and has the potential to constrain raffinate receipt.

Sellafield Limited's contingency plans had until recently placed considerable reliance upon a project to dose the cooling water circuits with nitrates as a way of stopping, or at least reducing the rate of, corrosion failures. Following a review of the technical information relating to nitrate dosing, carried out by NII, the licensee and by internationally-recognised independent corrosion experts, Sellafield Limited has decided not to pursue this strategy further. In the light of this significant development, Sellafield Limited is updating its strategy for the future safe storage of HAL. A draft strategy has nevertheless been provided to NII and will be finalised in the near future. NII will be performing a detailed review of Sellafield Limited's revised HAST strategy as part of our 2008 biennial HAL stocks review. This aspect of the review will consider, amongst other things, the need for replacement HASTs as a contingency against further cooling component failures and as a means of increasing the rate at which HAL can be vitrified. NII is supportive of Sellafield Ltd's project to build replacement HASTs; the project is currently looking at the options available.

#### **2.5.5 High Level Waste Plants – Quality Assurance (QA) Inspection**

During November 2008, NII carried out an inspection of the arrangements within HLWP for compliance with Licence Condition 17 (Quality Assurance). The arrangements were considered to be comprehensive and robust with regard to the Waste Vitrification Plant and the Residue Export Facility. The QA department's role within the Highly Active Liquid Evaporation and Storage plant was less clear, but the need for a more formal role is under consideration. NII has requested a response from Sellafield Limited to a number of issues and will work closely with Sellafield Limited on the implementation of any necessary improvements.

### **2.5.7 HALES Overdue Plant Maintenance Schedule items**

NII has finished its formal investigation and reporting of the HALES overdue maintenance event and we are about to write to Sellafield Limited to convey the outcome of our work and to request action against a number of recommendations. It is our opinion that the HALES overdue maintenance incident was caused by the failure of the teams within HALES to undertake examination, inspection, maintenance and testing of the HALES facility in a timely manner. The reasons for these were that there was a chronic lack of experienced engineers and that the teams were poorly managed and under resourced. There were several key underlying causes, including a management failure to recognise the developing resource problem, and poor management of change.

NII is minded to issue a Specification under LC6(5) placing a duty on Sellafield Limited to submit to HSE a bi-annual report of maintenance delivery. NII's decision to opt for a Specification was as a result of consideration of the HSE Enforcement Management Model. NII gave thought to alternative enforcement action because of the gravity of the incident. However the considerable work by Sellafield Limited once the incident was discovered indicated to us that further enforcement action would be disproportionate and not in the public interest. Meanwhile NII continues to engage with Sellafield Limited on the development of its recovery plan.

The investigation brought to light cross-site issues, for example the lack of completeness of Sellafield Ltd's arrangements under LC28 and implementation of Licence Condition compliance arrangements. These issues will be progressed in 2009.

### **2.5.8 Waste Vitrification Plant Operations**

Line 1 returned to HAL feed on 29 November after an outage to undertake significant repair work because of a plant malfunction in February 2008 and to carry out planned improvements. Since its return to service Line 1 has performed well. An extended planned outage is underway on Line 2 which will last until February 2009. Line 3 remains shut down to undertake outage work and because of the shield door event in September 2008 which is covered elsewhere in this report.

The shield door event caused Sellafield Limited to revise downwards the forecast of WVP container production in 2008/09, and NII anticipates that the 2009/10 production forecast could be affected as well. However this is unlikely to impact on Sellafield Limited's ability to comply with the HAL stocks Specification.

Reliable operation of the vitrification lines is an essential component of the drive to reduce HAL stocks, and NII continues to engage Sellafield Limited on issues associated with plant reliability. We note that Sellafield Limited is investing in improvements to the throughput and reliability of the vitrification process via its links with COGEMA: the recent success of Line 1 underlines the importance of this work.

## **2.5.9 Residue Export Facility (REF)**

The Waste Vitrification Plants convert Highly Active Liquor (HAL) into a solid glass waste product that is sealed in stainless steel containers, which are then transferred to the Vitrified Product Store (VPS) until a request to export them off-site is received. The containers destined for export will then be moved to the Residue Export Facility (REF) where they will undergo additional surface cleaning and testing prior to loading into an export flask and shipment to the customer.

Active commissioning of REF and the export of the first containers off site is being progressed through three permissioning phases. Phase 1, now successfully completed, involved moving active containers from the VPS into the cleaning cell and demonstrating the effectiveness of the equipment and the safety arrangements associated with container cleaning.

As part of NII's consideration of the safety case for phase 2 active commissioning, an emergency exercise was observed in late June. Despite demonstrating a number of positive features, Sellafield Limited and NII both agreed that it would be appropriate to repeat the exercise. This was done in late September and was considered by NII to demonstrate a high standard of emergency arrangements.

In December, NII issued a Licence Instrument to permission phase 2 active commissioning. Phase 2 involves the active commissioning of the remaining REF cells to demonstrate the effectiveness of the equipment, shielding and the arrangements to ensure safety associated with the retrieval, inspection and testing of active product containers followed by their loading and sealing into export flasks. The third and final stage of commissioning will involve commissioning the transport facilities on and off the Sellafield site, the finalisation of national and international agreements, processes and protocols associated with the movement of active material and ultimately the movement of the first filled product flask overseas.

## **2.6 MOX OPERATIONS**

### **2.6.1 Sellafield MOX Plant (SMP) Commissioning and Operation**

Licence Instrument No 728 (Agreement) was issued by NII in December 2008 to enable SMP to extend the scope of the Active Commissioning of the facility for a further two campaigns of MOX fuel production. This was subject to SMP providing sufficient evidence to assure NII that a strategic improvement plan was in place to develop the throughput and reliability of the plant, with sufficient controls in place to improve and operate the plant safely. SMP also provided a suitable plan to update the facility safety case and keep it current alongside plant developments.

SMP nuclear safety and environmental performance is good but production difficulties prevail and NDA and DECC are currently reviewing the future viability of the plant.

### **2.6.2 Sellafield Product And Residue Store (SPRS)**

The fit out of SPRS is nearing completion and setting to work of installed equipment

is gathering pace. SPRS have recently submitted the pre-inactive commissioning safety report (PICSR) for assessment by NII.

## **2.7 WASTE TREATMENT & DECOMMISSIONING**

Nothing to report this period.

## **2.8 LEGACY PONDS & SILOS (LP&S)**

Sellafield Ltd continues to make progress on operational nuclear safety improvements across LP&S at a steady and sustainable rate, with the full support of NII. Nonetheless, a recent incident with a pond skip handler has raised questions regarding aspects of work control affecting nuclear safety. Our investigation into the incident is ongoing and when complete we will form a view on the appropriateness of formal enforcement. The incident has provided a useful reminder to all concerned of the nature of the problems facing these fragile legacy facilities and the need for appropriately high standards of work control.

Progress also continues on the extensive preparations needed for the removal of the hazardous wastes from these facilities. However, the realisation of certain programme risks arising from technical and delivery issues has resulted in some key milestone dates slipping further backwards. Sellafield Ltd is currently reviewing the implication arising from these delays. In addition, the new Sellafield Executive has instigated a series of reviews of key activities to provide increased confidence of delivery and to identify opportunities to accelerate the removal of waste. NII is actively engaging in discussions on these matters with the licensee, and others, with a view to encouraging, and where possible assisting, the earliest practicable removal of the hazardous wastes from these fragile legacy facilities.

In our last report we indicated that we had written to Sellafield Ltd regarding the project delays in Legacy Ponds and Silos and the potential non-compliance with the Specifications we have issued in these areas, related to the remediation of the waste contained therein. We have received an interim response from the licensee, which presents a limited amount of information, because of the amount of work involved in providing a response, the licensee has indicated that the majority of the information required to answer NII's queries will be available by the end of May 2009. We are continuing to engage with Sellafield Ltd, as it progresses the work to respond to NII.

## **2.9 SITE & PLANT SERVICES, INCLUDING RESEARCH & DEVELOPMENT**

### **2.9.1 Decontamination Strategy**

NII has expressed concerns to Sellafield Ltd regarding the lack of an overall site strategy for the provision of decontamination facilities across the Sellafield Site. A meeting was held in February 2008 when Sellafield Ltd agreed to undertake work to develop a strategy for future decontamination activities at Sellafield. An update meeting was held in December 2008, where little progress was evident. NII continues to consider that the provision of adequate and sufficient facilities for the decontamination of operational and redundant plant, equipment and material to be

an important issue which needs to be addressed in the future plans for the Sellafield Site and we are actively pressing the site to ensure this occurs. NII will now seek to have regular updates on the progress being made by Sellafield Ltd in developing and implementing a decontamination strategy for the site.

## **2.9.2 Analytical Services**

Analytical Services provides a critical support service role to operations across the site. This function will need to be maintained over the coming decades. The main Analytical Services Facility is an "old" plant and although there are a significant number of ongoing projects to improve the current facilities it is evident that the existing facility will need to be replaced. Sellafield Ltd has indicated that its current strategy is to continue to operate the existing facilities to approx 2020. By 2014 however, the licensee has stated that the future Analytical Services requirements to support the site operations will be better defined. NII has held discussions with Sellafield Ltd and we will continue to seek assurance that the future strategy associated with functions provided currently by Analytical Services is fully included and funded within the forward strategy for the site.

## **2.10 EFFLUENT & ENCAPSULATION**

### **2.10.1 Plant Floc Retrieval Plant**

NII has agreed to a modification to allow reinstatement of motorised spillback rotation at the floc storage tanks. This modification is required to provide additional protection against breach of the containment cabinets by rotating equipment during re-suspension and transfer of floc for encapsulation in cement.

In preparation for re-suspension and transfer of the contents of a second floc tank, NII has given permission for reusing radioactive liquor already held in another tank to dilute the floc in preparation for re-suspension. The aim is to minimise consumption of clean water and minimise demands on effluent treatment, encapsulation and waste storage and ultimate disposal facilities.

### **2.10.2 Segregated Effluent Treatment**

NII's inspector completed a follow-up inspection in July to confirm the progress of the engineering improvements identified as necessary during the investigation into the overflow of low active liquid effluent that occurred back in March. In our last report we advised that a further follow-up inspection would be undertaken. By agreement, this was completed by the Environment Agency, who identified that 26 out of the 35 actions resulting from Sellafield's own investigation had been completed, 3 actions were due to complete by the end of January and the remaining 6 actions will be completed by a minor plant modification and issue of an Emergency Instruction. Although some slippage had occurred due to site personnel changes, progress was considered to be acceptable.

### **2.10.3 ILW - EPS1 and EPS2 Drum Inspections**

Good progress continues to be made with the completion of drum inspections on all

target drums within EPS1 in September 2008 and an inspection of 4 MEP derived drums from EPS2. A detailed statement and analysis of the findings has been supplied to NII.

The inspections have shown that side bulges are most likely due to small but significant sized irradiated uranium metal pieces within the concrete matrix, which under past practice were considered unable to follow the reprocessing route and thus were sent to waste. The intervention of the regulators in this area has led to improved practice, which means significantly reduced quantities of this type of uranium piece passing forward to the encapsulation plant, thus reducing the potential for bulges to occur in future drums.

Of the drums inspected to date none has shown a breach of containment. Modelling of the drums is being carried out to determine the potential for drum integrity be compromised. Rework of some drums is considered likely and Sellafield Ltd is looking at options of this.

NII has now agreed with the licensee a regime where a concerted period of drum inspections will be carried out each year for drums stored in EPS1 and 2.

### **3 CALDER HALL**

#### **3.1 General**

In a previous report, we explained that general degradation due to corrosion was emerging as an issue at Calder Hall. Sellafield Ltd has kept us informed of its findings from routine inspections that look for corrosion. Sellafield Ltd has concluded from these inspections that it needs to address the corrosion that is becoming evident on the external steelwork of some of the heat exchangers and the top ducts, which were part of the now redundant primary coolant gas circuit. We have supported the need for remediation work on the heat exchangers and we have been discussing the options, the safety case issues and the timescales for such work with the licensee.

### **4 SELLAFIELD LTD WINDSCALE**

#### **4.1 Integration of Windscale Site**

Following the initial “transition” and “embedding” phases of the work to incorporate the Windscale Site operations within the main Sellafield Site, discussions have continued with Sellafield Ltd relating to the “Further Integration” phase wherein Sellafield Ltd will work towards the endpoint of the full integration of the Windscale Site. Over the last few months, pending any decisions regarding the future management strategy for the Windscale Site that the new Executive may make, the activities to further integrate the Windscale arrangements, processes and procedures have been largely curtailed to those that have been shown to have a significant and immediate business case. However, NII continues to ensure that Sellafield Ltd actively manages any future further integration work, such that it proceeds in a controlled manner, avoiding integration by stealth.

A major exception to the "curtailment" on the progressing of further integration of the Windscale arrangements has been in the area of Emergency Arrangements. NII considered, and Sellafield Ltd has agreed, that the integration of the Windscale Emergency arrangements and Emergency Plan should be progressed in controlled manner at the earliest opportunity. Discussions between NII and Sellafield Ltd have taken place and it is NII's expectation that Sellafield Ltd will be in a position to commence the implementation of the integrated Emergency arrangements and Emergency Plan by 1<sup>st</sup> April 2009.

#### **4.2 Piles and WAGR/Western Areas Decommissioning Projects**

Progress on the Piles and WAGR/Western Area decommissioning project work and the proposed B14 Decommissioning Programme continue to be discussed with Sellafield Ltd Windscale. NII is keen to see the decommissioning of the cells within B14 progressed.

#### **4.3 B13 Project Meetings**

Meetings and visits continue to be undertaken, relating to the extensive programme of improvement projects within the B13 facility. Progress is being made in many areas of the Integrated Safety Improvement Programme (ISIP) although some of the project work has encountered difficulties. Successful completion of the work should allow the current constraints on operations within B13 to be lifted.

## HM NUCLEAR INSTALLATIONS INSPECTORATE

**TABLE 1**

**QUARTERLY RETURNS FOR SELLAFIELD, CALDER HALL AND WINDSCALE  
DURING THE QUARTER**

**1 October 2008 – 31 December 2008**

	<b>Sellafield Ltd - Sellafield<sup>1</sup></b>	<b>Calder Hall <sup>2</sup></b>	<b>Sellafield Ltd- Windscale</b>
<b>Number Of Visits</b>	70	0	5
<b>Inspection Days On Site</b>	229.5	2	8.5
<b>Enforcement Actions <sup>3</sup></b>	0	0	0
<b>Incidents in the quarter likely to be published in HSE's quarterly "Statement of Nuclear Incidents at Nuclear Installations"</b>	0	0	0
<b>Consents, Approvals</b>	1	0	1
<b>Licence Instruments</b>	14	0	1

<sup>1</sup> The figures shown for the Sellafield site are those for Sellafield Ltd's chemical plants, they do not include figures for the plants that principally form the Calder Hall nuclear power plant (see note 2 below)

<sup>2</sup> The figures shown for Calder Hall are for those plants on the Sellafield site principally associated with the Calder Hall nuclear power plant.

<sup>3</sup> An enforcement action may be a Direction issued by HSE under the nuclear site licence, an Improvement Notice, or a Prohibition Notice, or the laying of information in pursuit of a prosecution.

**TABLE 2****CONSENTS, APPROVALS AND ENFORCEMENT ACTIONS  
ISSUED DURING THE QUARTER****1 October 2008 to 31 December 2008**

<b>Date</b>	<b>Type</b>	<b>Ref. No.</b>	<b>Description</b>
<b>Sellafield Ltd - Sellafield (and Calder Works) – Nuclear Site Licence no. 31G</b>			
12/11/2008	Consent	713	LC3 - Application for consent to leasing of Sellafield Site from Nuclear Decommissioning Authority to Sellafield Ltd
<b>Sellafield Ltd – Windscale – Nuclear Site Licence no. 83</b>			
12/11/2008	Consent	511	LC3 - Application for consent to leasing of Windscale Site from Nuclear Decommissioning Authority to Sellafield Ltd

**TABLE 3****AGREEMENTS & ACKNOWLEDGEMENTS ISSUED DURING THE QUARTER****1 October 2008 TO 31 December 2008**

<b>Date</b>	<b>Ref. No.</b>	<b>Description</b>
<b>Sellafield Ltd – Sellafield (and Calder Works) – Nuclear Site Licence no. 31 G</b>		
23/12/2008	705	Agreement to Commence a Modification to an Existing Plant: PMP B229/07/1491 - Implementation of Safety Case for Criticality and Care & Maintenance in B229
19/12/2008	709	Agreement to commence active commissioning of WVP residue export facility B364
13/10/2008	716	Acknowledgement of receipt of plant modification proposal for risk mitigation of identified degraded components in the SADT area of B30
17/10/2008	717	Acknowledgment of Modification to an Existing Plant-Vessel Vent Damper Replacement (PMP HALES/B835/0049)
17/10/2008	718	Agreement to an Extension of Active Commissioning of the Phase 1 Alternative Residue Store - PMP SMP/AREA200/0295 Rev 1, to Increase the Permissible Number of Residue Cans in the Alternative Residue Store (Phase 1) from the Current Limit of 8 to 30
22/10/2008	719	Acknowledgement under arrangements made under condition 22(1) - Building 205: PCM filter changing and transfer acknowledgement of receipt of safety documentation
17/10/2008	720	Agreement to commence modification to an existing plant
20/11/2008	721	Agreement to commence an organisational change
19/12/2008	722	Agreement to Proceed with the Operational Services PMP C1
03/12/2008	723	Agreement - Building 205: Implementation of Low-Acid Flowsheet
05/12/2008	724	Acknowledgement of Receipt of Safety Documentation for Modification of B241 Floc Retrieval Plant
03/12/2008	725	Acknowledgement of receipt of PFS/209/0320 - Implementation of Safety Memo Cult No 11641, " Assessment of Filter Handling Operations Using the Metal Filter Box with Reduced DF", Use of Redesigned Metal Filter Boxes

08/12/2008	726	Agreement to Commence Use of the Sellafield MOX Plant (B572) Phase 1 Residue Store in Support of SMP Active Commissioning
22/12/2008	728	Agreement to an Extension of Plutonium Commissioning of the Sellafield MOX Plant (B572)
<b>Sellafield Ltd – Windscale – Nuclear Site Licence no. 83</b>		
20/11/2008	512	Agreement to commence an organisational change