Open Paper

NUCLEAR SAFETY ADVISORY COMMITTEE

REPORT FROM HSE FOR THE MEETING TO BE HELD JULY 2007
This report covers the period 1st March – 31st May 2007

Contents

GENERAL ISSUES

Overview

1. The previous high level of activity has continued across all areas throughout this period. There continues to be challenges from ageing plant, both in the Nuclear Power Plant and Nuclear Chemical Plant sectors.

2. Interest in potential new nuclear power reactors has increased, as has interest in possible new future radioactive waste disposal facilities.

3. Work in the MoD related nuclear sites is anticipated to grow as the rate of investment increases.

Strategic issues

4. Following an agreement under the Health & Safety at Work etc Act 1974 Section 13 between the Commission and Ministers, the work and staff of Office for Civil Nuclear Security (OCNS) on security and UK Safeguards Office (UKSO) on safeguards were transferred to HSE with effect from 1 April 2007. OCNS (30+ staff, headed by Roger Brunt) remain based in Harwell, and has become Division 5 of the renamed Nuclear Directorate. UKSO now forms part of the existing Division 2 covering fuel cycle facilities; its five staff moved from the Department of Trade and Industry's (DTI) Victoria Street HQ to HSE's Rose Court office where they are co-located with other ND staff and Policy Group colleagues dealing with nuclear safety issues.

Preparations for New Reactor Assessment

5. Following the 2006 Energy Review, Government asked the nuclear regulators to make preparations so as to be able to begin assessment of new reactors in early 2007. HSE set up a project to make these preparations, working in close conjunction with the other regulators, primarily EA and OCNS.

6. In January 2007, Joint Regulators and HSE specific guidance (available on the nuclear pages of the HSE website) was issued on a new Generic Design Acceptance assessment process. This was based on the outline proposals in HSE's Energy Review submission, extensive stakeholder engagement, and "peer review" by experienced nuclear inspectors. The guide sets out a 4 Step approach to assessment (increasing in detail at each Step) and for each Step, it sets out plainly:
   - description and aims;
   - what the Requestor is required to do;
   - what HSE will do.

7. At the HSC meeting of 15 May 2007 the Commission decided to direct HSE to "*assess any design proposal for any new nuclear installation".* It also agreed that HSE should submit amendment regulations for Ministerial agreement (these will amend the 2007 Fees Regulations to allow HSE to charge for generic design assessments). Accordingly, preparations are now in hand to make the nuclear charging provisions. After the revised fees regulations come in to force, we expect to set-up a small new nuclear reactor assessment team as part of a new Division 6.

8. The Government published its Energy White Paper on 23 May 2007, together with a consultation document on nuclear issues. This included an invitation to reactor vendors to write to regulators to ask for their designs to be assessed. They have until 22 June 2007 to do this, following which DTI will advise us which have credible operator support and support the UK's future needs. HSE will then be expected to commence assessment of all those that pass this selection process. Interaction with industry to-date suggests that there will 4 credibly supported designs.

9. HSE will then enter discussions with these vendors, for example on cost recovery, their submission timetable, and on operation of their public dialogue process, and we anticipate starting assessment late in summer 2007. The assessment will be conducted on a contingent basis pending a formal Government decision on the future of nuclear power, which is expected around end 2007. HSE's initial assessment will be limited in scope to a Fundamental Safety Overview (effectively an assessment of the licensability of the proposed designs as described in Steps 1 and 2 of the Generic Design Acceptance process). HSE will return to the HSC before any further assessment work in undertaken beyond this, and will anticipate that this will be in early 2008, by which time the Government are anticipated to have made a decision on any future role of nuclear power in the UK.

BNGSL Competition

10. ND participated in a workshop for bidders held on 12 and 13 April 2007 and has separately met some of the bidders to respond to further queries. Discussions with British Nuclear Fuels (BNF) plc, Nuclear Decommissioning Authority (NDA) and Government on enhanced governance arrangements for BNGSL are continuing.

Site Visits

11. HM Chief Inspector for Nuclear Installations (HMCI) has continued with his programme of site visits. Over the period covered by this report Dr Weightman visited Barrow Dockyards from 12-13 April 2007, where he was impressed with the progress made in improving safety but noted the need to continue such work.

12. He has also visited several nuclear sites in Japan with the Chief Executive of NDA, Ian Roxborough.

UKAEA

13. The programme for restructuring UKAEA has continued to raise issues over the proposed number of site licensee staff being allocated to the Parent Body Organisation. There have also been potential problems relating to the impact that NDA funding cuts could have upon the proposed Harwell and Winfrith structures. However recently a measure of agreement has been achieved and it is hoped that the programme can continue without affecting the relicensing dates for Dounreay, Harwell and Winfrith or NDA's desired competition date.

Managing Radioactive Waste Safely (MRWS) Programme

14. The regulators (HSE, Environment Agency (EA), and Scottish Environmental Protection Agency (SEPA)) continue to support the Department for Environment Food and Rural Affairs (DEFRA) and the Devolved Administrations in preparing a consultation document for publication in the summer. This forms parts of the Government response to the Committee on Radioactive Waste Management (CORWM). It is widely accepted in Government that it would be appropriate for a deep geological disposal facility to be licensed and we are proceeding on this basis. We anticipate a ramping up of demand on our resources from these initiatives for a number of reasons:

    - the Nuclear Decommissioning Agency (NDA) is now charged with the development of a repository. The old NIREX organisation has been integrated into the NDA and the regulators have been involved to ensure that the current regulatory process concerning waste conditioning is maintained. NDA is keen to engage in 'pre-licensing' discussions early in the process with regulators;
    - DEFRA wants regulator support for any public events it may run;
    - again, DEFRA sees the regulators as having an important role in any discussions with any communities considering the volunteerism route.

    Although the two are not directly linked, the new build process is likely to heighten interest in processes for disposing of waste products.

Low Level Waste Repository (LLWR)

15. The date for relicensing of the LLWR at Drigg continues to slip. Shadow working at the Repository has progressed satisfactorily and has been acknowledged as complete. The site is currently completing a commitment to remove its bulk quantities of Plutonium Contaminated Material before relicensing takes place, currently planned for late summer. This delay is not posing problems at present for the NDA competition of this site.

Windscale

16. The Windscale site needs to be relicensed prior to the completion of the BNGSL competition. Windscale is also likely to be the rate determining step in the relicensing of Dounreay, Harwell and Winfrith as it cannot be left as an “orphan” UKAEA site. Discussions are now at a late stage and documentation to justify the revised structure are at a late stage of preparation. The issue surrounding the future position of UKAEA staff appears to be resolved, the main issue now being that there are several vacancies in important safety related roles that need to be filled before the structure can operate in “shadow mode”. Although this is a risk to the programme the project is currently working to a revised programme which is consistent with the UKAEA relicensing dates and the NDA’s competition programme.

Magnox Electric

17. Work to relicense the Magnox South sites is continuing. Currently ND has issues regarding the proposed structure that remain to be resolved but so far

this has not impacted upon timescales although there is a risk. ND is continuing to support the NDA's preparations to compete the Magnox South sites and is due to give a presentation representing all the regulators at an Industry day in Windsor on 14 June.

Working with other Regulators

18. Working in collaboration with EA and SEPA, guidance has been prepared on the management of higher level radioactive waste on nuclear licensed sites. There has been engagement with industry on the development of this document. This will replace

    - "Conditioning of Intermediate Level Radioactive Waste on Nuclear Licensed Sites" published by HSE, EA and SEPA in March 2005.
    - "Improved Regulatory Arrangements for the Conditioning of Intermediate Level Radioactive Waste on Nuclear Licensed Sites: Regulators' Position Statement - December 2003"

NDA Funding

19. NDA has provided ND with further details of its proposed spending and the likely individual site implications. ND is to examining this proposal and will be communicating to NDA shortly but, given the timescales, do not anticipate giving anything other than an outline response.

Communication and Stakeholder engagement

20. The Communication and Stakeholder Engagement (CASE) team is working strategically to consolidate previous research work, and bring about a significant difference in ND's ability to communicate effectively. Now recognised as a strategic project, communications and engaging stakeholder matters will be made integral to how ND discharges its regulatory functions and operates internally.

21. Work continues on revising the nuclear pages of the HSE internet. As part of this, the nuclear e:Bulletin was launched in April 2007. The e-Bulletin provides an update of the latest news and information from HSE's Nuclear Directorate and over 800 people registered following the first edition.

22. An internal conference took place in March 2007 to update all staff on relevant developments including our plans for 2007/08 and introducing the new Nuclear Directorate established from 1 April 2007 to include OCNS and UK Safeguards.

23. There were 10 FOI requests and 2 correspondence from MPs during the period covered by this report.

Nuclear Research

24. Papers were prepared on the Nuclear Safety Research programme, taking into account the advice given by NuSAC SCR, for the HSC to consider at its meeting on 5 June 2007.

25. The advice from NuSAC SCR contained a number of reservations that will be raised at the Commission meeting; principally that the Nuclear Research Index (NRI) was not being efficiently maintained, due to a transfer of inspector resource from research to frontline activities, and that in the Human Factors area there has

not been sufficient progress in taking forward the outcomes of the 2005 cross-industry workshop on the topic.

26. ND has acted to address the specific concerns as set out in the paper. On the NRI ND has engaged external technical expertise to undertake a review and update of the NRI, facilitating discussions with frontline inspectors to draw on their expertise in a resource efficient manner. A Nuclear Topic Group for Human Factors issues has been set up to review the research need in this area, and human factors resource has transferred into ND and is currently being trained in nuclear specific issues. HSE is currently reviewing how human factors knowledge can be better shared across industries and synergies be drawn out.

Public Service Agreement (PSA) targets

27. We are continuing to work with industry on improving measures of major hazards risk control.

28. We have completed a pilot study with the Safety Directors' Forum. This involved industry reviewing its incident data, in terms of nuclear safety significance, for input to a revised Public Service Agreement metric. There were many positive features of this work, including a shared industry / regulator understanding of nuclear significant events data. However, the industry derived metric is not sufficiently transparent to meet our requirements. The robustness and transparency of ND's own PSA2 assessment process has been enhanced and audited by HSE's Internal Audit Section. We have decided that the industry pilot study work will not be progressed further. This has been discussed with industry.

Nuclear Sector Plan

29. In response to their concerns on the nuclear infrastructure in the UK, British Energy have proposed the development of a Nuclear Sector Plan. The objective of the proposal is to ensure there is a clear strategic focus on the sustained maintenance and development of the nuclear industry. This would cover a broad range of issues including: future resourcing and core skills; existing and future infrastructure needs. In recent months British Energy have been discussing the issue with the nuclear industry and the Department of Trade and Industry. We have discussed this proposal with British Energy and consider it would provide a clearer strategic focus for the nuclear industry.

OPERATIONAL ISSUES

OPERATING POWER REACTORS

Dungeness B

30. Dungeness B continues to experience problems with the fuel route. The main issue is with the demonstration of the continued integrity of Fuel Plug Units, especially those that were manufactured early in the station's life. This issue has had significant consequences for the refuelling programmes (extending them). Reactor 21 operated during the period until a planned refuelling outage during April and May 2007. Reactor 22 operated during the period until a planned refuelling outage on 30 May 2007. On 26 March 2007, there was a declaration of a site incident when a small leak of clean carbon dioxide from a supply pipe led to slightly enhanced levels of carbon dioxide in the atmosphere local to some reactor 22 plant areas. The leak was found in a corroded carbon dioxide make-up

pipe. On 2 April 2007 a site incident was declared following a leak from a bulk carbon dioxide tank during unloading from a carbon dioxide tanker. The leak was sealed within ten minutes of being discovered.

31. There were two Licence Instruments issued during the period. Licence Instrument No. 514 was issued on 5 April 2007 to Approve an amendment to Nuclear Safety Requirement 2.5 brought about by an increase in fuel irradiation limits. Licence Instrument No. 515 was issued on 28 April 2007 to Approve amendments to the Emergency Plan brought about by changes in issuing countermeasures and a harmonisation of terminology across the British Energy (BE) sites.

32. Anticipated Licence Instruments to permission the replacement Data Processing System and to permission installation and operation of the Neutron Scatter Plug crimping machine were postponed due to the continuing technical and contractual problems being encountered on the projects.

33. The Level 1 Emergency Exercise 'THAILAND' was held to test the adequacy of the emergency arrangements for an incident occurring at Dungeness B. The exercise provided an adequate demonstration of Dungeness B's emergency arrangements.

Hartlepool

34. Reactor 1 ran at full load throughout the period except for a brief refuelling outage at the end of April. Reactor 2 operated at full load throughout the reporting period.

35. An International Nuclear Events Scale (INES) 1 rated event was reported at the end of March when a Maintenance Schedule item did not have its scheduled maintenance completed within the permitted time limits. The equipment in question is the fire alarm and its links to a siren and PA system. The station is investigating this event and will report the outcomes of the investigation. An INES 0 event was raised during the Reactor 1 shutdown for the refuelling outage when the gas circulator inlet guide vanes and a boiler feedwater valve closed on quadrant 1D. Prompt action restored cooling to the quadrant and no temperature changes were recorded. The event was traced to a faulty relay which has been replaced.

36. Licence Instrument 516 was issued during the period to Approve Issue 5 of the Hartlepool Power Station Emergency Plan. Licence instrument 517 was also issued giving Agreement to a modification to install the reactor vessel flood detector and off load feed tripping system.

37. The Level 1 re-demonstration exercise "Apollo" was held in May 2007 and successfully demonstrated the stations' arrangements at the mobile access control point and communications in the command chain as required following Exercise "Athena" in January 2007.

Heysham 1

38. The Heysham 1 reactors have maintained a satisfactory safety performance during the period. Although the reactors have sustained steady operation during the last quarter, Reactor 1 operated on 3 quadrants for a time during February 2007 due to problems with gas circulators and boiler feed pumps. Reactor 2 continues to operate at reduced load (see below).

39. BE is continuing to examine hot box dome surface temperature of all four reactors at Heysham 1 and Hartlepool. As previously reported, all four reactors continue to comply with average temperature limits imposed by Technical Specification, however, a single thermocouple on Reactor 2 exceeds the original design limit at full load operation. Since October 2006 Reactor 2 has operated at reduced load to secure a margin against the design. Reactor 2 is currently operating at 90% (up from 84% reported last time) and continues to comply with the Engineering Change, which justifies sustained operation at reduced load. The station is preparing a further Engineering Change with the objective of justifying a higher design temperature limit that will permit the restoration of full load operation.

40. In February 2007 Reactor 2 shut down for its routine refuel outage. The outage was extended to permit a priority programme of inspection and modification activities on the Boiler Closure Units (BCUs). This very successful campaign included radiographic examination and the careful excavation of fillite insulating material to expose the wire tails observed during the original examination of BCU 2C1. Video recordings of the tails provided clear evidence that these tails are an artefact of construction and HSE agreed that BE should not attempt to recover or sample the wires. The work on BCU 2C1 has provided important validation of the capability of radiographs to record the location and disposition of BCU prestressing components and thus the baseline condition of BCUs. The station is scheduled to complete the baseline inspection programme during the Statutory Outages in 2007 and 2008 and this will inform a long term strategy for monitoring BCU condition.

41. The station will shortly commence an extensive project to replace all the remaining buried and cast-in-concrete cast iron components of the Essential Cooling Water System with glass coated carbon steel components. The project is expected to be completed before April 2008 and will remove the threat of failure due to graphitisation of the cast iron.

Heysham 2

42. The Station has operated steadily during the period. There was one automatic shutdown of Reactor 7 in May 2007 due to high Channel Gas Outlet Temperature as a result of inadvertent loss of feedwater to a quadrant; this event was categorised at INES 0.

43. At the end of March 2007 Reactor 8 embarked on its triennial periodic shutdown. During this shutdown, the Licensee conducted maintenance activities in accordance with the plant's Maintenance Schedule, together with inspections to support the station safety case and to comply with statutory requirements and implemented modifications and other remedial work requiring a reactor outage. As a result of prudent inspection work it was revealed that there was some deterioration in the condition of the Reactor Seawater System (RSW), which provides cooling duties for items of safety related plant and equipment. A large replacement programme of RSW pipes was undertaken by Station, using high density polyethylene pipe-work. Following completion of all outage work, HSE gave permission for reactor 8 to restart at the end of May 2007.

44. During the reactor 8 shutdown an INES level 1 event was reported to HSE. This incident occurred on the pile-cap when a team of BE personnel were engaged in work on a neutron source plug reactor assembly. A fault developed on the 3Te hoist normally used to lift the assembly. The operators decided to proceed with the work and perform the lift with the charge hall crane, which was not in compliance with their written instructions. A vigilant reactor operator stopped the

work. The Station commissioned an investigation into the circumstances surrounding this event; this investigation will conclude in June 2007. HSE will monitor the adequacy and implementation of the corrective actions emerging from the investigation.

Hinkley Point B

45. Both reactors at Hinkley Point B have been shutdown for the bulk of the period covered by this report. Reactors 3 and 4 were shutdown in September and October of 2006 respectively, for the purposes of undertaking a programme of boiler tube inspections. The defects in the boiler tubes have been caused by creep damage, as a consequence of operation over a lengthy period of time at high temperature. A safety case for return to service of both reactors has been produced by the Licensee and submitted for assessment by HSE. HSE permission to start-up Reactor 4 was given on 11 May 2007 and permission for start-up of Reactor 3 on 21 May 2007. Both reactors are being returned to service at 70% full power and at a reduced boiler steam outlet temperature of 470^{o}C, which will significantly reduce further creep damage to the boilers. Reactor 4 was manually tripped on 14 May 2007 due to problems on the turbine/alternator unit and is not due to re-start until early June 2007.

Hunterston B

46. Both reactors remained shut down at the beginning of the period, whilst the safety case for boiler tube integrity was being developed and assessed. Having obtained many improvements to the case and its presentation, HSE nuclear inspectors have now concluded that the case is adequate for restarting the reactors for the reduced operating temperatures and periods defined in their respective cases. Accordingly, HSE permission to start up Reactor 4 was given on 14 May and permission for Reactor 3 to start on 21 May. The Licence Instruments are related to different licence conditions because of the circumstances in which the reactors were shut down. The reactors are being restarted in sequence to allow adequate time for the revised operating conditions to be consolidated - Reactor 4 has been returned to service and Reactor 3 is raising power.

47. HSE has now completed its assessment of the Periodic Safety Review (PSR). Although a number of significant shortfalls were identified, the review has been accepted on the basis of a substantial amount of work committed by the licensee to be completed against a declared programme. HSE has advised the licensee that the on-going work will be monitored in detail to secure appropriate progress.

48. The station successfully demonstrated its emergency arrangements in Exercise Stockholm on 29 March. As with all exercises there were a number of learning points, which the station acknowledged and which will be progressed under normal future business. Overall the exercise was accepted by HSE as an adequate demonstration of the arrangements required under licence condition 11.

Oldbury

49. Graphite Safety Case, Reactor 2 - HSE completed its assessment of the licensee's safety case for the continued operation of Oldbury reactor 2 and consent to start up was issued on 18 May 2007. The detailed safety case took longer to evaluate than was expected, but we are now satisfied of the safety of continued operation at the predicted levels of graphite corrosion. Magnox Electric took the reactor critical on 19 May 2007 and had more or less achieved full power when a high voltage insulator brushing on the

Generator 2 transformer shattered explosively, resulting in an oil fire and reactor trip. There was no radiological hazard and no people were injured.

50. Graphite safety Case, Reactor 1 - The licensee has completed the preparation of its safety case for the continued operation of reactor 1 and has gained the agreement of the Nuclear Safety Committee. This document is now with the HSE for consideration and assessment has commenced. It is not clear how long this will take, but in the mean time the licensee continues with inspection of Reactor 1's graphite.

51. Oldbury has submitted to HSE its Environmental Statement for the decommissioning of Oldbury Power Station under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations. The Environmental Statement is currently out for public consultation until 29th June 2007.

Sizewell B

52. Sizewell B has operated continuously since the last report with no unplanned trips and no INES 1 events. The Replacement Reactor Pressure Vessel Head went into service after the last outage and has performed as designed. The Station is currently in Forced Outage 36 (started 29 May 2007) to de-load one turbine to enable a repair to be carried out on one of the generator transformers. The reactor is anticipated to remain on load at 50% power during this repair.

53. British Energy has ordered Reprocessed Uranium fuel for the next but one fuel charge (Cycle 11). This will require HSE's agreement to load this fuel as it will be a category 1 modification.

Torness

54. 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 a rating of 1 on the INES scale, which corresponds to a plant anomaly.

55. Further details of the following events notified to HSE are provided below.

56. Isotopic content of spent fuel. - Station reported that British Nuclear Group (BNG) had queried estimates of the isotopic content of spent fuel consigned from Torness to Sellafield between 1996 and 1999. Station is investigating and the preliminary findings suggest that the nuclear safety cases have remained secure for handling spent fuel at Torness, BNG and during transport. It appears that the procedure used to calculate the isotopic content under-estimated the quantities involved following commencement of use of more highly enriched reactor feed fuel. Station reported that the isotope likely to be affected most would be Uranium 235. The procedure was not used after 1999, and they have confirmed the current version provides estimates of isotopic content which are consistent with alternative procedures. They have confirmed that all Torness spent fuel has been accounted for in the consignments to BNG. Details of this event have been passed to UK Safeguards Office (UKSO) and Department for Transport (DfT).

57. Fuelling Machine Pressure Vessel Seals. - Torness is investigating an apparent degradation in the pressure retaining performance of elastomer 'O' ring seals in the flanges of the fuelling machine pressure vessel sections. Seals on two separate flanges have not met the acceptance criteria for the test used to confirm that the pressure retaining function of the seals required by the safety case is

preserved. Station has confirmed that the elastomer seals provide a secondary seal supporting the primary seals which are metal ring seals. They have confirmed that at Torness there is no evidence that any primary seal leakage has occurred in excess of the specification for the seals. They are currently continuing to use the fuelling machine under an interim basis for continued operation until a more permanent solution is available. HSE is monitoring the Licensee's progress with the investigation and developments with the remedial work.

Wylfa

58. The Reactor 1 Biennial Statutory Outage Inspection Document was presented to us and we agreed the scope of the maintenance and inspection work programme. Controlled reactor shutdown for the outage started on 6 April 2007. Sample inspection of the outage work programme is being undertaken with no significant issues so far identified. As in previous years reinforcement of a small number of guide tube assemblies will have to be satisfactorily completed before we may be in a position to Consent to reactor start up in July 2007.

59. Our investigation of two dropped load conventional safety events concluded that the Station satisfactorily responded to both the events and our investigation. On the basis of the agreements reached on the way forward and continuing demonstration of adequate progress we judged that there was no requirement for any further immediate regulatory action.

60. In response to the Sizewell A Pond Event our preliminary inspection at Wylfa found both Magnox and the Station to be proactive by undertaking well directed reviews and checks. The scope of investigation appeared reasonably comprehensive but the work programme is not yet complete. We shall monitor future progress.

61. During a single week early in May 2007 there were 6 minor fuel route events associated with operator error. In light of this we required the Station to explain why it remained satisfied with its competency to continue to refuel reactors on load. The Station held investigative workshops for all staff undertaking pile cap work that were designed to investigate the root cause of the events and develop improvement action plans. Our inspector observed a workshop and was satisfied that the Station satisfactorily responded to the events and, before resumption of refuelling, provided us with an adequate basis of its continued competency to refuel the Wylfa reactors on load.

62. Progress continues to be made towards developing an improved Nuclear Fire Hazard safety case. This will be a combination of an enhanced deterministic case that is scheduled for completion in the next reporting period and a new supporting probabilistic safety analysis that is planned to be available in the first half of 2008. As in previous periods nuclear inspectors carried out inspection visits and attended meetings to help progress technical aspects of the work programme. We remain satisfied with the rate of progress and predicted timescales for completion.

63. As a result of observing the satisfactory Level 1 Demonstration Emergency Exercise held on 18 October 2006 we identified three priority learning points associated with casualty rescue, dose management targets, and disrobing management. In follow up to these our site inspector observed the Shift Training Exercise BRAVO "07" held in March 2007. This demonstrated timely and improved rescue of the casualties and provided closure on the learning point. Equivalent improvement was not demonstrated on the other two issues and the Station agreed on the need for remedial action.

64. A revised Emergency Plan was issued for our Approval. Although the revisions were not major our assessment identified deficiencies that required the Plan to be revised and reissued. The assessment findings were discussed with the Station to ensure mutual understanding and agreement on the way forward. Amendment in line with our expectations is now in hand.

65. Dry Store Cell 4 (DSC 4) now only contains the 16 spent fuel elements affected by a roof leak that corroded their Magnox cladding. 946 undamaged fuel elements stored in the row that contains the corroded fuel elements were successfully removed and dispatched to Sellafield without incident. Dialogue has started on the work programme that needs to be completed to allow generation continuing until the end of 2010. Wylfa has to demonstrate that final defuelling can be completed without compromising the Oslo and Paris Commission (OSPAR) linked timescales defined in the Magnox Operating Plan (MOP) for reprocessing Wylfa fuel at Sellafield. This requires early completion of several work programmes that could conflict with the current strategic aim of recovering the damaged fuel in DSC 4 before the end of 2008. A review is being initiated to determine whether an extension to the timescales for its recovery can be justified.

66. We attended the Station Annual Review Meeting. Good quality presentations provided a clear understanding of the key matters addressed by the Station during 2006. We made it clear that although considerable progress was demonstrated in 2006, our areas of focus for 2007 will continue to be: human performance; performance of fuel route plant and its operation; management of Suitably Qualified Experienced Person (SQEP),; control and supervision / accountability processes; management of training; Low Level Waste management; and management of change compliance.

DECOMMISSIONING / DEFUELLING POWER REACTORS

Berkeley

67. Following the delicensing of a large part of the Berkeley Centre site, the Berkeley Nuclear Power Station (Berkeley NPS) staff have now relocated to the new Berkeley NPS licensed site. Emergency response arrangements have been reviewed and the site inspector has agreed in principle to the relocation of the Emergency Control Centre and Access Control Point onto the new licensed site.

68. The Active Waste Vaults Removal project preliminary work has progressed and contracts are ready to be let, subject to funding approval by the Nuclear Decommissioning Authority (NDA). A planning application is to be submitted for the above ground Intermediate Level Waste (ILW) store. Site staff are assessing the possible effects of proposed NDA funding cuts on planned decommissioning projects.

Bradwell

69. Decommissioning projects are progressing. The removal of asbestos based lagging material from the boiler houses is approximately 60% completed. The clean up of the cooling pond is progressing. A Best Practicable Means (BPM) study has been undertaken for scabbling of the pond internal structure. Core samples have been taken from the pond internal walls to ascertain the depth of penetration of contamination.

70. A project is ongoing to define methodologies for the sampling and characterisation of the nominally dry ILW (including Fuel Element Debris (FED)) in the underground vaults prior to its removal. Site staff are considering the

option of dissolution for the FED, and are assessing the possible effects of proposed NDA resourcing constraints on planned decommissioning projects.

Calder Hall

71. Calder Hall has continues to implement the modifications to its fuel routes that are necessary to begin defuelling the reactors. We carried out a readiness inspection of Reactor 4 which is the first to be completed. The licensee is seeking a Licence Instrument for active commissioning of Reactor 4 prior to asking permission for its routine defuelling. There is a small amount of remaining work to be completed to be ready for active commissioning, however, we concluded that Calder Hall has adequate arrangements in place to manage this work to completion. Also, we observed a shift exercise as part of our inspection of readiness, and judged that Calder Hall's emergency response to a defuelling incident was adequate. Presently, we are awaiting for Calder Hall to confirm that it has completed all non-active commissioning work.

72. We have continued to engage with Calder Hall on its proposal for the explosive demolition of the cooling towers. The licensee is seeking agreement to this modification. Although we agree that explosive demolition is the best option for removal of the towers, it has proved to be a difficult project owing to the need to have full confidence that the effect on the Sellafield site will be as expected by the safety case. Our main assessment effort has focussed on the implementation of the demolition, as the safety case depends on the assumptions made about this. The licensee has yet to provide us with the confidence we seek in the implementation, although we are working with the licensee to resolve our concerns.

Chapelcross

73. Preparations for defuelling are continuing at Chapelcross. As a result of issues with reprocessing at Sellafield, the date for the start of defuelling has been put back and the period for time to defuel is likely to be extended.

74. The cooling towers were demolished on 20 May 2007 using controlled explosions, which has had a significant impact on the skyline in Dumfries and Galloway. The demolition was broadcast over the internet and a large number of members of the public watched the event from surrounding vantage points.

75. Chapelcross Level 1 Emergency Exercise Gerda was held on 23 May 2007. The simulated event was a fire in the discharge well during defuelling. HSE found that the site's response was not adequate, mainly due to the time to recover casualties. A further demonstration exercise will be held.

76. The heat exchangers at Chapelcross are external to the reactor building and there were problems during the winter with asbestos falling during bad weather. The site is pursuing contracts to strip the asbestos quickly and also to build containments around the heat exchangers to protect them from the weather and contain any future falls. Some stripping work was in progress. However, HSE Field Operations Directorate (FOD) Construction Division recently visited the site for an asbestos inspection and issued two Prohibition Notices against the asbestos contractor.

Dungeness A

77. Resourcing constraints have curtailed most of the planned decommissioning projects. All that remains this year is defuelling, dissolution of fuel element debris and some minor works. The main part of the budget is meeting the fixed costs of the station. The station will provide a new decommissioning strategy in July 2007 for HSE consideration.

78. Dungeness A has adjusted its staffing in line with the expected requirements of defuelling and decommissioning. As anticipated, defuelling of the reactors has been inhibited by limitations at Sellafield on receipt of fuel. HSE has permitted a small number of fuel elements to be removed from the core to test and commission the refurbished charge machines. This work has been successful.

79. Issues held against the defuelling and decommissioning safety case remain extant. Further analysis is being prepared by the Licensee to demonstrate their "post generation" instrumentation.

Hinkley Point A

80. The initial follow-up to an incident in which a worker received a minor injury while working on inadvertently live electrical equipment has revealed the potential for severe injury/death and an investigation is being organised led by a suitable electrical expert.

81. Decommissioning work at site continues. Site staff are assessing the possible effects of proposed NDA resourcing constraints on planned decommissioning projects.

Hunterston A

82. An inspection of the Ponds buildings was undertaken in March 2007 by Field Operations Directorate and a number of issues were identified.

83. A lifting incident took place in Reactor 1 Fuel Tunnel during de-planting. Initial consideration indicates both a failure to promptly report the incident by the contractor, and a poor lifting assessment. An investigation is being organised with HSE FOD Construction Division in Glasgow leading.

84. Decommissioning work at site continues. Site staff are assessing the possible effects of proposed NDA resourcing constraints on planned decommissioning projects.

Sizewell A

85. The Sizewell A reactors are now permanently shutdown and on forced cooling. The Post Operation and Defuelling safety case has yet to be accepted by HSE Nuclear Inspectors. Defuelling of the reactors has yet to commence. On the positive side, nearly all of the pre-shutdown cooling pond, irradiated fuel stock has been sent off-site for reprocessing.

86. Safety performance in the reporting period has been acceptable; no events have been rated above zero on the INES scale. The uncontrolled loss of cooling pond water event, previously reported, resulted in HSE issuing a Direction under Licence Condition 15(4). The Licensee had until the end of May 2007 to formally respond to the Direction (a detailed report/package arrived at HSE Headquarters

on 30 May 2007 and the Licensee will make a presentation to us on 14 June 2007). At Sizewell A considerable pond system enhancements have been taking place, so as to avoid a re-occurrence of the event. HSE has yet to decide if further regulatory action is necessary.

Trawsfynydd

87. Decommissioning, waste retrieval and conditioning activities are progressing including both solid and liquid ILW wastes. An additional Licence Instrument was required to allow the site to carry out further active commissioning trials on boxes 6 and 7. An earlier agreement was limited to box 5 as part of commissioning trials including tamping and the inclusion of fuel pieces. The construction of the ILW store is ahead of programme with the roof casting under way and mechanical plant due to be delivered to site. Civil engineering and preparation of buildings for Safestore continues with the proposed installation of the Reactor Building capping roofs with HSE for assessment. The capping roofs are installed before building height reduction can start.
88. The site held a Level 1 demonstration emergency exercise on 15 May 2007. Improvements had been made to casualty handling and contamination control. The exercise was deemed to be an adequate demonstration of the site emergency arrangements.

NUCLEAR FUEL CYCLE FACILITIES

BRITISH NUCLEAR GROUP SELLAFIELD LIMITED (BNGSL)

Sellafield Mixed Oxide Plant (SMP) Contamination Event

89. On 10 January 2007, a contamination event occurred within SMP involving five workers. Biological sampling initiated by BNGSL has confirmed that the doses received by the workers were all less than the annual limit for intake. The Board of Inquiry set up by BNGSL to look into the event has completed its work. HSE has completed an investigation into the event and timescales for introducing improvements are being discussed with BNGSL.

90. The main areas for improvement are associated with: i) an improved approach to Plant Training; ii) improvements to safety culture; and iii) revisions to management and procedural controls.

Waste Treatment Complex – Supercompactor Glovebox Event

91. An event occurred on 24 October 2006 involving a major injury to a worker in the Waste Treatment Complex, caused by inadequate control of emergency stop and isolation systems associated with the Supercompactor Glovebox.

92. BNGSL undertook a Board of Inquiry into the event, and we carried out an independent investigation, culminating in the issue of an Improvement Notice on 20 March 2007. BNGSL's response should include developing a programme of work to improve compliance with PUWER 1998 Regulations 11, 15 16 and 19, starting with an in-depth machinery based risk assessment.

Thermal Oxide Reprocessing Plant

93. Since the Consent to restart was issued in early January, BNGSL has successfully processed two tanks of plutonium nitrate.

94. Reprocessing of fuel has still not commenced due to problems with the availability of downstream evaporation plants. HSE is currently considering a revised safety case, which will allow processing of the stored liquors from the THORP Feed Clarification Cell event.

95. There have been some indications that Advanced Gas Cooled Reactor (AGR) fuel cladding failures may have occurred within the receipt and storage ponds. BNGSL is keeping HSE appraised of the situation.

96. The removal of empty multi-element bottles (MEBs) from the receipt and storage ponds, to provide buffer capacity for incoming AGR fuel, requires the active commissioning of the MEB export facility. MEB decontamination problems have delayed the start of active commissioning and BNGSL is planning to undertake decontamination trials during the summer with the aim of resolving these problems.

Fuel Handling Plant (FHP)

97. As reported in the last quarter, BNGSL has carried out a detailed investigation into the cause of the elevated Cs-137 aerial discharges experienced in FHP in the last year. The cause has been attributed to aerosols resulting from the operation of the wind water line sprays around the ponds. BNGSL has changed the spray operating regime and the airborne activity levels have reduced to those last seen several years ago. HSE is now satisfied that there are no significant safety issues. The Environment Agency is the lead regulator for off-site discharges.

Magnox Reprocessing Operations

98. Reprocessing operations have ceased due to difficulties being experienced with downstream plants (the highly active liquor evaporators – see below). We continue to meet with BNGSL along with other key stakeholders to discuss the key issues surrounding the reprocessing of fuel in accordance with the Magnox Operating Programme. Asset care of such downstream plant is becoming an issue for HSE and we are currently discussing this with BNGSL senior management. Site wide inspections on asset care are planned for 2007/8.

Sellafield MOX Plant (SMP) Commissioning and Operation

99. The first European fuel campaign was completed and delivered to the reactor site. SMP MOX commissioning operations continued with the manufacture of pellets for another European customer. In the meantime, the rod manufacture and fuel assembly areas of the plant have been engaged in a large campaign change project, to switch over to a different variant of Pressurised Water Reactor (PWR) fuel for this customer. HSE are expecting to permission a number of modification proposals for this work.

100. Several discussions have been held with SMP about the higher than expected stocks of MOX material awaiting recycle into the process. The plant has produced a strategy for reducing this over recent years. HSE is monitoring delivery of this strategy and are receiving regular updates. However, to accommodate the high stocks of material that as yet cannot be recycled, there is a need for increased on-plant storage. Further meetings have been held with other regulators and SMP representatives about their proposals for interim storage of excess in line materials and the proposal for the first additional on plant store has been accepted in principle.

Higher Active Liquor (HAL) Stocks Specification

101. BNGSL continues to provide HSE with monthly reports summarising the quantities of highly active liquor HAL contained in the highly active storage tanks (HASTs). These figures, supported by our inspection activities, are used by HSE to judge whether BNGSL continues to meet the HAL Specification (Licence Instrument No 343) issued in 2000. This provides a limit on the amount of HAL that can be stored at any time and which requires HAL stocks reduction. Satisfactory performance of WVP coupled with the extended outage at THORP has meant that HAL stocks are currently well below the levels required by the Specification. Consequently, HSE is content that BNGSL has kept within the requirements of the Specification.

102. HSE's 2006 Biennial Review of the HAL Stocks Specification is now complete. Among other things, the Review recommends tightening the Specification to lock-in gains arising from THORP downtime. Work is now ongoing to implement the Review Recommendations, which will lead to the Specification being re-issued. In the meantime, HSE will continue to regulate the HAL stocks according to the existing Specification.

Highly Active Storage Tanks (HASTs) integrity

103. HAST cooling components have suffered over the years from corrosion. A number of cooling coils have been declared failed. A failure causes a breakthrough of activity into the cooling water circuits, which can lead to a radioactive release if not properly managed. HAST cooling coil failure rates and the location of recent failed coils has led to uncertainties over the ability of the newer HASTs to service the needs of the HAL stocks strategy. If the plant starts to deteriorate more quickly, then the ability of HALES to receive raffinates will be prejudiced.

104. BNGSL's present contingency plan is a project to dose the cooling water circuits with nitrates as a way of stopping, or at least reducing the rate of, corrosion failures. At present HSE has a number of outstanding concerns connected with nitrate dosing. One of the options to insure against these problems would be to build smaller, inherently safer replacement HASTs. In order for these to be effective on sensible timescales, work needs to start as soon as possible. HSE wishes to see new HAST designs developed to a stage where their viability could be judged alongside other options under consideration. BNGSL is in the process of evaluating the need for replacement HASTs as part of its response to the Recommendations of HSE's 2006 Biennial Review of the HAL Stocks Specification.

Highly Active (HA) Evaporator Integrity

105. There are currently three evaporators within HALES (referred to as Evaporators A, B and C). They are used to evaporate HA raffinate produced during reprocessing and to process effluent from WVP. Once concentrated through evaporation, the raffinate is called HAL. HAL is stored in the HALES facility prior to feeding to WVP for vitrification, which immobilises the waste for long-term storage and eventual disposal. The status of the evaporators (as of April 2007) is:

- Evaporator A: The failed coils on Evaporator A were isolated and HSE agreed to its restart under a revised safety case in February 2007. The evaporator restarted in March 2007 to support Magnox reprocessing.

- Evaporator B: This was shut down in December 2004 following activity breakthrough. 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. This project is still in its early stages.

- Evaporator C: The restart of Evaporator C planned for late November 2006 was delayed by BNGSL on conservative safety grounds until BNGSL could demonstrate that component thicknesses met safety case requirements. After further inspections and analysis, the evaporator was restarted in February 2007 to reduce the backlog of stored WVP effluents. This ensured that WVP operations were sustained and that reductions in HAL stored were achieved. The evaporator is currently shutdown for further inspections and HSE is currently considering a revised safety case for its operation to allow liquors from the THORP Feed Clarification Cell event to be processed through this evaporator.

106. The increase in the numbers of experienced engineers working on the evaporator recovery programme has led to significant improvements, for example in the rate and quality of safety case production, and with the developments of new techniques for the non-destructive testing of evaporator heating/cooling components.

107. HSE continues to engage BNGSL on the provision of new evaporative capacity. Groundworks for Evaporator D have already started, and HSE anticipates receiving the pre-construction safety case for Evaporator D shortly. HSE is working closely with BNGSL, the EA and the NDA on opportunities to accelerate Evaporator D whilst ensuring that the safety of design and construction is not compromised. BNGSL is also considering the need for further evaporative capacity (Evaporator E).

108. The position on evaporative capacity is evolving quickly and it is not possible at present to be certain as to the implications. The restart of Thorp reprocessing has already been delayed and the reprocessing of Magnox fuel will be below the normal throughput rate. This has knock-on implications for other plants at Sellafield.

Waste Vitrification Plant (WVP)

109. The performance of all three vitrification lines has been variable recently as a result of planned and unplanned outages. Line 3 exceeded its production target in 2006/07, although overall WVP performance was less than anticipated because of the outages. There have been no significant effects on HAL stocks reduction.

110. Line 1 is undergoing extensive refurbishment associated with BNGSL's link with COGEMA; this work should lead to lasting improvements to the throughput and reliability of Line 1, and similar work will be undertaken on Line 2 in due course. Line 2 recently returned to HAL feed and Line 1 is expected to follow shortly. Line 3 is currently in planned rebuild following a successful eight-month campaign and is expected to return to HAL feed in mid June 2007.

111. WVP continues to experience difficulties with the processing of radioactive waste from the breakdown cells, after a period of an improved performance over the last two years. These cells hold a significant amount of waste that originates largely from failed vitrification components removed during vitrification line rebuilds. If wastes volumes accumulate to an extent that further rebuilds are not possible then it may become difficult to maintain progress with vitrification, which

in turn could have consequences for HAL stocks reduction. HSE did carry out a radwaste management inspection in WVP (9 May 2007). It concluded that BNGSL does not apply sufficient management focus to waste clearance and does not have adequate inventory of the waste transferred into the breakdown cells. A further inspection is planned for later in June 2007 looking at waste transport from WVP to Miscellaneous Beta Gamma Waste Store (MBGWS) after which the findings of both these inspections will be conveyed to BNGSL.

Residue Export Facility (REF)

112. REF is progressing reasonably well though it is running slightly behind programme. Inactive commissioning is proceeding in stages. HSE continues to maintain regular contact on this strategically important project in advance of the start of active commissioning later in 2007. 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 BNGSL to learn from a number of minor conventional safety incidents and to improve safety awareness. The first phase of the safety case for active commissioning was submitted recently.

Plutonium Finishing and Storage

113. On the 10 October 2005, we issued BNGSL with Consent under LC31 (2) to restart feeds to the conditioning vessels of Finishing Line 5 at Sellafield. This consent was subject to 13 commitments from BNGSL to address safety related issues arising from our assessment of their submission for restart of the plant. Currently, the only outstanding commitment is the provision of a permanent neutron monitoring system in the finishing line glove boxes. This project is progressing in accordance with a revised programme but there has been some slippage and delivery of a fully commissioned system is now expected in July 2007.

Floc Retrieval Plant

114. Due to operational challenges, HSE gave a second extension to active commissioning of the Floc Retrieval Plant to 31 July 2007, following a request from BNGSL. However, recently performance has been significantly better and BNGSL are expected to seek permission to go into full operation in July 2007.

Encapsulated Product Stores

115. The site preparation and foundations phase of the project to deliver the new Encapsulated Product Store (EPS3) is still progressing but it has again fallen behind schedule and is now expected late June 2007. HSE has advised BNGSL that provision of suitable and sufficient storage is required in adequate time to avoid disrupting site operations for enhancing safety.

Waste Operating Unit

116. This operating unit consists of facilities for the decontamination of metals down to exempt levels, for the volume reduction of LLW, and for the volume reduction and safe package storage of Plutonium Contaminated Material (PCM). Most of the individual facilities have low radiological risk; hence, HSE inspection effort is appropriately limited. Effort will be mainly focused into 2 areas, the Waste Treatment Complex and the PCM Stores.

117. The Waste Treatment Complex is currently shutdown following a major injury to a worker on 24 October 2006, caused by inadequate control of emergency stop and isolation systems associated with the Supercompactor Glovebox. HSE Inspection effort will therefore focus on BNGSL's response to its Board of Inquiry into the above incident, and the Improvement Notice issued by HSE on 20 March 2007.

Emergency Exercise – 22 March 2007

118. Level 1 Emergency Exercise "Fieldfare" was carried out on the 22 March 2007 to demonstrate BNGSL's response, under the Emergency Plan, to an incident associated with B30. The scenario was both realistic and challenging and is considered by HSE to be a well prepared test of the BNGSL Emergency Response.

119. A number of HSE inspectors observed the exercise from a variety of locations and judged the exercise to be an acceptable demonstration of BNGSL's emergency preparedness on the day, with particularly strong performances in the Incident Contact Centre and Site Emergency Control Centre. A good performance was provided by the Access Control Point team who were under some pressure because of the space constraints, and a fairly challenging scenario. The Fire & Rescue Service and response teams also performed well.

120. The transfer of a simulated contaminated casualty to and through the reception process at the West Cumberland Hospital, Whitehaven was carried out. The inclusion of the hospital into this exercise did give us the opportunity to observe this interface and the contamination control at the hospital, which were both, considered to be of a good standard.

Strategic Interventions

121. HSE are pursuing a number of strategic interventions with the aim of securing long term site wide safety improvements by applying leverage at the highest level within BNGSL. These interventions are focused mainly at across site issues where evidence has been accumulated by inspection effort and it is considered by HSE that longer term improvement plans are needed. These interventions are aimed at securing improvements in such areas as: i) safety case quality; ii) corporate capability; iii) improve safety governance; iv) safety culture; v) operational experience/feedback; vi) strategic decision making; vii) hazard reduction; viii) asset care, along with an increased focus on High Level Waste(HLW).

122. One area of work, which is well underway, is the Sellafield Corporate Intervention Strategy (SCIS). The aim of this project is to work with BNGSL to achieve sustained improvements in managing for safety and safety culture. The project covers leadership, safety culture, organisational learning, organisational infrastructure, competence management, lessons for improvement following HSE/BNGSL interventions and key performance safety indicators. Open and positive discussions have been held this quarter with BNGSL management and further interventions on site are planned for the next quarter. This is being undertaken in a way that does not impede or take over the Licensee's responsibilities, and preserves regulatory independence.

Stakeholder Engagement

123. HSE have undertaken a number of initiatives in the last quarter to improve communication with stakeholders with interest in the Sellafield site.

124. Norwegian Regulators - Presentations were given to Norwegian Regulators and a joint visit to Sellafield (17 and 18 April) carried out to provide a better understanding on the role of HSE and the quality of inspection work carried out at Sellafield.

125. Nordic Joint Conference - This conference, which was set up jointly by the Bellona Foundation, 'Guardians of Our Common Seas' and the British Nuclear Group was held on 21-22 May 2007. The purpose of the conference was to discuss the THORP restart and the accelerated decommissioning and clean-up activities at Sellafield. The conference was designed to continue the open and frank discussions regarding concerns raised by Nordic stakeholders.

126. HSE gave a presentation on the way health and safety matters are regulated within the UK, the national and international standards utilised in regulating nuclear facilities and the extensive assessment and inspection work undertaken by HSE prior permitting the THORP plant to restart. HSE also pointed out that an IAEA peer review of the UK regulatory system had been undertaken last year, and the IAEA team had concluded that the UK system was robust.

Spent Fuel.

127. The HSE together with the EA have been developing a triangular working relationship with the NDA and British Nuclear Group on spent fuel. The aim is to ensure that the UK has strategies and programmes for dealing with the major hazard spent fuel presents in terms of safety, the environment and cost through to its final disposal. Our main focus continues to be on the Magnox fuels via the Magnox Operating Programme (commonly known as the MOP), and AGR fuel. British Nuclear Group developed the MOP as part of the closure programme for the remaining Magnox stations and to meet the UK's commitment to comply with OSPAR in 2020 of essentially, zero discharges into the sea. Following the evaporator issues in High Level Waste Plant, we have been discussing with BNG the minimisation of wetted Magnox fuel pond stocks for the event of a prolonged interruption of reprocessing leading to long fuel dwell times in ponds. We are seeking to develop the Spent Oxide Operating Programme (OOP) for AGR spent fuel, as soon as possible along the lines of the MOP. Recently, increasing caesium levels (indicative of corrosion of some AGR fuel) occurred in one of Sellafield's spent AGR fuel ponds. This has stressed the importance of developing an OOP as soon as possible to ensure that spent AGR fuel is managed to meet safety and environmental requirements both now and into the future until final disposal.

Legacy Ponds and Silos

128. Following a satisfactory inspection of the progress made against HSE's Improvement Notice on maintenance elements in relation to Legacy Ponds & Silos, the Notice has been discharged.

129. HSE has followed-up its concerns over delays to the provision of the Sludge Packaging Plant (SPP1) Buffer Tanks.

Low level Waste Repository (LLWR)

130. Shadow working at the LLWR has progressed satisfactorily and has been acknowledged as complete. The site is currently completing a commitment to remove its bulk quantities of PCM before relicensing takes place.

GENERAL SECTION

Springfield Fuels Ltd

131. Springfields Fuels Ltd (SFL) continues to work on the programme to process the legacy residues currently held on site. SFL intend to use, and modify, some of the Magnox Fuel Production Plant facilities to process some of these legacy residues. These plants were originally due to be decommissioned in the next few years. We will ensure SFL demonstrates that the facilities used to process the residues are fit for purpose. We welcome the improvements made by SFL across the site in relation to the storage of waste and residues.

132. We have been satisfied with the recent safety performance on the site.

URENCO - Capenhurst

133. The expansion of operations and facilities across the site continues. Equipment is now being installed in the latest extension to one of the site enrichment plants and construction work on a large new raft storage area has been completed. The design work for a major project for the site, the Tails Management Facility is also progressing. This facility comprises a number of plants which will deconvert the URENCO stock of Hex tails materials into a more stable oxide form.

134. Recent inspections of the operations at UCL have raised no significant issues.

UKAEA General - Restructuring Project

135. This project is seen as a high priority and effort has been diverted from inspection activities to review the submissions made to date by UKAEA. Further effort is needed to resolve the issue of the number of Parent Body Organisation (PBO) secondees, embedded within the Site Licensee Companies (SLCs).

UKAEA - Windscale

136. UKAEA continues to develop its thinking, in conjunction with Nexia, on how to improve the management of B13 and their operational interactions. Improvements are key to the effective delivery of the engineering improvement plan. A recent review of the B13 ventilation system indicates that significant engineering improvements are required, to provide a fit-for-purpose system that will support operations into the future.

UKAEA - Harwell and Winfrith

137. Both sites continue in their progressive and systematic reduction of hazards through post operational clean out, solid intermediate level waste recovery (at Harwell) and secondary containment deplanting at both steam generating heavy water reactor and Dragon reactors at Winfrith. Both sites face a period of uncertainty and staff concern as the reality of the NDA's proposed resourcing constraints for 2008 and beyond is recognised and planned for. Against the background of the cuts, dialogue continues between HSE, UKAEA and other stakeholders regarding the proposals to cluster together the two sites into a

single, stand-alone Site Licensee Company that will be ready for NDA's proposed competition of both sites.

GE Healthcare Ltd

138. HSE has written to the licensee requiring it to remedy inadequacies in its arrangements for the control of modifications to the plant and processes.

139. In December 2006, an unauthorised modification to a process had resulted in a release of radioactive iodine into a building. Several workers inhaled some, though the highest radiation dose received did not exceed the statutory limit. HSE carried out a preliminary investigation, which identified as a further issue, the inadequacy of the licensee's arrangements for dealing with incidents involving iodine.

140. The site inspector attended a meeting between the site and householders living next to it. The main safety-related topics were the presence of tritium in groundwater below the site and the proposal to remove some soil next to the site that contains a small amount of radium.

141. HSE arranged and hosted a visit to Amersham by four French regulators. The Autorité de Sûreté Nucléaire members (who included a Commissioner) wished to compare the Amersham plant with its French equivalent at Saclay, which has reportedly had much regulatory attention in recent years.

Imperial College

142. The repeat demonstration emergency exercise was held in April 2007. Though the College had made a number of improvements to its facilities and arrangements, the demonstration was still judged to be unsatisfactory. A programme for recovery from this position is being discussed.

143. Imperial College have submitted to HSE its Pre-Application Scoping Report for the decommissioning of the Consort Research Reactor under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations. HSE have undertaken a public consultation on this Scoping Report, which ended on 18 May 2007. HSE are considering the comments received and will publish their Pre-Application Opinion within 21 days of the end of the consultation period i.e. 8 June 2007.

BNGSL Capenhurst

144. We inspected the licensee's ongoing decommissioning projects, which continue to deliver tangible reductions in the site nuclear hazards. The recent discovery of a bat colony has delayed some decommissioning demolition work. We are encouraging the site to expedite the despatch (for recycling at Springfield) of the recovered enriched uranium residues, which arose from the recent processing of redundant plant equipment.

145. In contrast to the licensee disposing of a record quantity of solid low level and very low-level radioactive waste in the 2006/7 financial year, an issue has now emerged, that due to available funding, no solid low-level waste is planned to be disposed of, to the LLWR, in 2007/8. This proposed suspension of solid low-level radioactive waste disposals represents a significant step change in the radioactive waste disposal performance of the licensee.

UKAEA – DOUNREAY

Dounreay Cementation Plant Recovery

146. Recovery work following the Materials Testing Reactor raffinate spill in 2005 is progressing safely and in line with the dose budget although the work is taking much longer than expected.

Dounreay Shaft

147. The groundwater inflow to the shaft has reduced following completion of the grout blocker ring around the shaft and the roof over the shaft. At the same time, the dissolved radioactivity concentration has halved, possibly due to an increase in pH in the shaft liquor.

Emergency Exercise

148. We considered that the Level 1 emergency exercise held on 2 May 2007 was an adequate demonstration of the Dounreay emergency arrangements. The scenario was challenging since it involved simultaneous contaminated alkali metal fires in two adjacent buildings.

Enforcement Action

149. We are satisfied that UKAEA have complied with the requirements of the two Improvement Notices against Licence Conditions 4 and 25 served on them in January 2007 following our investigation into a plutonium intake at a facility on the Dounreay site. The Procurator Fiscal has considered the report of our investigation into this matter and decided that there is a case to be heard against UKAEA under Section 2 of the Health and Safety at Work etc Act 1974. A preliminary hearing was held at Wick Sheriff's Court on 18 May 2007. The case was deferred until 14 June 2007.

Safety Cases

150. We have raised issues with UKAEA on their arrangements for the production of safety cases and compliance with Licence Conditions 14 and 15. We have asked the Dounreay Nuclear Safety Committee to review the arrangements for safety case production and, in particular, the use of extensions, which we believe, should only be used in exceptional circumstances.

Dounreay Fast Reactor (DFR) and the Prototype Fast Reactor (PFR)

151. We are keen to see UKAEA progress with the treatment of liquid sodium and sodium/potassium (NaK) from the reactors in order to remove some of the highest hazards on the Dounreay site.

152. The NaK disposal plant at DFR has successfully completed the inactive commissioning phase. UKAEA is about to request our agreement to proceed to the active commissioning phase using contaminated NaK from the reactor vessel.

DEFENCE NUCLEAR SITES

Defence Facility Regulation

153. In general, the safety performance at the defence facilities inspected by us, namely Aldermaston and Burghfield (Atomic Weapons Establishments – AWE), Devonport (Devonport Royal Dockyard Ltd - DRDL), 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 - RRDL) and the Vulcan Naval Reactor Test Establishment at Dounreay, continues to be satisfactory.

154. Intervention strategies, developed jointly with MoD's Defence Nuclear Safety Regulator (DNSR), are being delivered across the Naval Nuclear Propulsion and Nuclear Weapons Programmes through the use of Project and Programme working. This approach is maximising the use of our resource through a process of joined up working and complementary regulation to ensure that intervention activities are proportionate and appropriately targeted.

MoD General – UK Staged Improvement Programme (SIP)

155. We continue to engage with the MoD UK-SIP, the purpose of which is to inform investment decisions across the MoD Naval Nuclear Propulsion Programme estate. Early regulatory engagement with the process is a high priority. This is to ensure that appropriate attention is given to nuclear safety related improvement projects with subsequent delivery, and risk reduction to a properly prioritised operational programme.

Devonport

156. Babcock International Group PLC announced on 10 May 2007 that the company had entered into an agreement with the current owners (KBR/Balfour-Beatty/Weir Group) for the acquisition of Devonport Management Limited (DML). We will continue to monitor these developments and engage with relevant stakeholders to ensure that, should there be any proposals for licensee or organisational change, these matters are properly conceived and implemented. Currently the licensee (DRDL) and its corporate and operational leadership and management structures remain unchanged and we are confident that nuclear safety related activities taking place at the site remain secure through the licensee's existing arrangements.

157. We have continued to monitor MoD's progress towards implementation of the strategy, through the FNF (Future Nuclear Facilities) project, for dealing with laid up submarines at Devonport prior to the commencement of decommissioning. Three fuelled submarines are now stored at Devonport awaiting the DDLP (Defuel, De-equip and Lay-up Preparations) process which cannot commence until improvements to the existing dockyard facilities are completed. The MoD has advised that long term funding for the FNF project has been secured and that the detailed design and analysis work is proceeding. The current programme suggests that the new facilities can be completed by 2012, but we are pressing for an improvement to this timescale. We are satisfied that, subject to satisfactory monitoring arrangements, the redundant submarines can be safely stored in a fuelled state, until the new facilities are brought into service.

158. We advised in our report for the previous period that following our investigation into an event within the Low Level Refuelling Facility, an Improvement Notice had been served identifying specific areas for improvement to operator training. We can confirm that the licensee placed a high priority on the shortfalls in performance and has provided a satisfactory response within the required timescale. It was reassuring that the licensee has recognised the learning opportunity and put in place a site wide improvement plan to address the issues.

Rosyth

159. The work to decommission the majority of the facilities used for nuclear activities (RD83 Project) is progressing safely and to programme. Preferred routes for removing waste from the site have been established and with our guidance and encouragement, there is evidence that an integrated approach to waste management is being developed across the defence nuclear sites and facilities. The overall project objective is to establish conditions such that the site can be delicenced.

Barrow

160. Through our planned intervention activity we continue to monitor and regulate the licensee's nuclear safety performance against the forthcoming significant project milestones of Astute Boat 1 Launch in June 2007 and active commissioning (Power Range Testing) in January 2008. We are working in partnership with the licensee in support of its programmes for continuous improvement of its safety performance, and in particular encouraging further development of its internal regulatory function. We are satisfied that nuclear safety continues to receive an appropriate high level of attention within the business and performance remains satisfactory.

Derby

161. We are completing our assessment of the licensee's Periodic Safety Review (PSR) submission for the Neptune Test Reactor. We will make a statement by the end of June 2007 with respect to the adequacy of the basis to support a further 10 year period of operation.

Portland Nuclear Submarine Operational Berth

162. We are continuing to offer guidance to Dorset County Council and other stakeholders in respect of plans to put in place off site emergency arrangements, in accordance with the Radiation (Emergency Preparedness and Public Information) Regulations, for an operational berth at Portland Port. The arrangements are being tested through a number of targeted emergency exercises that we are witnessing to ensure the necessary standard of performance has been demonstrated prior to the planned use by a Nuclear Powered submarine later in the year.

AWE (Atomic Weapons Establishment)

163. We have been working with AWE, MOD and other regulators to ensure that nuclear safety issues continue to be properly considered, including at the outset of the proposed programme of substantial investment at AWE. We have now agreed AWE's Nuclear and Explosives Safety Programme (NESP). The purpose of the NESP is to identify desired safety improvements, including the sequence and relative priority of these activities. These include improvements to both

physical infrastructure, either by construction of new facilities or modifications to existing ones, and to corporate management systems. We have adopted a permissioning approach to ensure efficient delivery of the improvements, aided by early engagement between ourselves and AWE, as appropriate, to ensure the improvements are supported by adequate safety cases.

164. We issued a Licence Instrument agreeing to a contained hydrodynamic trial at Aldermaston. This was the first such trial under the nuclear licensing regime.

165. We are also assessing three periodic reviews of safety for particular facilities at AWE.

166. Following the annual Level 1 Emergency Exercise at Aldermaston we have asked AWE to review and subsequently re-demonstrate some of their arrangements that could be particularly challenged by "out-of-hours" working.

ND ISSUES

Inspection Benchmarking Exercise

167. The ND Inspection Co-ordination Group (ICG) has recognised the need to improve the consistency and quality of its inspection process. Several improvements are being pursued including a series of benchmarking inspections, covering several nuclear licensed sites and several licence conditions. The first of these proposed benchmarking exercises is planned for 2007/8 and will effectively act as a pilot for any future benchmarking inspections. The project proposals include:

i) compare performance of licensees
ii) identify good and weaker practices in licensee arrangements
iii) identify and secure site improvements
iv) evaluate consistency of application of HSE's ND guidance and historical inspection markings
v) recommend revision of internal guidance
vi) make recommendations regarding future benchmarking inspections

168. The benchmarking inspection will cover a minimum of 4 sites and maybe extended to 6. The first Licence Condition to be covered is LC23 Operating Rules. The first on site inspection will start at Hartlepool on 25 to 29 June 2007. Sites to be covered include Reactor Sites, Nuclear Fuel Cycle Sites and Defence.

Security Informed Nuclear Safety

169. We are continuing to work closely with OCNS (Office of Civil Nuclear Security) on security informed nuclear safety matters. Synergies have been found with OCNS and the operational UK Safeguards team, both of which have joined Nuclear Directorate.

170. We hosted a three day visit by a Director-General of the Canadian Nuclear Safety Commission on security informed nuclear safety, during which, the approaches taken by the UK and Canada in relation to maintaining safety of nuclear facilities in the light of possible terrorist activity were reviewed.

171. The Canadian regulators were impressed with the work undertaken in the UK, and the approach taken by the Nuclear Inspectorate that engendered a positive response from Licensees with demonstrable improvements in safety. The design

basis for new nuclear facilities was discussed together with possible methodologies to counter extreme hazards.

INTERNATIONAL

INRA

172. A meeting of the International Nuclear Regulatory Association was held in Madrid on 23, 24 and 25 May 2007 (Spain now holds the Presidency). Agenda items included a members report on key nuclear events and developments in their country, International Regulatory Review System, waste management, Convention on Nuclear Safety and Safety Culture. As well as a general update on UK regulatory issues and organisational changes, we presented key lessons arising from the THORP leak.

WENRA

173. ND participates in the WENRA Waste and Decommissioning Working Group (WDWG) which has produced draft safety reference levels for the storage of waste and fuel, and for decommissioning. A national self-assessment has been carried out by each country in which the storage reference levels were benchmarked against national legislation and regulatory guidance. At the last meeting in May 2007, the national self-assessments underwent independent review by other countries, with the participants working in teams of four. The benchmarking work has shown that the requirements of the majority of the storage safety reference levels are already fully included in the UK regulatory documentation. For the few, however, minor amendments to some ND Technical Assessment Guides are required so that all the detailed requirements are reflected. A similar self-assessment exercise is about to start for the decommissioning safety reference levels, the results of which will be reviewed at the next meeting of the working group in November.

174. The WENRA Reactor Harmonisation Working Group (RHWG) has completed its work in developing a set of reference levels for harmonisation for existing reactors across Europe. The levels themselves were signed onto by the main WENRA group and placed on the WENRA website. The Nuclear Directorate has chaired this group for the last three years and the chair has now been handed over to the French regulator. WENRA is now reviewing the mandate of the group and one issue they are discussing is whether to extend the work to cover new reactors. The group is also likely to be reviewing the action plans that each country is developing to achieve harmonisation by 2010. The RHWG comprises senior regulators from 18 countries and is well placed to take such work forward.

IAEA IRRS

<u>Background</u>

175. The International Atomic Energy Agency (IAEA) provides an Integrated Regulatory Review Service (IRRS) at the request of Member States to provide a comparison of national nuclear safety arrangements with the IAEA Safety Standards. The IRRS programme provides for self assessment; planned improvements; peer review; and reporting. To inform ND's input to HSE's submission to DTI's energy review in 2006, in particular HSE's approach to regulating new nuclear build, IAEA was invited to conduct a modular IRRS review in March 2006 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.

176. ND Actions

- Prior to the 2006 IRRS, ND instigated a self-assessment in 2003. The invitation to IAEA for the IRRS signalled UK's intention to embark on a programme of regulatory during the next two years. The actions identified from the IRRS report are being progressed by existing ND working groups.
- The ND Management Board established a project to provide oversight of the various work streams and to monitor follow up activities. Due to resource constraints, this project has made limited progress. To reinvigorate the work a contract has been approved for an external contractor to monitor the progress achieved post-IRRS by October 2007.
- Subject to resource constraints, the current proposals are for ND to hold a further self assessment later in this financial year and invite a second modular IRRS mission in financial year 08/09.

Other IRRS Missions

177. ND Management Board members have supported IAEA IRRS missions to other countries. Notably, Dr Creswell led the mission to France in 2006, and others are participating in the missions to Japan and Pakistan in 2007. In addition, Dr Weightman has been invited to lead the mission to Germany in 2008.

Convention on Nuclear Safety

178. The UK report to the three yearly Convention on Nuclear Safety (CNS) is produced by HSE/ND on behalf of DTI, the lead Government Department. The next Review meeting of the parties is in April 2008. Prior to that the UK Report has to be submitted by 28 September 2007. An ND project team, supported by an external contractor and inputs from government departments, agencies, regulators and licensees, is in the process of producing the Report. Dr Weightman will lead the UK team at the Review meeting.

International Commission for Radiological Protection

179. The ICRP agreed its new fundamental recommendations at its meeting in Essen in March 2007, and is expected that the recommendations will be published in autumn 2007. The headline is that overall radiation risks have not changed significantly from publication 60, and that ICRP continue to use the Linear No-Threshold model of dose versus risk to extrapolate to low doses. ICRP have taken account of new biological and other information in a way that maintains as much stability in the recommendations as is consistent with the new information. Thus much has stayed the same as ICRP60, although there are various changes, including some changes from the January 2007 draft. Key points are:

- Retention of the 3 basis principles of radiation protection, i.e. Justification, Optimisation, and Dose Limits; although much greater emphasis is now placed on optimisation and the use of constraints.
- Clarification of the use of practices & interventions; now ICRP use: planned situations, existing situations, and emergency situations.
- Reversion to ICRP60 wording for Justification (the Jan07 draft had required consideration of alternative practices rather than whether the practice in question produces a net benefit).
- Cancer risk for the population has gone down from 6.0 % per Sv to 5.5 % per Sv, the dose limits having stayed the same.
- Introduction of a chapter on the protection of the environment.
- Although the dose limit for the lens of the eye have been retained, new data on the radio-sensitivity of the eye to be considered when available (this could result in a reduction of the dose limit).
- Exclusion/exemption - numbers in January 2007 draft recommendations have been deleted; they will be in Scope Document which ICRP recently consulted on.
- Some changes in relation to emergency situations including a greater emphasis on projected dose in optimising protection rather than relying solely on averted dose.
- Retained Dose and Dose Rate Effect Factor (DDREF) of 2 - there had been some consideration of reducing it.
- Now heritable disease risk factors only cover the 1st two generations as ICRP considers this adequately covers heritable risks.
- Risk coefficient for cancer now based on incidence data rather than mortality data, taking account of the proportion of fatalities.
- Still have work areas classified and not workers (this differs from the Euratom Directive).

180. It is expected that the on-going revision of the IAEA and Euratom Basic Safety Standards documents will take the ICRP recommendations into account to the extent practicable.