



**QUARTERLY REPORT TO
WEST CUMBRIA SITES STAKEHOLDER GROUP**

1 JANUARY TO 31 MARCH 2009

This report provides a summary of the outcome of our regulatory activities at Sellafield, Windscale, Calder Hall and the Low-Level Waste Repository (LLWR) near Drigg during January to March 2009.

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. OUR ROLE

We aim to prevent pollution, to enhance the environment, and to contribute to the sustainable development of the UK.

Operating and cleaning up nuclear sites generates radioactive and non-radioactive wastes. Our role as the environmental regulator is to ensure that the management and disposal of those wastes have little or no impact on people and the environment both now and in the future.

We inspect nuclear sites and assess proposals from operators, to provide assurance that the operator is complying with the limits and conditions of the authorisations we issue under the Radioactive Substances Act 1993 (RSA 93), the Environmental Permitting Regulations and other relevant legislation and policy. We supplement direct regulation with a partnership approach, working with the operators, the Nuclear Decommissioning Authority (NDA) and the Nuclear Installations Inspectorate (NII) to solve problems jointly. If you want to know more about our role on nuclear sites, see our website at the address below:

<http://www.environment-agency.gov.uk/business/sectors/32517.aspx>

We expect operators to comply fully with all relevant legislative requirements and authorisations. If this does not happen, we will not hesitate to use our enforcement powers to ensure that action is taken to protect the environment or to secure compliance.

Our regulatory strategy steers our work at nuclear sites. It sets out our long-term objectives, what we expect of the operators, and how our work links to the Environment Agency's corporate vision and goals. In summary our objectives are to:

- Ensure that environmental permits are up to date, flexible and fit for purpose and that they drive environmental improvement
- Assess compliance with the limits and conditions of the permits and to take enforcement action if necessary
- Reduce risks to the environment and avoid creating further legacies
- Ensure that integrated waste strategies continue to improve
- Ensure that solid waste is packaged in a form suitable for disposal
- Ensure that infrastructure and assets are maintained to minimise environmental impact
- Develop guidance on Best Available Techniques (BAT)
- Influence NDA so that they provide appropriate direction to operators to minimise waste and improve environmental outcomes
- Encourage integrated management of fuel and nuclear materials so as to prevent or minimise the potential environmental impacts
- Ensure land and groundwater contaminated by radioactivity or other pollutants is managed appropriately, and protect land and groundwater from further contamination

- Monitor and assess organisational change to ensure that environmental performance is maintained or improved

2. AUTHORISATIONS & PERMITS

2.1 Radioactive Substances Act 1993 (RSA93)

Disposal of radioactive wastes is only permitted subject to strict limits and conditions under an RSA93 authorisation.

Sellafield

Our annual review of the Sellafield RSA93 authorisation continued this quarter.

Low Level Waste Repository

We have received an application from LLWR for a variation to their RSA93 authorisation to enable transfer of metals to Studsvik's Metals Recycling Facility (MRF) at Lillyhall.

We completed our annual review of the LLWR RSA93 authorisation in February. With the proposed variations, the authorisation remains fit-for-purpose. However, a number of possible changes at the LLWR over the next few years may require further variations.

Transfers of low level radioactive waste

We are developing a proposal for a variation to be applied to all nuclear site authorisations. This will allow transfer of low level radioactive waste (LLW) metals directly to MRF, as well as via LLWR. It would also permit transfer of very low level radioactive waste (VLLW) and combustible LLW to LLWR, for onward transfer to an as-yet undefined location. The initial limits on these transfers would be zero, and this route would be opened up when it is demonstrated to be appropriate at a particular site. We expect to consult on these proposals in April with a view to varying authorisations from mid-June onwards.

3. DISCHARGES & THEIR IMPACT ON PEOPLE AND THE ENVIRONMENT

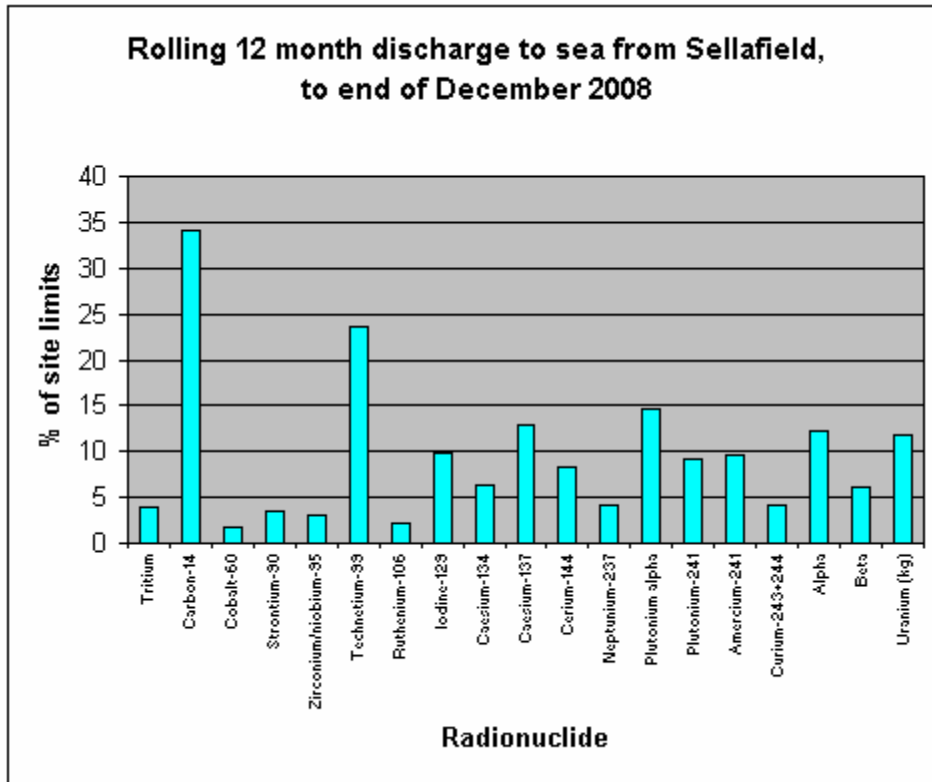
3.1 Radioactive discharges

We aim to ensure that the public and the environment are protected from the radiation exposure that may result from the disposal of radioactive waste.

There were no breaches of the authorised site limits on radioactive discharges to land, sea or air this quarter at any of the West Cumbria sites.

Discharges to sea

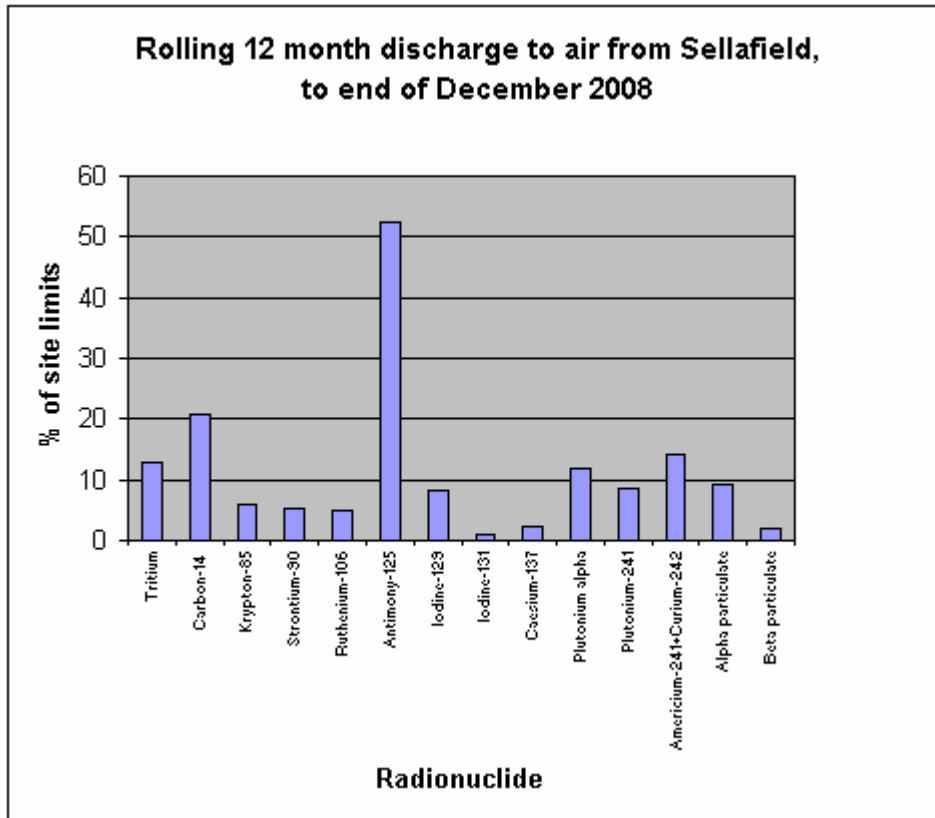
Radioactive discharges to sea from Sellafield over the 12 months to the end of December 2008 are shown as a percentage of the authorised site limits in the graph below:



All discharges were well below the authorised limits. Note that for certain radionuclides the site limits for calendar years relate to the amount of spent fuel reprocessed ('throughput related limits').

Discharges to air

Radioactive discharges to air from Sellafield over the 12 months to the end of December 2008 are shown as a percentage of the authorised site limits in the graph below:



We reported last time that the radioactive discharges to sea from Sellafield have been declining for sometime and have dropped below the UK discharge strategy targets for 2020. In 2007, discharges to sea for all radionuclides except tritium were the lowest they have been since the mid 1950s. The dose to the most exposed group of the public from discharges to sea of radionuclides subject to numerical limits is currently less than the UK discharge strategy aim for 2020 of 20 microsieverts per year. These developments are attributed to the recent low fuel reprocessing rates and the application of better waste management. However, over coming years, several factors may result in discharges rising above current levels i.e.:

- Reprocessing rates increasing to previous levels;
- Prolonged storage of Magnox and oxide fuel in fuel ponds; and
- Clean-up of the site.

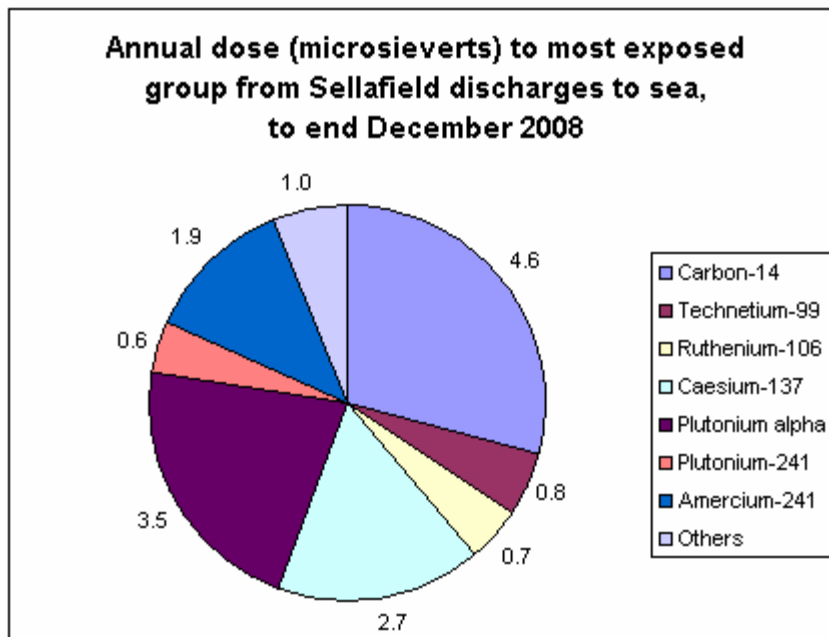
A challenge for Sellafield Ltd over the coming years is therefore to consolidate the achievement of the UK discharge strategy targets, if practicable, and to pursue greater reductions over the longer-term. The UK discharge strategy is currently being reviewed.

3.2 Radiation doses

Radiation doses to the most exposed groups of people from liquid and gaseous discharges from the Sellafield and Windscale sites continue to be well below the public dose limit of 1,000 microsieverts per year.

We estimate that the annual radiation dose to the most exposed group of the public was around 16 microsieverts (μSv) for liquid discharges made in the 12 months to the end of December 2008. This is about 3 per cent of the constraint on dose from discharges from a single site (500 μSv per year) and less than one per cent of the average dose from natural background radiation in the UK.

The radionuclides which contribute to this dose are highlighted in the following piechart:



Radiation doses from gaseous discharges are much (about ten times) lower than those from liquid discharges.

3.3 Environmental monitoring

Sellafield radioactive particles in the environment

The beach monitoring programme remains on target for 2008/09. A total of 17 stones and 22 particles were retrieved in January and February. The number of finds per hectare for most areas is significantly lower compared to last year, and for Sellafield beach is less than half of that for 2007/08.

The beach monitoring programme in 2009/10 will again include areas between Drigg Point and St Bees Head and we will consider whether there should be additional monitoring further afield. The radiation detection system will be further improved in 2009/10.

More details can be found in our latest web briefing note:

<http://www.environment-agency.gov.uk/homeandleisure/pollution/nuclear/31414.aspx>

and on the Sellafield website:

<http://www.sellafieldsites.com/what-we-do/featured-projects/beach-monitoring>

LLWR waste monitoring programme

Our review of LLWR's monitoring programmes concluded that robust systems are in place.

More details of discharge and environmental monitoring data can be found in our Radioactivity in Food and Environment (RIFE) report. This is published each year jointly with the Food Standards Agency, Scottish Environment Protection Agency (SEPA) and the Environment and Heritage Service of Northern Ireland. The RIFE report for 2007 was published in December 2008, and can be found on our website at:

<http://publications.environment-agency.gov.uk/pdf/GEHO1108BPBH-e-e.pdf?lang=e>

4. COMPLIANCE ASSESSMENT

4.1 Site inspection & assessment

Environmental monitoring at Sellafield

We carried out a week-long inspection of the environmental monitoring programme in February. No compliance issues were identified but we shall be recommending some further improvements to the programme.

LLWR Vault 9

Construction of Vault 9 is progressing and we continue to inspect the process with support from our landfill and nuclear waste assessment teams. We have agreed the quality standards to be used for liner protection materials, and are discussing the liner tests with LLWR.

Gaseous waste management at Sellafield

Good progress is being made against the recommendations of our June 2007 gaseous effluent team inspection, with only two recommendations remaining outstanding. We plan to have all of the recommendations closed out by mid 2009 but we will continue to monitor and assess the implementation of the recommendations.

Sellafield Pile fuel cladding silos

We completed an environmental review of this facility in January which included a review of the waste management strategy and 'environment case' for the facility. We did not identify any compliance issues, and were generally impressed by the management of this ageing legacy facility.

Although there have been some improvements which have reduced the environmental risk associated with this facility, knowledge of the condition of the waste needs to be further developed.

Sellafield Waste Vitrification Plant (WVP)

We inspected the abatement system for aerial discharges at the vitrification plant in January with the NII. Routine replacement of the high efficiency particulate air (HEPA) filters on Lines 1 and 2 has been delayed because of issues associated with the shielding at the base of the filter flask.

Magnox reprocessing plants

We carried out a two-day inspection of the Magnox reprocessing plant and associated plant. The overall picture was positive, but we believe there is scope to improve operating practices and arrangements further. Sellafield Ltd's investigations into a number of recent events have identified improvements in the operating instructions, training and the suitability/capability of specific plant components.

4.2 Improvement conditions

Low Level Waste Repository (Environmental Safety Case interim submission)

The current Radioactive Substances Act 1993 authorisation only allows disposal in Vault 8, which is nearly full. The operators are currently constructing Vault 9. However, this vault currently only has planning permission for *storage* as opposed to *disposal* and we have stated that we will not allow further disposal of waste until a satisfactory Environmental Safety Case is provided, which must demonstrate that disposals are safe now and into the long term future (taking into account the long time some radioactive elements take to decay, in some cases many thousands of years). An Environmental Safety Case was provided in 2002, but this did not adequately meet all our requirements. An updated case is required by May 2011.

The Environmental Safety Case must consider all potential impacts from the disposals now and in the future, such as movement of radioactivity through groundwater, impacts from gas generation or human intrusion into the waste in the future when full knowledge of the site may have been lost. A key issue is recent evidence that coastal erosion and destruction of the site is highly likely within a few thousand years time. At this time the waste will still be radioactive and so this is a central consideration of LLW Repository Limited in developing their updated Environmental Safety Case for May 2011. If we are to authorise further disposals to the LLWR we will expect the operators to demonstrate, for all future scenarios, including coastal erosion, that radiation exposure is acceptable and within criteria we set and is optimised to be as low as is reasonably achievable.

LLWR's authorisation required an interim submission to be made against the Environmental Safety Case in May 2008 (known as Requirement 2). We have now completed our technical review of LLWR's Requirement 2 submission. We concluded that the requirement has been substantially satisfied, but that significant work will still need to be completed before LLWR submits their final updated Environmental Safety Case in 2011. We will not allow any further disposals, or construction of the cap over the trenches, until radiological

capacity has been demonstrated and that risks from the facility are demonstrated to be as low as reasonably achievable.

Sellafield Environmental Permit improvement programme

A significant number of buildings at Sellafield discharge steam condensate from heating systems directly into the site drainage systems. We have asked Sellafield Ltd to consider ways of diverting these condensates to engineered systems.

Sellafield Ltd have submitted their review of the management arrangements and conditions of the facilities used for the delivery, storage and transfer of diesel at one of the site's substations. This identifies a number of improvements, some of which are completed. We have a number of concerns that need to be addressed – in particular, the source of the oily water arising in the brick-lined bund that contains the Drain Down Tanks, and options for inspection of the undercover pipework connecting to the bulk storage tanks.

4.3 Enforcement

Exclusion of solids in liquid effluent

Sellafield Ltd is developing 'cases' for each major facility which aim to demonstrate that adequate measures are being applied to exclude solids and particles from liquid effluents.

We continue to review and assess Sellafield Ltd's cases for the Site Ion Exchange Plant (SIXEP), Segregated Effluent Treatment Plant (SETP), Enhanced Actinide Removal Plant (EARP) and the Lagoon. Sellafield Ltd have been sampling liquid accountancy points since August 2008 for particles with a high concentration of radioactivity, and have not found anything 'of significance' so far. We expect to receive a report on this campaign shortly.

Boreholes

During an inspection in December 2007, we found a borehole close to the high level waste plants to be in an unacceptable condition. There were a number of failed components, contamination in the pit, and a general loss of understanding about the groundwater dewatering system in that area. We issued a warning letter in May 2008. We have closely monitored progress, and carried out an inspection in February. The majority of the recommendations from Sellafield Ltd's improvement plan and our warning letter are now satisfactorily complete. We will continue to monitor the actions as part of our quarterly groundwater review.

4.4 Environmental events & incidents

Condensate leaks at Sellafield

A leak from a condensate drain line from a ventilation duct which serves the Magnox Reprocessing plant was discovered in January. Monitoring of the concrete slab below found some fixed alpha and beta contamination, but the contaminated area was very limited and is situated well within the site boundary. Sellafield Ltd are sampling and testing to determine the significance of any ground contamination. The leak was attributed to loose

flange bolts, and tightening the bolts stopped the leak. Our initial investigations indicate that inadequate maintenance may have contributed to this incident, although there are also other potential issues with the adequacy of design, operating arrangements and the provision of secondary containment to prevent leaks escaping to ground. We expect to receive a report from Sellafield Ltd's Board of Inquiry into this incident by the end of March.

Contamination was also found on the walls and nearby ground in the medium active tank facility during preparations for a non-routine transfer of liquor. Initial investigations suggest this was due to an imperfect weld in a condensate pipeline. A clamp has been attached to the pipe to prevent further leakage while a permanent engineered solution is developed.

During the period it was confirmed that an on-going leak of non-radioactive steam condensate from a failed catch-pot was the source of water ingress into a store sump in the Product Finishing and Storage facility. The condensate has been temporarily re-routed to a bowser, which then overflows to a ground soak-away. Sellafield Ltd is in the process of putting in place a new routing for this stream, which will enable the heat in the stream to be re-used, prior to condensate disposal to drain.

Contaminated fan housings

In March Sellafield Ltd reported to us the detection of contamination on and around two redundant fan housings outside the Product Finishing and Storage facility. Access to the affected areas has been restricted while further assessment of the extent and nature of the contamination is undertaken. Sellafield Ltd's intention is to remove the affected ducting and fans, and a programme is being developed to work up arrangements for this. In the meantime effort is being directed at removing or fixing any loose contamination, and weatherproofing the area. This is supported by a regular programme of surveys to monitor the condition of the area.

Failure of compressed air system

The site compressed air system failed on 25 February, and the back-up system also failed because of a problem with the shared cooling system. Some key plants had to be shut down, while others activated local back-up systems. There was no environmental impact, but sampling equipment on some aerial discharges was lost for a few hours.

5. OTHER NEWS

We work with the site licence companies (SLCs), parent body organisations (PBOs), NDA, NII and others to make sure the environmental impact of day-to-day operations and decommissioning activities on nuclear sites is minimised, and that the risks posed to our environment from the hazardous facilities at Sellafield are reduced. This section highlights some of the progress this quarter.

Waste condition monitoring

We have previously reported quality issues ('lumpy') with drums from Magnox Encapsulation Plant (MEP). Recent RADSCAN tests have shown that protrusions on the side and base of some drums are associated with corrosion of uranium and mechanical damage. We are pleased that Sellafield Ltd are now planning drum inspections every year.

Preventing wildlife gaining access to contamination

Comprehensive and effective measures have been in place at the many facilities over the past 10 years to prevent animals (birds in particular) coming into contact with contamination. Together with NII we recently asked for a review of the site-wide co-ordination of such work – this has been done.

Steam supply infrastructure

Two of the three corroded stacks at Fellside Combined Heat and Power (CHP) Plant had been replaced by the end of March.

Sellafield Ltd is trying to accelerate the CHP (contingency) boiler park project, which is currently due to be operational in late 2011.

Corroded fuel processing

Processing of corroded fuel in the Fuel Handling Plant resumed following the re-start of Magnox reprocessing in January, enabling a total of 15 tonnes of corroded fuel to be reprocessed through 08/09. Sellafield Ltd is in the process of reviewing and improving its operating facilities and procedures for processing corroded fuels, which it believes should reduce the potential for loss of solids into the transfer line to SIXEP, and enable improved corroded fuel reprocessing rates to be achieved from 09/10. Processing rates have been low in recent years, and performance needs to be improved if all corroded fuel is to be processed before the end of Magnox reprocessing in 2016.

First generation Magnox Storage Pond sludge treatment

Sludge needs to be removed from the first generation Magnox Storage Pond to enable this ageing facility to be decommissioned.

Sellafield Ltd have started to construct a sludge buffer storage facility (SPP1). They are considering enhancing the design of this facility – a decision which may have significant cost, safety and environmental implications. We have encouraged Sellafield Ltd to make an early decision, to avoid any further delays in retrieving the sludge, and to consider contingency arrangements including temporary and emergency buffer storage.

Sellafield Ltd are undertaking a 'best practicable environmental option' assessment for treating the sludge over the next six months. This will consider two processes, both involving pre-treatment and encapsulation in cement.

Storage facilities for redundant pond furniture

Equipment needs to be removed from THORP Receipt and Storage pond to provide space for interim storage of AGR fuel. A portion of the 1,675 empty multi-element bottles (MEBs) due to be removed from the pond will be

disposed of as LLW, but a significant number require extended decay storage to reduce their cobalt-60 levels. The options for the storage of the ILW MEBs is under review by the operator.