



House of Commons
Defence Committee

**The Future of the UK's
Strategic Nuclear Deterrent:
the Manufacturing and Skills
Base: Government Response
to the Committee's Fourth
Report of Session 2006–07**

**Third Special Report of Session
2006–07**

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The Defence Committee

The Defence Committee is appointed by the House of Commons to examine the expenditure, administration, and policy of the Ministry of Defence and its associated public bodies.

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The following Members were also Members of the Committee during the Parliament.

Mr Colin Breed MP (*Liberal Democrat, South East Cornwall*)
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The Committee is one of the departmental select committees, the powers of which are set out in House of Commons Standing Orders, principally in SO No 152. These are available on the Internet via www.parliament.uk.

Publications

The Reports and evidence of the Committee are published by The Stationery Office by Order of the House. All publications of the Committee (including press notices) are on the Internet at www.parliament.uk/defcom.

Committee staff

The current staff of the Committee are Philippa Helme (Clerk), Eliot Wilson (Second Clerk), Ian Rogers (Audit Adviser), Stephen Jones (Committee Specialist), Adrian Jenner (Inquiry Manager), Richard Dawson (Committee Assistant), Sheryl Dinsdale (Secretary) and Stewart McIlvenna (Senior Office Clerk).

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Report

The Defence Committee published its Fourth Report of Session 2006–07 on *The Future of the UK's Strategic Nuclear Deterrent: the Manufacturing and Skills Base* on 19 December 2006, as House of Commons Paper HC 59. The Government's response to this report was received on 5 February 2007. This is appended below.

Appendix: Government response

Introduction

1. The Government is pleased to present its response to the House of Commons Defence Committee's Fourth Report of Session 2006-07: The Future of the UK's Strategic Nuclear Deterrent: the Manufacturing and Skills Base (HC59).
2. The Government's responses to the Committee's conclusions and recommendations, as summarised at pages 39 to 42 of the above report, are set out below. For clarity and simplicity and to avoid unnecessary duplication we have consolidated our responses to related recommendations.

The White Paper: The Future of the United Kingdom's Nuclear Deterrent and debate in Parliament

This report does not seek to assess the findings and conclusions of the Government's White Paper. That will be the focus of our next inquiry. (Paragraph 6)

3. The Government notes this comment and the timetable for the Committee's next inquiry, The Future of the UK's Strategic Nuclear Deterrent: The White Paper. The Secretary of State for Defence will give evidence to that inquiry.

Basis for decisions on the future of the United Kingdom's nuclear deterrent

Any decisions on the future of the UK's deterrent should be taken on the strategic defence needs of the country. Our intention in making this report is to ensure that the House of Commons, and the public, are aware of the manufacturing and skills base issues which will need to be addressed if a decision is made to renew the submarine-based deterrent. We recommend that the Government respond to this report in good time for publication before the debate in the House of Commons on the White Paper in March 2007. (Paragraph 7)

A decision to abandon the construction of nuclear submarines would have a profound impact upon local communities, particularly at Barrow. Nevertheless, we believe that employment factors should not be decisive in the debate on the future of the deterrent. (Paragraph 75)

4. The Government agrees that decisions on the future of the UK's deterrent should be taken on the basis of the strategic defence needs of the country. That is the basis on which the decisions announced to the House of Commons by the Prime Minister on 4 December 2006, and set out in detail in the White Paper: The Future of the United Kingdom's Nuclear Deterrent (Cm 6994), were made.
5. The Government agrees that it is helpful for Parliament and the public to be aware of the manufacturing and skills based issues relevant to the Government's decisions on the future of the UK's nuclear deterrent. The Government considers the Committee's report to be a useful contribution and has published its response to the Committee's findings in good time to inform Parliamentary and public discussion.

Retention in the UK of the capability safely to deliver, operate and maintain nuclear powered submarines

The Ministry of Defence believes that the UK should retain onshore a sovereign capability in the design, construction, operation, maintenance and decommissioning of nuclear-powered submarines. It is important that the public understand clearly the reasons for this. We call upon the MoD to provide, in its response to this report, a fuller explanation of the need for this sovereign capability. (Paragraph 31)

6. The Government set out the reasons why the UK should retain onshore the capability safely to deliver, operate and maintain nuclear-powered submarines in the White Paper: Defence Industrial Strategy (Cm 6697), published in December 2005. In section B2—Maritime of that White Paper we said:

B2.26 The UK's fleet of nuclear powered submarines requires a specialist subset of skills within the maritime industry. We have duties of nuclear ownership and commitments to the USA which can only be fulfilled by close control of an onshore submarine business. Therefore, it is essential that the UK retains the capability safely to deliver, operate and maintain these platforms, without significant reliance on unpredictable offshore expertise. This delivery spans from conceptual design through to disposal, and includes the management of submarine and nuclear safety; all underpinned by appropriate science and technology. Some submarine sub-system elements may be sourced from abroad, but only under appropriate arrangements that guarantee supply, or from a sufficiently broad supplier base to assure access and availability.

B2.27 Deep scientific and technical advice on hydrodynamics, manoeuvring and control, propulsor technology and atmosphere control are specific capabilities essential to submarine performance. Structural acoustic engineering design is not readily available from the broader market place and has to be maintained within the specialist submarine industry. Submarine hull and infrastructure design and construction require the use of specialist techniques, for example particular welding and fabrication processes. These specialist underpinning key capabilities must be sustained in the UK.

B2.28 The ability to manage Nuclear Steam Raising Plant throughout its life-cycle, including the fuel elements, is a strategic capability that must be retained onshore. This includes design and development, manufacture, test and evaluation and decommissioning. An irreducible minimum level of associated facilities, intellectual resource and supporting technologies must be provided within the UK or under arrangements that guarantee UK control and safe ownership.

The United Kingdom's submarine industry: skills, efficiency and collaboration

Witnesses to our inquiry maintain that the UK's current manufacturing and skills base is already at the minimum level necessary to sustain a viable onshore submarine industry. (Paragraph 39)

Witnesses to our inquiry agreed that the complexity and uniqueness of a nuclear submarine, and of the environment in which it operated, called for special skills, facilities and oversight not supported by any other shipbuilding programme. (Paragraph 42)

The UK submarine industry draws on a uniquely skilled and specialist workforce. Retaining that skills base will be essential if the UK decides it wants to continue to design, build and maintain nuclear-powered submarines. The skills base is now at a critical level. Any further erosion of the workforce may have significant implications for the future of the submarine programme. Sustaining skills in this sector is only possible with regular and continuous submarine work. (Paragraph 46)

It is clear that the gap between the Vanguard and Astute submarine programmes had a serious and debilitating impact on the UK's submarine industry and put at risk the future of the UK's submarine fleet. If the Government wants the UK to continue to design and build nuclear-powered submarines, it will be essential to maintain a regular rhythm of submarine construction. Reducing the frequency of construction below 22 months would be risky. Without a regular build "drumbeat", the UK skills base will erode and it may prove impossible or prohibitively expensive to recreate. (Paragraph 64)

7. The Ministry of Defence (MoD) attaches particular importance to maintaining an affordable and viable submarine design and manufacture capability in the United Kingdom. It recognises that in terms of the design and manufacturing skills base the industry is now at a minimum level to sustain a viable sovereign production capability and that it is important that the industry does not lose specialist skills. The MoD also recognises that there is a link between the maintenance of specialist skills and the level of work available to practise them.

8. The MoD agrees that the design and construction of nuclear-powered submarines require skills not supported by other shipbuilding programmes. This is a key tenet of the Maritime section of the Defence Industrial Strategy. Many of the skills involved in designing and building nuclear-powered conventionally-armed submarines (SSNs) (eg the Astute class) and nuclear-powered ballistic missile firing submarines (SSBNs) (eg the Vanguard class) are different from those required for surface ships. Additional highly specialised skills are necessary for integrating the weapon system into SSBNs.

9. The MoD notes the Committee's conclusion about the impact of the gap between the Vanguard and Astute build programmes. Important lessons have been learnt from our experience with the Astute programme. These include the need to retain and maintain specialist skills and the difficulties of doing so if there is a gap between programmes. If, to cover a gap in submarine work, specialised submarine designers are transferred to surface

ship projects, it is unrealistic to expect them to be able to reconvert back to submarines at the same level of skill as when they left that sector.

Affordability/driving down costs/through-life costs

Affordability must be a fundamental consideration in any new submarine programme. The Government is right to emphasise that orders for a Vanguard successor will be contingent on industry driving down and reducing costs and ensuring value for money throughout the submarine programme. Industry must deliver on this requirement. (Paragraph 98)

We are concerned that insufficient attention has been given to the costs of through-life support. While we understand that DML is not a supplier to the Astute programme, it seems odd and regrettable that the company responsible for through-life support on the UK's nuclear-powered submarines has had so little input into the design of the class. If the affordability of the submarine programme is to improve, it is essential that through-life costs are taken into consideration at the initial design phase. Far greater emphasis must be placed on this consideration before the design of any Vanguard successor submarine begins. (Paragraph 99)

If the UK goes ahead with procuring a successor to the Vanguard-class submarine, it is essential that industry collaborates far more extensively than it has done to date to drive down and control costs in the manner envisaged by the Defence Industrial Strategy. Promoting greater industrial collaboration should be a key priority for the MoD. In turn, the MoD must provide industry with clarity and consistency about operational requirements and specifications. It is vital that lessons are drawn from the problems experienced with the Astute-class programme. (Paragraph 105)

10. The Government welcomes the Committee's support on the need for industry to drive down costs and ensure value for money throughout the submarine programme. The Government also welcomes the Committee's conclusion about the need for greater collaboration within the submarine industry in order to drive down costs. Promoting greater industrial collaboration is a key priority for the MoD. Our position is set out clearly in section 6 of the White Paper: The Future of the United Kingdom's Nuclear Deterrent:

6.3 It would be our intention to build the new SSBNs in the UK, for reasons of national sovereignty, nuclear regulation, operational effectiveness and safety, and maintenance of key skills. But this is dependent on proposals from industry that provide the right capability at the right time and offer value for money. For the reasons set out in the Defence Industrial Strategy, progress towards industrial consolidation and a sustainable industrial base, will be an important ingredient. Final decisions will be taken in the lead up to the placing of a contract for the detailed design of the submarines.

6.4 For the replacement SSBN programme we expect that there will be a much greater collaborative effort between the MoD and industry than has been the case in the past.

6.5 The current industrial structure limits the scope for system-level competition in the UK. Therefore a key to successful procurement in the UK would be to work

closely with industry right down the supply chain to put in place sustainable collaborative arrangements that run through the life of the platform. This is important for driving down the whole-life costs of the programme. We will also seek to bear down on the costs by sourcing sub-system elements from overseas in line with the policy set out in the Defence Industrial Strategy.

11. The Defence Industrial Strategy highlighted serious concerns about the efficiency of the organisation of the submarine industry. As a consequence the MoD is looking to industry to deliver an indigenous industrial base that is affordable for the procurement and maintenance of submarines and which sustains critical capabilities. In the memorandum forwarded to the Committee on 23 October 2006, the MoD made the following comments about the need for cooperation and rationalisation in the submarine industry:

As we have made clear in the Defence Industrial Strategy, we would expect that any commitment by the Government to a long-term submarine build programme would be matched by a commitment by industry to rationalise and reduce costs. There is much to be gained from cooperation and rationalisation between the build entity (principally BAES at Barrow-in-Furness), the two support entities (Devonport Management Ltd and Babcock Naval Services at Faslane) and the Nuclear Steam Raising Plant provider (Rolls Royce), together with the Ministry of Defence as the customer/operator.

Potential benefits from such cooperation and rationalisation include the removal of overcapacity and overlapping competencies, avoidance of duplication, application of common processes, spread of best practice, more efficient procurement, supply chain management and sharing of knowledge and information across the enterprise—all leading to behavioural change and the potential for significantly improved enterprise performance and affordability. Transformed commercial arrangements are required to incentivise and deliver these benefits. Cooperation of this type is already being pursued to improve affordability and performance for in-service submarines and for the Astute programme.

12. The MoD recognises that it is essential that proper attention should be given to through-life costs at the initial design stage for the new submarines. The bringing together of the Department's submarine acquisition and support teams from across the Defence Procurement Agency (DPA) and Defence Logistics Organisation (DLO) under Director General Nuclear in April 2006 has created a clearer focus on through-life support and costs. This will be further reinforced with the merger of DPA and DLO to form Defence Equipment & Support.

13. The Department intends to build on the lessons learned from the Astute programme where design changes have been made, informed by experience with current in-service submarines, which are expected to achieve through-life cost savings of at least 10% compared to the Trafalgar Class SSNs. One of the key lessons learned from the Astute programme is the need for contracting arrangements that provide for close interaction between the design and support communities.

Interrelationship between SSN and SSBN construction

Even if the decision is taken not to procure a Vanguard successor, a specialist skills base will have to be retained in order to build SSNs and maintain and finally decommission the UK's existing fleet of nuclear-powered submarines. Some indication of the order of costs would be helpful in considering arguments about affordability and we ask that the MoD provide some information about this in their response to this report. (Paragraph 47)

The submarine construction supply chain is fragile and is particularly susceptible to gaps in the programme. Extended gaps are likely to result in an erosion of the UK's submarine manufacturing and skills base. There is also a risk that single source suppliers will abandon the supply chain in pursuit of more regular and assured work. If the UK intends to build a successor to the Vanguard-class, or maintain an SSN capability beyond the current Astute order book, the supply chain will have to be sustained. To achieve this, the MoD must give clear direction and certainty about the future submarine programme in order to encourage industry to invest. We call upon the MoD to provide, in its response to this report, an assessment of whether, how and at what cost the submarine supply chain could be maintained for the construction of future SSNs in the absence of a positive decision on a Vanguard successor. (Paragraph 54)

Without a new SSBN it is possible that there would be insufficient demand for nuclear submarines to sustain the industry. It is important to recognise that there is an interrelationship between SSN and SSBN construction. (Paragraph 61)

If there were no successor to the Vanguard-class submarine, there would be an ongoing need to retain onshore a capability to support and, ultimately, to decommission the current SSBN and SSN fleet. We call upon the MoD to state in its response to this report how much it would cost to sustain that capability. (Paragraph 76)

14. The MoD recognises that there is an interrelationship between SSN and SSBN construction.

15. The Government has made clear in the White Paper: The Future of the United Kingdom's Nuclear Deterrent that it has decided to maintain the United Kingdom's nuclear deterrent by procuring a new class of submarines. However, the Committee is correct in its conclusion that in the absence of an order for replacement SSBNs there would be a continuing need to sustain a range of specialist skills in the UK submarine industry to support and, ultimately, to decommission the current SSBN and SSN fleets.

16. The MoD notes the Committee's conclusions about the fragility of the supply chain and the desirability of the Department providing clear direction about the future submarine programme. As was made clear in evidence to the inquiry, the Department recognises that some companies will take the decision to exit the submarine sector if they do not receive clarity on the scope for future business. The risk is that if they do leave the market it would be difficult to regain the specialist capabilities they provide in the future.

17. The MoD estimates that the current cost of supporting the SSBN and SSN fleets is around £600 million per year. This figure includes headquarters costs, general support

from the Naval Bases and logistic support chain, contractor support, transportation costs and facilities maintenance. The costs of supporting the Astute class, once the new submarines enter service, are expected to be offset by savings arising from the ending of support to older submarines being retired from service. Also, as noted at paragraph 13 above, some savings in support funding for the Astute class, compared to current in-service submarines, are expected.

18. The MoD's strategy for de-commissioning nuclear-powered submarines is currently under review in the light of revised project proposals for de-fuelling facilities and the 2006 report of the Committee on Radioactive Waste Management¹. Financial provision for the de-commissioning of past and current SSNs and SSBNs is included in the MoD Accounts. This amounts to some £1.75 billion of undiscounted costs, including propulsion plant disposal.

The Astute programme

It is important that the MoD and industry agree promptly on a price for future Astute-class orders. Clarity and certainty about the future submarine programme is necessary if industry is to continue to invest in the manufacturing skills base. The MoD must also demonstrate that it has learned the lessons from the Astute programme, and implemented a much tighter contractual relationship with BAE Systems, before it commits expenditure to a new SSBN build programme. (Paragraph 65)

19. The MoD notes the Committee's findings in relation to the Astute-class programme and contractual arrangements with BAES. The Department has learned a number of lessons from experience with the Astute programme. Negotiations on prices for Astute-class submarines hulls 2 and 3 are concluding and will be subject to formal approval by the MoD and BAES.

20. The MoD intends to agree prices for any future submarine orders at an earlier stage than has been possible on Astute hulls 2 and 3. It will build on the tighter commercial terms proposed for Astute hulls 2 and 3 and the joint MoD/industry cost estimating processes put in place for those orders.

New design for new class of SSBNs versus commonality with existing submarines, and timetable for procurement decisions

The Government will need to consider carefully whether the potential long-term benefits of designing a completely new submarine, in which through-life affordability is built in from the start, could outweigh the cost-benefits of maximising commonality of design with existing submarines. And it will need to judge whether efforts to maximise commonality with existing submarines would be enough to sustain the specialist submarine design base in the UK. (Paragraph 67)

Using a well-tried reactor in the new submarines would minimise design-related risk, but in the longer term there might be benefit in both safety and design costs in investing in a new generation of reactor technology. (Paragraph 68)

¹ Managing our Radioactive Waste Safely, CoRWM Doc 700, dated 31 July 2006

We recommend that the MoD make clear in its response to this report the timetable for the procurement of the new submarines it proposes. This should indicate by when it will need to decide whether to opt for radical redesign or commonality of design for the submarine platform and for the nuclear reactor, and when it will need to decide between a three- or four-boat package. (Paragraph 69)

21. The MoD notes the Committee's recommendations that it should consider carefully the relative merits of designing a completely new submarine and maximising commonality of design with existing submarines (including in relation to reactor design). These issues will be considered in depth during the concept and assessment phases for the replacement submarines. The Government has, however, given some consideration to a number of basic design issues. In the White Paper: The Future of the United Kingdom's Nuclear Deterrent we made the following comments:

5–6 We have started to consider some of the fundamental design issues. We believe that the new submarines will need to be nuclear powered, as conventional propulsion systems cannot currently generate sufficient power and endurance to meet our requirements. We envisage that the design of the new SSBNs will maximise the degree of commonality with other in-service submarines where this can be done in a cost-effective manner. The scope for this will be determined during the next phase of work. However, some changes to the design of the Vanguard-class will be required, to take account of equipment obsolescence, the need to meet modern safety standards and to maximise the scope to make the SSBNs capable of adapting to any changes in our requirements and to any new technological developments.

5–9 We are not yet in position to make a firm judgement about how many submarines we require in the future because we do not yet understand comprehensively the likely operational availability of the replacement SSBNs. We will investigate fully whether there is scope to make sufficiently radical changes to the design of the new SSBNs, and their operating, manning, training and support arrangements, to enable us to maintain continuous deterrent patrols with a fleet of only three submarines. A final decision on the number of submarines that will be procured will be made when we know more about their detailed design.

22. The MoD recognises that a design based on evolution of the existing PWR2 reactor plant would minimise design-related risks. Regulatory best practice, however, requires continuous improvement to ensure that nuclear safety risks are as low as reasonably practicable. The MoD has not yet decided whether to develop a replacement for the PWR2 reactor plant but is investigating a number of concepts. All the concepts for replacement involve evolutionary design improvements and simplification rather than radical redesigns. More broadly, future submarine propulsion is being managed as a fully integrated primary (nuclear) and secondary (non-nuclear) plant design programme that will address anticipated nuclear regulatory requirements and exploit recent developments in marine propulsion technology. Industry stakeholders will be engaged to ensure that the whole plant design is optimised to reduce overall procurement and through-life costs. The aim is to reduce through-life costs by improving availability and minimising shore infrastructure needs, whilst meeting safety requirements.

23. The MoD expects to place a contract for the detailed design of the submarines in the period 2012 to 2014.

Shortages of science and engineering graduates and other skilled personnel and the skills base in the Ministry of Defence

We share our witnesses' concern about the shortage of science and engineering graduates, project managers and skilled and experienced technical staff, but this raises questions which go far beyond the scope of this report. (Paragraph 45)

Developing a Vanguard successor would be a huge undertaking. It is essential the MoD has the capacity to manage such a programme effectively. Any shortfall in preparedness must be addressed as a matter of priority. The MoD's shortage of systems engineers and project managers—skills essential at the start of a programme of this kind—is a cause of serious concern. If the decision is made to renew the deterrent, it is essential the MoD commit sufficient resources to the programme from the beginning. It will be desirable to bring in skills from industry. We recommend that the MoD state, in its response to this report, how it intends to address its skills shortages. (Paragraph 115)

24. The MoD notes the Committee's concerns about the need for it to ensure that it has the right skills in the right quantities to undertake a replacement SSBN programme. The Department is clear that to execute a programme of this size and complexity it is essential that the necessary skills are available in-house and in industry.

25. The Department has embarked on a major programme of work to address skills requirements and shortages. It has rejuvenated its graduate recruitment and development programmes for engineers. The latter has recently been re-accredited by four of the leading professional institutions for the engineering sector. The MoD is also seeking to expand its technician apprentice scheme, which is designed to meet Departmental needs for suitably qualified personnel with practical knowledge of the range of issues involved in nuclear submarine design and construction. Functional competency frameworks for engineering disciplines have been agreed and these are being linked to development programmes to provide the skilled people required in our projects.

The Naval Base Review

It is essential that the Naval Base Review take into account the implications for the future of the submarine industry. (Paragraph 97)

26. The MoD agrees with the Committee's recommendation. The Naval Base Review is examining the future requirements for naval base infrastructure to provide efficient and cost effective maintenance of and support to the Royal Navy. It is taking into account the requirements for support to the submarine fleet and the implications for the submarine industry.

The Atomic Weapons Establishment (AWE)

We recommend that in advance of any debate in the House of Commons on the future of the deterrent, the MoD clarifies what additional investment the Government intends

to make at the AWE as a result of the recommendations contained in the White Paper. (Paragraph 130)

Many observers have seen the investment programme at Aldermaston as a sign that the Government had already decided in principle to retain and renew the UK's nuclear deterrent. We accept Ministers' assurances that this was not the case. We accept too that investment in buildings and infrastructure at AWE was becoming time-critical, which might suggest that the decision on the future of the deterrent should have been taken in the last Parliament. But we are less convinced that investment in the new Orion Laser, the supercomputer and hydrodynamic facilities could not have waited for a decision in principle on the future of the UK's nuclear deterrent. If the investment was made to respond to requirements of regulators, the Government should state this in its response to this report. Large-scale investment should follow, and not precede, policy decisions of such paramount importance to the nation. (Paragraph 146)

27. The objectives of the programme of investment at the Atomic Weapons Establishment (AWE) were announced in July 2005. These are to meet the requirements of the 1998 Strategic Defence Review to ensure we are able to maintain the Trident system as an effective deterrent and to maintain a capability to design and produce a successor to the current warhead should this prove necessary. More details of the investment plans for the period to 2007/08 were provided to the Defence Committee in the MoD's memorandum of 24 November 2005, which was published in January 2006.

28. Our position on the future of the programme at AWE is set out at paragraph 5–13 of the White Paper: The Future of the United Kingdom's Nuclear Deterrent:

5–13 We will continue the programme of investment in sustaining capabilities at the Atomic Weapons Establishment (AWE), both to ensure we can maintain the existing warhead for as long as necessary and to enable us to develop a replacement warhead if that is required. Additional investment averaging £350 million per annum over the years 2005/06 to 2007/08 was announced last year. Further investment will be necessary, and early in the next decade the costs of AWE are likely—at their peak—to be equivalent of about 3% of the current defence budget (compared to about 2.5% today).

Details of investment at AWE for the period beyond 2007/08 will be determined over the next year, following this year's Comprehensive Spending Review.

29. The decision to replace the current Helen laser with a new more capable facility, Orion, was taken because of the age and increasing obsolescence of the existing laser which has been in use for over 25 years. It reflects the fact that the existing laser's capabilities are insufficient to provide the necessary confidence that the ageing Trident warheads will remain safe and serviceable until the end of their currently projected lives. With a build and commissioning timescale of about five years, delaying the decision to invest in a new laser until after decisions on a future deterrent had been taken would have led to an unacceptable capability gap and put at risk AWE's ability to underwrite the current warhead. At worst this could have led to the early withdrawal from service of Trident.

30. Similarly, the decision to invest in new supercomputing facilities was taken in response to the increasing limitations of current computer facilities and the growing complexity of

the modelling required to underwrite the safety and performance of the Trident stockpile as it matures and as we rely more on hi-fidelity laboratory experiments in the absence of live testing.

31. As to AWE's hydrodynamics facilities, consideration of possible replacement is still at the initial concept phase.

The MoD and the AWE must apply the lessons from the A91 episode in managing the new infrastructure investment at Aldermaston. (Paragraph 131)

32. The MoD recognises the need to ensure that the lessons from the A91 project are applied in pursuing the programme of essential investment at AWE.

The widespread suspicion about the work of the AWE and the Government's investment there is partly a consequence of the secrecy which surrounds its work. We fully accept the need to maintain secrecy about some aspects of its work, but there is a case for greater openness, not least to ensure that the public is aware of the positive contribution the AWE makes to the verification of the Comprehensive Test Ban Treaty. (Paragraph 147)

33. The Government has made significant efforts to be more open about the work at AWE Aldermaston. For instance, in February 2002 a detailed article describing the scientific basis of the programme to support the Trident warhead, co-authored by the MoD Chief Scientific Advisor and AWE staff, was published in the international scientific journal *Nature*. As described above, the Department also set out details of the forward investment plans in July 2005 and described the purpose of this investment in detail in the memorandum it provided to the Committee in November 2005. The MoD has engaged closely with the local planning authorities to explain the detailed plans for the AWE sites. We agree with the Committee that more could be done to increase public awareness of some of the work that AWE does, including the contribution it makes to verification of the Comprehensive Test Ban Treaty, and will reflect further on how this might be achieved.