



## Recent developments at the Atomic Weapons Establishment

Standard Note: SN/IA/05024

Last updated: 24 March 2009

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Section International Affairs and Defence Section

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In July 2005 the Government announced a new programme of investment for the Atomic Weapons Establishment (AWE) at Aldermaston, where the UK's nuclear warheads are built and maintained. Specific programmes include the development of a new laser facility, known as ORION, and a replacement hydrodynamics testing facility. The Government says the new facilities are required to ensure the safety and reliability of the existing stockpile and to ensure the UK has the capacity, if required, to develop a replacement warhead in the future. It says the current warhead design deployed on the UK's Trident ballistic missile submarines is likely to last into the 2020s, and that decisions on whether to refurbish or replace the existing stockpile are likely to be necessary in the next Parliament.

This note provides details on the new investment programme and looks at the ORION laser and replacement hydrodynamics testing facilities. It also examines some of the issues raised by anti-nuclear campaigners. In addition, it analyses the new ownership arrangements at AWE Management Ltd (AWEML), the consortium which manages AWE on behalf of the government, which resulted from the decision by British Nuclear Fuels Ltd (BNFL) to sell their one-third stake in AWEML to the US-based Jacobs Engineering Group on 18 December 2008.

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Related papers include:

- Library Research Paper 06/52, [The Future of the British Nuclear Deterrent](#), 3 November 2006;
- Library Standard Note SN/IA/4199, [In brief: The Trident White Paper](#);
- Library Standard Note SN/IA/491, [Treaty on the Non-Proliferation of Nuclear Weapons](#);
- Library Standard Note SN/IA/1404, [Arms Control and Weapons of Mass Destruction](#);

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## 1 Background

The infrastructure for building and maintaining British nuclear warheads is located at the two government-owned and contractor-operated Atomic Weapons Establishment sites at Aldermaston and Burghfield in Berkshire. The Government has a contract with AWE Management Ltd, while a separate company, AWE plc, employs the work force. Figures from January 2007 show that AWE plc, as primary contractors, were employing 3,990 staff at Aldermaston and 331 at Burghfield, while there were an additional 2,000 people employed through various contracting arrangements to support operations at both sites.<sup>1</sup>

The Government said in the 1998 Strategic Defence Review White Paper that it would retain a robust capability at AWE Aldermaston to “underwrite the safety and reliability of our nuclear warheads, without recourse to nuclear testing”, adding that it considered it would be “premature to abandon a minimum capability to design and produce a successor to Trident should this prove necessary.”<sup>2</sup> That position was reiterated in the December 2003 Defence White Paper<sup>3</sup> and in subsequent PQs, with the Government saying it would seek “sustainment of capabilities” at Aldermaston.<sup>4</sup>

## 2 The new investment programme at AWE

### 2.1 The announcement of the new investment programme

A new programme of investment at the Aldermaston and Burghfield facilities was announced by the then Defence Secretary, John Reid, on 19 July 2005:

[A]greement has been reached with AWE Management Ltd. (AWE ML) to take forward a programme of investment in sustaining key skills and facilities at the Atomic Weapons Establishment. This will include the provision of necessary extra supporting infrastructure. [...]

The purpose of this investment of some £350 million over each of the next three years is to ensure that we can maintain the existing Trident warhead stockpile throughout its intended in-service life. In the absence of the ability to undertake live nuclear testing given that the UK has signed and ratified the Comprehensive Test Ban Treaty, it is necessary to invest in the facilities at AWE which will provide assurance that the existing Trident warhead stockpile is reliable and safe.<sup>5</sup>

Details of MoD expenditure on Aldermaston were provided in a PQ answer of October 2005:

The contract between the Ministry of Defence and Atomic Weapons Establishment Management Limited commenced in April 2000. Annual expenditure at the Establishment since then, and that projected for 2005-06 to 2007-08, is as follows:

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<sup>1</sup> HC Deb 19 February 2007, c220w and HC Deb 6 March 2007, c1876w

<sup>2</sup> *Strategic Defence Review: Supporting Essays*, July 1998, Supporting Essay Five: Deterrence, Arms Control and Proliferation, p.5-5, para 14

<sup>3</sup> *Delivering Security in a Changing World*, Defence White Paper, December 2003, Cm 6041-I, chapter I, para 1.2

<sup>4</sup> See for example HC Deb 14 June 2005, c337w

<sup>5</sup> HC Deb 19 July 2005, c59WS

*Atomic weapons establishment annual expenditure  
(as at October 2005, £ million, 2005-06 prices)*

	<i>£ million</i>
2000-01	311
2001-02	291
2002-03	278
2003-04	300
2004-05	363
2005-06	<sup>(1)</sup> 507

<sup>(1)</sup> Forecast.

On current planning we expect expenditure at the Atomic Weapons Establishment to be a total for the next two financial years (2006–07 and 2007–08) of around £1.5 billion.<sup>6</sup>

A Parliamentary Answer from October 2006 provided a more detailed breakdown of the figures for 2006-07 and 2007-08:

The currently planned capital expenditure at the two AWE sites at Aldermaston and Burghfield is in the order of £340 million in 2006-07 and £420 million for 2007-08, both at outturn prices.<sup>7</sup>

The then defence Minister Adam Ingram said in a Parliamentary Answer of 5 February 2007 that:

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. As the White Paper, 'The Future of the United Kingdom's Nuclear Deterrent' published in December 2006, made clear, further investment at AWE will be necessary and early in the next decade the costs of AWE are likely—at their peak—to be the equivalent of about 3 per cent. of the current defence budget.<sup>8</sup>

Further details on the main areas for investment were provided by the Ministry of Defence in a Memorandum to the Defence Committee in January 2006:

To provide assurance of warhead safety and reliability without undertaking full-scale testing, scientists must be able to demonstrate their understanding of the physical and chemical processes that occur within the warhead. In addition, age-related changes must be investigated and the implications understood. Computer simulations are used to predict the effect of future changes and warheads are routinely withdrawn from the operational stockpile for forensic examination, which further improves the accuracy of these simulations. The specific capabilities required to undertake this assurance work fall into three main areas - high performance computer simulation, hydrodynamics and high energy density physics. Experiments and models are used to test theoretical understanding of the scientific principles and processes involved. This warhead assurance work represents the core activity presently undertaken at AWE.

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<sup>6</sup> HC Deb 10 October 2005, c15w

<sup>7</sup> HC Deb 2 October 2006, c2562w

<sup>8</sup> HC Deb 5 February 2007, c685-6w

[...] Particular projects to be taken forward include concept and design studies for the replacement of major facilities for hydrodynamics experiments; and the development of a new high energy laser facility (Project Orion).<sup>9</sup>

The MoD said work was required to refurbish the basic office infrastructure, as well as retaining basic warhead assembly and disassembly facilities:

[...] AWE are required to ensure that we can sustain the Trident warhead in-service throughout its operational life, and also that the warhead can safely be taken out of service at the end of its service life. It is possible that during the in-service life of a warhead, faults can emerge in components as they age. In extremis, this may require the remanufacture of new replacement components in order to ensure the safety and performance of the overall warhead. It is therefore necessary that AWE sustain a basic capability to remanufacture key components of the Trident warhead. Moreover, when the time comes to withdraw the Trident stockpile, a range of skills and facilities will be required safely to disassemble the warheads. [...]

An additional focus of the programme at AWE will therefore be to replace or refurbish some of the basic assembly and disassembly facilities at Aldermaston and Burghfield. These will include new facilities for handling high explosives and highly enriched uranium, modernisation of the assembly/disassembly facilities at Burghfield, and facilities for non-nuclear components in the warhead.<sup>10</sup>

Finally, the Memorandum set out plans for investing in key skills:

The average age of the workforce at AWE has been increasing, as the generation recruited to meet the initial requirements of the Chevaline and Trident programmes near the end of their careers. There is therefore a requirement to recruit new members of staff to ensure that the core skills within AWE are sustained. Other new staff will be required to assist the infrastructure sustainment programme and also to operate the new facilities as they come on stream. We have therefore started a programme of recruitment and it is planned to increase the current workforce by around 350 staff per annum until 2007/08, of whom some 70% will be Non-Industrial staff and 30% Industrial staff.<sup>11</sup>

The document concluded:

This additional investment at AWE is required to sustain the existing warhead stockpile in-service irrespective of decisions on any successor warhead. The investment will sustain core skills and facilities that could also be used in future to develop a successor but no decisions have yet been made either in principle or practice on this issue.<sup>12</sup>

## **2.2 Successor warhead?**

The then Defence Secretary, John Reid, said on 21 March 2006 that there was currently “no programme at Aldermaston to develop a new warhead”<sup>13</sup>, a position that was reiterated by his successor, Des Browne, in June 2006.<sup>14</sup> The Ministry of Defence said in its

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<sup>9</sup> Memorandum submitted by the Ministry of Defence, Annex C (Investment at the Atomic Weapons Establishment), 19 January 2006, paras 7-8

<sup>10</sup> *ibid*, paras 9-10

<sup>11</sup> *ibid*, para 11

<sup>12</sup> *ibid*, para 13

<sup>13</sup> HC Deb 21 March 2006, c364w

<sup>14</sup> HC Deb 26 June 2006, c159w

Memorandum to the Defence Committee of January 2006 that the “current warhead design can, if required, be maintained in service at least into the 2020s, with some relatively minor upgrading and refurbishment during the first half of the next decade”.<sup>15</sup>

The Government provided more detail on the timetable for a decision on refurbishing or replacing the current warhead in its White Paper on *The Future of the United Kingdom’s Nuclear Deterrent* (Cm 6994), which was published on 4 December 2006:

7-3. The UK produced a new nuclear warhead to coincide with the introduction into service of the Trident system. This warhead was designed and manufactured in the UK by AWE, although it was decided that it would be more cost effective to procure certain non-nuclear components of the warhead from the United States.

7-4. The current warhead design is likely to last into the 2020s, although we do not yet have sufficient information to judge precisely how long we can retain it in-service. Decisions on whether and how we may need to refurbish or replace this warhead are likely to be necessary in the next Parliament. In order to inform these decisions, we will undertake a detailed review of the optimum life of the existing warhead stockpile and analyse the range of replacement options that might be available. This will include a number of activities to be undertaken with the United States under the 1958 UK-US Agreement for Cooperation on the Uses of Atomic Energy for Mutual Defence Purposes.<sup>16</sup>

For more detail on the 1958 agreement, commonly known as the Mutual Defence Agreement or MDA, see Library Standard Note SN/IA/3147, [UK-USA Mutual Defence Agreement](#), which was written in 2004 at the time of the agreement’s renewal for a further ten years.

A new design of warhead could seek to enhance safety and reliability and enable improved stewardship of the stockpile without recourse to full explosive testing, thereby allowing the UK to continue its testing moratorium in line with the Comprehensive Test Ban Treaty.

Some commentators speculate that a new warhead might be developed so as to offer a wider range of yield [i.e. explosive] options, perhaps to allow more “useable” smaller weapons to be deployed against more “precise” targets.<sup>17</sup> The Bush administration has pursued the idea of smaller and more specialised nuclear warheads that could be used against hardened or underground targets, perhaps to destroy chemical or biological weapons agents in the possession of so-called rogue states, although efforts to secure funding for such a programme have encountered congressional opposition.

### **2.3 Specific Programmes at Aldermaston**

As noted above, the Government has set out plans to upgrade or replace a number of major facilities at AWE Aldermaston, including a facility for conducting hydrodynamics experiments and the development of a new high energy laser facility. An *Independent* article on Aldermaston from October 2006 characterised the scale of the work involved as follows:

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<sup>15</sup> Memorandum submitted by the Ministry of Defence, Annex B (The Expected Life of the Trident System) , 19 January 2006, para 2a

<sup>16</sup> *The Future of the United Kingdom’s Nuclear Deterrent*, Cm 6994, 4 December 2006: <http://www.mod.uk/DefenceInternet/AboutDefence/CorporatePublications/PolicyStrategyandPlanning/DefenceWhitePaper2006Cm6994.htm>

<sup>17</sup> See for example ‘Secret plan for N-bomb factory’, *The Observer*, 16 June 2002

“AWE chiefs described it as the biggest construction site in England, and have compared it with the fifth terminal at Heathrow.”<sup>18</sup>

### **Supercomputers**

According to AWE, the hydrodynamics and laser facilities are required to ensure an appropriate understanding of the physics involved with nuclear weapons. The facilities will provide scientific data for AWE’s computers, which include a three teraflop IBM supercomputer known as “Blue Oak” that was delivered at the end of 2001. The 2001 *AWE Annual Report* commented:

Supercomputing is vital to our science-based stockpile maintenance and capability programmes in a nuclear testban era. It enables us to mathematically model the complex processes in a nuclear event. The new supercomputer, with a capability to perform three million - million calculations per second, placed us in the world’s top ten in terms of computational power. Calculations that had previously taken weeks to complete can now be done in minutes.<sup>19</sup>

The 2005-06 *AWE Annual Report* said that work was underway on a project to install a new 41 teraflop supercomputer, known as “Larch”, which was to be commissioned during the summer of 2006.<sup>20</sup> The AWE website suggested that Larch was expected to deliver more than 20 times the throughput of Blue Oak, with the potential for that to increase to almost 30 times after code tuning.<sup>21</sup>

### **ORION Laser Facility**

The ORION laser facility is intended to replace the HELEN laser, which has been in operation for around 25 years. A Parliamentary Answer from February 2006 provided background:

In 2001 a review of the capability provided by the HELEN laser identified a requirement to replace it in order to attain, under laboratory conditions, previously inaccessible temperature and pressure regimes akin to those actually obtained in a nuclear weapon. This was deemed essential to underwrite the continued safety and reliability of the Trident nuclear warhead stockpile in the nuclear test ban era. Until its planned decommissioning in 2008, HELEN will continue to be used for worthwhile experiments both in support of Trident and as a test bed for some of the technologies and equipment to be used on the ORION laser.<sup>22</sup>

Further detail was provided in the *AWE Annual Report* for 2002:

Materials enter a plasma state in a nuclear detonation. The study of plasma physics is therefore an essential area of research for AWE’s scientists in assuring the safety, performance and reliability of the United Kingdom’s nuclear stockpile in service, without recourse to actual nuclear testing. The proposed new laser will enable conditions to be generated that will more closely simulate those found at the centre of a star or within a nuclear detonation -albeit on a minute scale.

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<sup>18</sup> [‘Aldermaston recruits scientists 'to work on nuclear warheads'’, \*Independent\*, 20 October 2006](#)

<sup>19</sup> [AWE Annual Report 2001](#), p.12

<sup>20</sup> [AWE Annual Report 2005-06](#), p.10

<sup>21</sup> [http://www.awe.co.uk/main\\_site/scientific\\_and\\_technical/featured\\_areas/hpc\\_contents/Larch/index.html](http://www.awe.co.uk/main_site/scientific_and_technical/featured_areas/hpc_contents/Larch/index.html)

<sup>22</sup> HC Deb 6 February 2006, c825w

It will be twice the physical size of HELEN and 1,000 times more powerful. Laser light will be split into both 'long' and 'short' pulses of power. Ten long pulse beams will create enormous pressure. During this 'long' period, of one thousandth of a millionth of a second, two 'short' pulse beams, delivered in just one millionth of a millionth of a second, will create high temperatures. The long pulse beams are a direct development of the existing HELEN laser using a multi-pass configuration. The short-pulse beams have their origin in the VULCAN laser at the Rutherford Appleton Laboratory that has just commissioned a single short-pulse system. [...]

If the laser is approved it is intended that the facility will lead to greater collaboration between AWE's staff and those in United Kingdom universities and research centres. As well as enabling experiments of crucial importance to weapon physics, the laser should also be able to explore such areas as astrophysical plasmas and inertial confinement fusion. Proposals will therefore be sought from the academic community, through the Rutherford Appleton Laboratory, for the use of a proportion of the 'shots' available on the laser.<sup>23</sup>

The proposal to develop a replacement for HELEN came after the Government chose not to continue with plans to participate in a programme at the US National Ignition Facility. Minister of State Adam Ingram set out the Government's position in a Parliamentary Answer of May 2005:

The Ministry of Defence is currently considering a new proposal for a laser facility at AWE to replace the existing HELEN laser. In 2001, because of time and cost overruns on the United States National Ignition Facility, it was decided not to continue with plans, announced on 5 July 1999, Official Report, column 341W, to build a United Kingdom target chamber attached to that facility.<sup>24</sup>

The Defence Secretary, Des Browne, said in answer to a PQ in June 2006 that: "Project Orion has a maximum contract value of £183 million against the current contract deliverables."<sup>25</sup> According to the AWE Annual Report for 2005-06, the project received final planning approval in January 2006 and will take around five years to build and commission.<sup>26</sup>

### ***Hydrodynamics testing***

Research into hydrodynamics allows scientists to study the behaviour of materials subjected to explosive shock, such as during a nuclear explosion. Typically, experiments involving high explosives last only a few tens of millionths of a second, so special diagnostics are required to tell the scientist what actually happened in the experiment. Gathering data on how materials behave and interact when they become fluid or hydrodynamic under extreme conditions enables researchers to simulate such processes using computer modelling and thereby better understand how weapon components perform as they age, without recourse to full-scale nuclear testing.

The Government insists such testing is required to underwrite the safety and reliability of the UK's nuclear deterrent,<sup>27</sup> and said in June 2006 that it planned to increase the number of scientists working on hydrodynamics from 70 to 95 over the next three years. Furthermore, a replacement hydrodynamics testing facility, reportedly known as the Core Punch Facility, is

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<sup>23</sup> [AWE Annual Report 2002](#), p.6

<sup>24</sup> HC Deb 21 May 2005, c1251w

<sup>25</sup> HC Deb 16 June 2006, c1528w

<sup>26</sup> [AWE Annual Report 2005-06](#), p.10

<sup>27</sup> See for example, HC Deb 6 June 2006, c504w



planned, which will have the capacity to make measurements an order of magnitude more precise than the existing facility.<sup>28</sup>

In October 2004 Mr Ingram was asked what environmental impact assessment had been conducted on the planned replacement facility and what his estimate was of the cost of the facility. He responded:

A number of options for such a facility are still under consideration and mature costings are therefore not available. Environmental impact is one of a range of issues that will be addressed in the normal way as our plans develop.<sup>29</sup>

In June 2006 the Defence Secretary reiterated that a number of options remained under consideration for the replacement facility and that completion dates for the work would depend on the option selected.<sup>30</sup> He also provided figures for the costs of such testing:

It is planned to spend in the order of £5 million on hydrodynamic testing at the Atomic Weapons Establishment this year, rising to around £6 million by the end of 2007-08. The precise budget beyond that has not been finalised.<sup>31</sup>

## 2.4 Criticisms

Some observers question the Government's assertion that the planned replacement hydrodynamics and laser facilities are required to ensure the safety and reliability of the existing warhead stockpile. They argue that such facilities would be of limited use in that regard, but would be vital for the development of new warhead designs. In a report from October 2006, Greenpeace quoted former scientists involved with the US nuclear programme, who suggested that maintenance of existing warheads would best be achieved via engineering-based inspection and remanufacture, rather than AWE's approach of science-based stockpile stewardship using computer modelling, and laser and hydrodynamics testing. The Greenpeace report characterised an engineering-based approach as follows:

In essence this involves detaching and checking each of the thousands of individual parts that make up a nuclear weapon and its subsystems. If there are any problems or signs of deterioration the part is simply replaced by an identical part. Stocks of identical parts are created through remanufacturing parts according to their original specifications. As long as the basic weapon design, particularly the plutonium pit in the warhead itself, is not changed then this method will continue to work.<sup>32</sup>

Consequently, one scientist advising the US Government on nuclear issues believes it is important to distinguish between "stockpile stewardship" and "curatorship":

I suggest that it is better to describe the future task as curatorship [i.e. engineering-based inspection and remanufacture] than as stewardship, and emphasize the distinction between these two concepts. In stewardship the human resources required to design and develop weapons are maintained, with skills honed on classified and unclassified experiments conducted at facilities such as the National Ignition Facility (NIF) and in hydronuclear tests. In curatorship these facilities are not built... only those

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<sup>28</sup> [AWE Annual Report 2002](#), p.5

<sup>29</sup> HC Deb 4 October 2005, c1863w

<sup>30</sup> HC Deb 16 June 2006, 1520w

<sup>31</sup> HC Deb 29 June 2007, 532-3w

<sup>32</sup> [Britain's New Bomb Programme Exposed](#), Greenpeace report, October 2006, p.5

skills required to remanufacture weapons according to their original specifications are preserved. The purpose of this and that they are primarily intended for the improvement of existing warheads or for the development of new designs. The purpose of this note is to argue that curatorship is preferable to stewardship. The chief nuclear danger in the present world is that of proliferation, and stewardship will exacerbate this danger, while curatorship will mitigate it while preserving our existing nuclear forces...<sup>33</sup>

A further concern raised by critics is that the development of new warhead designs using computer modelling could eventually lead to pressure for a resumption of full-scale testing to ensure the new designs work. Greenpeace commented:

The creation of completely new nuclear weapons through the use of advanced computer modeling and laboratory experiments will inevitably lead to reduced confidence in the reliability of those weapons because the conditions created by the use of powerful lasers or hydrodynamic tests are very different to those created by an actual nuclear explosion. It will only be a matter of time before politicians and the military begin to create pressure for a return to full-scale nuclear testing to make sure their new weapons 'really work'. [...]

The new hi-tech developments being built at Aldermaston set Britain on the road towards resuming full-scale nuclear tests.<sup>34</sup>

In addition, Greenpeace and other anti-nuclear campaigners criticise the Government's approach of developing advanced testing facilities and computer modelling capabilities, arguing that it is undermining both the nuclear Non-Proliferation Treaty and the Comprehensive nuclear Test Ban Treaty. Greenpeace suggested in its October 2006 report that:

The non-nuclear weapons states that signed up to the CTBT clearly understood that this treaty was intended to end nuclear weapons development. The UK investment programme at Aldermaston is turning the CTBT into a hollow shell that allows those states with advanced technology to develop new nuclear weapons without nuclear testing. The danger to the CTBT is especially acute as the UK's continued support for the CTBT after the US Senate voted against it has been important in persuading the non-nuclear states not to abandon the treaty.<sup>35</sup>

Others dispute the view that the new facilities are being developed with the primary aim of developing new warhead designs, arguing instead that the main driver is probably the need to retain key personnel for the future. An article in the *Guardian* from January 2006 commented:

Frank Barnaby, a former AWE weapons scientist and now nuclear issues consultant at the Oxford Research Group, believes that Orion would help in the development of new warheads only indirectly. "I think it's a genuine misunderstanding. There are so many designs already available, it's hard to see the need for a new one," he said.

"What you do need is to maintain a team of scientists who could develop a nuclear weapon if you ever wanted them to and that is a national asset. But in order to get

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<sup>33</sup> Quoted in *ibid.* p.6-7

<sup>34</sup> *ibid.* p.7

<sup>35</sup> *ibid.* p.9

young people to join and stay, you've got to excite them. Orion and supercomputers have a definite element of keeping together the team and getting them to stay."<sup>36</sup>

### **3 Ownership arrangements at AWE**

#### **3.1 Original ownership arrangements**

AWE is a government-owned, contractor-operated (GO-CO) establishment. This means that the site and facilities at AWE remain in government ownership but responsibility for operations, management and employment of the workforce is contracted to a private company. The first management contract was awarded in 1993. Following a competition held by the Ministry of Defence, the contract for a second term was awarded on 1 April 2000 to AWE Management Ltd for a period of ten years. In January 2003 the contract was extended to 25 years. AWE Management Ltd thus operates the site and facilities at the Atomic Weapons Establishment on behalf of the MoD.

AWE Management Ltd was formed as an equal partnership consortium comprising British Nuclear Fuels Ltd, the US defence company Lockheed Martin, and the UK-based Serco group, with each owning a third of the consortium.

Lockheed Martin's website explains the GO-CO arrangement in place at AWE:

The United Kingdom's Atomic Weapons Establishment is managed on behalf of the Ministry of Defence under a Government-owned/contractor-operated arrangement. This means that the AWE sites and facilities remain in Government ownership but responsibility for operations and the employment of the workforce is contracted to a private company [...]

AWE Management Ltd. is an equal partnership consortium formed by Lockheed Martin, British Nuclear Fuels Ltd (BNFL), and SERCO. It brings together the experience of its parent companies in the fields of industry and commerce, defence and nuclear technology.

A key factor in the new management contract is a partnering arrangement between AWE Plc and the Ministry of Defence, which will ensure inward investment and the efficient, cost effective and safe delivery of AWE's programmes to meet the requirements of the UK Ministry of Defence.<sup>37</sup>

AWE's website provides further information about the ownership and management of the facilities at Aldermaston and Burghfield:

AWE employs around 4,500 staff and over 2,000 contractors, whose work covers a vast range of disciplines. We employ scientists, engineers, technicians, crafts-people and safety specialists, as well as business and administrative experts – many of whom are leaders in their field.

AWE is managed for the Ministry of Defence (MoD) through a contractor-operated arrangement. While our sites and facilities remain in government ownership, their management, day-to-day operations and the maintenance of Britain's nuclear stockpile is contracted to a private company: AWE Management Limited (AWE ML).

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<sup>36</sup> ['£100m laser project will mimic nuclear explosion'](#), *Guardian*, 20 January 2006

<sup>37</sup> <http://www.lockheedmartin.co.uk/products/awe.html>

AWE ML is formed of three equal shareholders – British Nuclear Group (BNG), Serco, and Lockheed Martin. BNG has unrivalled knowledge of the nuclear industry, particularly health & safety and decommissioning issues; Serco has international experience in the management of civilian and military projects and services; and Lockheed Martin has a proven record of successfully delivering complex defence equipment, including nuclear weapon production and stewardship in the United States.

AWE ML was awarded a 10-year contract to manage AWE in April 2000. This was extended in 2003 and is now set to run until March 2025.

AWE plc is the company that AWE ML has delegated to deliver the contract. It employs the workforce, maintains the nuclear site operating licenses and discharge authorisations, and its directors have total responsibility for management and operations.

The MoD, apart from being our customer, holds a golden share in AWE plc and monitors our operations and performance, and along with other regulators assures high safety and security standards.

### **3.2 BNFL's decision to sell its stake in AWE Management Ltd**

On 16 July 2007, BNFL announced its intention to sell its stake in AWE Management Ltd (AWEML). A press release explained the decision:

BNFL has today announced it has commenced the process to sell its one-third share in AWE Management Limited (AWEML).

BNFL's Group CEO Mike Parker said: "BNFL's priority here is to maximise the proceeds from the sale of our share in AWEML. We will also ensure through the process that, following the sale, the AWEML consortium will continue to have all the necessary skills to manage the performance of AWEML's subsidiary, AWE plc, in continuing to meet the requirements of its customer, the Ministry of Defence."

AWEML is an equal joint venture involving BNFL, Lockheed Martin UK and Serco Group plc to provide the Ministry of Defence (MoD) with a professional, integrated team of technical and management experience to operate and manage the Aldermaston and Burghfield AWE sites in Berkshire.

The sale of BNFL's one-third stake in AWEML is a further step along BNFL's strategic journey. BNFL has already successfully completed the sales of its US subsidiaries Westinghouse and BNG America, and recently announced the sale of its UK subsidiary Reactor Sites Management Company.<sup>38</sup>

On 18 December 2008, BNFL announced that it had completed the sale of its one-third stake in AWE Management Ltd to the US-based Jacobs Engineering Group. A statement on the BNFL website simply stated that:

BNFL is delighted to confirm that it has today agreed the sale of its one third shareholding in AWE Management Limited to the Jacobs Engineering Group.<sup>39</sup>

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<sup>38</sup> "BNFL commences sale of its one-third share in AWE Management Limited", BNFL Press Releases, 16 July 2007, <http://www.bnfl.com/content.php?pageID=108&newsID=285>

<sup>39</sup> "Sale of One Third Shareholding", BNFL, 18 December 2008, <http://www.bnfl.com/content.php?pageID=60&newsID=291>

Commenting on his company's purchase of BNFL's stake in AWE, Jacobs President and Chief Executive Officer Craig Martin said:

We are excited to expand our strategic relationship with AWEML and become partners of Lockheed Martin and Serco [...] We are now able to offer the Ministry of Defence a much broader range of services to support their mission.<sup>40</sup>

Jacobs Engineering Group is a major contractor in the US Department of Energy's nuclear weapons establishment.

The sale of BNFL's shareholding to Jacobs Engineering Group means that AWE Management Ltd is now owned by Jacobs, Lockheed Martin and Serco, each with a one-third stake. It also means that two-thirds of AWEML is owned by American companies.

The sale, however, is of BNFL's stake in the management company which controls the operation and management of the site and facilities at AWE Aldermaston and Burghfield. The sale does not affect the overall government-owned, contractor-operated arrangements which have been in place since the current management contract was awarded in 2000 and extended in 2003. As a result, the sale does not involve the transfer of ownership of the site and facilities themselves, which remain owned by the UK Government.

### **3.3 Concerns about the new ownership arrangements**

The new ownership arrangements at AWE Management Ltd has attracted criticism by some who argue that two American companies – Jacobs and Lockheed Martin – now own two-thirds of the UK's sole nuclear weapons laboratory which has implications for the independence of the UK's nuclear deterrent. The Government has also faced criticism that the sale was announced on BNFL's website rather than by ministers making a statement to Parliament.

The Conservative defence spokesman, Gerald Howarth MP, said:

The only way this became public knowledge was when the US company issued a statement to the media.<sup>41</sup>

Mr Howarth also stated:

It is consistent with the government's unwillingness to share matters nuclear with parliament. It is not an issue about which we can be cavalier. We need to know what the implications are.<sup>42</sup>

He continued:

The AWE is critical to Britain's nuclear deterrent capability and we find it astonishing that the decision regarding the increase in US involvement in the company was not announced to Parliament. It is now imperative that the Government spells out its understanding of the implications of this move for the United Kingdom and our nuclear deterrent.<sup>43</sup>

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<sup>40</sup> Cited in "Jacobs buys into consortium operating UK nuke site", *Defence Daily International*, 9 January 2009

<sup>41</sup> Cited in "Nuclear sell-off sparks anger", *The Sunday Telegraph*, 21 December 2008

<sup>42</sup> Cited in "MPs attack sale of nuclear arms plant", *The Sunday Times*, 21 December 2008

<sup>43</sup> Cited in "Secret nuclear sell-off storm", *The Independent*, 20 December 2008

The Liberal Democrat defence spokesman, Nick Harvey MP, commented that:

It is staggering that the Government could do something of such strategic importance without informing Parliament. [...] The whole argument used for Britain having a separate weapons establishment is that this is required by the [nuclear] non-proliferation treaty, as technology-sharing is not allowed. We must therefore query the rationale of a US company having a majority shareholding in AWE [...] There has always seemed to be a lot of cloak and dagger around Aldermaston, and now it appears the Government has concealed something of huge significance from Parliament. If the company has declared the deal is going ahead to the New York Stock Exchange, they must be fairly sure this is the case.<sup>44</sup>

Anti-nuclear campaigners also claimed that the sale of BNFL's stake in AWEML to the Jacobs Engineering Group would compromise the independence of Britain's nuclear deterrent. Jeremy Corbyn MP argued that:

It is almost unbelievable that something as serious as the development of nuclear weapons should be privatised to an American company.<sup>45</sup>

Dr Kate Hudson, Chairman of the Campaign for Nuclear Disarmament (CND), said:

It is outrageous that control of Britain's so-called 'independent' nuclear weapons is being handed over to American corporations.<sup>46</sup>

The Ministry of Defence (MoD), however, maintained that the UK's strategic interests had been protected with a "special share". An MoD spokesman said that:

It is the UK government, not AWE, that sets the UK's nuclear policy. UK sovereign interests remain protected at all times, as does the independence of the UK deterrent. The safe operation of AWE will remain unaffected by the sale.<sup>47</sup>

### 3.4 Recent Statements and Parliamentary Questions

In a Written Ministerial Statement on 12 January 2009, Pat McFadden MP, Minister of State at the Department for Business and Regulatory Reform (BERR), maintained that the sale of BNFL's share in AWEML had followed a "competitive process" which had been conducted in "close consultation" with BERR and the MoD. Mr McFadden stated that the sale did not compromise the operational independence of UK's strategic nuclear deterrent and that all AWE sites "remain in Government ownership". He also stated that the MoD continued to hold a "special share in AWE plc which would "allow the MoD to assume control of AWE plc should that become necessary". Mr McFadden said:

Further to the previous Secretary of State's announcement on 16 July 2007, Official Report, column 1WS, regarding the planned sale by British Nuclear Fuels Ltd (BNFL) of its one third stake in Atomic Weapons Establishment Management Ltd (AWEML), I can confirm that agreement was reached on 17 December 2008 to sell the one third stake to a UK subsidiary of the Jacobs Engineering Group, subject to clearance under EU merger control requirements. The terms of the deal remain commercially sensitive.

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<sup>44</sup> Cited in "Secret nuclear sell-off storm", *The Independent*, 20 December 2008

<sup>45</sup> Cited in "Secret nuclear sell-off storm", *The Independent*, 20 December 2008

<sup>46</sup> Cited in "Secret nuclear sell-off storm", *The Independent*, 20 December 2008

<sup>47</sup> Cited in "Nuclear sell-off sparks anger", *The Sunday Telegraph*, 21 December 2008

Jacobs is already working as a key strategic partner to AWEML and their acquisition of BNFL's one-third stake followed a competitive process conducted by BNFL in close consultation with the BERR and the Ministry of Defence (MOD). HMG is satisfied that the sale of BNFL's one third stake to Jacobs achieves the dual objective of maximising shareholder return from the stake while ensuring that a strong AWEML consortium is in place under Government owned contractor operated arrangements to manage the enduring performance of AWEML's subsidiary, AWE plc, which is responsible for the day-to-day operation of AWE itself and for meeting the requirements of the customer, the MOD. The MOD is satisfied that Jacobs meets the relevant security requirements.

Strategic requirements and the UK deterrent programme are set by the UK Government. UK nuclear forces will remain fully operationally independent; decision-making and the use of the system remains entirely sovereign to the UK. All AWE sites and assets remain in Government ownership, as they have done since AWE was first contractorised in 1993. The MOD continues to hold a special share in AWE plc, which would allow the MOD to assume control of AWE plc, should that become necessary.<sup>48</sup>

On 20 January 2008, in response to a Parliamentary Question by David Anderson MP, Mr McFadden said:

The Government have not sold any of their stake in the Atomic Weapons Establishment itself. All Atomic Weapons Establishment sites and assets remain in Government ownership, as they have done since the Atomic Weapons Establishment was first contractorised in 1993. What happened on 17 December was that BNFL reached agreement to sell its one-third share in AWE Management Limited (AWEML) to Jacobs Engineering Group subject to clearance under EU merger control requirements. AWEML is the consortium of BNFL, Serco and Lockheed Martin that has the 25 year contract with MOD to manage and operate the Atomic Weapons Establishment on MOD's behalf. The sale of the one-third share arose as a result of the dismantling of BNFL and the terms remain confidential between the parties. Further details of the sale and the nature of AWEML's relationship with AWE plc are given in the written statements that I gave to the House on 12 January this year, Official Report, column 1WS and my right hon. Friend, the previous Secretary of State gave to the House on 16 July 2007, Official Report, column 1WS, respectively.<sup>49</sup>

In a Written Parliament Answer on 26 January 2009, Baroness Taylor, Parliamentary Under-Secretary of State at the Ministry of Defence provided details of the Government's "special share" in AWE. She commented:

The Atomic Weapons Establishment (AWE) operates under Government-owned contractor operated arrangements. AWE has been contractorised since 1993. The UK Government have retained full ownership and control of all AWE assets, vested in the Secretary of State for Defence. The management and operation of AWE have been contracted to AWE Management Limited (AWEML) since 1 April 2000. Day-to-day operations are undertaken by a separate company, AWE plc, which is owned by AWEML and has its own board of directors with no AWEML parent company affiliations. The Ministry of Defence (MoD) holds a special share in AWE plc, which would allow intervention in the management of AWE or the transfer of responsibility to another contractor if that became necessary. The AWE contract is managed by the Directorate Strategic Weapons (DSW) in the Defence Equipment and Support area of the MoD. DSW works with a wide range of stakeholders in the MoD and other government departments. The primary document that defines the relationship between the MoD and AWEML is the contract between the parties. This requires the MoD to be

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<sup>48</sup> HC Deb, 12 January 2009, Col 1WS

<sup>49</sup> HC Deb, 20 January 2009, Col 1314W

consulted in respect of any changes to the composition of AWEML. Such consultation took place in respect of the recent changes in ownership of AWEML, which has no bearing on the ownership and control of AWE assets. Strategic requirements and the UK deterrent programme are set by the UK Government. UK nuclear forces will remain fully operationally independent; decision-making and the use of the system remains entirely sovereign to the UK.<sup>50</sup>

In a separate Parliamentary Answer, on 2 February 2009, Lord Mynes, a Government Treasury spokesman, stated:

HM Treasury were involved in the development of BNFL's strategy. This strategy involved transferring the management of decommissioning sites to NDA appointed contractors through competitive processes, ceasing to carry out any non-commercial activities and seeking to realise value from other assets including the sale of the BNFL stake in the management company for the Atomic Weapons Establishment. Implementation of the sale of the AWE stake was led by BERR and approved by BERR's Secretary of State and accounting officer. Treasury officials provided advice on the interpretation of rules relating to parliamentary notification as covered in Managing Public Money.<sup>51</sup>

In response to a Parliamentary Question by Lord Aster of Heaven on 3 March 2008, Baroness Vadera, Parliamentary Under-Secretary of State at the Department for Business and Regulatory Reform said:

The decision on the form of the announcement was taken by the Board of BNFL, having consulted with the shareholder executive and the MoD. As is common, with transactions of this nature, it was a term of the Jacobs proposal that the price and other commercially sensitive terms remained confidential. The Jacobs proposal was materially superior to the other proposal received. The board of BNFL was advised in relation to the disposal by NM Rothschild and Freshfields.<sup>52</sup>

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<sup>50</sup> Written Parliamentary Question, 26 January 2009, House of Lords, Col 2-3WA

<sup>51</sup> Written Parliamentary Question, 2 February 2009, House of Lords, Col 85-WA

<sup>52</sup> Written Parliamentary Question, 3 March 2009, House of Lords, Col 130-1WA