HSE

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Nuclear *Newsletter*

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Contents

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General issues

Overview

As in the last period, the previous high level of activity has continued. There are continuing challenges from ageing plant, both in the nuclear power plant and nuclear chemical plant sectors. Our resourcing pressures continue and the international environment is now becoming more complex but we have had a reasonable response to job adverts placed before Christmas based on new salary levels. Funding constraints on the Nuclear Decommissioning Authority (NDA) owned sites are delaying decommissioning and we are in discussion with the licensees, NDA and others on potential safety implications and measures to address the issue.

Our initial assessment of the four designs for new plant has proceeded well and we are on target to meet our programme for Step 2 of the Generic Design Assessment.[1]

Generic Design Assessment (GDA)

The Government published the White paper *Meeting the Energy Challenge – A White Paper on Nuclear Power* on 10 January 2008. In announcing the White Paper in Parliament, John Hutton, Secretary of State for Business, Enterprise and Regulatory Reform (BERR) said 'the Government believe that new nuclear power stations should have a role to play in this country's future energy mix alongside other low-carbon sources. The Government's view is that it is in the public interest to allow energy companies the option of investing in new nuclear power stations and that we should therefore take the active steps necessary to facilitate that'. He also went on to say that 'Ensuring the safety and security of new nuclear provision will remain a top priority. Having reviewed the evidence put forward and the advice of independent regulators, we are confident that we have a robust regulatory framework. The International Atomic Energy Agency (IAEA) concluded that our regulatory framework is mature, flexible and transparent, with highly trained and experienced inspectors.'

[1] *Update as of 18 March 2008: We have been able to complete Step 2 ahead of the programme and reports were published on the HSE website (18 March 2008).*

The White Paper also announced the intention to review the nuclear regulatory regime to see whether efficiency of transparencies can be enhanced. This review is being led by Dr Tim Stone, a senior advisor from KPMG.

Following the Government's announcement and the White Paper, we wrote to all four requesting parties clarifying our intentions for progressing GDA in the time period between the formal end of Step 2 and the start of Step 3. If all four requesting parties confirm that they want their design to continue assessment through GDA, before Step 3 formally commences, BERR intends to conduct a prioritisation process to select up to three designs which it considers should proceed to Step 3.

Governance of strategic projects

The project support office, which provides the governance function for the Nuclear Directorate's (ND's) strategic projects, has been established and is now providing the management board with regular overviews of progress. While providing information on all of the projects it highlights those worthy of more rigorous scrutiny by the board. Such issues have been improvements to leadership and management, the need to progress procurement of outsourced technical support and preparation for the return visit of IAEA's Integrated Regulatory Review Service (IRRS) team.

Benchmarking against Licence Condition 23 (LC23)

One strategic project which is moving forward successfully is HSE's benchmarking exercise to look at consistency of compliance with LC23. Six different licensed sites have been chosen and a series of inspections carried out. Benchmarking inspections have continued across the selected nuclear installations and the final inspection was undertaken at Dounreay in February 2008. The inspections are being carried out against a series of expectations derived from relevant IAEA guidance, supplemented by a specifically developed question set. The benchmark question set provides a tool for systematically gathering information across various nuclear installations, from which revised inspection guidance will eventually be developed.

HSE is currently reviewing how to discuss the findings of this benchmarking inspection with licensees to ensure a better consistency of approach.

Sellafield Ltd competition

ND continues to participate in the activities relating to the competition for ownership of Sellafield Ltd. The competition relies upon Windscale being relicensed to Sellafield Ltd from the UK Atomic Energy Authority (UKAEA) prior to the contract award. Relicensing is currently scheduled for 1 April 2008. ND, including the Office for Civil Nuclear Security (OCNS), participated in a working group with NDA, the Environment Agency and Sellafield Ltd that meets regularly to monitor the transition process and address regulatory expectations. On NDA's programme, contract award to the successful parent body organisation (PBO) bidder is scheduled for 23 September with share transfer on 24 November 2008. ND has emphasised that licence compliance arrangements, notably LC12 (suitably qualified and experienced persons) and LC36 (management of change) apply to the whole licensee including the Board and Executive Team. Sellafield Ltd is developing induction plans for incoming PBO secondees and reviewing how the LC36 arrangements will be applied to changes at Board level. The induction process, following contract award, will include a formal 'introduction to the regulators'. Various discussions have been held at senior level in NDA, Sellafield Ltd, BNFL and the Environment Agency to secure the appropriate attention to leadership of the site through this period of transition. Furthermore, three new independent members of the Sellafield Board have been appointed.

Windscale

As described above, it is intended that the Windscale site will be transferred from UKAEA to Sellafield Ltd for inclusion in the Sellafield competition. UKAEA and Sellafield have been preparing for this transition for some time and have been in 'shadow working' of the new structure since October 2007. HSE is in the process of assessing the outcome of shadow working and preparing to relicense the site. No major obstacles have been identified to relicensing on 1 April 2008.

Dounreay

Dounreay is to be relicensed as a stand-alone licensee (Dounreay Site Restoration Ltd) following a period of shadow working. HSE has carried out a readiness inspection to confirm that the new organisation is suitable and sufficient to enable a new licence to be issued on 1 April 2008. No major obstacles have been identified to relicensing on 1 April 2008.

Site visits

HM Chief Inspector for Nuclear Installations has continued with his site visits programme. Over this period Dr Weightman visited Hinkley A and B in October 2007; AWE sites at Aldermaston and Burghfield in November 2007; and Hunterston A and B in February 2008.

Studsvik UK Ltd – metal recycling facility

Studsvik UK Ltd was granted a Nuclear Site Licence for its metal recycling facility at Workington, with effect from 18 February 2008. The site is currently vacant awaiting the start of construction works, with an expectation of becoming operational in September/October 2008. The site will process low-level radioactive metal arising from operations and decommissioning of UK nuclear facilities. Following treatment, the recycled metal will be proven to be below exemption limits before eventually being sold into the UK recycled metal market for industrial use.

Low level waste repository (LLWR)

Transfer of LLW Repository Limited's shares to the new PBO (UK Nuclear Waste Management Limited – a consortium of Washington Group International, Studsvik UK, AREVA-NC and Serco Assurance) will occur on 1 April 2008, enabling the new team to begin work in earnest after a period of due diligence.

Magnox Electric

Work to relicense the Magnox South sites is continuing. HSE has carried out further inspections following Magnox North and Magnox South entry into shadow working in November 2007. The shadow working period is to allow Magnox North and Magnox South to demonstrate their capability to operate as two separate organisations, each with five of the Magnox Electric Limited plants under their management.

Nuclear Decommissioning Authority (NDA)

HSE is continuing to work with NDA and licensees to formulate lifetime plans for each site and to establish efficient co-ordinated working arrangements that reflect each party's duties. Problems have arisen due to increased spending forecasts pressurising the NDA budget with the consequence that several intended decommissioning projects across the NDA fleet have been deferred. All parties are working together to resolve the issues that have arisen due to these deferrals.

Communication and stakeholder engagement

Following the transfer of OCNS and the UK Safeguards Office to HSE in April 2007, a new more inclusive mission has been agreed for ND: 'To protect people and society from the hazards of the nuclear industry.'

Media research during 2007/08 has confirmed that nuclear issues in the UK are becoming increasingly high profile. Transparency, openness and clear accountability are major aspects of earning public trust and building confidence in the nuclear regulatory system. To begin to address this, the ND Management Board has agreed to four communication and stakeholder engagement goals for 2008/11:

- raised awareness and understanding of ND's role and responsibilities in ensuring nuclear safety and security;
- greater transparency about ND's regulatory processes, ease of access to good quality and timely information, and actively listening to feedback to improve our approach;
- enhanced and proactive two-way communication arrangements with those who can contribute to improving nuclear safety or security; and
- a strong and dynamic two-way communication culture in ND.

These will be taken forward through a wide range of activities and projects, involving stakeholders wherever appropriate, and there will be efforts to define how we measure the effectiveness of our communications and engagement.

Following a working group made up of HSE, the Defence Nuclear Safety Regulator (DNSR) and representatives of the Safety Directors' Forum, the regulators and the full Forum have agreed in principle to a 'Regulatory Nuclear Interface Protocol'. The protocol has been developed in recognition that to achieve our organisations' respective, and distinct, missions and objectives, we need to work with key stakeholders as effectively and efficiently as possible. The more strategic approach adopted should facilitate this. Organisations' CEOs/directors will formally sign up to the initiative at the Major Hazards conference ('Leading from the top: Avoiding major incidents') on 29 April 2008. After that it will be rolled out and embedded across the signatory organisations.

The fifth edition of the nuclear e-Bulletin was issued in January 2008. Just over 2000 people have registered for this service. This is a 10% increase of registrations since the fourth edition (October 2007).

There were ten freedom of information (FOI) requests and four items of correspondence from MPs during the period covered by this report.

Nuclear research

The 2008/09 nuclear research programme will be submitted to HSE for approval at its 28 May 2008 meeting.

Over the last year we have established stronger management arrangements for the 2007/08 Nuclear Safety Research Levy Programme. This is on target to be delivered to time and within 1% of budget.

The review of the Nuclear Research Index (NRI) has been completed and changes implemented. These were discussed at the Nuclear Safety Advisory Committee (NuSAC) RG6 on 2 October 2007 and considered satisfactory. This review had also enabled the 2007 update be undertaken in all technical area sections except Human Factors. This review and the 2007 NRI update illustrated that in most technical areas, a more strategic way of presenting our concerns was appropriate on account of the maturity of the technical area. This approach is being progressed in terms of the 2008/09 programme and beyond.

The ND Human Factors Nuclear Topic Group has given the NRI Human Factors section a thorough and critical review. The result has been a rationalisation and down rating of the priorities of some of the issues. The review will be presented to the April 2008 NuSAC RG6 meeting. In parallel with this review, the Human Factors Sellafield Research Strategy statements are being updated. The original plan of placing all of the human factors research issues, for all licensees, in the NRI will no longer be implemented because of the difficulties. Instead the NRI will continue to concentrate on issues applicable to generating power reactors and where there are issues common to Sellafield or decommissioning licensees. They will be referred to in the Human Factors sections of their strategy statements. This will allow common issues to be recognised and, where appropriate, progressed together.

Staffing

HSE currently has a large recruitment campaign underway aimed initially at increasing the number of nuclear inspectors by around 20% (the maximum we can assimilate over a relatively short period) this calendar year. Such levels of recruitment will have to continue in future years, given the age profile of the Nuclear Inspectorate and the forward work programme. A major recruitment was initiated before Christmas based on improved salaries agreed by HM Treasury in November 2007. Around 60 candidates are being interviewed.

Operational issues

Operating power reactors

Dungeness B

Dungeness B continues to experience problems with the fuel route. The main issue is with the demonstration of continued integrity of fuel plug units (FPUs), especially those that were manufactured early in the station's life. This issue has had significant consequences for the refuelling programmes (extending them). Both reactors operated throughout the period, except when they were offline for planned refuelling outages, Reactor 21 being offline in November 2007 and Reactor 22 being offline in January 2008.

Following uncontrolled releases of carbon dioxide on 26 March 2007, 2 April 2007, 10 September, and 26 September 2007, we carried out a formal investigation into these events. This resulted in an Improvement Notice being served on British Energy at Dungeness B on 12 October 2007. The Improvement Notice required Dungeness B to carry out improvements to the carbon dioxide plant to return it to a state where all risks arising from its operation are controlled, and to improve arrangements for plant maintenance. Dungeness has now completed all of the actions required to comply with the Improvement Notice which was formally closed out by HSE on 31 January 2008.

On 31 January 2008 HSE accepted the second periodic safety review (PSR2). This was after consideration of the safety review carried out and submitted by Dungeness B. HSE published a statement that, subject to the successful completion of an agreed programme of work, Dungeness B has justified operation for the next period, up to the year 2018.

There were no Licence Instruments issued during the period. Anticipated Licence Instruments to permission the replacement data processing system and to permission installation and operation of the FPU crimping machine were postponed due to continuing technical and contractual problems.

Hartlepool

Around the beginning of the period Reactor 1 was shut down for its statutory outage and has remained shut down since, following the discovery of degraded prestressing wire windings on a number of boiler closure units (BCUs) (see below). Reactor 2 started the period at full load and had an unplanned automatic trip on the 10 October 2007 when a fault was revealed during planned switching operations. The unit was restarted on 11 October 2007 and subsequently shut down on 20 October 2007 following the discovery of a failed prestressing wire on Reactor 1 and has since remained out of operation.

An International Nuclear Event Scale (INES) 1 event was reported for an event which occurred on 19 September 2007. During the Reactor 1 statutory outage, the position of gas circulator inlet guide vanes changed state from closed to open while refuelling operations took place. This was outside of the technical specification limiting conditions of operation. The site inspector investigated the event and concluded an appropriate level of internal investigation was applied to the event and a suitable and sufficient corrective action plan developed and implemented.

A second INES 1 event was reported on 19 September 2007 when a BCU prestressing wire anchorage was reported to be missing the tail wire beyond the anchorage (the unstressed end of the wire). A further INES 1 event was reported on 20 October 2007 when a Reactor 1 BCU prestressing wire was found to have a break in the tension wire. Reactor 2 was shut down by British Energy the same day and Heysham Reactor 1 the following day. Heysham Reactor 2 was already shut down for refuelling.

A BCU recovery project has been initiated and the subject is receiving close scrutiny by us with Category 1 safety cases required before the return to service of either reactor. Specific regulatory holds are in place for the restart of both reactors.

Licence Instrument 521 was issued during the period, giving Agreement to a modification to install new temperature monitoring units in the reactor safety circuits. Licence Instrument 523 was issued giving Agreement to a modification to install an automatic quadrant feed trip for use in major boiler tube leakage faults. No notable enforcement activity was deemed necessary in the reporting period.

As described in the 'Heysham 1' section below, we have received the PSR2 submission for both the Hartlepool and Heysham 1 facilities.

An emergency exercise scheduled for 5 December 2007 was deferred until 27 March 2008 due to the demands on the workforce associated with the BCU recovery project. The site muster arrangements and newly installed equipment were successfully demonstrated to the site inspector on 5 December 2007.

Heysham 1

The Heysham 1 reactors were both operating at the start of this reporting period. However, both reactors remain shut down due to the BCU issue already reported in the 'Hartlepool' section above.

The annual Level 1 emergency exercise was held in November 2007. We deemed this to be an adequate demonstration of the emergency arrangements.

The essential cooling water (ECW) project (reported in the last report to NuSAC), to replace all the remaining buried and cast-in-concrete cast iron components of the ECW system with glass-coated carbon steel components, continues and remains on course to be completed by April 2008.

In February 2008 we received the PSR2 submission for both the Hartlepool and Heysham 1 facilities, the third in a series of PSR2 assessment projects following on from Hinkley Point B/Hunterston B, and Dungeness B. We will assess this submission and develop a view on British Energy's compliance with Nuclear Site Licence Condition 15. The due date for our decision is the end of January 2009.

Two Licence Instruments were issued regarding the Heysham 1 facility, one of which (the Nursery) is reported below under 'Heysham 2'. Licence Instrument 538 was issued giving our agreement under Nuclear Site Licence Condition 22(1) to replace safety circuit temperature monitoring unit equipment. A further Licence Instrument agreeing to the implementation of an automatic quadrant feed trip for use in major boiler tube leakage faults is expected to be issued soon. This modification is identical to one already agreed by HSE for Hartlepool.

An INES 1 event was reported on 8 July 2007 in which an unlatched control rod paid out when lifted by the fuelling machine. The site inspector investigated the event and concluded that no further regulatory action was necessary after a suitable and sufficient corrective action plan was developed and implemented.

Heysham 2

During routine maintenance of the Reactor 8 make up shield (MUS) in December 2007, the station detected that one of a pair of rubber seals had failed. These seals form part of the primary containment when refuelling the reactor at low power. There are several seal pairs on the MUS joints and a safety case was provided by the station to justify the use of the MUS until May 2008. We have requested that station replace the seal earlier than that originally proposed. The station has now committed to replacing the seals, starting in March 2008. In the interim, more onerous limits and conditions have been applied to the use of the MUS.

The station had an unplanned automatic shutdown of Reactor 8 in January 2008. This originated from maintenance work being carried out on a stator water cooling pump, which led to a turbine trip and in turn the reactor tripped. The forced outage lasted two weeks; the station performed the necessary remedial work and also took the opportunity to repair other plant defects that required an outage. The station has not yet concluded its detailed investigation into the circumstances surrounding this event.

Reactor 7 operated throughout the period without any significant problems. The licensee has not reported any events above INES 0 during the period.

The annual Level 1 emergency exercise was held in October 2007, HSE deemed it to be an adequate demonstration of the emergency arrangements by the station.

A children's nursery had operated for many years on the licensed site but outside the securely fenced area. However, for the last two years it had been closed. The station has proposed to reopen it. HSE sought legal advice and was informed that the nursery would require HSE consent to reopen. The station applied for consent and this was duly granted in November 2007. The main concern for the children would be in the event of a nuclear emergency; the station has reviewed its arrangements in this regard. The nursery periodically participates in emergency exercises and the usual response is to evacuate the children as soon as it is practicable; a rota of drivers and vehicles is maintained to effect any evacuation.

Hinkley Point B

Both reactors at Hinkley Point B have operated steadily at reduced power over the whole reporting period. The reactors returned to service earlier in 2007 at reduced power, this was to comply with safety case limits on boiler temperatures.

The licensee has undertaken a significant programme of work during the reporting period to clean up trace amounts of asbestos fibre found on cable trays and pipework in the Hinkley Point B gas circulator halls.

The licensee has discovered that the effects of irradiation embrittlement on core restraint components in the Hinkley Point B reactors are more severe than previously assumed. This potentially undermines the existing safety case for the graphite core. A justification for continued operation has been produced and a more detailed safety case is being developed to secure the long-term position, which will include an enhanced core inspection programme for the 2008 outages.

There have been no significant incidents on the site during the reporting period.

Hunterston B

Throughout the period both reactors have continued to operate, generally at around 60% power to remain within the safety case limits on bifurcation temperature and superheat margin at the upper transition joints. Reactor 3 was shut down on 1 February for a planned outage as part of the ongoing consolidation of the boiler tube safety case; the boiler work planned for the outage is extensive. In addition, graphite core channels will be inspected, including 13 edge channels; this is to demonstrate continued compliance with the core edge and core restraints integrity case.

Both reactors were tripped in an event on 4 October 2007 due to loss of indications following failure of a component in a 110 V uninterruptible power supply. Although both reactors were returned to service within a few days, the final repair required several weeks to procure and install appropriate electronic parts, due to obsolescence issues.

An INES 1 rated event occurred on 20 November 2007, when a control rod assembly jammed during a test outside the reactor. The problem was caused by the failure of a small friction component in a disk brake; this dislodged and caused the jam. Storage and handling of spares have been improved to prevent recurrence.

Oldbury

Reactor 2 has continued to operate supplying steam to turbine-alternator number 1, except for one short outage caused by faulty instrumentation. The licensee has provided further information in support of its safety case for the graphite core's continued operation up until the planned end of generation. We are now evaluating this.

The licensee has investigated the problems encountered on its number 2 turbine alternator and has found that the vibration was caused by corrosion that took place during the previous lengthy outage period. The machine has been assessed, cleaned and rebalanced and is now being reassembled before return to service. We are taking steps to confirm that the licensee has fully assessed the safety implications of the findings and is properly managing the return to service.

For the Reactor 1 graphite safety case, there are issues to resolve before issuing consent for it to return to service. In the mean time, the company continues to conduct camera inspections of the reactor core graphite. The inspection team has now completed over 65% of the active core channels and has found no defects of significance for the graphite case.

Following consideration of the licensee's application and subsequent public consultation, HSE has granted consent, subject to conditions, to the carrying out of the decommissioning project at Oldbury under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations.

Sizewell B

Sizewell B has operated continuously throughout the period with only a minor power reduction to 98% to repair a condenser tube leak. Sizewell B is approaching refuelling outage 9 and begins a power coastdown at the end of February 2007 with a drop to 50% power in mid-March 2007 to begin outage work on turbine 1. This is planned to be a short outage of 25 days.

During the period Sizewell B has reported one INES 1 event. In December 2007 checks on the component cooling water system indicated that the flows to some

components were different to the 'as commissioned' flows. An operability assessment was produced to justify current operation and an event recovery process established. The event recovery took each of the four trains of engineered safeguards in turn and re-established the 'as commissioned' flows. During the final Train A recovery it was established that high head safety injection pump A had inadequate flows to the room and mechanical seal cooler, and reactor building spray pump A had inadequate flow to its room cooler. This rendered the pumps inoperable and outside the operability assessment. The flows were returned to 'as commissioned' and pumps declared operable. The arrangement for ensuring adequate flow was based on the positions of throttle valves set during commissioning and then locked in place. Some of these valves are set almost closed and do not provide a very reliable means of controlling flows. French practice is to use orifice plates. Westinghouse practice is as per Sizewell B. Operational experience feedback (OEF) has been sent out to make other operators aware of this event. Longer-term resolution of the problem is still being considered and in the mean time routine checks of the actual flows have been established.

The licensee has produced a strategy paper for storing spent fuel over the lifetime of the station. This proposes using 75% of the existing pond rack capacity in a safety case which is predominately safety by design (no burn-up credit taken and absorbers installed in 25% of the locations). This will support operation up to 2015. After that the company is considering the option of dry store casks on site or wet flask transfer to Sellafield.

Torness

During the recent period of operation, no faults have occurred that have exceeded the design basis for the station and its safety case, and no events have been reported above INES 1, which corresponds to a plant anomaly.

Following the annual Level 1 emergency exercise in March 2007, the station agreed to provide a further demonstration of the arrangements to ensure the safety of people not initially accounted for during an emergency. A team of our inspectors observed the Torness further demonstration exercise in December 2007, which in addition to the aspects agreed for demonstration included use of the new emergency control centre (ECC) facility. We deemed the demonstration of arrangements to account for people to be adequate overall, and the new ECC to be suitable for inclusion in the site emergency arrangements, subject to completion of outstanding work. Some improvement opportunities were identified in respect of the site emergency arrangements and these were confirmed in a letter to the station. The exercise completed our requirements for demonstration of the station's emergency arrangements for 2007.

Following the initial return to service of Reactor 1 after its 2007 periodic shutdown, the reactor was shut down on further occasions to carry out corrective action in response to adverse conditions discovered on the plant. We have asked the station to provide further information on the circumstances which resulted in the need for the extended shutdown, the remedial measures implemented on the plant and steps taken to prevent a recurrence.

Wylfa

There have been no significant nuclear safety events at Wylfa. Both Reactor 1 and 2 have been operating at full power other than for short periods for repairs to steam generating plant and boiler tube repairs.

At the end of January 2008 the licensee reported that an irradiated fuel element had been unexpectedly found in a storage location in dry store cell No 5 while carrying out a survey of the cell. While this event was within the facility's safety case it highlighted weaknesses in operational record keeping which are being reviewed by site.

The Wylfa emergency arrangements were sufficiently demonstrated during the Level 1 exercise 'Cemaes 07' held on 28 November 2007. Implementation of enhancements to address the recurring issue associated with a graduated response at the access control point to control the dose of intervention personnel

was not demonstrated. We subsequently observed the January 2008 shift exercise as a means of demonstrating adequate implementation and clearance of the issue.

We attended the Emergency Planning Consultative Committee Meeting held on 16 October 2007. We have also received and assessed an application by the station for HSE approval of the revised emergency plan. A Licence Instrument approving the substitution of a reissued emergency plan in place of the current emergency plan is being prepared by HSE.

A demonstration of Wylfa's off-site emergency arrangements was successfully completed during the Level 2 emergency exercise 'Cemyln' on 23 January 2008 when the Strategic Command Centre at Colwyn Bay, the Corporate Emergency Support Centre at Barnwood, the Redgrave Incident Support Centre at Bootle and the Wylfa site took part.

On 11 October 2007 while bringing Reactor 1 back to power with turbine alternator 2 in service, condenser instability occurred due to a tripped extraction pump. This event led to an unplanned trip of Reactor 1, which was at power. Post-trip functions operated normally and within the safety case. We monitored the station's response and judged it to be good. The Site Director decided not to restart Reactor 1 until he was assured that plant configuration was fully understood and shown to be correct. The process for providing this assurance was presented to us before Reactor start up. Completion of the identified checks required Reactor 1 to remain shut down for over a week. The process of assurance was satisfactorily completed before restart of the reactor. The event is being fully investigated by the station and will be followed up by our site inspector.

A HSE benchmark inspection team visited Wylfa 22–26 October 2007 to examine the station's arrangements for operating rule compliance. This was part of a series of six industry-wide benchmarking team inspections. The objectives of the benchmarking programme included a comparison of the performance of a cross-industry sample of licensees and the identification of good practices and weaknesses in the licensees' arrangements. The benchmark inspection was carried out against a series of expectations for operating rule compliance derived from relevant IAEA guidance, supplemented by a specifically developed question set. Findings have been sent to Wylfa as a basis for future regulatory exchanges.

A HSE assist visit was undertaken in December 2007 regarding aspects of the station's human performance. Its objective was to consider proactive station initiatives introduced in response to an undesirable trend in human performance events and provide opportunity to offer advice if necessary. The team included a specialist from HSE's Hazardous Installations Directorate to provide a cross-cutting behavioural safety contribution from the experience gained from regulating other high-hazard plant. A number of good practices were highlighted by HSE and we were able to offer further advice to enhance their process.

Decommissioning/defuelling power reactors

Berkeley

We observed a Level 1 emergency exercise in November 2007 that demonstrated the revised emergency response facilities on site. The demonstration was judged to be of a good standard.

We noted at the annual regulatory review meeting in November 2007 that Berkeley had maintained an adequate safety performance overall, despite what had been a challenging year. Magnox South has responded initially to NDA funding cuts by deferring the planned intermediate level waste (ILW) retrieval, treatment and storage projects at Berkeley. Changes to the Berkeley decommissioning programmes brought about by these deferrals would delay the planned entry into the care and maintenance phase from 2011 to 2026.

As a result of these deferrals, a HSE team visited the Berkeley site in January 2008 on a fact-finding inspection. We found evidence that Berkeley is not compliant with elements of the Nuclear Site Licence Condition that relate to the decommissioning operations. We are currently considering appropriate regulatory strategy and action. The licensee is reconsidering the adequacy of its case for this deferral.

In November 2007 we made a determination under regulation 13 of the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations that an Environmental Impact Assessment was not required for the change to the decommissioning project at Berkeley Nuclear Power Station. The change to the project was to construct a purpose-built ILW store rather than convert Berkeley's Reactor 2 Blower House basement into an ILW store. HSE produced a report describing the main reasons on which the decision was based and this is available on the nuclear pages of the HSE website: www.hse.gov.uk/nuclear/consult.htm.

Bradwell

Removal of asbestos-based lagging from the boilers is nearing completion. Cooling pond clean up is progressing well and pond underwater furniture (eg fuel skips) is being recovered for decontamination and temporary on-site storage before disposal as low level waste.

In response to proposed NDA funding cuts, Bradwell is planning to defer the retrieval of ILW from the storage vaults for treatment and disposal or storage. We have expressed dissatisfaction at the licensee's approach to this issue and have requested a justification for the associated changes to the decommissioning programmes, along with an adequate safety case to support continued storage of ILW in the waste vaults beyond 2012. Members of the public local to Bradwell have expressed concern about these proposed deferrals and we are currently responding to a formal complaint that was received by HSE, which included a request to investigate the situation.

Calder Hall

To implement the changes in the magnox operating plan (MOP), the licensees propose to delay the defuelling programmes for some of the magnox reactors. The biggest impact will be at Calder Hall where the delay will be about five years if Government sanctions reprocessing beyond 2012. This will lead to a reduction in work scope at Calder Hall. As a consequence, Sellafield intends to reduce the number of Calder Hall staff until defuelling is required by the MOP. Under LC36 (control of organisational change), Calder Hall has produced a justification for the change that considers all the relevant issues including the current safety case, maintaining the defuelling capability and continued surveillance of the plant. We are still considering the justification.

Chapelcross

Chapelcross Level 1 emergency exercise 'Gerda' was held on 23 May 2007. We found that the site's response was not adequate, principally as a result of the length of time to recover casualties. We therefore required the site to provide a further demonstration of its arrangements. Magnox Electric Ltd undertook a significant amount of training and practising in preparation for the exercise 'Hayley', which was held on 11 October 2007. We noted a significant improvement over the earlier exercise and concluded that the site had provided an adequate demonstration of its arrangements.

Chapelcross is planning to start defuelling in spring 2008. We have been monitoring progress towards this and have had several discussions with the licensee to ensure that the site understands the regulatory requirements to allow HSE to consider agreeing to the start of defuelling.

Chapelcross is currently producing its PSR, a major review of safety that is undertaken every ten years. HSE intends to make a decision on the adequacy of the PSR by 31 March 2009 and to allow this the licensee is expected to present its PSR and an improvement plan to HSE by 31 March 2008. The licensee has recently advised HSE that it cannot meet this date and will provide the submissions in August 2008.

Dungeness A

Safety performance at Dungeness A in the reporting period has been acceptable and no events have been rated above INES 0. The reactors are now permanently shut down and on forced cooling. The post-operation and defuelling safety case (PODSC) has now been accepted. Initial trials have indicated that both reactors should enter the passive cooling phase in March 2008.

Bulk defuelling of the first of the reactors is planned to commence in April 2008. However, this does rely upon the continued performance of Sellafield's reprocessing plant.

Financial constraints threaten to limit most of the planned decommissioning projects at Dungeness. The main part of the budget is meeting the fixed costs of the station. However, defuelling and dissolution of fuel element debris continues to be unaffected. We are discussing decommissioning progress corporately with the licensee and NDA.

Dungeness A gave an adequate demonstration of their emergency arrangements at the annual Level 1 exercise in October 2007.

Hinkley Point A

Investigation into the electrical incident reported to the last meeting is now complete. Formal letters were sent to the licensee and the contractor involved, requiring improvements across several areas including management and supervision of contractors, work control and communication between different parties involved in works. Both the licensee and the contractor responded well to HSE's recommendations and it was judged that no further enforcement action was warranted in this case.

There have been no further events rated above INES 0.

A Level 1 emergency exercise took place in June 2007 and the Licensee demonstrated that its arrangements under Licence Condition 11 were adequate.

Hinkley Point A has entered shadow working as a prelude to setting up Magnox South as a standalone licensee. Site-specific elements of the management of change process this involves were inspected before entry and found to be adequate.

The funding situation for next financial year is expected to represent a significant shortfall on what is needed to maintain the volume of decommissioning anticipated during 2007. Latest estimates show a drop from £50.5 million down to £37 million. The prospect for future years is equally pessimistic. As reported to the last meeting, some projects have been deferred, in particular, the project for dealing with solid ILW waste may be deferred for several years. The new ILW store was stopped in mid-build early in 2007 and latest indications are that this project is not now expected to be complete before 2017.

Hunterston A

The project to retrieve fuel element debris from the vaults is well developed and on-site work is set to start during 2008. This represents the largest remaining nuclear inventory on site. Work has progressed to set appropriate regulatory hold point and interactions for this project.

No issues above INES 0 have been reported.

As with other magnox sites, Hunterston A has entered shadow working as a prelude to setting up Magnox North and hiving off Magnox South as a separate licensee. Site-specific elements of the management of change process that this involves were inspected before shadow working and found to be adequate.

The Hunterston A funding for the financial year 2008/09 is expected to enable all major decommissioning projects to proceed as expected. Funding for future years is still uncertain.

Sizewell A

Safety performance at Sizewell A in the reporting period has been acceptable; no events have been rated above INES 0. HSE assessment of the PODSC is now complete as safety issues have been resolved satisfactorily. Following successful completion of the passive cooling trials on the Sizewell A reactors, HSE agreement to entry into 'PODSC Phase 3 Cooling' was given. These reactors should not now require forced cooling in any normal or fault condition and consequently a significant amount of plant will cease to be safety related, so it can be removed from the maintenance schedule. Bulk defuelling of the reactors is now planned to commence in mid-2009.

A Level 1 emergency exercise took place in October 2007 and the licensee demonstrated that its current arrangements under Licence Condition 11 are adequate.

Trawsfynydd

Decommissioning, waste retrieval and conditioning activities are progressing covering both solid and liquid ILW wastes. Active commissioning trials on fuel element debris (FED) boxes 6 and 7 are nearing completion.

Civil enabling work continues on the North FED project. This plant was inspected and a Licence Instrument was issued in December 2007 to allow the work to continue. We have ensured that projects such as recovering wet ILW wastes from the pond north void are included in the site decommissioning programme for 2008/09.

The construction of the ILW store is complete and active commissioning will start in 2008. Civil engineering and preparation of buildings for Safestore continues with the proposed installation of the reactor building capping roofs with HSE for assessment and initial work is scheduled to start in 2008.

Following HSE intervention, temporary weatherproofing of the reactor buildings roofs (Safestores 1 and 2) has ensured a safer working environment for the partial relocation of the primary circuit components boiler height reduction project workforce, and a dry environment for the continued interim storage of ILW packages in the Safestore basements pending their transfer to the new ILW store.

Nuclear fuel cycle facilities – Sellafield Limited

General issues

There is a great deal of change planned for the Sellafield site over the coming months including the transfer of Windscale to Sellafield Limited, the transfer of International Nuclear Services to NDA and the transition to a new PBO. We have recognised this and regulatory effort has been and will continue to be focused on this area to ensure the transitions are managed appropriately. The site has prepared its latest lifetime plan cost estimate, which is currently well in excess of the annual site funding limit indicated by NDA. Our inspectors are currently discussing the issue with both parties. Events have continued to occur on the site, with the most recent significant events being the Thorp elevator incident and the Fellside combined heat and power (CHP) incident. These and others continue to be followed up by us to ensure that the licensee takes appropriate action and to determine whether formal enforcement action is required. We are pleased that the benefits realised by the wide co-operation established for the MOP are now being repeated with the development of an oxide operating plan.

Recent events and inspections at Sellafield have called into question the licensee's management of ageing plant. In response we have developed an intervention for 2007/08 to gather data on the current status of facilities and the adequacy of improvement strategies. This work is being carried out by our inspectors as part of their planned inspections for compliance with Licence Condition 28 (examination, inspection, maintenance and testing). To date, responses received indicate that the need for good standards of management of ageing plant is recognised but that the rate of implementation is too slow. We believe that the poor rate of progress is probably caused by a lack of capability within Sellafield Limited operating units rather than, for example, a shortfall of funding – although there is conflicting evidence on funding availability. We will be working closely with Sellafield Limited to better understand the issues and to promote improved implementation. Included in this is a proposed site-wide workshop in April 2008.

Sellafield PBO transition

Our inspectors have overseen the early preparations by Sellafield Limited and NDA to facilitate the transition to a new PBO, and a new Sellafield Executive. The latest timescales associated with the transition are: tender returns April 2008, contract award October 2008, share transfer December 2008 and transition closeout April 2009. The transition to a PBO will not require any relicensing activity, but because of the changes to the executive body of the site licence company, a Licence Condition LC36 (control of organisational change) submission will be required and inspectors will be looking to ensure that the requirements of LC12 (duly authorised and other suitably qualified and experienced persons) and LC26 (control and supervision of operations)

are complied with, both during and after the transition. The arrangements in these areas are already being reviewed.

We believe it is important that the position and standing of the current Sellafield Limited Executive is not undermined and that it is able to discharge its duties in an appropriate manner throughout this period of significant change. To ensure safety is not affected during the transition period a senior transition forum has been set up which will meet regularly to monitor progress.

It is our intention to regularly monitor safety performance during the periods of PBO and Windscale transitions using routine site visits, safety performance indicator (SPI) data (which the site is in the process of collating) and the additional key indicator information that the licensee has identified as being useful for the transition periods.

Windscale transition

We have agreed that the assimilation of the UKAEA Windscale site into the Sellafield licensed site is to be done in two phases. Regulatory effort has been focused on the first phase, which involves relicensing the Windscale site to Sellafield Limited, currently scheduled for the 1 April 2008. A relicensing submission has been received and our inspectors have been progressing interventions in the form of readiness inspections and attendance at transition meetings to gain assurance regarding the Windscale transfer. Although the inspections did not reveal any significant issues, there are a number of factors that could still contribute to a delay to the scheduled transition from UKAEA to Sellafield Limited, notably the need to identify a Sellafield Limited director to take executive responsibility for the addition to the Sellafield Limited portfolio, and the delay in finalising the details of the Nuclear Transfer Scheme. The second phase in the transition process will bring together the two sites under one licence during 2009.

Funding

Sellafield Limited is in the process of finalising its cost estimate for Lifetime Plan 2008, and NDA are determining a funding limit that is likely to be less than the licensee's cost estimate. We are looking at the potential for undue pressure on the licensee's organisation and the potential effects on the licensee's ability to deliver important agreed safety improvements. We are discussing this matter with both Sellafield Limited and NDA.

Research and Development Department Strategy (analytical services)

Sellafield Limited's short-term strategy will be based on the recommendations from the safety case continual operations safety report and their impact on the use of the Analytical Services Building. A facilities plan incorporating medium and long-term strategies is close to being completed by the licensee, which includes consideration of the following:

- the type of analysis work required and potential reduction of the operational area;
- the scope and funding of decommissioning;
- the removal of risk during refurbishment of redundant laboratories including the former Nexia and Euratom laboratories; and
- the removal of inventory.

Decontamination strategy

HSE has been proactive in working with Sellafield Limited to develop short, medium, and long-term strategies for decontamination on site. The short-term strategy is linked to the improvements made to the existing decontamination centre following the recommendations from the recent safety case review. In the medium term, the effluent plant maintenance facility (EPMF) has been identified as a possible replacement for the existing decontamination centre. A strategy paper has been prepared, and an assessment of the physical requirements for the EPMF to function as a decontamination centre has been carried out. Sellafield Limited's long-term decontamination strategy is linked to the overall radioactive waste management strategy for the site.

Site-wide events

Irradiated fuel transport flasks: Quality assurance issues have been identified with a number of components fitted by Sellafield Limited to advanced gas-cooled reactor (AGR) and magnox irradiated fuel transport flasks. Discrepancies have been identified between the quality standard of as-fitted components and the quality specified by British Energy and Magnox, which has led to restrictions on the use of both types of flask during the period, the restrictions are still

in place at the time of writing this report. We worked closely with Department for Transport (DfT) inspectors to ensure that appropriate precautionary measures were implemented by the dutyholders in each instance to avert the potential increases in risk. Flasks will only be returned to service once the quality issues have been adequately addressed. We will be following up the apparent inadequacies in the procurement process regarding component quality and seeking assurance that the issue does not have wider implications for the Sellafield site. We will again be liaising closely with DfT inspectors.

Fellside CHP stacks: The primary purpose of Fellside CHP is to provide reliable high and low pressure steam supplies to the Sellafield site, there are three gas turbines adjacent to one another, each having its own dedicated stack, a separate auxiliary boiler is also provided as a diverse means of generating steam. On 4 February 2008, scaffolders working on Fellside CHP plant observed that the stack associated with gas turbine 3 was leaning away from the vertical. Subsequent inspections revealed advanced corrosion at the base of all three stacks, which led to Sellafield Limited shutting down the gas turbines. We are satisfied that nuclear safety was not challenged; Sellafield Limited took immediate action to reduce the steam demand by shedding non-essential loads and essential steam demand continued to be met via the Fellside auxiliary boiler. The potential for stack collapse has been addressed as the corroded stacks have been reduced in height from 20 m to 2 m, pending installation of replacement stacks, which is likely to take approximately six months. The reliability and availability of steam supplies has been secured with capacity now available via the gas turbines, which are now able to operate with reduced height stacks. The long-term provision of diverse steam supplies will be pursued with the licensee.

Sellafield MOX plant (SMP)

Operations this quarter have seen short spells of much improved performance interspersed with some operational difficulties that have caused disruption to production.

A number of relatively minor events involving contamination and mechanical failures of equipment have been noted. These have been brought to the attention of the SMP management and we are considering more detailed assessment of some of the events.

Work continues on the arrangements for permissioning the next phase of operations for SMP based on plant improvements and updates to the operational safety cases.

Thermal oxide reprocessing plant (Thorp)

The application by Sellafield Limited to commence the active commissioning of the multi-element bottle export facility (MEBXF) was processed, and a Licence Instrument was issued in October 2007 that permitted the use of up to 50 multi-element bottles (MEBs) to actively commission the MEBXF. Active commissioning began in December 2007 and, at the end of January 2008, four MEBs had been decontaminated, transferred to the MEBXF and exported to the MEB interim store. Sellafield Limited hopes to have ten MEBs in the store before the end of March 2008.

Sellafield Limited allocated a low safety category to proposals for the replacement of the medium active salt-free evaporator, this was questioned by us. The proposals involve the use of a large crane, in the vicinity of safety-critical plant, to lift the new evaporator and associated equipment into position. Sellafield Limited continued to maintain that the categorisation was appropriate, and so HSE issued a specification in October 2007 requiring Sellafield Limited to seek the advice of the Nuclear Safety Committee (NSC) on the proposals. The proposals, which were improved and given a higher category, were cleared by NSC in November 2007. Sellafield Limited applied for agreement to carry out the proposals in early December 2007, which was given in a Licence Instrument issued several days later. The proposals were undertaken without event. In relation to categorising modifications, a number of recent events have led us to conclude that these are inconsistencies in how this is undertaken at Sellafield. Consequently, a Divisional Intervention will be taken forward on this topic during 2008/09.

Sellafield Limited has been informed that, as with the other reprocessing plant on site, outage restart consents will be regularly required from HSE to permit the continued operation of the plant. Discussions have continued on what information HSE will require from Sellafield Limited to support the issuing of such Consents.

In October 2007 the dissolved fuel produced from shearing 33 te of AGR suspect fuel, and diluted recovered liquor from the Feed Clarification Cell leak in 2005, had been shared between the three chemical separation feed (HEP/SEP) buffer tanks to produce a blend suitable for reprocessing. Reprocessing dissolved fuel and recovered liquor was started and completed in November 2007.

As part of the Thorp restart, following the major leak in the Feed Clarification Cell in 2005, it was agreed that Sellafield Limited would provide a report after 55 te of fuel had been reprocessed. The purpose of the report is to give added confidence that Sellafield Limited can safely operate the modified plant. Due to delays because of problems with the highly active liquor evaporation and storage (HALES) plant, it was agreed with Sellafield Limited that the report would be produced after 33 te not 55 te. The report has been sent to us and is being assessed.

In early December 2007 Sellafield Limited applied to HSE for permission to process raffinate liquors that would result from the shearing and reprocessing of 300 te fuel, using evaporator C in HALES. The application is being processed; however, recent problems associated with overdue maintenance on safety-critical plant within HALES are causing delays.

On 29 January 2008 Sellafield Limited decided to resume the shearing and dissolution of irradiated fuel, and to store the dissolved fuel within the plant until permission was obtained to use the HALES plant, which would then allow reprocessing to be undertaken. (Fuel shearing had last been undertaken in August 2007.)

During the evening of 29 January 2008 the elevator system, used for raising fuel from the feedpond to the shear cave, failed. The failure resulted in the bogie, holding stainless steel cans containing irradiated AGR fuel pins, rolling down the ramp and back into the feed pond. There has been no increase in pond or air activity levels. Sellafield Limited is investigating the event and we are closely monitoring the position. Shearing will not recommence until the root cause of the event has been established, remedial measures put in hand to prevent a recurrence and we are satisfied with the position.

In February 2008 the first meeting of the Oxide Operating Strategy Regulatory Forum (OOSRF) was held. The meeting involved the plant owners (NDA), the licensee (Sellafield Limited), and regulators (HSE, OCNS and the Environment Agency). NDA hopes to have a draft oxide operating plan, analogous to the magnox operating plan available in April 2008.

Strategy for longer-term management of oxide fuel

After agreeing the terms of reference plant owners (NDA), the licensee (Sellafield Limited) and the regulators (HSE, OCNS and the Environment Agency) held the first meeting of the Oxide Operating Strategy Regulatory Forum (OOSRF) on 5 February 2008 was a success, with a second meeting planned for May 2008. We expect to receive a draft oxide operating plan for discussion at the May 2008 meeting. It is expected that this plan will need considerable development over the next 12 months.

Fuel handling plant (FHP)

Operations at the decanning plant have continued to be below expectations, mainly due to plant breakdowns, with the main reasons being a lack of maintenance and asset care. We are in discussion with Sellafield Limited regarding improvements to asset care but funding remains a key issue.

Magnox reprocessing operations

Recent plant problems and the consequential low rate of reprocessing of spent magnox fuel mean that the magnox operating plan (MOP) (for managing the end of life of the UK's magnox reactor programme) will not be delivered by 2012. This has led to two significant changes that NDA propose for the next version of the MOP, MOP 8, which NDA has issued for consultation with the aim of its incorporation into lifetime plans in 2008:

- the need to extend the end date for magnox reprocessing and the MOP beyond 2012 but before 2020 when the UK is committed to fulfilling the obligations under the Convention for the Protection of the Maritime Environment of the North East Atlantic 1992 (the 'OSPAR Convention'); and
- the need to manage the quantity of wetted fuel in the system as a measure against plant failures.

The proposed extension beyond 2012 requires sanction by the UK Government as it is a change to the current policy to complete the MOP by about 2012. We have advised the Department for Environment, Food and Rural Affairs' (Defra's) UK Discharge Strategy Review that in our view, reprocessing continues to be the only proven safe means of dealing with spent magnox fuel, as set down in current UK policy.

Magnox reprocessing plants are ageing facilities and plant reliability is an issue. We believe that there is a significant challenge in funding, developing, implementing and embedding an asset management system which meets relevant national/international standards, and we are encouraging Sellafield Limited to continue to develop its programme. NDA and the licensees have recognised that there is no contingency should the Magnox reprocessing route fail, and following regulatory pressure, NDA and the licensees are making progress towards developing a contingency.

To implement the changes in the MOP, the licensees propose to delay the defuelling programmes for some of the magnox reactors. The biggest impact will be at Calder Hall where the delay will be about five years, if the Government sanctions reprocessing beyond 2012.

Higher active liquor (HAL) stocks specification

The specification limits the amount of HAL that can be stored at any time; it also promotes reduction of HAL stocks. Following the last biennial review of HAL stocks, we made a public commitment to revise Specification 343 to lock-in the gains arising from the unplanned Thorp shutdown. A revised specification (No 679), replacing Specification 343, was issued on 29 October 2007.

This new specification locks in the gains arising from the unplanned Thorp shutdown, which facilitated a faster reduction of HAL stocks than was predicted when Specification 343 was issued.

We have kept a secondary limit for oxide-derived HAL stocks in the revised specification as oxide-derived HAL is more hazardous than magnox HAL. However, the current oxide control curve from Specification 343 has been revised, as under certain circumstances it does not always promote optimal operational decisions that are in the best interests of safety. A new limit for oxide-derived liquors, evaluated in terms of the mass of uranium originally present in the front-end oxide fuel from which the stored liquid HAL was derived, has been used in the revised Specification 679. Like the total volume limit, the oxide limit locks-in gains arising from the unplanned Thorp shutdown.

Sellafield Limited continues to provide HSE with monthly reports summarising the quantities of stored HAL. These figures, supported by our inspection activities, are used by HSE to judge whether Sellafield Limited continues to meet the HAL stocks specification. We are satisfied that Sellafield has maintained HAL stocks below the limits specified.

Highly active storage tank (HAST) integrity

Previous reports have indicated that HAST cooling components have suffered over the years from corrosion and a number of cooling coils have been declared failed. A failure causes a very small breakthrough of activity into the cooling water circuits which can lead to a radioactive release if not properly managed. Recent HAST cooling coil failure rates and (specifically) the location of 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 knock-on consequences). The rate of cooling coil failure will determine the volumetric capacity of HASTs to store HAL and this has the potential to constrain raffinate receipt.

Sellafield Limited's contingency plans included firstly a project to dose the cooling water circuits with nitrates as a way of stopping (or at least reducing the rate of) corrosion failures; and secondly the construction and operation of replacement HASTs. However, nitrate dosing has recently been abandoned as a technique to halt or retard the established corrosion, with the result that replacement HASTs now represent the only viable strategy to assure future HAL storage integrity. HSE agrees that the conservative decision in response to these problems would be to build smaller, inherently safer replacement HASTs and it believes that replacement HASTs should be progressed with urgency.

Highly active (HA) evaporator integrity

There are currently three evaporators within HALES (referred to as Evaporators A, B and C). They are used to evaporate highly active raffinate produced during reprocessing and to process effluent from the waste vitrification plant (WVP). Once concentrated through evaporation, the resulting HAL is stored in the HALES facility before feeding to the WVP for vitrification, which immobilises the waste for long-term storage and eventual disposal. The status of each evaporator is:

- Evaporator A suffered a failed coil on 20 June 2007. The evaporator is currently shut down and has undergone significant engineering modifications with a view to providing additional operational capacity. A new operational safety case has been received and is currently being assessed.
- Evaporator B: This was shut down in December 2004 following failure of a heating/cooling coil. There is an ongoing project to inspect, assess and modify evaporator B that will lead to a revised safety case to justify operation in 2008. Progress continues to be made. We have received a revised safety case for Evaporator B which we are be assessing.
- Evaporator C: This continues to operate on magnox liquors, WVP effluents and Thorp liquors from the Thorp feed clarification cell (FCC) event plus liquors from a small amount of shearing used to dilute the FCC liquors. We have received and are assessing a plant modification proposal from Sellafield Limited that would allow Evaporator C to process liquors from a further 300 te of oxide fuel reprocessing.

We continue to engage Sellafield Limited on the provision of new evaporative capacity. The groundwork for Evaporator D is well advanced but the expected start to work on the base slab at the beginning of 2008 has been delayed. The pre-construction safety case for Evaporator D is now expected around July 2008. We are working closely with Sellafield Limited, the Environment Agency and NDA on opportunities to accelerate Evaporator D while ensuring that the safety of design and construction is not compromised. Sellafield Limited is also considering the need for further evaporative capacity (Evaporator E).

Further permissions depend on the outcome of the HALES overdue plant maintenance schedule investigations covered below.

On 28 November 2007 HSE was informed that a significant number of activities on the HALES plant maintenance schedule were overdue. Some had been overdue over an extended time period. We asked the licensee to justify – urgently – the continued safe operation of HALES and especially the continued safe operation of Evaporator C. A satisfactory response was received. As a further precaution we have indicated that we will not permission any revised safety justifications for enhanced evaporator application until both licensee and our investigations are adequately completed and recommendation plans are in place. No equipment failures have been identified during subsequent completion of maintenance.

Revised working arrangements were introduced which restored compliance with the plant maintenance schedule by mid-December 2007. Nevertheless the cause of the event requires thorough investigation to prevent a recurrence hence we have initiated a formal investigation in accordance with HSE's Enforcement Management Model.

Waste vitrification plant (WVP)

There are three vitrification lines located within the WVP: currently two are operational with the third under maintenance. The two oldest vitrification lines, which have operated since 1990, are undergoing a phased refurbishment to ensure that they remain available for the projected life of WVP and can support the future decommissioning programme for the Sellafield site. This work is planned for completion by spring 2009. Reliable operation of the vitrification lines is an important component of the drive to reduce HAL stocks, and we continue to engage Sellafield Limited on issues associated with plant reliability.

We have reported previously on an inspection of radwaste management within WVP, specifically the medium active and highly active waste held in the breakdown cells of WVP Lines 1, 2 and 3. This waste comprises failed components removed from the WVP process cells. While accepting their operational

constraints, we concluded that Sellafield Limited should increase the focus applied to radwaste management to minimise, so far as is reasonably practicable, the amount of radwaste accumulated in the cells, and then should control the quantity of waste to a level consistent with operational requirements. We also concluded that Sellafield Limited does not properly segregate highly active radwaste arisings, and questions the adequacy of the WVP safety case for the accumulation of highly active radwaste in the breakdown cells.

Sellafield Limited has responded positively to our views and accepts the findings of the inspections. Good progress has been made with the development of an action plan to address the issues.

Residue export facility (REF)

REF is progressing reasonably well (though it is running slightly behind programme), inactive commissioning is proceeding in stages and we continue to maintain regular contact on this strategically important project in advance of the start of active commissioning later this year. Regulatory issues include the necessary interfaces with other facilities at Sellafield to ensure the safe and timely export overseas of containers of high-level waste (in accordance with Government policy on waste substitution). Standards of housekeeping and health and safety on REF remain generally good, although efforts continue to be made by Sellafield Limited to learn from a number of minor conventional safety incidents and to improve safety awareness. We expect to conduct an inspection early in 2008 as part of the process for assessing Sellafield Limited's readiness to start active commissioning of REF.

Sellafield product and residue store

Integrated works testing is coming to an end. The construction of the shell of the facility is substantially complete and work is starting on fitting out the internal systems and equipment.

Installation of the storage modules was delayed by the protective inner coating exhibiting a tendency to flaking. This required further justification work and repairs to be effected.

Discussions are ongoing between Sellafield project staff and the principal build contractors and it is likely that Sellafield will take over the direct running of the subcontracts sooner than was anticipated in the original project plan. We are monitoring the situation to ensure no undue delays in the completion of the project.

Waste treatment complex (WTC)

In early December 2008 WTC began a slow, controlled restart following a shutdown period of some 14 months brought about by a major injury accident. The restart is entitled 'Phase 4 Active Commissioning Stages 1–3 Operability and Maintainability Trials', and is programmed to take place over a period of 15–21 months. If Sellafield Limited achieves all the objectives of the trials, it then plans to apply for a Consent to commence routine operations of WTC.

During Stages 1–3 of the trials Sellafield Limited intends to develop further plant improvements, to reduce the plant's dependency on operational controls, and has provided written details of its improvement programme. Also, we have written to Sellafield Limited noting some actions under review which are key to the long-term viability of WTC1A, and its role in the strategy to satisfy the HSE Specification (Licence Instrument 326) for Sellafield Limited to convert 90% of plutonium-contaminated material stocks, as at 2000, to a safe passive form by 2020. We will be reviewing progress against these actions as well as monitoring progress with the trials and formally examining Sellafield Limited's safety case in support of Stages 2 and 3.

Sellafield Limited completed Stage 1 of the trials at the end of January 2008, having undertaken two drum supercompactions per shift for two months.

HSE will be meeting with Sellafield Limited and the Environment Agency in March 2008 to discuss plans to form a plutonium-contaminated material Overarching Strategy Group, along the same lines as the magnox operating plan and oxide operating plan.

Plutonium finishing and storage (PF&S)

During December 2007 PF&S experienced a number of delays to operation. The first was the discovery of inconsistencies between actual safety mechanism responses and that expected from the safety case for part of the product finishing process. Consequently, Sellafield Limited shut down product finishing operations while the plant was modified to meet the requirements of the safety case. Following this an unrelated blockage was discovered in part of the product finishing process that will require an extended period of shutdown to resolve. PF&S is not expected to return to operation until late February 2008 at the earliest.

A permanent neutron monitoring system has now been installed and is expected to undergo commissioning and benchmarking tests against the interim monitoring arrangements to establish trip limits during the early part of 2008. When these tests have been successfully completed the system will be connected to the plant and run in parallel with the interim arrangements. Sellafield Limited intends to meet with us during March 2008 to discuss the findings of their commissioning and benchmarking tests.

On 11 July 2007, during diamond core drilling work to remove an area of radioactive contamination from the floor of the central waste handling facility, which is part of the product storage facility, an incident involving two contractors occurred. Shortly after drilling began the alpha-in-air monitor sampling the work area came into alarm, indicating a release of airborne contamination. The internal biological sampling results from Sellafield Limited dosimetry indicates that the two contractors involved in the incident have received an internal dose. Initial dose assessments indicated that one individual was likely to exceed the annual dose limit of 20 mSv. After an extended sampling and analysis period the final dose assessment for this individual indicated a committed dose of 15.7 mSv. The dose assessed for the second individual was 2.6 mSv. HSE's investigation of the event continues.

On 4 February 2008 Sellafield Limited reported that during routine maintenance on evaporators in PF&S the functional testing of the resistance temperature devices used to detect the presence of liquor in the sump at elevated temperatures were incorrectly connected. Consequently, a leak into a sump would have triggered the incorrect alarms and interlocks for that sump. This incident follows on from a previous event associated with the interlocks to the sump probes that was identified on 5 November 2007 and several other regulatory interactions with PF&S regarding adequacy of safety mechanism proof testing and availability of safety systems. As a result of these events we have requested that before resuming operations of Finishing Line 5 Sellafield Limited undertake a comprehensive, documented, review of all safety mechanisms, devices and circuits providing protection against criticality and radiological faults. A meeting is due to be held between Sellafield Limited and HSE at the end of February 2008 to discuss the outcome of the review and consider whether the findings have any impact on continued safe operation of Finishing Line 5.

Effluent and floc retrieval plant

Floc retrieval from the floc storage tanks has been delayed following the discovery of contamination of the inactive water supply to the floc pump seal flush system. As a result of this there has been no operation of the floc retrieval facility since June 2007 while the mechanism of the contamination has been investigated and any necessary modifications made to the affected system. This problem was resolved during November 2007. Floc retrieval is now progressing without the use of the seal flush system. Some batches of floc were processed during December 2007; however, the process is now experiencing further delays due to blockages in the waste packaging and encapsulation plant which encapsulates the floc that has been concentrated in the enhanced actinide removal plant. This blockage is currently being addressed by using acid to break it down. Sellafield Limited has taken the decision to delay further operation until early 2009.

Encapsulation plants

During the second quarter of 2007 the magnox encapsulation plant (MEP) was shut down due to operational problems preventing the production of an acceptable encapsulated waste product. Significant effort was involved in exploring the root cause of the problems and resolving them during the third quarter. In the past quarter MEP has been operational. A recent brief shutdown period during February 2008 has enabled some investigation of the success

of the modifications to the plant following a campaign of 250 drums. This investigation has identified other issues that may need further resolution during the longer magnox shutdown toward the end of 2008 but also indicates that improvements may be necessary to support sustained improved operability and availability of MEP.

Encapsulated product stores (EPS): During the summer of 2007, Sellafield Limited had commenced its first inspection programme of encapsulated ILW drums. A sample of 16 drums of MEP was inspected from the total population of 17 000 drums at that time. Results from these inspections identified three drums with areas of localised swelling. Sellafield Limited has now completed its investigation into these unexpected observations to establish potential causes and consider the impact on further/future drum inspections. We have taken a close interest in this investigation and have considered Sellafield Limited's conclusions in conjunction with the Environment Agency. Sellafield Limited has concluded that uranium metal corrosion may be the cause of the localised swelling. HSE and the Environment Agency have written a joint letter to Sellafield Limited querying the long-term integrity and disposability of any packages that exhibit such features and particularly those produced within the MEP. Sellafield Limited has been advised that HSE and the Environment Agency jointly consider that until the uranium/grout process is better understood Sellafield Limited should adopt the precautionary approach with respect to conditioning and disposal of wastes containing uranium metal. A meeting to discuss Sellafield Limited's response to this letter is expected to take place at the end of February 2008.

The construction of a new EPS3 is continuing to programme and active commissioning of the facility is expected to commence in April 2011.

Delays to Thorp operations and magnox reprocessing during the last two years have alleviated some of the pressure on ensuring timely availability of this facility.

Emergency exercises

Level 1 emergency exercise 'Goshawk' was carried out on 21 November 2007 to demonstrate Sellafield Limited's response under its Emergency Plan. A team of our inspectors observed the exercise, which was focused on an incident associated with the Sellafield FHP, and they judged it to be an acceptable demonstration of the licensee's emergency preparedness on the day. It was felt there had been strong performances in the site emergency control centre and the incident control centre, however, it is worth highlighting that there were some issues with how scenario changes were communicated though the response organisation and with the level of command and control in certain areas. These are being followed up by our inspectors with Sellafield Limited.

Strategic interventions

Asset care: We are increasingly aware of issues regarding the standard of asset care undertaken on the Sellafield site. Recent evidence has highlighted the potential extent of the problem, from issues within high-level waste plants to the Fellside CHP stacks.

In response we have developed an intervention for 2007/08 to gather data on the current status of facilities and the adequacy of improvement strategies. This work is being carried out by our inspectors as part of their planned inspections for compliance with Licence Condition 28 (examination, inspection, maintenance and testing). To date, responses received indicate that the need for good standards of management of ageing plant is recognised but that the rate of implementation is too slow. We currently believe that the poor rate of progress is probably caused by a lack of capability within Sellafield Limited operating units rather than, for example, a shortfall of funding – although there is conflicting evidence on funding availability. We will be working closely with Sellafield Limited to better understand the issues and to promote improved implementation. Included in this is a proposed site-wide workshop in April 2008. Asset care will continue to be a major intervention during 2008/09.

Safety performance indicators (SPIs): In line with our initiative to ensure that a range of key performance indicators are established across the nuclear industry we have agreed a group of pilot SPIs with Sellafield Limited, which will be trialled over the coming months. Our intervention will ensure a suitable and sufficient range of nuclear SPIs are developed for the Sellafield site, and are used effectively by Sellafield Limited management to measure and monitor nuclear safety performance.

Operational experience feedback (OEF): It is intended to continue to take forward an intervention to establish the adequacy and effectiveness of Sellafield Limited's OEF process and how lessons are learned from incidents that occur on the site. This was initiated in 2007 and will continue into 2008/09.

Stakeholder engagement

During the reporting period we have continued to support the West Cumbria Site Stakeholders Group and relevant sub-committees. We also continue to work closely with other regulatory bodies involved with the Sellafield Site. Members of the Nuclear Directorate held a liaison meeting with their inspector counterparts in the Environment Agency at the end of February.

Legacy ponds and silos (LP&S)

In the last report to NuSAC we highlighted the need for further improvements in day-to-day operational nuclear safety across LP&S. Since then we have had a number of open and constructive meetings with Sellafield in which they have acknowledged the issues and reiterated their desire to further raise operational nuclear safety performance. We appear to share a broad understanding of the issues and of the way forward.

To help facilitate some early improvements, Sellafield decided, with our support, to suspend permissioning requests to HSE until sufficient improvements have been made. This is the current position as of mid-February 2008. HSE permissioning of plant modifications is critical to the early retrieval and passive storage of sludge and other materiel from these fragile plants and therefore we have agreed with Sellafield a process to resume permissioning at the earliest possible date, commensurate with a demonstrable improvement in operational nuclear safety performance across LP&S. We anticipate a restart of permissioning in April 2008.

We continue to monitor the programme of early improvements Sellafield is putting in place, and our inspections to date give us with confidence in their approach. However, we recognise that creating sustainable improvement is a long-term process and therefore of critical importance is the development and implementation of their long-term improvement programme. We will continue to challenge and monitor the development and implementation of Sellafield's improvement programme to secure worthwhile improvements in operational nuclear safety across LP&S.

Other fuel cycle plants

Springfields Fuels Ltd

The licensee continues to develop the programme to process the legacy residues currently held on site. The licensee will use some of the magnox plants to process some of these legacy residues, aiming to revise the safety case to enable these plants to process residues of low enrichment. These plants were originally due to be decommissioned in the next few years. We will ensure that the licensee demonstrates that the facilities used to process the residues are fit for purpose.

We inspected the implementation of the Oxide Fuels Complex continued operations safety environment report (COSER) safety case, with a broadly acceptable outcome.

We inspected the licensee's arrangements for addressing the emergent boiler corrosion issues at the CHP plant. It was concluded that due attention had been applied to safety matters and the impact was largely on production operations rather than on safety.

We remain satisfied with the recent safety performance on the site.

URENCO – Capenhurst

HSE permissioned the commissioning and operation of the latest extension to one of the site enrichment plants in October 2007. A large new raft storage area is currently being actively commissioned. The design work for the next major project on the site, the tails management facility, is proceeding. This facility is composed of a suite of plants that will deconvert the URENCO stock of 'Hex Tails' materials into a more stable oxide form.

The licensee successfully demonstrated the Level 1 emergency arrangements to HSE at an exercise held in November 2007.

A group of French nuclear inspectors visited the HSE offices and an enrichment facility in February 2008, to discuss the regulation of centrifuge enrichment plants.

Recent inspections of the licensee have raised no significant issues.

Sellafield Limited – Capenhurst works

The licensee's ongoing decommissioning projects continue to deliver tangible reductions in the site nuclear hazards. We have inspected the licensee's recent active commissioning of a new facility to process legacy uranium hexafluoride bottles. The decommissioning demolition work has proceeded apace.

An INES 1 event in January 2008, involving a minor spillage of some uranic powder from redundant plant pipework, was investigated by us and the licensee was found to have addressed the issue appropriately. Funding constraints are currently affecting the timing of the despatch, for recycling at Springfields Fuels Limited, of the recovered enriched uranium residues, which arose from the recovery from redundant plant equipment.

In contrast to the licensee disposing of a record quantity of solid low-level and very low-level radioactive waste in the 2006/07 financial year, no solid LLW has been disposed of to LLWR in 2007/08. This is now expected to restart later in 2008. Very low-level solid radioactive waste disposals continue following their reinstatement. The licensee is effectively recycling other redundant plant equipment arising from operations.

Ongoing inspections continue to be directed towards assessment of the proposed site organisational changes, to ensure that the size and shape of the site organisation remains compatible with a nuclear site licensee's duties relative to the hazards on the site, as decommissioning projects are completed.

The site safety representatives continue to deliver an exemplary contribution to the site safety culture.

Nuclear research facilities

UKAEA general – restructuring project

We have continued to commit significant assessment effort on UKAEA's submissions to support the restructuring and future relicensing of the UKAEA Dounreay, Windscale and Harwell/Winfrith sites. To date one Licence Instrument to begin the process of transferring UKAEA Windscale to Sellafield Limited has been issued. This assessment work has had an impact on the scale of compliance inspection across the sites. The revised submission for Harwell/Winfrith, which was submitted in July 2007, has continued to present a number of difficulties to us in terms of both its quality and, in some areas, the nature of the proposals, which together have both delayed and prolonged the assessment process. The few remaining issues focus on succession planning and other matters relevant to the sustainability of Research Sites Restoration Ltd as a stand-alone licensee, which it is hoped will be resolved by UKAEA in the near future, thereby allowing reorganisation at Harwell and Winfrith to commence ahead of a period of shadow working.

UKAEA – Windscale

It is planned that a new licence for the Windscale site will be issued to Sellafield Limited in April 2008. Both UKAEA and Sellafield Limited are currently working well together during the period of shadow working of the new management structures and procedures. The monitoring and review of the shadow working arrangements has formed a significant part of our inspection programme during the period.

October 2007 marked the 50th anniversary of the fire in Pile 1. UKAEA arranged a number of presentations to stakeholders and media at the time to outline their plans to complete the decommissioning of the Pile 1 and Pile 2 facilities. The Pile 1 fuel and isotope removal prototype equipment has now been installed in the off-site test facility and is currently undergoing a series of trials.

Further updates on the Windscale AGR/Western Area decommissioning project work have been obtained from the project team. The work to remove the wall sections of the Windscale AGR reactor vessel is nearing completion. Discussions continue with UKAEA relating to the proposed programme to decommission the reactor post-irradiation examination (PIE) facility.

The extensive programme of engineering improvements to the leased post-irradiation examination (PIE) facility has commenced. We are engaged in ongoing discussions with UKAEA and Nexia Solutions to facilitate the regulation of the further project work that is to be undertaken to allow the recommencement of normal operations within the facility.

In December 2007 we made a determination under regulation 13 of the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations that an Environmental Impact Assessment was not required for the change to the Windscale Piles Reactor Decommissioning Project. The change was acceleration to the project which would speed up some operational aspects and remove the care and maintenance period. HSE produced a report describing the main reasons on which the decision was based and this is available on the nuclear pages of the HSE website: www.hse.gov.uk/nuclear/consult.htm.

UKAEA – Harwell and Winfrith

We have found that UKAEA, in changing its decommissioning plan (Lifetime Plan 2006/07), has not complied with Licence Condition 35(1) (decommissioning). In response, we took enforcement action under Licence Condition 35(3) by issuing specifications at both Winfrith and Harwell requiring the company to submit for approval a part of the Lifetime Plan 2006/07 which outlined the timescales for completing decommissioning in the major plant areas. We issued the associated approvals in February 2008. The effect of the enforcement action is that UKAEA is now required to return to the Lifetime Plan 2006/07 decommissioning programmes, or to justify changes following consideration of relevant factors. The way forward for UKAEA in this matter has since been discussed with the company and we are awaiting a response. An explanation of our action has been placed on our website at www.hse.gov.uk/nuclear/winharlc35enf.htm.

GE Healthcare Ltd (GEHL)

Both the Amersham and Cardiff sites held successful demonstration emergency exercises.

GEHL has closed plants at the Amersham site that manufactured radioactive products for use in areas of life sciences research as non-radioactive alternatives are gaining market share. We received and assessed an associated organisational change submission and safety representatives were consulted.

It is intended that one of GEHL's two small licensed sites at Harwell will become part of the main licensed site when it is relicensed. We have had meetings with GEHL, UKAEA and NDA to facilitate this.

Imperial College

The Consort reactor (the UK's last civil research reactor) will cease commercial operations in March 2008. NDA's possible role in its decommissioning has been slower to emerge than expected, but we have recently met NDA and the College to discuss their joint project to develop a business case for the site to be designated under the Energy Act.

The site held a successful demonstration emergency exercise. This followed a year in which several important elements of the response have been improved by extensive training.

We have discussed with the College the implications of the recent resignation of the Director of Operations.

UKAEA – Dounreay

Restructuring

The programme for restructuring UKAEA is continuing. Following the review of the Safety Management Prospectus for Dounreay Site Restoration Limited (DSRL), HSE gave Agreement (under Licence Instrument 536) on 16 October 2007 to UKAEA Dounreay to begin shadow working of the DSRL organisation. The aim is for relicensing of Dounreay to take place on 1 April 2008 subject to a satisfactory period of shadow working. During the period of shadow working, UKAEA

remains the licensee. The HSE Dounreay Inspection Team has been closely monitoring the performance of the shadow DSRL organisation. A relicensing readiness inspection is scheduled for week beginning 25 February 2008 involving a team of four inspectors.

Control of work

During November 2007, a team of five inspectors confirmed that operations they selected to inspect were being performed in accordance with safe systems of work and under the control and supervision of suitably qualified and experienced persons. Since the inspection, UKAEA has acted to:

- improve work planning at the prototype fast reactor (PFR);
- ensure that specialists in safety significant roles remain competent;
- clarify the role of point-of-work safety assessments;
- encourage use of reverse job briefs; and
- require decommissioning messages across the site to perform self-checking reviews of work in progress.

Enforcement action

Breach of Criticality Clearance Certificate: In November 2007, a Criticality Control Certificate at PFR was breached which we considered to be a fundamental loss of nuclear safety control. The incident occurred during the transfer of irradiated fuel to a single location in the irradiated fuel cave at PFR. One particular assembly, which had been the subject of a corrosion experiment dating back to 1981, was lifted from its storage container in violation of the criticality control certificate. The control was in place because corrosion of the fuel could have resulted in the accumulation of debris, including fissile material, in the bottom of the container, disturbance of which may have led to a criticality event.

Subsequent assessment by criticality specialists found that there was no criticality hazard in removing the corrosion experiment assembly from the container, the event was, however, a safety management failure. We therefore undertook a detailed inspection of arrangements for criticality control both at PFR and across the Dounreay site. The failure was mainly attributable to inadequate work control and supervision in the irradiated fuel cave. UKAEA management recognised the seriousness of this event and steps have been taken to raise the profile of criticality controls across the site along with other improvements including work control.

We applied the HSE Enforcement Management Model to the event and a letter was issued requiring improvements in work control/planning in the irradiated fuel cave as well as training and supervision. Consideration of 'dutyholder factors' reduced the action from the initial expectation of an Improvement Notice.

Safety cases

In early 2007, at our request, the Dounreay Nuclear Safety Committee reviewed the arrangements for safety case production and the use of extensions to safety cases. Improvements have now been made in monitoring and periodic review of safety cases. The outstanding issue from the review is the adequacy of resources to produce safety cases and their independent peer review. We will continue to monitor this situation through normal site inspection work.

Dounreay cementation plant recovery

Recovery work following the materials testing reactor raffinate spill in 2005 is now approaching completion. Although dose uptake associated with this work rose significantly towards the end of 2007, we found no indications that doses were not as low as reasonably practicable. The original dose budget proved to be highly optimistic since the spilled cement powder had set firmly and was more contaminated than expected. Cement removal required use of a jack-hammer and sulphuric acid. The decontamination work successfully reduced dose rates, allowing damaged equipment to be replaced. Use of telemetry-enabled electronic personal dosemeters, temporary shielding and 3 m long tools, helped restrict the collective whole-body dose uptake since the start of the project to 88 mSv.

Dounreay fast reactor (DFR) and the prototype fast reactor (PFR)

Following assessment of the Pre-active Commissioning Safety Report for the sodium/potassium (NaK) disposal plant and site inspections, a Licence Instrument was issued in December 2007 agreeing to the commencement of active commissioning. Due to problems with the plant, the first batch of NaK was not transferred from the reactor to the destruction plant until mid-February 2008. A sample of this batch is currently undergoing analysis before processing the batch in the plant.

Defence nuclear sites

Defence facility regulation

Across the defence nuclear sector we are continuing with our intervention activities and in general we are satisfied that safety performance at the defence facilities inspected by us, namely:

- Aldermaston and Burghfield (Atomic Weapons Establishments (AWE));
- Devonport (Devonport Royal Dockyard Ltd);
- HM Naval Base Devonport;
- Barrow (BAE Systems Marine (BAESM));
- Derby (Rolls Royce Marine Power Operations Ltd (RRMPOL));
- HM Naval Base Clyde, Rosyth (Rosyth Royal Dockyard Ltd); and
- the Vulcan Naval Reactor Test Establishment at Dounreay;

continues to be satisfactory.

We continue to pursue intervention strategies that are based around project and programme working across both the weapons and propulsion sectors of the defence nuclear industry. The strategies and plans reflect the joint regulatory approach adopted by HSE and the Ministry of Defence's (MoD's) Defence Nuclear Safety Regulator (DNSR). We have recently enhanced our joint working, with DNSR now playing an active role within the programme-focused intervention progress groups, which operate at the strategic level and prioritise intervention activity. The partnering approach on the whole is functioning well, ensuring efficient and effective use of resources between the two regulatory bodies.

During the period the annual MoD/HSE senior-level operational policy and regulatory liaison annual review meetings were held. Both meetings were chaired by the Chief Inspector, with the Director General Submarines leading for MoD at the operational policy meeting and the Chairman of the Defence Nuclear Environment and Safety Board leading for MoD at the regulatory liaison meeting. Overall it was concluded that there was a shared understanding of nuclear safety performance and priority areas for improvement within the MoD propulsion and weapons programmes. The joint nuclear safety regulatory approach was judged to be working effectively and efficiently.

MoD general – UK Staged Improvement Programme (SIP)

We have continued to engage with the MoD UK-SIP and the Through Life Management Plan initiative, which aims to inform nuclear safety-related investment decisions across the 'MoD Submarine Enterprise' with initial application focusing on the Naval Nuclear Propulsion Programme. We provided our support to the initiative at the above mentioned senior level operational policy meeting with the caveat that robust justifications and transparency of the process will be important to secure regulatory support for this nuclear safety improvement prioritisation process.

Devonport and Rosyth

The acquisition of Devonport Management Limited (DML) by Babcock International Group PLC is now complete. We continue to monitor developments since the acquisition and have engaged with relevant stakeholders and senior management to ensure potential organisational changes are properly conceived and implemented as required by the site licence. The licensee organisations – Devonport Royal Dockyard Ltd and Rosyth Royal Dockyard Ltd – are to remain in place within the larger Babcock International Group structures. We have held discussions regarding future licensee board structures, including the role expected of non-executive board members and the operation and transparency of the boards within the Babcock organisation. We are confident that nuclear safety-related activities taking place at the sites remain secure through the licensee's existing arrangements.

We continue to monitor MoD's progress towards implementing the strategy for

dealing with laid up submarines at Devonport before starting decommissioning via the Future Nuclear Facilities project. Since our last briefing a contract has been put in place to dismantle the submarine refit complex (SRC) refuelling crane, with the activity programmed for completion in summer 2008. This will mark a significant reduction to the hazard potential of the facility and is an enabler towards fleet time docking submarine maintenance work transferring from 10 dock to the SRC.

We advised in our report for the previous period that following our investigation into an event within the low-level refuelling facility and the issue of an Improvement Notice, that the licensee has recognised the learning opportunity and put in place a site-wide improvement plan to address the issues raised during our investigation. We regularly monitor the licensee's progress against this programme and can report that the improvements to safety behaviours on the Devonport site are commensurate with our expectations.

The work at Rosyth to decommission the majority of the facilities used for nuclear activities (RD83 Project) continues to progress safely and ahead of programme. Dismantling of the large hammer head refuelling crane is complete. It is anticipated that two of the three parts of the site will be offered for de-licencing during 2009. To this end HSE has initiated a programme to analyse confirmatory ground samples on the two decommissioning areas. A best practicable environmental option process undertaken to confirm the disposal route for resin wastes stored on the third part of the site has identified four viable options and these are now being further refined before a decision on the disposal option is proposed and presented to the regulators for consideration.

Barrow

As reported previously, we judged that aspects of the on-site exercise of the emergency arrangements in July 2007 were not demonstrated adequately. Consequently, we required the licensee to address the identified areas for improvement and undertake a further Level 1 exercise to demonstrate the adequacy of its on-site arrangements before the start of Astute active commissioning. This redemonstration took place in January 2008, based on a submarine nuclear reactor accident. We considered that this was a satisfactory demonstration of the emergency arrangements for the Barrow site.

Our joint regulatory intervention strategy with DNSR continues to focus on key nuclear safety-related activities within the Astute boat 1 programme. The core load process is now underway and we have planned inspections to inform the hold point for active commissioning (power range testing) programmed for later in the year.

Following a radiography incident onboard Astute, where two people, who were unconnected with radiography, remained within the designated controlled area we served an Improvement Notice that requires the company to introduce safe systems of work that ensure all reasonably practicable measures are taken to prevent similar events occurring in the future. BAE Systems has notified HSE that it has made improvements to comply with the schedule of requirements. We intend to check the adequacy of the systems of work during the first quarter of 2008.

Derby

The majority of the improvements identified during the PSR for the Neptune Test Reactor have now been completed with the remaining improvements being actively progressed.

In accordance with our Integrated Intervention Strategy, we continue to have early engagement with the licensee on the Regeneration Project for the nuclear fuel production plant (NFPP). Our assessment of the NFPP Preliminary Safety and Environmental Report did not identify any significant issues and concluded that the licensee had provided suitable and sufficient safety documentation to support progress of the Regeneration Project at this stage.

Portsmouth nuclear submarine operational berths

We witnessed the testing of the off-site emergency arrangements put in place by Portsmouth City Council for the operational berths at HM Naval Base Portsmouth in accordance with the Radiation (Emergency Preparedness and Public

Information) Regulations (REPPIR) through a number of targeted exercises. The key learning points identified during the previous emergency exercise in November 2004 had been satisfactorily addressed, with a number of aspects demonstrated well.

Submarine plant hazard identification and risk evaluation (HIRE)

In accordance with REPPIR, MoD has undertaken a triennial review of HIRE for the submarine plant and associated berthing facilities. The Reports of Assessment (RoA) of this review have been issued, as required, to HSE and DNSR and are currently under assessment. The revised HIRE and associated RoA conclude changes to the current emergency planning arrangements may be appropriate. However, to ensure a clear position and confidence is maintained in respect of the existing arrangements, local authorities have be instructed not to revise their existing plans until HSE has assessed the submissions and provided further advice.

AWE (Atomic Weapons Establishment)

In accordance with our Integrated Intervention Strategy, we continue our early engagement with the licensee on significant projects to ensure our regulatory expectations are given due consideration early in the decision-making and optioneering process, thereby minimising future potential regulatory risk. A formal hierarchical framework of regulator/licensee meetings has now been established that involves other regulators (DNSR and the Environment Agency), which is working well, where important milestones and regulatory hold points are discussed.

We are continuing to assess a number of PSR submissions relating to facilities across both the Aldermaston and Burghfield sites. In addition we are providing advice and guidance to the licensee as it implements improvements to its PSR processes arising from a review it undertook following HSE findings relating to early PSR submissions.

Parts of the AWE sites suffered from flooding in July 2007, particularly the Burghfield site, which delayed remediation work identified by the PSR and affected the emergency arrangements infrastructure. The facilities are now almost back to the pre-event condition and PSR remedial work has been resumed. Revised emergency response arrangements were witnessed and permission to sanction routine operations will be sought shortly.

We have issued three Licence Instruments. The first agreed to the limited continued use of the current process facilities for weapons assembly/disassembly in accordance with our permissioning approach to secure efficient delivery of identified improvements. The remaining Licence Instruments (one covering Aldermaston and a similar one for Burghfield) require the licensee to provide HSE with records of certain types of radioactive material.

In June 1999, HSE issued a specification (Licence Instrument 33) which obliged AWE to encapsulate legacy waste sludges into a safe passive state by 1 January 2008. This has now been accomplished.

Following a number of operating rule breaches over the past 12 months, HSE is currently investigating and reviewing options to determine the best way forward to secure improvements.

Nuclear new build

The GDA Step 2 'Fundamental Safety Overview' assessments for the four designs[2] (AECL's ACR-1000, EDF/AREVA's UK EPR, GE-Hitachi's ESBWR and Westinghouse's AP1000) are nearing completion and we aim to publish the public reports of these assessments by 18 March 2008. The reports will be available on the joint regulators' website. Placing all reports on the website of the Joint Programme Office (JPO) (www.hse.gov.uk/newreactors) will be consistent with the principle of openness that we have adopted throughout our GDA process.

An end date of the 4 January 2008 was agreed for all public comments to be addressed in the Step 2 reports. The public can still comment on the designs and the requesting parties will respond, but all comments received after the 4 January 2008 will be considered in future assessments. Further information can also be found on the JPO website

[2] *Update as of 18 March 2008. We have been able to complete Step 2 ahead of the programme and reports were published on the HSE website (18 March 2008).*

(www.hse.gov.uk/newreactors) set up by the nuclear regulators to oversee the GDA process. There are links to this site from the HSE and Environment Agency websites.

A Process Review Board has been set up to provide additional assurance to HM Chief Inspector of Nuclear Installations that appropriate governance processes have been applied during the GDA process for new nuclear power stations. It will operate in a manner that commands confidence and enhances the rigour of the GDA. To achieve this aim it must provide an appropriate challenge function to the proper application of the GDA governance processes, and be open and transparent in the manner in which it operates. In February 2008, the Process Review Board was involved in:

- reviewing the effectiveness of the public involvement process;
- reviewing the appropriateness and effectiveness of the arrangements for co-ordinating the activities of the separate regulators;
- reviewing the appropriateness of the processes, practices and procedures associated with the Generic Design Assessment;
- reviewing the effectiveness of the decision-making process;
- reviewing the extent to which HSE is following the processes and procedures set out in its guidance and in agreements with requesting parties.

The Process Review Board has fed back their findings to the HM Chief Inspector of Nuclear Installations and their report will be published on the JPO website (www.hse.gov.uk/newreactors) on 18 March 2008.

Steps 3 and 4 of the GDA will increasingly focus on the detailed evidence provided by the requesting parties to support the high-level safety claims examined in Step 2. ND still needs to recruit new inspection staff to allow inspectors to be released to fully resource the project.

HSE and the Environment Agency held a joint seminar for potential operators of new nuclear power stations at Aintree, Liverpool on 26 February 2008. The aim of the seminar was to help potential new nuclear power station operators and their industrial supporters understand the UK's nuclear regulatory system, and in particular the responsibilities of operators under the safety, security and environmental legislation applicable to nuclear generation. The event was attended by around 100 delegates including representatives of 11 companies interested in either becoming nuclear generators in the UK, or forming business partnerships with such operators, and the four organisations who have submitted nuclear power station designs to be assessed by the UK nuclear regulators.

Increasing interest in possible new build means that HSE is being called upon to provide advice to potential new nuclear licensees on matters relating to licence applications and licensing in general. Up to now we have been able to engage to a very limited extent, partly due to a need to ensure our scarce resources are directed at higher priority work, but also because there is no mechanism in place which would allow HSE to recover its costs for any increased levels of interaction. To address this, HSE is proposing to introduce a clause in the Health and Safety (Fees) Regulations 2008 which will allow it to recover its costs for work undertaken with companies that have declared themselves as 'potential nuclear site licensees'. The Regulations, following due Parliamentary process, should come into force in April 2008.

The legal and regulatory framework for nuclear safety is UK specific, and also under international conventions nuclear safety is a national responsibility. However, this has not (and in future GDA steps will not) prevented HSE from making appropriate arrangements to make use of overseas regulators assessments. HSE has bilateral and multilateral arrangements with the regulators reviewing the four GDA designs (ie Canadian, Finnish, French and United States of America) and their supporting technical support organisations, and has been pursuing the contacts facilitated by these agreements.

HSE has been participating for over a year in the multi-design evaluation project (MDEP), whose secretariat is supplied by the Organisation for Economic Co-operation and Development's Nuclear Energy Agency (OECD NEA). The aim of the MDEP is to move towards greater convergence and harmonisation of regulatory requirements and practices in relation to new reactor designs. The group comprises the regulators from ten countries

which have made a commitment to building new power reactors, plus IAEA. It is split into three stages: Stage 1 is a co-operation between countries which are building/reviewing the Areva EPR (currently ASN (France), STUK (Finland) and NRC (USA) but at the last meeting both HSE and CNSC (Canada) were invited as observers); Stage 2 is to work on the convergence process; and Stage 3 is to apply the findings of Stage 2 to future designs. In the last year a pilot project has been run by Stage 2, under the control of a Steering Technical Committee (STC) to consider the feasibility of meeting the general aims. The STC report is to be considered by the Policy Group, made up of the heads of the relevant regulatory bodies who will be asked to endorse a series of recommendations for future work. The overview from the STC is that convergence is a long-term aim that should be considered in the light of generation IV designs, but increased co-operation on the designs that are being currently considered for exploitation will assist understanding and so enhance moves to convergence. The detailed recommendations include: setting up groups parallel to MDEP 1 for other designs which are being considered by at least three countries; extension of the multinational inspections of vendor and manufacturers; comparison of design codes, including those for pressure components and digital control and instrumentation (C&I); and several areas for collaborating with other NEA groups on various generic issues. We are members of the EPR and AP1000 groups, the only design-specific groups set up so far.

International work

International committees

The experience and expertise of our nuclear inspectors continues to be required by the international nuclear community and organisations: Dr Weightman is currently Chair of the Committee on Nuclear Regulatory Activities (CRNA) and sits on the International Nuclear Safety Advisory Group.

International Committee on Radioactive Protection (ICRP)

ICRP has recently published new recommendations that are liable to have both direct and indirect implications not only for the nuclear industry but also non-nuclear industry. Overall the new recommendations contain no fundamental changes to ICRP's radiation protection policy, but they do include many detailed changes. Although this means that ICRP's recommendations should have little direct effect on radiation protection standards, it is likely that both IAEA and the EC (for different reasons) will propose some significant changes to their basic safety standards (BSS) documents. This in turn is expected to lead to the need to revise the Ionising Radiations Regulations and also the Radiation (Emergency Preparedness and Public Information) Regulations. HSE will continue to maintain an interest in the review and revision of both BSS documents to influence their development in a way which guards against the introduction of changes that are detrimental for the UK or changes where there is a marginal safety benefit at considerable cost.

European Union – High-Level Group

The European High-Level Group on Nuclear Safety and Waste Management was created with the aim of maintaining and further improving the safety of nuclear installations, the safe management of spent fuel and radioactive waste, and the financing of the decommissioning of nuclear installations and safety of the management of spent fuel and radioactive waste. The Group met in October 2007 and January 2008 to develop its Terms of Reference and Work Programme. Dr Weightman was elected Vice-Chairman of the Group and Chairman of the Sub-group on Improving Nuclear Safety Arrangements.

Western European Nuclear Regulators Association (WENRA)

At the last NuSAC meeting it was reported that the WENRA Reactor Harmonisation Working Group (RHWG) was continuing its work on harmonisation of integrated management systems in line with IAEA's work in this area. This has now been completed and the reference levels updated on the WENRA website.

WENRA has considered the proposed mandate for the RHWG and endorsed the continuation of ongoing monitoring of national action plans (to incorporate the reference levels into regulatory

requirements and ensure implementation at existing nuclear power stations) and the provision of technical support for WENRA's EC High-Level Group activities but asked for further clarification on the proposal for a study on safety for new reactors. The RHWG has prepared a paper on this subject for WENRA to consider at its next meeting in March 2008.

The WENRA Waste and Decommissioning Working Group (WDWG) has produced draft Safety Reference Levels (SRLs) for decommissioning and storage of radioactive waste and spent fuel. Both the decommissioning and storage SRLs have been benchmarked against the requirements in the UK regulatory system and the results peer reviewed by other members of the Sub-group. The vast majority of SRLs are already addressed by the UK regulatory system, however, more information needs to be included to fully take account of some SRLs. This is being addressed by the project to revise the Technical Assessment Guides (TAGs).

The next stage is 'implementation benchmarking', ie the extent to which individual stores and associated licensees' arrangements comply with requirements of the SRLs in practice. This work is about to start based on three UK waste stores and the results will be considered at the next meeting of the Sub-group.

International Atomic Energy Agency (IAEA) – Integrated Regulatory Review Service (IRRS)

Background: As reported in previous reports to NuSAC, IAEA was invited to conduct a modular IRR review in March 2006, in part to assess how HSE intends to go about the appraisal of reactor designs. The final report of the IAEA mission, together with HSE/ND's initial response, is on the HSE website.

Update on ND actions: The actions identified from the IRRS report are being progressed by existing ND working groups. To reinvigorate the work a contract was placed for an external contractor to monitor the progress achieved post-IRRS. The preliminary results of this review have noted variable progress but that all of the issues associated with potential new build are either completed or being delivered.

Other IRRS missions: An ND Management Board member has supported an IAEA IRRS mission to Spain in January 2008. A forthcoming mission to Pakistan in 2008 will also be supported. In addition, Dr Weightman has been invited to lead the mission to Germany in September 2008.

Convention on Nuclear Safety (CNS)

The UK report to the three-yearly CNS is produced by HSE/ND on behalf of BERR, the lead government department. The next review meeting of the parties is in April 2008. Prior to that the UK report was submitted ahead of the 28 September 2007 deadline. A ND project team, supported by inputs from government departments, agencies, regulators and licensees, has responded to 164 questions arising from the report. Dr Weightman will lead the UK team at the review meeting.

Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management

The UK report to the three-yearly Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (Joint Convention) is produced by HSE/ND on behalf of Defra, the lead government department. The next review meeting of the parties will be May 2009. Prior to that the UK report has to be submitted by the 11 October 2008 deadline. A ND project team, supported by external contractors and inputs from government departments, agencies, regulators and licensees, has been formed to develop the report. Dr Weightman will lead the UK team at the review meeting next year.

Freedom of Information Act 2000 (FOI)

The Freedom of Information Act 2000 places a duty on public authorities to provide information on their activities to requesters. ND has received 180 requests for information under the provisions of FOI/EIR so far, 174 of which have been satisfactorily closed. Eleven appeals have taken place, with the original decisions to withhold upheld. There is currently one appeal on active cases. There are currently no appeals for ND registered with the Information Commissioner. ND is having to deal with an increasing number of complex requests, this has meant that on occasion the deadlines have had to be extended to enable the public interest test to be undertaken. Details of the information that has been released under the Freedom of Information Act 2000/Environmental Information Regulations 2004 can be found at: **www.hse.gov.uk/foi/latest.htm**

Information on the work of ND can be found at: **www.hse.gov.uk/nuclear/index.htm**

Freedom of Information requests relating to the work of HSE's Nuclear Directorate should be sent to:

Michael Jennions
Building 4N.1
Redgrave Court
Merton Road
L20 7HS

or via e-mail to:
NDenquiries@hse.gsi.gov.uk

Further information

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HSE's quarterly statement of nuclear incidents at nuclear installations can be obtained from **www.hse.gov.uk/nuclear/quarterly-stat/index.htm** or from the HSE, Nuclear Directorate, Division 4a, Building 4N.G, Redgrave Court, Merton Road, Bootle, Merseyside L20 7HS, Tel: 0151 951 3484.

This document is available web only at:
www.hse.gov.uk/nuclear/newsletters.htm

Your views

The Editor welcomes your views about the newsletter or the work of ND. While we do not undertake to publish individual letters, comments about the scope and depth of coverage will help us assess the impact of the newsletter and ensure that it remains relevant and informative. Please send any comments you may have to Paul Jones, Building 4N.G Redgrave Court, Bootle, Merseyside L20 7HS or e-mail: **NDenquiries@hse.gsi.gov.uk**