

**BRIEF TO WEST CUMBRIA SITES STAKEHOLDER GROUP,
DECOMMISSIONING SUB-COMMITTEE*****[MARCH TO AUGUST 2011]***

This brief provides a summary of the outcome of our regulatory activities associated with decommissioning at Sellafield, Windscale, and Calder Hall during the period March to August 2011. This report aligns with the Sellafield Plan 2011 (<http://www.sellafieldsites.com/media-centre/resource-centre>.) which was published in August 2011. It uses the same colour coding and includes:

- Risk and Hazard Reduction;
- Site Decommissioning; and
- Land and Groundwater Remediation

A summary of each programme can be found in the Sellafield Plan and is not repeated here. Calder Hall is currently covered in the Spent Fuel Management section of the Sellafield Plan. In this report we include it within the Site Decommissioning section for completeness.

Our nuclear regulators attend meetings of the WCSSG and most of its sub-committees. We are happy to respond to questions raised there, or you can contact us at our Penrith office:

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We are always looking to improve our reporting and would be happy to hear your views on the format and content of this report.

1 Introduction

This brief provides a summary of the outcome of our regulatory activities associated with decommissioning at Sellafield, Windscale, and Calder Hall during March to August 2011. The report aligns with the Sellafield Plan 2011 (<http://www.sellafieldsites.com/media-centre/resource-centre>.) which was published in August 2011. It uses the same colour coding and includes:

- Risk and Hazard Reduction
- Site Decommissioning
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A summary of each programme can be found in the Sellafield Plan and is not repeated here. Calder Hall is currently covered in the Spent Fuel Management section of the Sellafield Plan. In this report we include it within the Site Decommissioning section for completeness.

This brief should be read in conjunction with our most recent reports to West Cumbria Site Stakeholder Group main committee (<http://www.wcssg.co.uk/document-library>).

2 Our Regulatory Approach

We aim to do all that we can to facilitate prompt decommissioning at Sellafield and in particular to support hazard and risk reduction associated with the major legacy facilities at Sellafield. We continue to give this outcome priority in our regulatory plans. Our risk informed approach to regulation in this area is summarised in our September 2010 report.

We continue to work with the Office of Nuclear Regulation (ONR) and Sellafield Limited (SL) to refine the SL and regulatory processes. In May 2011, together with SL and ONR, we reviewed the trial flexible permissioning process, which has been developed to support prompt clean-up of the major legacy facilities. Overall the trial is seen as a success and will continue, and may be extended to other areas. We have agreed to jointly pursue a number of developments to enhance the process over the coming year.

3 Decommissioning Lifetime Plan and Strategy

3.1 Lifetime Plan 2011 – Performance Plan

We have previously stated that we expect the major high hazard and risk reduction at Sellafield to be completed much earlier than the contact baseline. Consequently we welcome the publication in August 2011 of the Sellafield Plan 2011 (<http://www.sellafieldsites.com/media-centre/resource-centre>.) which seeks to achieve this, but more needs to be done to meet our aspirations. Our main concern is the timescales for reduction of environmental risk. We continue to work with Sellafield Ltd, ONR, Nuclear Decommissioning Authority (NDA) and Government to support earlier completion.

We are working closely with the ONR to obtain appropriate justification for SL's position on slow down and deferral of decommissioning projects and their associated safety justification. Discussions are currently ongoing with SL on this matter; however SL has put forward draft proposals to Regulators on how they will underpin and justify their position, which are broadly acceptable.

3.2 Sellafield Higher Activity Waste (Intermediate Level Waste) Strategy

Sellafield produced a draft Site Higher Activity Waste strategy in July 2010. The regulators commented in September 2010. SL now has a final version of the strategy which has been provided to us. The strategy contains a number of recommendations, including exploring optimisation of the strategy with stakeholders and progressing opportunities to optimise the strategy. We continue to work with SL, ONR and NDA to seek to realise some of the significant opportunities that could deliver more integrated waste management and realise significant savings in terms of time, costs and waste volumes. We have promoted a workshop which is planned for October 2011 to seek to explore the strategic opportunities and issues and how they can be addressed.

4 Risk and Hazard Reduction

A summary of the outcome of our regulatory activities associated with the nine major risk and hazard reduction programmes covered in the Sellafield Plan 2011 is given below. The Sellafield High Hazard and Risk Reduction Programme (SHHaRRP) currently encompasses four of the highest priority programmes covering the clean-up of the legacy ponds and silos facilities (see section 4.3-4.6). We look forward to the publication of the public version of the SHHaRRP report. We think that this, together with the wider Sellafield Plan 2011 and developing Decommissioning Strategy (see section 5) should help to provide greater focus and a framework for the WCSSG Decommissioning Sub committee to scrutinize decommissioning progress at Sellafield.

4.1 Floc Storage Tanks

Nothing to report.

4.2 First Generation Reprocessing Plant

4.2.1 Separation Area Ventilation:

This project intends to re-direct gaseous effluents discharges, away from the ageing Magnox reprocessing discharge stacks, to a new stack called the Separation Area Ventilation (SAV) stack. The new 120m high stack has been constructed and work continues to construct the plant and monitoring buildings and ventilation ducting. Through the recent 'Radioactive Substances Regulation Environmental Permit' variation completed in August 11, we have permitted the SAV stack subject to controls. The new stack has discharge limits that are equal to the sum of the existing discharge limits for the Magnox reprocessing and Magnox cell ventilation stacks. The limits that apply to the Magnox reprocessing and Magnox cell ventilation stacks will be retained until the diversion of gaseous effluent to the new stack is complete. The site gaseous discharge limits will continue to ensure strict control of the overall site gaseous discharges and their impact. We will require SL to notify us, 3 months in advance, of the re-direction of gaseous effluents to the new SAV stack and to provide key information supporting this work. This will allow us to review, in advance, SL's arrangements covering the re-direction of gaseous effluent. We will reduce or remove the limits that apply to the Magnox reprocessing and Magnox cell ventilation stacks through a subsequent permit variation taking into account SL's decommissioning and demolition plans for these stacks.

4.2.2 Magnox Reprocessing Stack Removal

The detailed design phase for the stack removal is coming to an end. Once complete, SL will then be in a position to produce the report that will draw together all the environmental assessment and decision making carried out to date. We still expect a Best Available Techniques (BAT) case to be produced in 2011; the exact date for this is still to be confirmed. In due course, this will inform any need for permit revision and our response to ONR on the licensing of stack decommissioning and demolition.

4.3 Pile Fuel Storage Pond (PFSP)

4.3.1 Pond De-sludging

Since September 2008 SL has encountered problems with de-sludging the pond to an in pond corral. Initially there were problems mobilising and transferring sludge to the corral. Now the sludge is not settling in the corral as expected. We inspected the facility in late August to try to fully understand the problems. On the basis of our findings, we continue to encourage a systematic technical investigation, including sludge characterisation, optimisation of the use of existing equipment and the consideration of what additional techniques might be needed to resolve the current difficulties. We continue to believe there would also be substantial benefit from utilising wider national and international experience and are working with NDA to help to facilitate this.

4.3.2 Metal Fuel Export

SL is seeking a licence instrument from ONR to cover a proposed pilot transfer of metal fuel from the Pile Fuel Storage Pond (PFSP) to the Fuel Handling Plant (FHP). We have reviewed documentation covering the justification for the work and the environmental controls. Based on our review, we have raised no objection to ONR licensing the proposed pilot transfer of fuel; subject to the specified environmental controls being implemented. We have noted that the current plan is for interim storage of the fuel in FHP until an export route can be developed. As a result of fuel corrosion, the interim storage of this fuel at FHP will have generated liquid effluent and solid radioactive waste (sludge). We accept the need to explore the option of PFSP metal fuel transfer to FHP on the grounds of safety and environmental risk reduction. However, we have noted that the case for extending this to all the PFSP metal fuel or FGMSF metal fuel is not made at this time. Any future case will need to be justified and will need to address a number of other regulatory issues which have already been provided to SL.

4.3.3 Sludge Treatment and Retrieval and Treatment of Other Wastes

SL are conducting a further study to find the best solution for sludge treatment and to seek early opportunities for retrieval/treatment of the other wastes currently stored in the pond. We attended a workshop in August 2011 and are keen to support this work as it aims to bring forward the end date for the PFSP programme. We are encouraging integrated consideration of this and other similar studies within the First Generation Magnox Storage Pond and Magnox Swarf Storage Silos programmes, as we think there may be integrated solutions which may deliver overall environmental and other benefits.

4.4 First Generation Magnox Storage Pond (FGMSP)

4.4.1 Pond Visibility Trial

The FGMSP can suffer from algal blooms in the summer months which reduces pond water visibility and hampers work in the pond. Various potential options to resolve this problem have been put forward but to date no solution found. Given the earlier success of an Independent Pond Purge (IPP) trial (see our March 2011 report), SL consider that simultaneously utilising the IPP and the pond water input from the Fuel Handling Plant may provide a solution for controlling algal blooms. This is because they believe that the algal bloom may originate in an area of the pond which is relatively stagnant when the IPP is not operating. Following a review of SL's proposals covering the FGMSP pond visibility trial, we have raised no objections to the trial proceeding; subject to the specified environmental controls. We have asked SL to inform us when the trial has commenced and to provide progress reports.

4.4.2 Pond Solids Treatment Process

SL are conducting studies to develop a waste treatment solution(s) for fuel and wastes currently stored in the FGMSP and the PFSP. They are keen to undertake down selection of potential treatment options over the coming months. We have supported workshops which have helped to develop the down selection process and have reviewed the benefits and detriments associated with a range of potential waste treatment processes. SL intend to make a down select decision shortly that will focus future work on the most promising options. It is likely to take greater than 10 years to develop a solution. However, we are keen to see this progressed as soon as practicable in order to minimise the generation of radioactive waste which arises from fuel corrosion whilst it is stored in ponds.

4.4.3 Short Term Risk Reduction Work

A current key area of focus is ensuring continued nuclear containment by addressing vulnerable aspects of the facility structure. The latest work involves the cutting and sealing of pipes and other sealing work. We are working with SL and ONR to ensure that this work can be carried out without any unnecessary delay, but with due regard for safety and environmental protection. This currently involves the review of the justification for the work and the associated environmental controls, together with the approval of temporary gaseous waste outlets. We expect to complete our work shortly and to respond to ONR. This will allow ONR to finalise their decision on the licensing of the planned work. We were disappointed to identify errors in some of SL's environmental assessment and are currently seeking to understand why this occurred and how a recurrence can be avoided.

4.4.4 Effluent Distribution Tanks (EDT) Enhancements

Our September 2010 report highlighted a number of concerns relating to the EDT facility following an inspection. Since that time SL has undertaken work on the plant which has addressed a number of the issues raised. SL are now developing a plant enhancement project that will seek to ensure that the plant can support the legacy facility clean-up programme for the next 25 years. We are currently working with SL to ensure that this work will take full account of current plans, potential opportunities, flexibility and contingencies.

4.5 Magnox Swarf Storage Silos (MSSS)

4.5.1 Liquor Activity Reduction Project

As previously reported, the MSSS Liquor Activity Reduction (LAR) project continues to deliver risk reduction. SL has been studying the possibilities of extending LAR to the older parts of the facility, where there are significant concerns about the standards of containment and associated land and groundwater protection. We have provided advice to assist in this work and we have welcomed a very recent SL decision to extend LAR to some of the older parts of the MSSS facility by 2013. SL continue to consider whether and how LAR could be applied to the oldest parts of the MSSS facility. The LAR process has significant potential to become an important element of the overall leak prevention strategy for this facility (see section 6 below).

4.5.2 Magnox Swarf Storage Silos Elevated Gaseous Discharges

Gaseous discharges from one of the MSSS stacks were elevated in April and May 2011. SL has undertaken a detailed investigation. The cause of the elevated discharges in April has been identified as relating to problems with the ventilation fan automatic changeover system. The elevated discharges in May related to planned and unplanned outages of the steam supply to the wet scrubber. SL sought to minimise the planned outage of the steam supply and are seeking to minimise future issues arising from fan changeovers. The investigation has also added to the knowledge regarding optimisation of the wet scrubber performance.

4.5.3 Gaseous Effluent Ventilation System

As reported previously, SL's proposal to ensure BAT for gaseous effluent abatement during MSSS waste retrievals has changed from use of a wet scrubber followed by High Efficiency Particulate Air (HEPA) filters for each system, to a combined system using the two existing wet scrubbers in series, with an option to retrofit single stage HEPAs (or other final abatement equipment), depending on increased understanding of the gaseous waste challenge and scrubber performance determined through early retrieval operations.

In April 2011 we set out our concerns regarding the future decision on whether to install additional final abatement. In summary we are concerned that the proposed solution, if final filtration is not fitted, may not represent BAT when compared to standards of abatement applied elsewhere on the Sellafield site and more widely across the nuclear industry. SL has now developed a programme to seek to further optimise the wet scrubber performance, increase the technical understanding of the abatement efficiency of two scrubbers in series and to further explore contingencies. We are closely engaged with these developments.

4.5.4 Silos Direct Encapsulation Plant

The Silos Direct Encapsulation Plant (SDP) is intended to treat the waste retrieved from the MSSS facility. This project is on the critical path leading to the start of sustain waste retrievals from the MSSS facility and consequently we are keen to see the plant designed and construction as soon as practicable. How there remains considerable uncertainty in project costs and timescales which SL and NDA need to resolve before the work progresses into a full scale project. A particular current focus for us is the development of the waste product. SL about to submit documentation to support the issuing of an interim Letter of Compliance by NDA's Radioactive Waste Management Division. We are scrutinising this process recognising that waste packages from this plant will represent a significant proportion of the total waste volume and radioactive inventory of the planned Geological Disposal Facility.

4.5.5 Re-Use of Windscale Advanced Gas Cooled Reactor (WAGR) Waste Treatment Plant for MSSS Waste

Currently it is expected that the MSSS facility will be able to retrieve and export waste before SDP is available. SL has been investigating how this gap could be filled. Their current favoured option is to re-use the WAGR waste treatment facility for some of the MSSS waste, as it could potentially fill this gap and also provide an alternative waste treatment route once SDP operations commence. We have engaged with SL and visited the WAGR facility to understand this option in more detail. A number of modifications to the facility will be required to allow the required waste management process. During our visit we raised a number of technical issues that will need to be addressed. We are seeking to ensure SL has demonstrated that this is the best way forward and will want to scrutinise the environment case (including waste product development) when/if SL develops this option.

4.6 Pile Fuel Cladding Silos (PFCS) clean-up programme

In April we completed our review of the environment case for the construction of the waste retrievals building and control room. SL satisfactorily addressed issues arising from our review and we responded to ONR with no objection to them issuing a licence instrument to commence the construction work. However, we highlighted a few on-going concerns regarding emergency arrangements and the forward waste management strategy (including waste characterisation, ability to retrieve raw waste for treatment, treatment of waste in a timely manner and the potential to close down waste treatment options, potentially leading to an inferior waste product). We are looking to SL to undertake appropriate work to address these issues going forward. The project continues to look for innovative ways to accelerate work; including progressing revised silo hole and deflector plate cutting techniques to facilitate waste retrievals.

4.7 Highly Active Liquor (HAL) Programme

Nothing to report.

4.8 Plutonium Contaminated Material (PCM) Treatment & Storage Programme

We attended an update meeting with SL, ONR and NDA on PCM operations and strategy. SL's operational approach has been a focus on hazard and risk reduction, plant reliability, asset care and maintenance, Suitably Qualified and Experienced People (SQEP) and development of an optimisation programme for feedstock to maximise product passivity. From a strategic perspective, SL are focussing on deliverability, assessing impact of external events such as Fukushima (stress tests), characterisation, opportunities for waste package optimisation and processing, achieving passivity. We and ONR have commented on SL's latest PCM strategy and overall we are supportive of the approach being taken.

4.9 Windscale

An incident involving the transport of redundant waste oil drums from Windscale occurred in July. Forty six drums, consigned as hazardous waste, were leaving the site when radioactive contamination was detected. The consignment was returned to Windscale, where subsequent monitoring showed seven of the drums to be affected by low levels of radioactive contamination. All drums are now securely stored pending further investigation. There was no impact to people or the environment, either on or off the site as a result of this incident.

Although different circumstances apply, this incident has similarities to the Lillyhall bag incident of April 2010 (i.e. waste being transported from the site for treatment/disposal that was not appropriately characterised and categorised prior to consignment from site). We are carrying out initial fact finding to obtain a fuller understanding of the incident. We have informed and initially discussed the matter with ONR and Department of Transport (DfT). We expect SL's report into the incident in September 2011.

5 Decommissioning

In addition to the hazard and risk reduction programmes, a much longer term and wide ranging (broad front) decommissioning programme will be required at Sellafield. This programme is currently relatively small but will need to expand to address a backlog of facilities that currently require decommissioning and also to decommission facilities once their operational life is complete. A summary of the outcome of our regulatory activities in this area is given below. Calder Hall is currently covered in the [Spent Fuel Management](#) section of the Sellafield Plan but we include it within this section for completeness.

5.1 Site Decommissioning

There has been some deferral and slow down of decommissioning at Sellafield, whilst priority is given to progressing SHHaRRP and other hazard and risk reduction programmes (see section 4). As a result, we are continuing to seek BAT assessments for the necessary surveillance and asset care and maintenance regimes, required to maintain the facilities and supporting equipment and infra-structure.

SL are reconsidering the wider decommissioning strategy. Taking account of work already undertaken on the site end states, SL propose to take an empirical approach to assessing and comparing the consequences and benefits of a limited number of scenarios. It is understood the work will consider broad options for the tactical approaches that could be taken and the implications for the site end state. It is expected that this will require additional facility and waste characterisation aimed at further understanding what SL has and how to deal with it. There will also be a need to take account of the developing site Land Quality Management Strategy. We continue to work with SL, ONR and NDA to support these developments. In developing the future decommissioning strategy, we think that SL needs to consider setting an End State Goal and working back from this, identifying interim states that need to be achieved on the way. We also believe there should be a drive to reach the site end state much earlier than the current date (2120). This will involve a consideration of the choreography and timing of decommissioning and optimising the construction of new supporting plants to ensure maximum efficiency and benefits are gained through early site remediation.

Sellafield Ltd has maintained their alpha decommissioning portfolio capability and is maintaining delivery on several work fronts. This is a welcome and important development,

given Sellafield Ltd's previous intention to place the portfolio into an asset care and maintenance regime.

5.1.1 Pile 1 Chimney Decommissioning

We supported a presentation by SL to the WCSSG Decommissioning sub committee on the approach to decommission the Pile 1 chimney. We facilitated by providing clarity on a number of points and asking 'guiding questions' of SL to ensure the representatives obtained the full picture.

We carried out a prompt review of SL's latest BAT assessment for removal of the filter gallery from Pile 1. We have confirmed to SL that we have no objection to them proceeding, assuming our comments on the assessment are incorporated. The comments centred around clarification and providing additional detail on the approach being taken, which we believe will add further value and underpinning to the document.

5.1.2 Solvent Recovery Plant Stack

After a corrosion hole was encountered in the external ventilation ducting SL has checked the remainder of the ventilation system. As a result of this, another area of concern has also been identified. SL's proposed short term remedial action is to repair the hole using an aluminium plate and surround this with a carbon fibre wrap. In the short to medium term SL are considering closing down the ventilation to the main radioactive source term in the facility, to minimise the hazard and risk. We requested SL also consider proactive remedial works on the other area of concern and we continue to monitor developments.

5.1.3 Redundant Plutonium Purification Plant

We have considered the outcome of the investigation carried out by SL into the leak of radioactive waste from a ventilation duct that occurred in February 2011. Although there was no release or impact to the environment either on or off the site, we consider that SL has failed to fully comply with the conditions of their permit, which is an offence under the Environmental Permitting Regulations, 2010.

Taking account of the Environmental Permitting Regulations functional guidance and the nature of the offence, it is assessed that a warning letter is a proportionate response on this occasion. Despite the fact there are previous related offences we do not believe it would be in our interest, the operator's or the public's interest to escalate the response further. We issued a warning letter to SL on the 19th August 2011. We will be agreeing a programme with SL to address the causes and to seek to avoid a reoccurrence of this type of event.

5.1.4 Demolition of B100 facilities

The buildings have been successfully demolished to slab level. All the wastes generated from the demolition have not yet been dealt with (i.e. the steel is still being processed on site). We are awaiting the close out waste management plan for the work. The outcome is that SL no longer have to fund asset care and maintenance of these facilities, it reduces the nuclear foot print and provides opportunities for future re-use of the land to support onward decommissioning and site restoration.

5.2 Calder Hall Decommissioning Programme

Calder Hall is currently addressed within the spent fuel management section of Sellafield Plan 2011. Once planned defuelling is complete (2015), it will be transferred to the Decommissioning programmes. Work continues on risk reduction activities with the removal and recovery of several top ducts from the heat exchangers. We are following up an apparent fingerprint administration anomaly associated with the subsequent treatment of the ducts.

6 End State – Land and Groundwater Remediation

The regulators continue to work together with SL, to prevent and minimise further contamination, and to protect groundwater and restore land, so that the site and its environs are suitable for any future use agreed with the community.

EA and ONR have carried out a review of SL's signpost document for Land Quality management. The report provides a good overview of historical and more recent work carried out to understand the status of ground and groundwater contamination at the Sellafield Site. The proposed future work programme needs to be prioritised and appropriate justification provided.

6.1 Solid Active Waste Disposal Area (SAWDA)

SL has commenced the programme for producing a BAT case this financial year for the on going management of the Solid Active Waste Disposal Area (SAWDA). We welcome this commitment, which we hope will lead to a robust justification on how the area will be managed going forward to achieve the best environmental outcome. The delivery of this is being supported by both EA and ONR. Dependent on the success of the BAT case for SAWDA, SL are also planning a BAT case for groundwater management across the site. We welcome this initiative.

6.2 Magnox Swarf Storage Silos – Leak Prevention

Working with ONR, we have continued to promote the development and implementation of an aqueous waste leak prevention, containment and mitigation strategy, without delay and ahead of the commencement of retrievals of solid radioactive waste from the MSSS facility. SL has now developed a specification for work to develop and implement a leak prevention/mitigation strategy for the MSSS facility. We are encouraged by, and supportive of, the overall holistic and integrated approach to solving this issue. We believe this starts to address our main concerns. The study is taking a fresh look at available techniques to prevent, minimise and mitigate leaks and seeks to implement practicable measures. SL consider that a very recent structural assessment of the MSSS facility continues to support the decision to cancel the project that sought to hydraulically isolate the facility from the groundwater as a means to ensure any leaks could be managed.

SL commissioned a desk based review of the application of high resolution Electro Resistivity Tomography (ERT) to leak detection at the MSSS facility. In summary the findings of the report are positive and the report recommends a trial adjacent to the MSSS facility. We reviewed the report and provided the output to SL. Overall we think the presented desk study is comprehensive and has addressed many of the known potential performance issues. Overall this is encouraging as it appears that ERT could offer a realistic leak detection capability. We have provided a number of detailed comments that we hope will help the trial to proceed and deliver a positive outcome.

SL has also taken the decision to seek to accelerate MSSS Liquor Activity Reduction for an older part of the facility as a leak minimisation measure (see Section 4.5).

6.3 Wider Legacy Plant Leak Prevention

Building on the MSSS leak prevention approach (see above), we continue to press for similar approaches to be applied to other legacy facilities. In particular we are keen to ensure SL develops the same approach for the legacy ponds as soon as practicable.

6.4 New Waste Stores for Decommissioning Waste

SL has already constructed the Box Encapsulation Product Packing Store 1 (BEPPS1) and is currently moving towards the construction of a facility to allow import and export of waste to this store. As previously reported it recently came to light that a limited part of the basements of these facilities may be below the water table. We have been consulted by Cumbria County Council on the planning application for this plant. In summary we objected to the application as submitted because we did not consider that adequate information had been provided to demonstrate that the risks posed to groundwater can be satisfactorily managed and that surface water can be managed sustainably. We set out what information is required to address our concerns and will work with SL to resolve these matters as soon as practicable.

6.5 Site Leak Prevention

Together with ONR, we have been reviewing and providing guidance and feedback on elements of SL's new management system relating to compliance with Licence Condition 34.