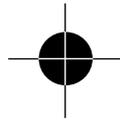
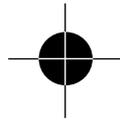


Relicensing the Atomic Weapons Establishment sites to AWE plc



**Report on the performance of
AWE plc as a licensee twelve months after the relicensing of
Aldermaston and Burghfield on 1 April 2000**

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EXECUTIVE SUMMARY

The safety of nuclear installations in the UK is the responsibility of holders of nuclear site licences and is assured through a permissioning system of regulatory control. A nuclear site licence, which can only be granted to a corporate body, permits the use of a site for specified activities. Thus, for most sites, licensing applies throughout the lifetime of an installation from design and siting, through construction, commissioning, operation, and modification to eventual completion of decommissioning. AWE, however, had been operating for many years before being first licensed in July 1997 when its legal immunity from the Nuclear Installations Act 1965¹ was removed.

In 1997, HSE's Nuclear Installations Inspectorate (NII) granted licences to Hunting BRAE Ltd to manage the operation of the Atomic Weapons Establishment (AWE) sites at Aldermaston and Burghfield. The Ministry of Defence (MoD) contract with Hunting BRAE expired on 31 March 2000, and the Ministry decided that AWE plc should hold the licences in future. As nuclear site licences cannot be transferred from one party to another, the changeover in the management of the sites necessitated the revocation of the nuclear site licences held by Hunting BRAE Ltd, and the grant of new licences to the new operator, AWE plc. The new licences came into effect on 1 April 2000 and the NII published a report² on the licensing exercise in May 2000.

At the time of relicensing, the Secretary of State for Defence gave a commitment in a House of Commons Written Answer³ to review the safety performance of the new licensee after 3 and 12 months. HSE's 3 month review was completed and a report published in July 2000⁴. It concluded that health and safety had been successfully managed during the change of contractor and licensee. The purpose of this report is to review the performance of AWE plc over the first twelve months under its new management contractors, AWE Management Ltd. Performance has been reviewed continuously over the period as part of the routine regulatory oversight augmented by an additional team inspection at the end of the period. Close liaison has been maintained with the Environment Agency (EA) over the 12 month period and two Environment Agency inspectors worked with the HSE team on the team inspection. This was to ensure that, where HSE and the EA have joint interests, the opportunity has been taken to explore and report on matters of mutual concern.

A variety of areas of good performance have been identified during this period. Perhaps the most important has been the attention given to waste management and decommissioning by the licensee, and the progress that has been achieved over the review period. This work, as well as normal operational tasks, has been undertaken whilst radiation doses to the workforce (both contractor and employee) have been reduced. We are encouraged to see that targets have been set for further reductions in radiation dose. We expect this to be achieved by the proposed new ways of managing radiation dose associated with projects, the introduction of remote decommissioning/ dismantling techniques, and reductions in monitoring requirements for stored materials. We are encouraged that our concerns over succession planning have been addressed, at least for the senior managers, and now expect the process to be extended to staff who hold the licensee's technical expertise. This will ensure that the licensee will continue to have a sustainable organisation capable of meeting its duties under the licence in future. Our checks on the working of the Nuclear Safety Committee (an advisory body on nuclear safety matters required to be established under Licence Condition 13) indicate that this is working effectively. It also has links with the Warhead Safety Committee, a

development which we welcome. We were also pleased to see that the company Assurance function had been successfully reorganised after thorough review of assurance functions and alternative structures.

Positive Inventory Verification (PIV) is required to ensure that fissile material in storage remains intact and secure. However, this process is one of the chief contributors to doses to staff. AWE plc has proposals to extend intervals between the checks and is considering improved containers. Both these lines of action are welcomed.

Progress has been made in the area of conventional safety: for example campaigns aimed at reducing back injuries have been completed and facility-specific occupational health staff are being introduced to continue to address these issues. The Integrated Hazardous Substances database, put in place on Aldermaston to respond to Control of Major Accident Hazards Regulations (COMAH) requirements, is seen as a development that should provide an adequate level of control to allow the site to maintain its lower tier status: HSE/ EA inspectors will be reviewing its implementation as part of the regulatory overview.

Turning now to areas where further improvement is necessary, we were disappointed that progress of arrangements under Licence Condition 12 (Duly Authorised and other Suitably Qualified and Experienced Persons) has been very slow. The licensee has yet to develop fully satisfactory arrangements to ensure that all staff who carry out safety related activities are suitably qualified and experienced, but we have now agreed a target date for end of May 2001. This position has also affected the production of the staffing baseline document (required under Licence Condition 36, Control of Organisational Change) which has progressed little in the past 12 months. This document is intended to demonstrate the licensee has an adequate organisational structure and employee resources to be able to continue to deliver its duties under the licence over the lifetime of the licensee. We will be concentrating our effort in the coming months in this area to ensure a satisfactory position is reached. Licence Condition 36 provides powers which enable the NII to halt changes which it thinks will be detrimental to safety: these powers will be used in the interim period should it be considered necessary.

We are also concerned about the situation we found when looking at the control of fissile material. Difficulties identified in the 3 month review over the production of certification documentation have not been satisfactorily progressed. In addition, infringements of control arrangements are occurring more frequently than is desirable, indicating the arrangements need to be reconsidered. Operational constraints associated with fissile material control are also limiting the decommissioning of some facilities – a longer term problem that will need to be addressed. The licensee has made proposals to address the short term issues and, if they are implemented to our satisfaction, they should solve the problems. We judge the situation not to be so severe that immediate enforcement action is required. However, it is our intention to continue to press AWE to institute the necessary improvements and we shall return to AWE with a small team of inspectors who specialise in this area later this year to check progress on this issue.

Whilst other areas for improvement are listed in Annex 1, two further issues are worthy of mention here. The first is that very important part of any organisational safety structure which reviews incidents and events (both internal and external). This function extracts the lessons for the organisation and feeds them back into the management chain with the

intention of ensuring similar events do not happen again. Our checks indicated that, while systems appear to be in place, the evidence suggested they are limited in effectiveness. This important issue will be kept under review as part of the routine regulatory oversight. If the position does not improve in the next 6 months, a small team will look at this area specifically and make recommendations for any further necessary actions.

The second issue is in the decommissioning and waste area. During the team inspection, we learned that decommissioning of an elderly production facility is to be delayed. In addition, we learned that the implementation of a process which is central to the long term strategy for waste and the handling of certain special nuclear materials is to be postponed indefinitely. Since both these decisions impinge on strategies previously agreed with the NII, we were disappointed that the licensee had not realised its responsibility to discuss these important changes with us before finalising its position. Indeed, in the case of the delay to decommissioning, the change to a formally Approved programme requires the licensee to provide a formal justification for the change and obtain our agreement. We will assess the justification for this change as part of our routine regulatory process. The central issue of how the licensee includes the regulator's concerns in its decision making process needs to be resolved as a matter of urgency .

In conclusion, the review at three months after the change of contract and licensee found that health and safety had been successfully managed during the transition by AWE plc. Whilst areas for further development and improvement have inevitably been identified as a result of routine inspection activities by the HSE over the last 12 months, many areas of good practice and innovative thinking have also been identified. The inspection activities over the 12 months have confirmed the safety performance of the licensee continues to be satisfactory. It is our judgement that the management systems put in place, and those being developed, if adequately implemented, should deliver a satisfactory level of safety performance in the future.

This report represents the final response to the commitment given by the Secretary of State for Defence to review the safety performance of the Atomic Weapons Establishment under the new management contractor. Issues raised in the report will now be progressed as part of normal regulatory business. We will continue to report quarterly to the Local Liaison Committee on our regulatory activity.

RELICENSING THE ATOMIC WEAPONS ESTABLISHMENT SITES TO AWE plc

Report on the performance of AWE plc as a licensee twelve months after the relicensing of Aldermaston and Burghfield on 1 April 2000

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- **Annex 1:** Action List for areas requiring further development and improvement by AWE plc.
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INTRODUCTION

Background and purpose of report

1. Hunting BRAE's 7 year contract to manage the AWE sites at Aldermaston and Burghfield expired on 31 March 2000. Following a tendering exercise during 1999, the MoD's Defence Procurement Agency appointed AWE Management Limited (AWE ML), a consortium comprising BNFL, Lockheed Martin and SERCO, as the new management contractor. The Defence Procurement Agency also wanted the new licences to be held by AWE plc, the employer of the labour force, so that any future change of the management contractor would not result in a requirement to relicense or responsibility reverting to MoD. The sites are therefore being operated by AWE plc, which holds the new site licences. AWE ML now owns all the shares in AWE plc, with the exception of one Special Share which is retained by the Secretary of State for Defence.

2. Following public criticism of the past safety record of BNFL and Lockheed Martin in the weeks leading up to relicensing of the sites, Her Majesty's Chief Inspector of Nuclear Installations stated that he would provide reports to the Secretary of State for Defence on the performance of the new licensee after 3 and 12 months of operation of the new contract. A House of Commons Written Answer³ by the Secretary of State for Defence on 29 March 2000 gave commitments that public reports on these reviews would be issued after 3 and after 12 months following relicensing.

Scope of report

3. This report is based on the findings of the NII's routine regulatory oversight, and a review of the topics that were identified in the three month review of performance. It looks at areas which are considered important for current safe operation of the facilities, and also at longer term issues such as management of radioactive waste and decommissioning of redundant facilities.

Strategy for performance assessment

4. Progress over the twelve month period has been monitored using the established planned inspection programme and meetings with all levels of AWE plc management to confirm that agreed safety improvement plans were being kept on schedule. Performance indicators have also been used to monitor the Company during the three-month and twelve-month review periods. These were chosen to ensure that a range of diverse safety requirements was examined to provide a reliable indication of the new licensee's ability and commitment to meet HSE's expectations. To augment the findings of routine inspection activities, a team inspection was carried out by six HSE inspectors, comprising five NII inspectors and one explosives inspector: two EA inspectors also assisted.

ASSESSMENT OF PERFORMANCE

Performance indicators and commentary on findings

5. Fifteen key areas of safety were selected to assess the performance of AWE plc since 1 April 2000. These areas were selected to give an overview of a wide range of safety

practices and performance. They were developed from routine inspection findings, previous work done during the relicensing of AWE plc, and from findings in the 3 monthly safety review. They include issues important for safe operation of facilities and longer term issues such as radioactive waste handling and decommissioning.

6. The current position has been established by inspections under a planned inspection programme, the team inspection, and special meetings to discuss and clarify specific topics. The results of this review of the first 12 months of operation are presented below under the key topic areas.

Compliance with regulatory requirements

7. HSE's nuclear and explosives inspectors have continued with a programme of planned inspections to ensure compliance with licence conditions and other regulatory requirements. The NII inspection team for AWE has been increased by one inspector since the new contract came into force on 1 April 2000. This enabled us to give closer attention to regulatory compliance following the change of contract.

8. Two specific areas have been identified where compliance with site licence conditions has been disappointing and further effort by AWE plc will be required to achieve a satisfactory standard. The first concerns the identification of Suitably Qualified and Experienced Persons, which is a specific requirement contained in the conditions attached to the nuclear site licence. Whilst there are arrangements in place for the selection and training of persons who undertake work which may affect the safety of operations, these arrangements are not transparent and there is not yet a satisfactory system in place to clearly identify such individuals. We have held discussions with the AWE plc management to resolve this issue and it has been agreed that revised arrangements will be prepared and implemented by the end of May 2001.

Action 1. AWE plc to revise arrangements under Licence Condition 12 for identification of Suitably Qualified and Experienced Persons.

9. The other issue which requires concentrated effort by AWE plc concerns the development of the baseline document under Licence Condition 36 – Control of Organisational Change. This is discussed in detail in para 52 et seq, but further development of this document is required. Until we are satisfied with the staffing baseline, no staffing reductions which could affect safety will be allowed.

Action 2. AWE plc to further develop the baseline document required under Licence Condition 36.

Emergency arrangements

10. Licence Condition 11 requires the licensee to make and implement adequate arrangements for dealing with any accident or emergency arising on the site and its effects. In September 2000, AWE plc gave a satisfactory demonstration of these arrangements at Burghfield at an emergency exercise. NII inspectors witnessed the exercise, took part in the subsequent debriefing, and is following up the licensee's plans to make improvements to some aspects, notably the facilities for command and control.

11. The first exercise to demonstrate arrangements for dealing with an emergency with significant off-site consequences (a 'Level 2' exercise), was held in November 1998. Such exercises entail the establishment of an off-site control centre and test the ability of the various agencies involved to work effectively together under a Police Gold Commander. A number of necessary improvements were identified, for instance in communications and information handling. These improvements are scheduled to be demonstrated in November 2001: in preparation for this, a table-top exercise was held in March 2001. AWE plc has itself assessed various facets of that exercise and has consequently set up a number of workshops aimed at ensuring an adequate performance in November. We witnessed the table-top exercise and considered it provided an adequate opportunity for the lessons to be learned.

12. We have also been seeking improvements to the arrangements for the involvement of the County Fire Brigades and the local hospitals. Adequate progress is being made. NII inspectors again observed a joint fire exercise at Aldermaston in March 2001 which we judged to be beneficial. Though the involvement of County Fire Brigades in formal demonstration emergency exercises has been limited so far to sending observers, we hope that they will take part in a Level 1 Aldermaston site exercise in May 2001.

Incident arrangements

13. Licence Condition 7 requires that the licensee shall make and implement adequate arrangements for the notification, recording, investigation and reporting of incidents occurring on the site. AWE plc has completed the review reported previously⁴ of the arrangements it inherited: the new Abnormal Events System has been in place for some 6 months. We support the new features such as a fast-track investigation procedure for more significant events with a target of reporting within 24 hours, and a Category 0 for minor events that require no further investigation. We have noted, however, that the fast-track investigation team has been understaffed, and that Category 0 has been almost unused and its benefits unrealised. The fast-track investigation team is being strengthened. However, there is still some way to go before the licensee meets its own targets for the time taken to produce investigation reports. The licensee needs to give further thought to setting targets for timely clearing of actions and to monitoring against these targets.

Action 3. AWE plc to set targets for timely clearing of actions arising from incident investigations.

14. AWE plc has also set up a Review, Learn and Improve (RLI) system to analyse Abnormal Events. This analysis, supplemented by inspection findings and comments on safety culture, is presented to the Nuclear Safety Committee (NSC) as a standing item on its agenda. A key purpose of these presentations is to seek an NSC view on the top five issues and on the top five examples of best practice. This view is communicated to the Culture and Improvement Team and to operational areas, and is also incorporated in the fortnightly report from the AWE Director of Assurance to the AWE plc Executive.

15. While we recognise that systems have been put in place, we could not find evidence that they were working effectively. We do not consider this to be an acceptable position and this key area will be kept under continuous review as part of the routine inspection process. If

significant progress has not been made in the next 6 months, a small team will look specifically at this aspect of the safety structure with a remit to recommend whether formal enforcement action is required.

Action 4. AWE plc to continue to develop the Review, Learn and Improve function and ensure it is working effectively.

16. AWE plc recognises that the ultimate success of the Improvement element of the RLI function can only be claimed through the elimination of repeat events or the elimination of root causes. We agree with this view.

Decommissioning Arrangements

17. The decommissioning of many old redundant facilities at the Aldermaston site represents a considerable challenge for the foreseeable future. The workload will increase as additional facilities approach the end of their working lives. In November 2000, AWE plc produced an integrated Decommissioning and Waste Management Plan: this recognises the interdependency of the two areas and the increasing dominance of waste arising from decommissioning work and legacy issues. Work has also begun on the preparation of a radioactive waste management Quinquennial Review submission which will provide a better estimate of the work to be done over the next 50 years and beyond.

18. AWE plc does not have the resources to decommission each facility as it becomes non-operational. A prioritisation system exists which is hazard based, so that some facilities are held at the care and maintenance stage awaiting the commencement of dismantling. We accept that resources are not infinite and the lower hazard facilities may have to be placed in a care and maintenance regime pending the commencement of decommissioning.

19. In April 2000, we approved a site-wide 10 year Decommissioning Plan as well as three facility-specific plans. Overall, during the first year since relicensing AWE plc has maintained steady progress with decommissioning to the schedule outlined in the plans. In the case of an old gas processing facility, AWE plc has brought forward the plans for decommissioning, which is welcomed. However, in the case of one of the production facilities, the post-operational clean out work scheduled to take place has not happened. One of the reasons for this is that a decision to provide a replacement production facility is still under review. The justification for this programme slippage is being discussed with AWE plc, but the slippage is disappointing in view of the hazard category of this building. We are also concerned that this change to an Approved plan was not discussed with NII prior to the position being finalised.

Action 5. AWE plc to review its safety related decision making procedures to ensure that NII is consulted prior to positions being finalised and to ensure formal justification is provided for any changes to an Approved plan.

20. The progress of decommissioning within the three facilities for which specific plans have been Approved has been satisfactory. In November 2000, dismantling work began in the facility which represents the most challenging and hazardous decommissioning project on site. The facility team had spent almost 3 years preparing the plant for safe decommissioning.

After considering the safety submission, we gave a formal agreement to commence dismantling work in November 2000. Of the other two facility-specific Approved plans, the shutdown research reactor is on schedule. The other plant, an old production facility, had started to slip. The licensee recognised the problem and put in a new management team. This team has fundamentally reviewed the project and presented a new plan which it estimates will bring the overall timescales close to those originally approved. We will continue to monitor the situation very closely to ensure that adequate momentum is maintained in the dismantling work in this facility.

21. Reorganisation of the decommissioning and waste divisions under a common Environmental Programmes Group (EPG) Manager has helped to provide a better focus to both the operational and project activities. A section within EPG has been exploring more advanced and automated decommissioning techniques which will be needed to deliver the growing amount of decommissioning work to be undertaken over the coming decades. AWE plc has recently identified two possible technologies that could be used in future, and some development work will be needed to introduce the more automated techniques. The vision of AWE plc is to remove, as far as possible, the very labour intensive methods and procedures which have now been in use for several years. This is welcomed, as it should further reduce the risk and radiation doses to the workforce. Overall, in the area of decommissioning, AWE plc has met regulatory expectations, with one exception, noted above. There is no indication at this stage to suggest that AWE plc will not be able to meet the challenging programme of work ahead. In the longer term, we are concerned that impediments to delivery of decommissioning programmes are more likely to be due to people and skill shortages, rather than lack of motivation. We will be keeping this area under review as part of our routine regulatory inspections under Licence Conditions 35 and 36.

Radioactive waste management

22. The integrated Decommissioning and Radioactive Waste Plan brings together the work which is needed to deal with decommissioning, legacy, and operational solid and liquid radioactive wastes. A number of formal regulatory requirements, in the form of NII Specifications, were inherited by AWE plc relating to the wastes produced on site. These have led to AWE plc commencing the specification and design of two new waste treatment plants to be built in the next 6 years. One plant is for immobilising radioactive sludges: the other is to deal with legacy and future operational ILW waste arisings. In the last year, the AWE plc effort on these projects has intensified.

23. Three of the NII Specifications are related to some twenty ageing sludge tanks which are no longer in operational use. The contents of these tanks need to be removed, treated and immobilised pending disposal. In July 2000, one of the oldest tanks suffered a "pinhole" leak and some of the tank liquor escaped into the surrounding bund. This liquid contained very small amounts of radioactivity. AWE's initial and continued response to this event has been satisfactory: a comprehensive inspection programme is nearing completion and the emergency arrangements have been strengthened. These include erection of a new confinement structure over the tanks which is due for completion in early 2002.

24. In parallel, a concept design for a new facility to treat and immobilise the contents of the sludge tanks was completed in December 2000. Further work has continued to refine the concept and AWE plc anticipates placing a detailed design and build contract in May 2001.

A preliminary safety report will also be supplied to initiate regulatory assessment of the proposed new plant. Construction is estimated to commence in 2003, assuming a satisfactory safety case is provided. In the meantime, two sludge tanks have been emptied using a mobile cementation plant, and the resultant low level waste has been disposed of at the Drigg site in Cumbria. We are content with these efforts and commend AWE plc for meeting one of NII's Specifications early.

25. The newly constructed Intermediate Level Waste (ILW) solid waste store has been inactively commissioned and handed over to the operators on schedule. We have recently given our formal agreement to permit AWE plc to commence bringing drums of radioactive waste into the store. This facility has been completed to a high standard and AWE plc deserves credit on the handling of this project.

26. The transfer of wastes from older unsuitable stores into the modern stores was interrupted in June 2000 when AWE plc discovered, during a routine review of the safety case, that the stacking pallets being used did not meet fire safety requirements. A new pallet design was produced and safety trials undertaken. As this was a Category A modification, our formal agreement was required before re-stacking of some 9000 drums in the modern ILW stores. All this work was completed within 8 months and was well conceived and executed by all the staff responsible. The transfer of the waste from the older stores resumed in March 2001 after a period of staff refresher training. The completion date for transfer from the older stores has slipped overall by 12 months to the end of 2003: however we consider this to be acceptable in the circumstances.

27. The second capital project is the provision of a new solid ILW treatment facility, needed to deal with considerable legacy and future waste arisings. AWE plc is in the process of writing a Best Practicable Means (BPM) study and functional specification for this plant and states that these will be completed in September 2001. Discussions have been held with suppliers of long lead time items, such as the supercompactor and assay equipment. We accept that there are considerable benefits to be gained by purchasing the assay equipment as soon as possible, as this will allow the early despatch to Drigg of re-sentenced legacy waste drums. AWE plc has been working to install the assay suite before the ILW plant is built to ensure that the first NII Specification for legacy drums is met early.

28. Prior to April 2000, strong incentives for minimising waste generation on site were not in place, partly due to the contractual arrangements that previously existed. Improvements have been made in this area and for the first time facilities, including those being decommissioned, have been allocated annual waste generation targets. This year they have been set to 90% of the previous year's arisings. Overall we are satisfied that adequate progress has been made in this area in the first year of the contract.

29. In response to the requirements of the revised discharge authorisation AWE plc has made a commitment to cease discharges through the Pangbourne pipeline into the Thames by April 2005. A Best Practicable Environmental Option (BPEO) study outlining the way forward on dealing with liquid wastes after the closure of the pipeline was provided to both EA and NII in September 2000. Subsequent discussions between the Regulators and AWE plc have clarified the position and a contract to design and build a new effluent treatment plant is planned to be let in 2001. This work has led to a detailed scrutiny of radioactive liquid effluent arisings on site. We welcome the emphasis on waste minimisation which has

resulted in efforts to make significant reductions in volumes of effluent generated over the next five years a priority. Design and Construction will be regulated by NII and will not proceed until we are satisfied with the safety case. A preliminary safety report for the proposed new effluent treatment plant is to be sent to the NII in Autumn 2001.

Fissile Material Control Systems

30. Criticality risks are controlled by prescribing the configuration and quantity of fissile material, neutron reflectors, and moderators at each work station. An area of concern identified over the past few years has been the number of fissile material control infringements. These infringements have been largely due to procedural weaknesses and not connected to any threat of a real criticality accident. However, ambiguities in procedures are not acceptable. Detailed comments on these areas of concern are contained under the following two headings, criticality certification and operational issues:

Criticality Certification

31. Prior to the change of management contractor on 1 April 2000, we had already identified that the methodology for the analysis and generation of criticality certificates at AWE sites was unduly complex. This complexity increased the work load on the criticality specialists who were overstretched in handling constant requests for modifications to certificates - with an increased risk of human error. With the change in management contractor on 1 April 2000, the opportunity was taken to reinforce our concerns regarding procedural weaknesses by making the improvement of this issue a performance indicator.

32. The new management team instigated workshops on criticality safety to clarify the position at the start of the new contract, to identify solutions and priorities, and to review resourcing. The workshop findings were presented to the Executive in June 2000, resulting in agreement to pursue the recruitment of additional specialist staff and the updating of computer equipment. The position in April 2001 is that the new computer hardware has been installed and has just gone operational. Although AWE plc has not been successful in recruiting criticality expertise externally, it has identified two existing employees suitably qualified to be trained for criticality work. The AWE plc Executive has recognised the possible difficulty in retention of qualified criticality expertise and is reviewing the salary structure. We welcome this approach and await developments in this area.

33. AWE plc has also looked at the demand for criticality related changes emanating from the facilities. For the facilities generating the majority of the work, AWE plc has appointed a facility criticality manager as a specialist advisor. This has resulted in a reduction in the demand on the criticality unit. However, although improvements have been made in the method of generating and handling certificate modifications, these improvements have been slow to be implemented. Criticality re-certification across the sites remains a major task, though we recognise there has been a significant drive to update existing certificates that are not facility specific.

Operational Issues

34. In reviewing anomalies related to fissile material control, AWE plc has identified an error mechanism in the transfer of English language rule statements into computer code for

the fissile material monitoring system. To address this, AWE plc has introduced a reverse engineering stage to improve detection of translation errors. We consider that this development will reduce sources of error in this process.

35. One area where AWE plc had been asked to review the potential for improvements was the provision of engineered controls to protect against conditions which could lead to an erosion of criticality safety margins. AWE plc conducted an initial review in March 2000, which was updated in March 2001. The results of these reviews showed that there were already a number of engineered controls in the existing plant: in addition, those practical improvements that were identified have now been implemented.

36. To derive a performance indicator for fissile material safety since April 2000, AWE plc was asked to compare the events and anomalies reported in the last year of the previous contract, with those reported in the first year of the new contract. Whilst the overall figure for reported fissile material control events has marginally increased (by 5%), the number of higher category events has reduced to 36% of the previous year's figure. However, at no time in the last year was there an event which resulted in an erosion of the minimum safety margin relevant to criticality.

37. While we are encouraged by the reduction in the number of higher category events, the continuance of events of this kind indicates that further work is required to establish the root cause. The licensee's staff have recognised this problem and are considering options to improve matters. However, in view of the poor progress in the certification work and the comparatively frequent operational infringements, we will continue to monitor progress in this area through our routine regulatory oversight and by a specialist team inspection on this topic early in 2002, when the measures taken by the licensee should be delivering the required improvements.

Action 6. AWE plc to review fissile material management systems including the updating of criticality certificates across the Company in order to eliminate infringements of administrative procedures.

Management of special nuclear material (SNM)

Strategy

38. Following the Strategic Defence Review published in 1998, the future demands on production at AWE sites were clarified, defining the requirements for nuclear materials to satisfy the published programme. This allowed the previous contractor to start to identify a strategy for dealing with SNM (plutonium, enriched uranium and tritium), but very little progress was made before the new contract started on 1 April 2000.

39. The safe handling, storage, surveillance and use of SNM are important to safety at AWE. As part of the relicensing requirements, the new contractor agreed to produce a strategy for managing SNM. To ensure that radiation doses to workers are reduced and materials are properly controlled, we requested a strategy to address a number of important issues. These included putting SNM into a stable form, using containers that are suitable for long-term storage (avoiding frequent handling and unpacking for surveillance checks), and transferring packages from the older facilities to the newer purpose-designed stores. This transfer will then release older facilities for decommissioning.

40. It was recognised that long and short-term programmes for SNM could not be established immediately, nor put in place by the new contractor on the first day of the new licence. We therefore agreed that AWE plc would produce a programme addressing the issues related to SNM by the end of September 2000. This was achieved, with a further issue of the integrated programme planned for later in 2001. The initial programme covered the operations carried out involving the use of SNM, and was aimed at demonstrating that the company would continue to handle these materials in a safe manner. We will continue to press for the development and delivery of this strategy as part of routine regulatory work.

Action 7. AWE plc to review and implement strategy for the storage and treatment of special nuclear material.

Handling of SNM

41. The new contract has allowed AWE plc more flexibility in its approach to SNM, though the actual material remains under the ownership and overall control of MoD. In the last year, this has resulted in conflicts between commitments to move material, as in the case of transfers of SNM into a safeguards regime following publication of the MoD's Strategic Defence Review, and the programme to repackage and move material into modern stores. AWE plc identified that there were resource constraints associated with SNM transfers and has procured additional specialist assay equipment, and implemented a second shift, to improve the rate of transfer of material. This has allowed AWE plc to meet MoD's requirements on transfers into safeguards and maintain progress on the repackaging programmes. However, there remains a significant quantity of SNM in older facilities which has to be transferred to the new store. Delays in transferring SNM could delay the final decommissioning of these older facilities.

42. A particular long-standing concern is the treatment of radioactive residues that arise when the special nuclear materials are purified. Delays in treating the residues increase the radiation dose commitment to operators, both from monitoring and inspection during interim storage, and during the final processing. We were therefore disturbed to learn that the February 2001 AWE plc Board meeting had postponed indefinitely proposals to develop a treatment process for these residues. This leaves legacy material and a continuing arising without a treatment process. Although we have been informed that the postponement decision will be reviewed annually, we will discuss with the licensee its intentions for these residues at an early opportunity. We will require a process to be developed on timescales which will minimise the radiation dose to operators so far as is reasonably practicable. If agreement is not possible, formal enforcement action will be taken.

43. This issue, together with some other changes to previously stated intentions including those related to decommissioning described above, has implications for the licensee's decision-making process. It is not clear to us how the decision-making process weighs the immediate and long-term safety implications of any decision, nor how it incorporates regulatory and other stakeholder concerns. Action 5 above addresses this issue.

44. AWE plc also reported progress on recovery of liquid residues and identification of small quantities of complex mixtures. While we remain concerned about the storage of liquid residues, and in particular the length of time some have been stored, we are encouraged by the AWE plc response.

45. We also have concerns regarding some component parts from legacy and decommissioned weapons. We have confirmed that progress is being made in relation to the handling of these components, but the philosophy is not fully developed across the full range. Further discussions to clarify the position will take place as part of the routine regulatory oversight.

Storage and Surveillance

46. AWE plc has started to design a long term storage container for SNM. The use of such containers should allow a longer period between surveillance inspections, resulting in reduced manual handling, lower operator radiation doses, and less waste. The design is aimed at a projected container lifetime of 50 years, but is not planned to be in use before 2010. In the interim, AWE plc is reviewing the current surveillance requirements for the existing rim-sealed containers, and is proposing to increase the intervals between surveillance inspections. We welcome these steps, which will reduce radiation doses to operators, and will continue to encourage the licensee to make improvements in this area expeditiously.

47. The other driver for inspection of SNM is to satisfy MoD on accountancy issues. AWE plc is discussing with MoD alternative techniques which will reduce the amount of manual handling and give increased assurance on the security of the material. One option is the use of digital x-ray equipment which has been procured and is currently being evaluated.

48. AWE plc has confirmed its intention to progress both issues identified above and to make some improvements in material accountancy which have been agreed with NII. Completion of this work will address our concerns about radiation dose reduction and material accountancy issues.

Action 8. In developing the SNM strategy in accordance with Action 7, AWE plc to take account of the need to minimise radiation dose commitment and optimise material accountancy aspects.

Operation of the Nuclear Safety Committee

49. Licence Condition 13 requires the licensee to establish a Nuclear Safety Committee to consider safety-related matters and give advice to the licensee. During the three month review⁴, we concluded that the new licensee had made an early review of the scope and efficiency of the committee's business and that the committee remained effective. The further work that we have done over the year has confirmed our view that the NSC is working effectively.

50. A review of the membership is in progress. We judge this to be appropriate to ensure that new viewpoints are incorporated periodically, and that suitable advice is available on the new capital projects as they emerge.

51. We also consider the Nuclear Safety Committee has maintained suitable links with the Warhead Safety Committee.

Organisational Changes

52. The licensee has produced top tier arrangements under Licence Condition 36 that are suitable for Approval under the licence. These arrangements require proposals for changes to the organisational and employee resource to be categorised on the basis of their potential safety impact. The chosen category dictates the level of independent peer review that the change undergoes. Ultimately, changes that can have a significant effect on safety, and hence could undermine the basis on which the licence was granted, require agreement from NII.

53. As part of the lower tier documentation, the licensee is required to produce a baseline document. This document should be a demonstration that the licensee has in place a safety organisation containing sufficient suitably qualified and experienced employees to ensure it can meet its duties under the licence. These duties are outlined in Notes for Applicants⁶. The level of employee resource identified in the document should be that required in a sustainable organisation, capable of delivering its duties under the licence, throughout the period for which the licensee is responsible for the nuclear site. Under the new contract arrangements, AWE plc would remain the licensee, even if the management contractor were to be changed. Thus the AWE plc organisation and employee resource not only needs to be adequate to address present challenges but those of the future, ultimately those of decommissioning the whole site. To achieve this overview, processes need to be in place to review the future requirements and to adjust the baseline appropriately. Once a satisfactory baseline document has been achieved, the licensee and we can use it to make judgement about changes in licensee organisation and employee resource. This document is therefore very important, especially in situations where the licensee may be considering reducing staff or outsourcing work in safety-related areas.

54. The licensee has produced a version of the baseline, but it was not considered adequate for the purpose. Discussions have taken place with the licensee to improve the scope of the document. A recently redrafted document has now been submitted and will be assessed as part of our routine inspection work. However, a preliminary review suggests that further development work will be necessary. (See Action 2)

55. An additional problem in the area has been the register of changes required under the arrangements. This register is the vehicle by which we are made aware of impending changes to the organisational resources, and the licensee's decision on the categorisation of the change. The register (a database) has not been operated in a way which has given us adequate warning of changes, although large scale changes - eg the reorganisation of the Assurance function - were discussed with us as part of the change process. Improvements in the way the register works have already been put in hand. We will review the effectiveness of these new arrangements as part of our routine work. It was, however, disappointing to find that the above problems had been identified by the licensee's audit function, but the corrective actions were being implemented only very slowly – indicating insufficient priority has been allocated to this area.

56. It should be noted that, while the baseline document is being developed to an acceptable standard, NII can use powers under Licence Condition 36 to halt any change which is considered to adversely affect safety on the site.

57. In the discussions on the Assurance function re-organisation, we were pleased to see that the new organisation was chosen after a thorough review of assurance functions and alternative structures. The change was implemented in January 2001 so it has not yet been possible to form a definitive judgement: however no significant drawbacks have been identified thus far.

Succession planning and training

58. During planned inspection work carried out by the NII during the last year, it was observed that an earlier succession planning system originally introduced by Hunting-BRAE Ltd had not been fully maintained and supported. The change of licensee in April 2000 and subsequent re-organisations by AWE plc have added to the disruption of some important human resource management activity, including succession planning arrangements for managers and key technical staff. We have stressed to AWE plc over the last year the need to take early corrective action to bring the succession plans and training systems, in particular, fully up to date. AWE plc has carried out a full review of human resource planning within the Company. Key elements of this review included establishing People Development Groups for each organisational area; a strategic planning exercise to ensure a linkage exists between long-term business plans and human resource management; the revision of the Performance Management System; the establishment of behavioural and technical competence standards; succession management; the replacement of the Company personnel IT system; and the introduction of a common IT training system (Registrar) across the AWE sites to replace 70 to 80 facility based local systems. We welcome this approach taken by the Company.

59. We can confirm that succession plans are now in place for Directors and senior managers. AWE plc has accepted the commitment to extend this process downwards to cover key technical areas to maintain capability over time. AWE plc has also commenced work on the replacement IT based training management system. Software contractors have been engaged to undertake the initial project study phase of this new system and full implementation is planned by mid 2002. We are content with the progress being made in this area and will monitor the work through our planned inspection programme to ensure that satisfactory progress is maintained.

Action 9. AWE plc to fully implement succession plans for all key staff within the Company.

Action 10. AWE plc to fully implement the ‘Registrar’ training system across the Company.

Public relations

60. AWE plc has continued efforts to develop the relationship with the local community by, amongst other means, publication of information on the Company’s work activities. The frequency of meetings of the Local Liaison Committee has been increased to four times a year and activities have included familiarisation visits to some site facilities. Other improvements to AWE’s arrangements include: organising seminars and workshops on safety and environmental topics; extending the availability of the AWE Newslink publication;

publication of AWE's quarterly report has been improved to make the information more understandable to members of the public; and the AWE web site has been expanded to provide more information including the minutes of the Local Liaison Committee. Publication of an AWE brochure which was planned to be available at the end of 2000 has been delayed, but preparation of the document is well advanced and is now expected to be publicly available mid May 2001.

61. AWE plc has also been advised by the Royal Society for the Prevention of Accidents (RoSPA) that it has won the Public Service and National Defence Sector Award for 2000. This is the first time that AWE plc has won this level of award and the Company is justifiably proud of this achievement. AWE plc considers that the award provides a positive demonstration to the public of the Company's conventional health and safety performance.

Radiation doses

62. AWE plc kept the Radiation Safety Objectives (RSO) on annual radiation doses set by Hunting-BRAE Ltd for the year 2000. These were 5mSv and 750mSv for individual and collective doses respectively. These targets were achieved, the actual doses being 4.96mSv and 520mSv respectively.

63. New annual radiation dose objectives have been set for 2001 which require the maximum individual dose to be kept below 4mSv and the collective dose to be constrained to 450mSv. In addition, work is now being controlled on a work package basis, with RSOs being set by the Facility Management. This has the effect of exerting a downward pressure on radiation doses and thus makes a positive contribution to ensuring doses are ALARP (As Low as Reasonably Practicable). AWE plc publishes internal reports setting out RSOs for each area, including a description of the work programmes. Monthly reports are produced by AWE plc which monitor performance against the RSOs. We will continue to review these reports as part of our routine regulatory oversight.

64. The additional analysis of radiation doses has identified one particular area which is giving rise to enhanced radiation exposure of workers. This work involves checking the storage of radioactive material (Positive Inventory Verification) for security reasons. We are requiring AWE plc to undertake a reassessment of this work and the intervals between inspections in order to seek further reductions in the radiation doses to operators.

Action 11. AWE plc to review requirements for Positive Inventory Verification of radioactive material in order to reduce radiation doses to workers..

Implementation of and compliance with the Control of Major Accident Hazards Regulations (COMAH)

65. The Aldermaston site has been notified as a lower tier COMAH site but the Burghfield site is not subject to COMAH. Effective control and monitoring of overall inventories of hazardous materials (as well as individual holdings of such materials) is central to ensuring that at no time is the top tier COMAH threshold crossed. To control this, AWE plc is developing an Integrated Hazardous Substances Database for the Aldermaston site which will cover all non-radioactive hazardous materials. The basic development of the database is completed: it is currently being pilot tested and AWE's target date for the system to be fully operational with all inventories entered is October 2001.

Action 12. AWE to develop an up to date fully operational database of hazardous materials .

66. The Major Accident Prevention Policy document (MAPP) required under COMAH for the Aldermaston site was issued in August 2000. A new template for Facility Emergency Response Plans (FERPs) has been produced together with a Major Accident Hazard database which lists the accidents with COMAH consequences which could occur. The existing Aldermaston emergency exercise programme is being amended to incorporate COMAH major accident hazard exercises. All equipment needed to control and prevent the spread of released material for all COMAH major accident hazard incidents has been acquired, and the acquisition of extra equipment needed for post incident clean up is being addressed.

67. An inspection of Burghfield, in November 2000, confirmed that systems to control inventories of hazardous materials at that site were in place and working effectively to ensure that the threshold for the application of COMAH is not crossed. Overall AWE plc has made good progress in the past 12 months in complying with COMAH, and continued progress will be monitored by the COMAH Competent Authority comprising HSE's Explosives Inspectorate and the Environment Agency.

Lost Time Accidents and Sickness absence

68. A target Lost Time Accident Rate (LTAR) for the year 2000 of 0.3 per 100,000 hours worked was achieved, the final figure being 0.25. For 2001, the target LTAR has been set at 0.2, and the average for the first two months of this year is 0.09 (45 % of the target). The biggest proportion of LTAs was associated with manual handling accidents, with the next most common being slips, trips, and falls. Musculoskeletal problems continue to be the most common cause of sickness absence - averaging roughly a third of all absence in 2000. To address this problem and the manual handling LTAs, AWE plc held a one day exhibition "Backchat 2000" in October 2000 and is reinforcing the message by further lectures and manual handling training. Turning to slips, trips and falls, a three pronged approach to accident reduction - comprising a poster campaign, tool box talks and special AWE workplace inspections - has been put in place. AWE plc has also taken important steps to focus particular attention on reducing the Lost Time Accident Rate (LTAR) for the Ministry of Defence Police (MDP) based at AWE sites which is welcomed.

69. Sickness absence is being addressed by a variety of approaches: of note is the introduction of facility-specific occupational nursing staff for each organisational area. Performance in both LTA and sickness absence areas is considered satisfactory and we will, as part of our ongoing inspection programme, continue to monitor AWE's progress in these areas.

CONCLUSIONS

70. During the first 12 months of AWE plc's management of the Aldermaston and Burghfield sites we have monitored their nuclear safety performance through their compliance with the nuclear site licence, and their delivery of approved programmes and other commitments. With our HSE colleagues, we have maintained an oversight of their performance in the conventional safety area. We consider that AWE plc's performance has

been satisfactory and demonstrates that AWE plc has successfully managed health and safety. The new contractor has not only built on the strengths of the previous contractor but has taken some initiatives which are improving safety performance and progress in the wastes and decommissioning areas. There remain some problems but we are confident that the licensee will be able to address these to our satisfaction. We will ensure the required improvements are made through our routine regulatory process.

Action 13 : AWE plc to agree with NII a programme to respond to the actions above within one month of the publication of the report.

ANNEX 1**AREAS FOR FURTHER DEVELOPMENT AND IMPROVEMENT BY AWE plc**

| ACTION No. | PARA No. | DESCRIPTION OF REQUIREMENT |
|-------------------|-----------------|---|
| 1 | 8 | AWE plc to revise arrangements under Licence Condition 12 for identification of Suitably Qualified and Experienced Persons. |
| 2 | 9, 54 | AWE plc to further develop the baseline document required under Licence Condition 36. |
| 3 | 13 | AWE plc to set targets for timely clearing of actions arising from incident investigations. |
| 4 | 14-15 | AWE plc is to continue to develop the Review, Learn and Improve function. |
| 5 | 19 | AWE plc to review its safety related decision making procedures to ensure that NII is consulted before positions are finalised and to ensure formal justification is provided for any changes to an Approved plan |
| 6 | 37 | AWE plc to review fissile material management systems including the updating of criticality certificates across the Company in order to eliminate infringements of administrative procedures |
| 7 | 40 | AWE plc to review and implement strategy for the storage and treatment of special nuclear material. |
| 8 | 48 | In developing the SNM strategy in accordance with Action 7, AWE plc to take account of the need to minimise radiation dose commitment and optimise material accountancy aspects |
| 9 | 59 | AWE plc to fully implement succession plans for all key staff within the Company. |
| 10 | 59 | AWE plc to fully implement the Registrar training system across the Company by July 2002. |
| 11 | 64 | AWE plc to review requirements for Positive Inventory Verification of radioactive material in order to reduce radiation doses to workers |
| 12 | 65 | AWE to develop an up to date database of hazardous materials which is to be fully operational . |
| 13 | 70 | AWE plc to agree with NII a programme to respond to the actions above within one month of the publication of the report. |

ANNEX 2

REFERENCES

Reference

1. The Nuclear Installations Act 1965 (as amended) (1965 c.57).
2. Relicensing the Atomic Weapons Establishment sites to AWE plc - Report on the work by the Health and Safety Executive to grant nuclear site licences for the AWE sites at Aldermaston and Burghfield. May 2000.
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6. Nuclear Site Licences under the Nuclear Installations Act 1965 (as amended) - Notes for Applicants HSE Books 1994 HS(G) 120 (ISBN 07176 0795X).

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