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# The Future of the British Nuclear Deterrent

The UK's strategic nuclear deterrent will reach the end of its service life in approximately 2024.

In summer 2006 the Government announced that a White Paper on the future of the British nuclear deterrent would be published before the end of the year and that the issue would be debated and put to a vote in Parliament.

This paper sets out a number of issues that may inform that debate, including assessments of the future security environment; the UK's international treaty obligations; the potential cost of procuring a successor system; and the implications of dispensing with the deterrent. It also examines public opinion and the options available to the Government.

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## Summary of main points

The British nuclear deterrent is based entirely on the three components of the Trident weapons system. This comprises four Vanguard-class nuclear-powered submarines, each carrying a maximum of 48 nuclear warheads, which are mounted on up to 16 Trident II D5 ballistic missiles. The total stockpile of active warheads stands at fewer than 200.

The Trident system entered service in late 1994 and has a projected lifespan of approximately 25-30 years. A replacement would, therefore, need to enter service in the mid-2020s. The current estimate of the total acquisition cost of the Trident programme in cash terms is £9.8bn. At today's prices this is £14.9bn.

In light of the lengthy procurement process required for complex weapons systems, the Government has said a decision on the future of the nuclear deterrent will be required by the end of 2006. A White Paper will be published and a debate and vote will be held in Parliament.

The decision on whether to replace Trident or to dispense with the deterrent involves consideration of a number of issues. These include the current and emerging strategic environment and the threats that the UK may face in the coming decades; the UK's international treaty obligations, most notably under the nuclear Non-Proliferation Treaty, which commits the UK and the other four recognised nuclear powers to the total elimination of their nuclear arsenals; and public and international opinion. Recent polls suggest that opinion on replacing Trident has become sharply divided, with a slim majority (51%) in favour of replacement and around two-in-five (39%) respondents supporting cancellation of the nuclear weapons programme altogether.

Once the fundamental decision on replacement or disarmament has been taken, various other issues then have to be addressed, such as the potential cost of a successor system; the impact on the UK's domestic industrial base; the scope for UK involvement in ongoing, or future, US programmes relating to its nuclear deterrent capability; and whether changes to the UK's current nuclear deterrent posture are possible.

The Government has a number of broad options available, each with its own technical and political limitations and benefits. The procurement of a successor system could involve the extension of the in-service life of the current deterrent capability in the near term; a direct replacement for Trident in line with current UK-US agreement; or the procurement of an entirely brand new capability. Alternatively the Government could move towards disarmament and possibly the retention of a "virtual arsenal".

It is not possible to produce a reliable estimate of the level of expenditure on a successor system as this will depend entirely upon the option that is chosen and any changes that may be made to the size and/or readiness of the UK's nuclear deterrent.



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# I Evolution of the British Nuclear Deterrent<sup>1</sup>

The UK first tested a nuclear explosive device in October 1952, becoming the third state to develop nuclear weapons after the United States and the Soviet Union.<sup>2</sup> The following year the Royal Air Force began testing a rudimentary air-dropped fission device, the 10 kiloton Blue Danube free-fall bomb.<sup>3</sup> Development work proceeded under conditions of the utmost secrecy and as a matter of great urgency, driven by the British Government's concerns about rising Cold War tensions and the threat posed by the Soviet Union's superiority in conventional forces in central Europe.<sup>4</sup>

Responsibility for the delivery of those early weapons lay with the V bombers of the RAF's strategic bomber force, although technical challenges and low serviceability rates meant that the first weapons were not formally accepted into RAF service until 1957. Weapon production, which required large quantities of fissile material, was also hampered by delays and a shortage of highly enrichment uranium.<sup>5</sup> By 1958 the UK is believed to have possessed around 58 warhead cores.

Further tests at Malden Island and Christmas Island in the Pacific in 1957-8 involved the detonation of a 3 megaton thermonuclear device.<sup>6</sup> The first fully operational British-built thermonuclear weapon – the 1 megaton Red Snow warhead, which was developed from the US W28 design – entered service in 1961. Blue Steel, the RAF's first nuclear-armed, stand-off air-to-surface missile which carried the Red Snow warhead, achieved operational status in 1963.

In 1958 the UK and the United States concluded a 'Mutual Agreement for Co-operation on the Uses of Atomic Energy for Mutual Defence Purposes'.<sup>7</sup> The Agreement, which has come to be seen as the cornerstone of the British nuclear weapons programme, enables exchanges of technical information and allows the UK to draw on US warhead designs, although final responsibility for building and maintaining the warheads remains

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<sup>1</sup> An earlier draft of this paper was used by the House of Commons Defence Select Committee in its report on *The Future of the UK's Strategic Nuclear Deterrent: the Strategic Context*, HC986, Session 2005-06 (<http://www.publications.parliament.uk/pa/cm200506/cmselect/cmdfence/1488/148802.htm>)

<sup>2</sup> The test, codenamed Hurricane, was conducted in the Monte Bello Islands off the north-west coast of Australia. The device was detonated on a surplus warship.

<sup>3</sup> A kiloton is an explosive force equivalent to that of one thousand metric tons of TNT. There are two main types of nuclear weapon: those that rely on nuclear fission (colloquially known as atomic bombs) and those more powerful devices that use nuclear fission and fusion (commonly referred to as thermonuclear or hydrogen bombs).

<sup>4</sup> For a detailed history of the development of the British nuclear deterrent, see Margaret Gowing, *Independence and Deterrence – Britain and Atomic Energy 1945-1952*, Volumes 1 & 2, 1974

<sup>5</sup> On 1 and 2 March 1955 the House of Commons held a debate on the motion "That this House approves the Statement on Defence 1955, Command Paper No 9391". That Statement was primarily concerned with the development of the H-bomb. An amendment to the text of that motion was tabled on 2 March 1955 which, while approving the development of a nuclear weapons capability, criticised the Statement for its lack of detail regarding the UK's conventional forces. That amendment did not pass on division. A vote on the original text of the motion (Division No. 39) was approved by 303 to 253 votes (HC Deb 1 March 1955, 1893-2012 and HC Deb 2 March 1955, c2066-2199).

<sup>6</sup> A megaton is an explosive force equivalent to that of one million metric tons of TNT. The largest device detonated thus far was a Soviet warhead that had a yield of 58 megatons.

<sup>7</sup> For more detail on the MDA and the recent 10-year extension of the provision relating to the transfer of materials, see Library Standard Note SN/IA/3147, *UK-USA Mutual Defence Agreement*.

with the UK's Atomic Weapons Establishment (AWE).<sup>8</sup> An amendment to the Agreement was introduced in 1959, allowing purchases and exchanges of fissile and thermonuclear material. One of the primary advantages of cooperation with the US was that it enabled the UK to build more compact and efficient warheads, such as the thermonuclear Red Snow warhead, and thereby make better use of its limited stocks of fissile material. US-UK collaboration brought other benefits too, such as allowing the UK to use the US test site in Nevada. Frequent atmospheric and underground testing allowed British scientists to improve the weapons' reliability and safety and to increase their yield or explosive power. The cooperation also created technical challenges, not least in adapting US designs to British engineering practices.

In the late 1950s the USA and UK were also engaged in a joint project to develop the Skybolt air-launched stand-off missile, which the British viewed as the central component of their future nuclear capability. In 1962, however, the Kennedy administration cancelled the project. To fill the gap, the British Government reached agreement with the USA in December of that year to procure the Polaris submarine-launched missile system, which entered service later that decade.

The shift to a submarine-launched missile system represented a dramatic improvement in capability. The RAF's bomber force required large, static bases and was perceived to be vulnerable to a first strike by the most likely opponent, the Soviet Union, whereas the new submarine fleet was mobile and difficult for the Soviets to track.<sup>9</sup> Strong air defences could deplete the bomber force before it reached its target, in contrast to a missile attack which could be mounted from a distance, minimising the risk to the crew and the submarine. Furthermore, the cost and technical challenges of designing an effective missile-defence system meant that a multiple ballistic missile strike from a Polaris submarine would be extremely difficult to defend against.<sup>10</sup>

The Polaris system comprised four Resolution-class ballistic missile submarines, each armed with sixteen Polaris missiles. The submarines were designed and built in the UK, albeit with initial assistance from the US in designing the nuclear propulsion system. The missiles and their launch systems were purchased from the United States, while the warheads were built in the UK, again with US collaboration. At first, the warheads used were a scaled-down version of the existing British WE 177 warhead, which had entered service in 1966. Three warheads could be carried on each missile, but concerns about the ability of Polaris to penetrate Soviet defences subsequently resulted in the development by the UK of the more advanced Chevaline system, which could carry two warheads mounted on a redesigned Polaris 'front end'. Chevaline was "hardened"

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<sup>8</sup> See Section III D below for more detail on AWE Aldermaston.

<sup>9</sup> The UK has a geographical advantage in this regard, in that ballistic missile submarines departing on patrol have a number of routes out into deep water, making detection by an opposing hunter-killer submarine extremely difficult. See Michael Clarke, 'Does my bomb look big in this? Britain's nuclear choices after Trident', *International Affairs*, January 2004, Vol 80, Issue 1, page 50, footnote 6.

<sup>10</sup> For a history of missile defence, the rather rudimentary Soviet system around Moscow, and current US efforts to develop a system, see Library Research Paper 03/28, *Ballistic Missile Defence*, 26 March 2003 and Library Standard Note SN/IA/2972, *Ballistic Missile Defence - Latest Developments*, 23 March 2004.

against nuclear attack and employed decoys and penetration aids to help it defeat Soviet nuclear-armed anti-ballistic-missile defences around Moscow.<sup>11</sup>

By the final decade of the Cold War the British nuclear deterrent had three main elements: strategic, sub-strategic and tactical.<sup>12</sup> Polaris Chevaline served in the strategic role for use against multiple targets in the adversary's homeland, such as missile silos, industrial complexes or centres of population, while the sub-strategic role for a more "limited" strike against individual targets on enemy territory was fulfilled by the WE 177 free-fall bomb carried by the RAF's Vulcan and Tornado aircraft. Lower yield WE 177 devices served in the tactical role for use against enemy troops and equipment on the battlefield and in a naval role for use as a nuclear depth charge against submarines. Furthermore, US tactical nuclear warheads were deployed on heavy artillery and short-range Lance missiles under a US-UK dual-key arrangement, although these were withdrawn in the late 1980s as part of a US-Soviet initiative to reduce tactical weapons.

By 1998 the WE 177 had been withdrawn from service and the Polaris/Chevaline system phased out and replaced by four Vanguard-class submarines armed with Trident missiles. This left the UK with no dedicated tactical nuclear capability, and with Trident as the sole remaining nuclear weapons system fulfilling both the strategic and sub-strategic roles.

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<sup>11</sup> Discussion on the role of Parliament in the Polaris and Chevaline decisions is available in Library Background Paper No. 225, *The Modernisation of British Theatre Nuclear Forces*, 5 April 1989.

<sup>12</sup> There is some overlap between these three roles in terms of the weaponry's range and explosive power (known as yield), and a more useful distinction can perhaps be made in terms of the type of target. See Section II G below for a discussion of British strategic and sub-strategic capabilities.

## II Trident

### A. Procurement Decision

The decision to acquire Trident dates back to 1980. In a Statement to the House on 15 July 1980 the then Secretary of State for Defence, Francis Pym, stated:

With permission Mr Speaker, I should like to make a statement on the eventual replacement of the Polaris force, which now provides Britain's strategic nuclear deterrent.

As the House knows, the Government regard the maintenance of such a capability as an essential element in the defence effort that we undertake for our own and Western security [...]

We have studied with great care possible systems to replace Polaris. We have concluded that the best and most cost-effective choice is the Trident submarine-launched ballistic missile system developed by the United States [...]

The agreement that we have reached is on the same lines as the 1962 Nassau agreement, under which we acquired Polaris. We shall design and build our own submarines and nuclear warheads here in the United Kingdom, and buy the Trident missile system, complete with its MIRV [multiple independently targetable re-entry vehicle<sup>13</sup>] capability, from the United States. Once bought, it will be entirely in our ownership and operational control, but we shall commit the whole force to NATO in the same way as the Polaris force is committed today.<sup>14</sup>

In response to that statement the Shadow Defence Secretary, William Rodgers, criticised the manner in which the Government had announced its decision, and raised several concerns over its financial implications. He stated:

The whole House recognises that this matter raises difficult political issues, because it involves a question of judgement about the state of the world and the Alliance 15 to 20 years ahead. Also, on the figures that the right hon. Gentleman gave, it raises difficult financial issues. First the cost is high in terms of our conventional obligations in NATO. Many hon. Members on both sides of the House will be worried by the effect that that may have, within the defence budget, for our present obligations. As both sides of the House will recognise, with limited national resources at a time of no growth, or slow growth, this programme will pre-empt a large sum of money, which could go towards other worthy programmes.

We have asked, first, for a full and informed debate, which has not taken place. That is not only the view of the Opposition, and not only the view in the House. Secondly, some time ago we asked specifically for a Green Paper, and the right hon. Gentleman refused us that. Thirdly, at the moment a Select Committee is considering some important issues relating to this decision on behalf of the whole House. There are those who will say that it could be a contempt of the House for

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<sup>13</sup> MIRV capability enables each missile to simultaneously engage multiple targets.

<sup>14</sup> HC Deb 15 July 1980, c1235

the Secretary of State to make an announcement of this sort before the Select Committee and the House have had the opportunity to discuss the matter.

Irrespective of arguments about what may or may not have happened in the past, in today's circumstances an announcement of this sort, made in this way, falls far below the standards that the Government should set on such issues. In those circumstances many hon. Members are deeply sceptical about the decision. We believe that the case for buying Trident has not been made, and we cannot approve it.<sup>15</sup>

Liberal Spokesman Stephen Ross also opposed the Government's decision:

Is the Secretary of State aware that we on the Liberal bench have consistently opposed the whole concept of an independent nuclear deterrent? Therefore, his announcement today gives us no joy.<sup>16</sup>

After detailed consideration the decision was taken in March 1982 to acquire the Trident II D5 missile from the US instead of the Trident I C4 variant as originally envisaged. Announcing this decision to the House the then Secretary of State for Defence, John Nott, outlined:

After detailed consideration here, and with the United States, we have now decided also to purchase the Trident II D5, instead of the Trident I C4 missile system, from the United States.

The number of warheads that the Trident II D5 missile will carry, and therefore Trident's striking power, remains wholly a matter of choice for the British Government. Our intention is that the move to D5 will not involve any significant change in the planned total number of warheads than we originally envisaged for our Trident I C4 force.

The reasons for our choice of Trident II are briefly as follows. Just as the Polaris system will, by the mid-1990s, have been in service for approaching 30 years and will have reached the end of its operational life, so the Trident system must remain operational until 2020- that is, 40 years from now.

Our experience with Polaris and the decision – endorsed by the last labour Government – to modernise the Polaris missile with Chevaline at great cost has shown us the financial and operational penalties of running and developing a United Kingdom unique system. Following President Reagan's decision to accelerate the Trident II D5 programme, if we were to choose the C4 missile, it would enter service with the Royal navy only shortly before it left service with the United States. This would mean that the United Kingdom alone would be responsible for keeping open special Trident I C4 support facilities in the United States, and the United Kingdom alone would be forced to fund, as with Chevaline, any research and development needed to counter improved Soviet anti-ballistic missile defences. For these reasons, our judgement is that the

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<sup>15</sup> HC Deb 15 July 1980, c1237

<sup>16</sup> *ibid*, c1239

through life costs for Trident I would almost certainly be higher than for Trident II.<sup>17</sup>

From the decision in 1980 it took 14 years to complete the acquisition of the Trident capability with the first Vanguard-class submarine entering service in December 1994.

## **B. Technical Capability**

The technical capability of the Trident system can be divided into three component parts:

- The platform (four Vanguard-class submarines)
- The delivery system (Trident II D5 missile)
- The warhead

### **1. Vanguard-Class Submarine**

Designed and purpose-built in the UK, the submarine was designed solely as a nuclear-powered ballistic missile carrier. As such it differed greatly from its predecessor, the Resolution-class 'Polaris' submarines, whose design was adapted at the time from the existing Valiant-class submarine. Despite having a smaller complement of personnel, the Vanguard-class vessels were larger than the Polaris submarine in order to accommodate the Trident II D5 missile. They also incorporated several improvements from previous submarines including a new custom-designed nuclear-powered propulsion system, based on the second-generation Rolls Royce Pressurised Water Reactor (PWR2), and a new tactical weapon system for self-defence purposes, including a new submarine command system.

Each submarine has 16 independently-controlled missile tubes, which makes the Vanguard-class technically capable of carrying 192 warheads per vessel.<sup>18</sup> However, under limits imposed in the 1998 Strategic Defence Review (SDR) each submarine carries a maximum of 48 warheads while on patrol.<sup>19</sup> The submarine also has four torpedo tubes capable of firing conventional Spearfish torpedoes.

The first Vanguard-class submarine (HMS *Vanguard*) entered service in December 1994, with the last of the class of four (HMS *Vengeance*) entering service in 2001.

In February 2002 a Long Overhaul Period (Refuel) (LOP (R)) programme for the Vanguard-class submarines began, including the incorporation of a new reactor core (Core H) which will eliminate the need to undertake further reactor fuelling before the end of the service life of the submarine. HMS *Vanguard* was the first to undertake the refit

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<sup>17</sup> HC Deb 11 March 1982, c975. The exchange of letters between the UK and US were published as Cm 8517, Session 1981-82

<sup>18</sup> Each Trident-II D5 missile is capable of carrying 12 warheads.

<sup>19</sup> The changes introduced under SDR are examined in greater detail in Section II F.

programme and re-entered operational service at the beginning of 2006 following the successful completion of its Demonstration and Shakedown Operations phase.<sup>20</sup>

HMS *Victorious* arrived at Devonport Naval Base to begin its refit in January 2005 and is expected back into service at the end of 2007. HMS *Vigilant* and HMS *Vengeance* are scheduled to enter the LOP (R) refit from 2008 onwards.

## 2. Trident II D5 Missile System

The Trident II D5 missile system, which is manufactured in the US by Lockheed Martin, is a three-stage solid-fuel inertially-guided rocket approximately 13m long, nearly 2m in diameter and weighing 60 tonnes. It has a range of between 6,500km and 12,000km, dependent upon payload, and its accuracy is measured in metres.<sup>21</sup> Each missile is capable of carrying up to 12 warheads, although under the limitations imposed by the Strategic Defence Review (SDR), each missile is believed to carry an average of three apiece.

The missile is ejected from the submarine by high-pressure gas and only when it reaches the surface does the first rocket stage automatically fire. The missile's own inertial guidance system then takes over. After the third rocket motor has separated, the warhead carrier takes a star sighting to confirm the missile's position and then manoeuvres to a point at which the warheads can be released to free-fall onto their targets. Each missile has an MIRV (multiple independently targetable re-entry vehicle) capability which enables each missile to engage multiple targets simultaneously.

The UK had originally intended to purchase 65 Trident missile bodies, but this was reduced to 58 by the Labour Government in 1998.<sup>22</sup> The UK has title to these 58 missile bodies, which are held in a communal pool at the Strategic Weapons facility at the Kings Bay Submarine Base in Georgia, USA.<sup>23</sup> Maintenance and in-service support of the missiles is undertaken at Kings Bay at periodic intervals, normally after a submarine has been through refit. This arrangement was considered to be the most cost effective as the UK has not had to construct its own servicing facilities.<sup>24</sup>

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<sup>20</sup> Demonstration and Shakedown Operations involve at sea test launches of the Trident system (minus the payload of the missile) and are part of the sea worthiness trials and the sea training that are required to demonstrate the crew's ability to meet the safety requirements for handling, maintaining and operating the strategic weapons system before the submarine can return to operational service.

<sup>21</sup> The precision of ballistic missiles is measured by what is known as the circular error probability or CEP, which is the radius of the circle within which half the strikes would impact. The CEP for Trident is reported to be around 90 metres: thus, each warhead would impact within 90 meters of the target point with a probability of 50%.

<sup>22</sup> In July 1998 the Government announced six missiles had been test fired as part of the work-up of the submarines, with a further eight to be test-fired over the life of the Trident programme. A further four missiles were to be held as a "processing margin". Some of the seven missiles not purchased by the Government were required as in-service spares, while the remainder were to be sold back to the US. HC Deb 30 July 1998, c448-9w

<sup>23</sup> Because of the pooling arrangements, a missile that is deployed on a US submarine may later deploy on a British submarine and vice versa.

<sup>24</sup> Commodore Tim Hare, Royal Navy (retired) suggested in evidence to the Defence Committee that the arrangement had saved the UK in the region of £3.8 billion. Defence Committee, *The Future of the UK's Strategic Nuclear Deterrent: the Strategic Context*, HC 986, Session 2005-06, Ev. 34

### 3. Warhead

According to the Ministry of Defence, the warhead on the Trident II D5 is of British design and built at the Atomic Weapons Establishment (AWE) at Aldermaston. Public information is scarce, although it is believed to be closely related to the American W76 warhead, a thermonuclear warhead in the 80-100 kiloton deployed by the US on its Trident missiles.<sup>25</sup> The warheads undergo regular maintenance and refurbishment at AWE Aldermaston when components with a shorter lifespan are replaced.

### C. Cost

The cost of the Trident programme has been met out of the existing defence budget. Speaking in the House in July 1980 Defence Secretary Francis Pym commented:

The provision of the strategic deterrent has always been part of normal defence budgeting. It is a weapons system, like any other weapons system – ships, tanks, or whatever it may be. Within the defence budget this can and will be accommodated in the same way as Polaris was accommodated 10 to 20 years ago.<sup>26</sup>

In 1982, and following on from the decision to procure the Trident II D5 missile instead of the I C4 variant, the capital costs of procuring and maintaining Trident were estimated at 1981 prices to be £7.5bn.<sup>27</sup>

In 1991 those cost estimates were revised upwards. The current estimate of the total acquisition cost of the Trident programme in cash terms is £9.8bn. Payments already made are expressed at the prices and exchange rates actually incurred and future spend at the current financial year exchange rate. If all expenditure, past and projected, is brought up to current economic conditions the real terms estimate is £14.9bn.<sup>28</sup>

The MoD has not provided cash figures on the costs of maintaining the deterrent. Since Trident became operational in 1994, annual expenditure for capital and running costs, including the costs for the Atomic Weapons Establishment, has ranged between 3% and 4.5% of the annual defence budget.<sup>29</sup> This was equivalent to £1.2bn - £1.7bn in 2005/06.<sup>30</sup>

The annual expenditure of Trident is expected to be between 5% and 5.5% of the defence budget in 2006-07 and 2007-08.<sup>31</sup> This is equivalent to £1.9bn - £2.1bn in 2006/07 and £2bn - £2.2bn in 2007/08.<sup>32</sup>

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<sup>25</sup> Center for Defense Information (CDI) Nuclear Weapons Database, <http://www.cdi.org/issues/nukef&f/database/uknukes.html>

<sup>26</sup> HC Deb 15 July 1980, c1239

<sup>27</sup> HC Deb 11 March 1982, c976

<sup>28</sup> HC Deb 18 January 2005 c29

<sup>29</sup> HC Deb 3 July 2006 c713w

<sup>30</sup> Using Stage One RAB/ Near cash defence expenditure figure from Table 6, *The Government's Expenditure Plans 2005/06 to 2007/08*, MoD

<sup>31</sup> HC Deb 2 October 2006 c2578w

According to the MoD this increase in maintenance costs is due primarily to the programme of additional investment in sustaining key skills and facilities at the Atomic Weapons Establishment, as announced by the Defence Secretary in July 2005.<sup>33</sup> This spending, of £350m over each of the 3 years from 2006/07, is to ensure that the existing Trident warhead stockpile is reliable and safe throughout its intended in-service life.

## D. US Involvement and the Independence Issue

Critics who question the value of the British nuclear deterrent argue that, due to the reliance on the US for aspects of procuring and maintaining the Trident missile system, the UK deterrent cannot be deemed to be truly independent. In a March 2006 briefing the campaign group Greenpeace argued:

It is difficult to conceive of any situation in which a prime Minister would fire Trident without prior US approval. The USA would see such an act as cutting across its self-declared prerogative as the world's policeman, and would almost certainly make the UK pay a high price for its presumption. The fact that the UK is completely technically dependent on the USA for the maintenance of its Trident system [...] means that one way the USA could show its displeasure would be to cut off the technical support needed for the UK to continue to send Trident to sea.<sup>34</sup>

Others dispute this view. Commodore Tim Hare, Royal Navy (retired), said in evidence to the Defence Committee in March 2006 that:

operationally the system is completely independent of the United States. Any decision to launch missiles is a sovereign decision taken by the UK and does not involve anybody else. I have read talk in the press about the Americans having some technical golden key. That is just not right; they do not. [...] the only engagement with the United States that we have now, and which we have had for a very long time, relates to the design authority for the missile and supporting launcher, fire control and navigational sub-systems that are housed in the Vanguard-class submarines. [...]

The best analogy I can give is that if Ford went bust tomorrow all the Ford Focuses in the country would not suddenly come to a grinding halt. Certainly, it would be difficult if the United States withdrew its design authority and logistics support for the missiles, fire control launcher and navigational sub-systems. Eventually, it would cause some difficulty, but I argue that that would take quite a long time.<sup>35</sup>

He added that the UK was in no way dependent on the US for the process of targeting the missiles.<sup>36</sup> Others contend that the guidance system would require data from the US GPS satellite system.<sup>37</sup>

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<sup>32</sup> As footnote 26

<sup>33</sup> HC Deb 19 July 2005 c59WS. See Section III D for more detail on AWE Aldermaston.

<sup>34</sup> Greenpeace, *Why Britain should stop deploying Trident*, March 2006

<sup>35</sup> Defence Committee, *The Future of the UK's Strategic Nuclear Deterrent: the Strategic Context*, HC 986, Session 2005-06, Ev.35-36

<sup>36</sup> *ibid*

The International Institute for Strategic Studies (IISS) characterised the degree of UK dependence on the US as follows:

Britain has [...] accepted dependence on US supply for key elements of its capability, although ownership of them rests with the United Kingdom. The United States would be able, if it went back on its commitments, to pose over a period of years increasingly severe difficulty for the maintenance of Britain's capability.

Operational decisions on the use of the capability remain entirely with the United Kingdom government; neither the United States nor NATO – to which the force is formally declared – has either legal or physical power to override such decisions.<sup>38</sup>

In response to the Defence Select Committee's report in June 2006 on *The Future of the UK's Strategic Nuclear Deterrent* the MOD stated:

In terms of the current system, as we have made clear on many occasions, the UK Trident system is **fully** operationally independent of the US or any other state. Decision-making and use of the system remains entirely sovereign to the UK. Only the Prime Minister can authorise the use of the UK's nuclear deterrent, even if the missiles are to be fired as part of a NATO response. The instruction to fire would be transmitted to the submarine using entirely UK codes and UK equipment. All the command and control procedures are totally independent. The Vanguard-class submarines can readily operate without the Global Positioning by Satellite (GPS) system and the Trident D5 missile does not use GPS at all: it has an inertial guidance system. We would require no lesser degree of operational independence for any successor system should the Government decide to replace Trident.<sup>39</sup>

By contrast, France has retained complete independence of its nuclear deterrent in procurement and maintenance terms, but at a greater financial cost. The French nuclear arsenal is commonly believed to account for between 10-20% of the French defence budget,<sup>40</sup> as opposed to 3-5.5% for the UK deterrent.<sup>41</sup>

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<sup>37</sup> Defence Committee, *The Future of the UK's Strategic Nuclear Deterrent: the Strategic Context*, HC 986, Session 2005-06, Ev.4

<sup>38</sup> 'The future of Britain's nuclear deterrent', *IISS Strategic Comments*, March 2006, Vol 12, Issue 2

<sup>39</sup> Defence Committee, *The Future of the UK's Strategic Nuclear Deterrent: the Strategic Context: Government Response to the Committee's Eighth report of Session 2005-06*, HC 1558, Session 2005-06, p.5

<sup>40</sup> In 2005 total French defence expenditure was approximately £30bn (IISS, *Military Balance 2006*)

<sup>41</sup> Further information on the French nuclear deterrent, including its force structure, procurement and support and level of independence is available in Library Standard Note SN/IA/4079, *The French Nuclear Deterrent*.

## E. Parliamentary Oversight of Trident

A series of documents was published by the Ministry of Defence in the early to mid 1980s as a means of informing Parliament of the issues surrounding the Trident procurement decision and the progress of the project.<sup>42</sup> The first, published on 15 July 1980 in tandem with the Government's announcement in the House,<sup>43</sup> was intended to set out the Government's justification for its choice of system to replace Polaris.<sup>44</sup> As part of that assessment, general considerations underpinning the Trident decision were set out,<sup>45</sup> along with the differing choices of launch platforms and delivery systems that had been evaluated.

On 3 March 1981 the decision to maintain the UK's nuclear deterrent and the specific choice of the Trident system was debated, and endorsed, in the House of Commons. The debate was on the substantive motion:

That this House endorses the Government's decision to maintain a strategic nuclear deterrent and the choice of the Trident missile system as the successor to the Polaris force.<sup>46</sup>

The motion was approved by 316 to 248 votes.<sup>47</sup> The voting record for Division No. 89 is available in Appendix One.

During that debate the then Secretary of State, John Knott, acknowledged that decisions relating to the design of the new submarine had yet to be taken.<sup>48</sup> However, in March 1982 a further memorandum<sup>49</sup> was published by the MOD confirming those design choices and the reasons behind the decision to procure the Trident II D5 missile instead of the Trident I C4 variant.

A further MOD document was published in January 1987<sup>50</sup> reiterating all of the decisions that had been taken with regard to the Trident system, and in response to suggestions that other systems would have been more appropriate and cost effective for the UK than Trident. The possibility of Anglo-French collaboration on a missile delivery system in place of UK-US co-operation on Trident was outlined in the MOD paper as one such suggestion.

In 1983 the Public Accounts Committee recommended that Parliament should "be kept fully informed on Trident developments, progress and costs at regular intervals

<sup>42</sup> These documents were recently re-published in response to a freedom of information request to the MOD. A link to the electronic version of these documents is available in Appendix One.

<sup>43</sup> This is set out in section II A.

<sup>44</sup> *The Future United Kingdom Strategic Nuclear Deterrent Force*, Defence Open Government Document 80/23

<sup>45</sup> These included the intended role of the UK deterrent force, readiness and vulnerability issues, timescales and co-operation with the US in terms of procurement and maintenance.

<sup>46</sup> HC Deb 3 March 1981, c137. The subsequent debate can be found at c138-219.

<sup>47</sup> Ibid, c219-224

<sup>48</sup> Ibid, c142

<sup>49</sup> *The United Kingdom Trident programme*, Defence Open Government Document 82/1

<sup>50</sup> *Trident and the Alternatives*, Defence Open Government Document 87/01

throughout the life of the programme".<sup>51</sup> This recommendation was endorsed by the Defence Committee in a report in July 1985.<sup>52</sup> Consequently, between 1986 and 1995 the Defence Committee conducted annual evidence sessions on the progress of the Trident programme. The basis for the Committee's discussions was an annual report presented by the MOD and which appeared as written evidence in the Committee's subsequent reports.<sup>53</sup>

During the 1980s the Public Accounts Committee and the National Audit Office also periodically examined the costs and management of the Trident programme.<sup>54</sup>

## F. Changes to the British Nuclear Posture Since 1992

With the end of the Cold War in the late 1980s the then Conservative Government undertook a reassessment of the British nuclear posture. The US tactical nuclear warheads mounted on heavy artillery and the Lance missile system were withdrawn, the Royal Air Force's sub-strategic air-launched nuclear weapons were phased out and the Royal Navy's surface ships lost the capability to carry or deploy nuclear weapons. Once complete in 1998, these reductions left Trident as the country's sole nuclear system. The total warhead stockpile was reduced by around 20 per cent and the number of operationally available warheads fell from around 400 during the 1980s to under 300. The result was a sharp fall in the explosive power of the operationally deployed deterrent, which dropped to an estimated 40 per cent of the megatonnage available during the 1970s.<sup>55</sup>

The new Labour Government re-examined the nuclear deterrent in its *Strategic Defence Review White Paper* of July 1998 and announced further reductions as a response to the improved strategic environment:

- The number of operationally available nuclear warheads was reduced to fewer than 200, a reduction of one third from the previous Government's planned level of up to 300;
- The total nuclear stockpile of active and inactive warheads was reduced by around 50 per cent compared to the levels seen in the 1970s, down from just under 80 per cent under the previous Government;

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<sup>51</sup> Committee of Public Accounts, Nineteenth Report, HC 348, Session 1983-84

<sup>52</sup> Defence Committee, *The Trident Programme*, HC 479, Session 1984-85

<sup>53</sup> Defence Committee, *Progress of the Trident Programme*, HC 297, Session 1993-94 sets out a list of those reports in its Annex. The committee published a further, and final, report in July 1995 (HC 350, Session 1994-95).

<sup>54</sup> Committee of Public Accounts, *The United Kingdom Trident Programme*, HC 348, Session 1983-84 ; National Audit Office, *Ministry of Defence Trident Project*, HC 237, Session 1984-85; National Audit Office, *Ministry of Defence and Property Services Agency: Control and Management of the Trident Programme*, HC 27, Session 1987-88; Committee of Public Accounts, *The Torpedo Programme and Design and Procurement of Warships: Control and Management of the Trident Programme*, HC 189-i, Session 1987-88; Committee of Public Accounts, *Ministry of Defence: Nuclear Research and Support Services*, HC 415, Session 1990-91.

<sup>55</sup> Figures from the *Strategic Defence Review: Supporting Essays*, July 1998, Supporting Essay Five: Deterrence, Arms Control and Proliferation, p.5-2 – 5-3, para 8 and Figure 1.

- The number of warheads carried by Trident submarines on deterrent patrol was reduced to 48, down from the previous Government's ceiling of 96;
- As a result of these reductions, the Government said the potential explosive power of the Trident system would equal around 30 per cent of the operationally available warheads held during the 1970s. It also asserted that the explosive power of the 48 warheads deployed on each Trident submarine would be one third less than the 32 Chevaline warheads that had been eventually deployed on each Polaris submarine.<sup>56</sup>

By contrast, of the five recognised nuclear powers, Russia and the USA have the largest arsenals with an estimated 5,830 and 5,735 active warheads respectively. France and China have around 350 and 130-400 active warheads respectively.<sup>57</sup> Of the three nuclear powers outside the Non-Proliferation Treaty, India is generally acknowledged to have between 40 and 90 warheads, Israel between 75 and 200, and Pakistan between 30 and 50. North Korea, which apparently conducted its first nuclear weapon test on 9 October 2006, is believed to possess a handful of devices at most.

The true value of the British reductions made under SDR was questioned by some commentators, on the grounds that the potential *destructive* power of the Trident system remained considerably greater than that of the Polaris Chevaline. Rebecca Johnson of the Acronym Institute wrote in a critique of the SDR from July 1998:

Fewer nuclear weapons are of course better than more, but at around 192 warheads of around 100 kt [kilotons], Britain's nuclear forces still pack a potential explosive power of more than 19 megatons. The SDR especially underlined that the new policy represents a reduction of more than 70 percent in the potential explosive power of Britain's nuclear forces since the end of the Cold War. Explosive power, however, does not necessarily equate with potential damage: single large bombs or lots of nuclear artillery shells used on a battlefield would kill fewer people and wreak less havoc than *Trident*-type medium-sized (100 kt) multiple warheads, independently targeted as part of a strategic strike force.<sup>58</sup>

Commander Robert Green (Royal Navy, retired), also writing in July 1998, noted that the potential explosive power of a Trident warhead was “eight times the yield of the Hiroshima bomb”, adding that:

the lower-yield, highly accurately delivered *Trident* warheads can be more destructive than higher-yield, inaccurate ones. Moreover, unlike Chevaline each *Trident* warhead is independently targetable. This means that a *Trident*

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<sup>56</sup> Figures from the *Strategic Defence Review: Supporting Essays*, July 1998, Supporting Essay Five: Deterrence, Arms Control and Proliferation, p.5-2 – 5-3, paras 9-10 and Figure 1.

<sup>57</sup> Accurate figures are difficult to obtain, given the secrecy that often surrounds nuclear issues. There is also a frequent lack of clarity about the number of active warheads and the number held in reserve or at lower stages of readiness. If both active and inactive stockpiles are taken into consideration, the Russian and US nuclear arsenals are believed to number close to 16,000 and 10,000 respectively. For more detail, see Library Standard Note SN/IA/3817, *State Possession of Nuclear Weapons*, 10 October 2006.

<sup>58</sup> Rebecca Johnson, 'Still Punching Above Our Weight', *Disarmament Diplomacy*, Issue 28, July 1998, from <http://www.acronym.org.uk/dd/dd28/28johns.htm>

submarine with 48 warheads can still strike one third more targets more destructively than a Polaris submarine could with Chevaline.<sup>59</sup>

Nicola Butler of the Acronym Institute argued in November 2004 that:

Despite the figures, the UK's record on nuclear disarmament is very weak. It cites the dismantlement of weapons such as the WE177 free fall bomb and the Chevaline warhead, but these are weapons that had reached the end of their service life and were in fact replaced by the more capable Trident system.

Although the UK Government highlights a reduction in the "potential explosive power" of its warheads, qualitative improvements make this comparison somewhat misleading. Trident's greater speed, accuracy, and independently targetable warheads enable it to reach more targets than Polaris Chevaline [...]. As the Defence Select Committee noted in 1994, "Trident's accuracy and sophistication in other respects does - and was always intended to - represent a significant enhancement of the UK's nuclear capability. We have invested a great deal of money to make it possible to attack more targets with greater effectiveness using nominally equivalent explosive power". [HC 297 of Session 1993-94, p.xiv]<sup>60</sup>

In addition to changes in capability, the SDR also announced adjustments to the operational posture of the British deterrent, so that the usual patrol cycle was reduced to one Trident submarine on patrol at any one time. The missiles on board were also de-targeted, meaning that target data would need to be loaded into the guidance system before launch, an operation that takes a few minutes. The "notice to fire" period was increased from the few minutes' quick reaction alert sustained during the Cold War to a notice period measured in days. This reduction in alert status was essentially a political and operational matter rather than a technical issue: the system itself could still be brought rapidly to readiness at a time of crisis, if a political decision were taken to do so.<sup>61</sup> A further proposal for moving to single rather than double crewing of Trident submarines was dropped after a trial period due to concerns over the pressure single crewing would place on Service personnel and their families.<sup>62</sup>

The SDR also considered the question of when British nuclear weapons could be brought into multilateral talks with the other nuclear powers:

On nuclear arms control, the Government hopes for further bilateral reductions in US and Russian strategic weapons through the Strategic Arms Reduction Treaty process [...] Our own arsenal [...] is the minimum necessary to provide for our security for the foreseeable future and very much smaller than those of the major

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<sup>59</sup> Cmdr Robert Green, Royal Navy (Retired), 'The SDR And Britain's Nuclear Disarmament Obligations', *Disarmament Diplomacy*, Issue 28, July 1998, from <http://www.acronym.org.uk/28green.htm>

<sup>60</sup> *Military and political aspects of British Nuclear Forces and Defence Policy*, Presentation by Nicola Butler, 6 November 2004, <http://www.basicint.org/nuclear/legalnb.htm#06>

<sup>61</sup> See for example Defence Committee, *The Future of the UK's Strategic Nuclear Deterrent: the Strategic Context*, HC 986, Session 2005-06, Ev.2 and Ev.35

<sup>62</sup> HC Deb 18 January 2000, c396-7w

nuclear powers. Considerable further reductions in the latter would be needed before further British reductions could become feasible.<sup>63</sup>

Other measures were discussed, but rejected, such as introducing a policy of “no first use” of nuclear weapons. The then Defence Secretary, Geoff Hoon, said in October 1999:

In conducting the Strategic Defence Review, the Government concluded that a policy of no first use of nuclear weapons would be incompatible with our and NATO's doctrine of deterrence, and that it would not further nuclear disarmament objectives.<sup>64</sup>

The SDR did, however, highlight the limitations placed on the use of British nuclear weapons, including the restrictions in place in the three nuclear-free zones around the world.<sup>65</sup> In it the Government stated:

we will not use nuclear weapons against a non-nuclear weapon state not in material breach of its nuclear non-proliferation obligations, unless it attacks us, our Allies or a state to which we have a security commitment, in association or alliance with a nuclear weapon state.<sup>66</sup>

This would leave open the possibility of a nuclear strike against a non-nuclear weapon state that was “in material breach of its nuclear non-proliferation obligations”, an issue that came to the fore prior to the US-UK invasion of Iraq in March 2003.<sup>67</sup>

## G. Sub-Strategic and Tactical Nuclear Capabilities

In the event of a full-scale strategic nuclear strike, all or a significant part of the available Trident force would be launched against an adversary, with the intention of causing catastrophic damage. One level down from a strategic strike is what is termed the sub-strategic option, whereby one or a handful of nuclear warheads would be fired at an adversary as a means of sending a political message and demonstrating resolve, without inflicting the full destructive power and catastrophic effects of the whole deterrent. Targets might include smaller regional adversaries with weapons of mass destruction. A further level down is the tactical nuclear option, where weapons would be used for a military purpose against enemy units on the battlefield.

The British Government asserts that, following the withdrawal of the WE 177 free-fall device and nuclear-tipped artillery and Lance missile capabilities, the UK holds no

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<sup>63</sup> *Strategic Defence Review*, Cm 3999, Para 70

<sup>64</sup> HC Deb 25 October 2002, c706w

<sup>65</sup> The areas affected are Latin America (Treaty of Tlatelolco), the South Pacific (The Treaty of Raratonga), and Africa (The Treaty of Pelindaba). The UK has signed and ratified the relevant protocols. See Section 3 C of Library Standard Note SN/IA/1404, *Arms Control and Weapons of Mass Destruction*, for more detail on the regional nuclear-free zones.

<sup>66</sup> ‘Deterrence, Arms Control and Proliferation,’ page 5-11, *The Strategic Defence Review Supporting Essays*

<sup>67</sup> See comments by Defence Secretary Geoff Hoon to the Defence Committee, Minutes of Evidence for 20 March 2002, HC 644-ii, 1 May 2002, Q234-237

dedicated tactical nuclear weapons for use on the battlefield.<sup>68</sup> A sub-strategic capability remains, in the form of Trident, which in 1998 took over the role formerly assigned to RAF Tornado aircraft armed with the WE 177.

The 1998 Strategic Defence Review declared that:

The credibility of deterrence also depends on retaining an option for a limited strike that would not automatically lead to a full scale nuclear exchange. Unlike Polaris and Chevaline, Trident must also be capable of performing this "sub-strategic" role.<sup>69</sup>

The Ministry of Defence has argued that:

A sub-strategic element is an essential component of a nuclear deterrent policy. In extreme circumstances of self defence, a capability for the more limited use of nuclear weapons would allow us to signal to an aggressor that he has miscalculated our resolve, without using the full destructive power that Trident offers.<sup>70</sup>

The British Government has always revealed little about the number and yield of warheads, although, in operational terms, it is widely conjectured that missiles intended for the sub-strategic role carry only a single warhead, potentially with a reduced yield of 1 kiloton or less if the unboosted primary stage is detonated, or a yield of a few kilotons if the boosted primary is used.<sup>71</sup> This compares with a maximum yield for the warhead of around 80-100 kilotons.

It is possible that the sub-strategic role would be carried out by a different boat to the one deployed on deterrent patrol, primarily because launching one or two missiles in a limited strike could reveal the location of the boat and leave it vulnerable to attack, with the risk that it would not be able to mount a follow-up strategic strike if required.<sup>72</sup>

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<sup>68</sup> HC Deb 9 December 2002, c20w

<sup>69</sup> *The Strategic Defence Review*, Cm 3999, July 1998, p.18, para 63

<sup>70</sup> HL Deb 1 July 1999, c57WA

<sup>71</sup> See for example 'British nuclear forces, 2005', NRDC Nuclear Notebook, *Bulletin of the Atomic Scientists*, November-December 2005, [http://www.thebulletin.org/article\\_nn.php?art\\_ofn=nd05norris](http://www.thebulletin.org/article_nn.php?art_ofn=nd05norris)

<sup>72</sup> "We wouldn't necessarily use the deployed submarine as the sub-strategic boat. We may sail another specifically in that role, so we have the flexibility of doing either or both." Commander Tom Herman, 1 Submarine Squadron, *Navy News Clyde Supplement*, May 1996

### III After Trident?

The first Vanguard-class submarine (HMS *Vanguard*) entered service in December 1994, with the last of the class of four (HMS *Vengeance*) entering service in 2001. It is anticipated that the Trident system will have approximately a thirty-year lifespan, meaning that any potential replacement would need to enter service by around 2024.<sup>73</sup> Given the long design and development process involved with Trident, it has consistently been suggested that a decision on a possible replacement would have to be taken before the end of the decade. Rebecca Johnson wrote in *Disarmament Diplomacy* in March 2004 that:

While some consider it premature to worry about replacing Trident, which was built with an expected lifetime to 2024, past experience suggests that unless the government has decided to abandon its reliance on nuclear 'deterrence' it will need to begin working on a Trident successor soon. To place this in context, the replacement for the ageing Chevaline system was mooted in the late 1970s and the decision to build four submarines and equip them with American long-range ballistic missiles with British nuclear warheads (tailored, however, to US designs) was taken by Margaret Thatcher in 1980. The first missiles, leased from an American pool of Trident D-5 missiles based in Virginia, were delivered to the Royal Navy in 1992. The first submarine armed with Trident missiles and 100 kt warheads went on patrol in 1994. From decision to deployment, the process took 14 years.<sup>74</sup>

Since the decision to procure Trident was taken in July 1980, the international security environment has altered significantly. Traditional threats prompted by the bipolar nature of the Cold War have dissipated, while international terrorism and asymmetric warfare have become prevalent.<sup>75</sup> In recent years there has also been greater acknowledgement and understanding of the implications of non-military threats, including environmental factors such as climate change, energy security and conflicts over fresh water and natural resources, and social factors like migration, demography and health epidemics.<sup>76</sup>

In light of these changes to the UK's prevailing strategic circumstances, the issue of whether the UK needs to retain a nuclear deterrent capability has come to the fore. Questions over the UK's international arms control obligations; the legality of nuclear

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<sup>73</sup> In an August 2006 briefing paper the Nuclear Cluster at the Defence Logistics Organisation, which is responsible for maintaining the current nuclear deterrent, suggested that "introduction of any new [deterrent] submarine would probably be planned for around 2024, which sounds a long way off, but is actually quite a tight timescale for something like this" (<http://www.mod.uk/NR/rdonlyres/F25A7345-AA9D-46E8-B33A-76304FBF7B53/0/NuclearclusterPDF.pdf>). This would assume a 30-year in-service life. During evidence to the Defence Select Committee, however, the MOD indicated that it was working to a 25-year in-service life of the submarine, which would entail HMS *Vanguard* leaving service in 2019 and HMS *Vengeance* in 2026.

<sup>74</sup> 'Why is Britain's Nuclear Weapons Infrastructure Being Upgraded?', *Disarmament Diplomacy*, Issue No. 76, March/April 2004

<sup>75</sup> In contrast to conventional warfare, where the belligerents deploy forces of a similar type, asymmetric warfare involves belligerents of unequal strength, who employ unconventional strategies and tactics to inflict harm that is out of proportion with the level of force used. The term is commonly applied to conflicts where a conventional army is fighting a guerrilla enemy or where terrorist methods are employed.

<sup>76</sup> See for example Barry Buzan, *Security: a New Framework for Analysis*, Lynne Rienner, 2003

weapons within international law; the potential cost of any successor system; and the impact on the UK's domestic industrial base within this context have exercised political commentators, academia and the media alike.

## A. Future Threat Assessment

Following the collapse of the Soviet Union some analysts argued that nuclear deterrence was no longer relevant to the changed circumstances of the post-Cold War era.<sup>77</sup> The ideological confrontation between the US and NATO and the Soviet Union and the Warsaw Pact countries that had necessitated and exacerbated a policy of deterrence was over. Multi-faceted intra-state tension and conflict was becoming the norm, with the emergence of non-state actors as a defining force in international relations. Maintaining nuclear weapons in light of these emerging trends was considered by some, therefore, to be unnecessary.

This argument continues to be advocated over a decade later, and more so since the events of 11 September 2001. Opponents of maintaining a nuclear capability have argued that traditional notions of deterrence are no longer credible against non-state actors like al-Qaeda, which employ asymmetric methods of warfare and which are considered, along with rogue states, to be most likely to take advantage of the proliferation of technology relating to weapons of mass destruction or weapons of mass effect (WMD and WME).

Former foreign secretary Robin Cook argued in July 2005 that:

The justification for both Polaris and Trident was that we faced in the Soviet Union a great, hostile bear bristling with nuclear claws. The missiles were put on submarines precisely because the ocean bed was the only place they could hide from Russian firepower. But those are calculations from a long-vanished era. The Soviet Union has disintegrated, its satellites are our allies in the European Union, and the west is now sinking large funds into helping Russia to defuse and dismantle the warheads that we once feared.

No other credible nuclear threat has stepped forward to replace the Soviet Union as a rationale for the British nuclear weapons system. To be sure, two or three other nations have emerged with a crude nuclear capability, but none of them has developed the capacity or the motivation to attack Britain. [...] the collapse of the cold war has removed even the theoretical justification for our possessing strategic nuclear weapons.<sup>78</sup>

He also took the view that:

nuclear weapons are hopelessly irrelevant to that terrorist threat. The elegant theories of deterrence all appear beside the point in the face of a suicide bomber

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<sup>77</sup> Some question whether the British arsenal has ever served a useful purpose, even at the height of the Cold War, arguing that it was too small to influence Soviet decision making. See T Milne, H Beach, J L Finney, R S Pease, J Rotblat, *An End to UK Nuclear Weapons*, British Pugwash Group, 2002, p.13.

<sup>78</sup> Robin Cook, MP, 'Worse Than Irrelevant', *The Guardian*, 29 July 2005

who actively courts martyrdom. And if we ever were deluded enough to wreak our revenge by unleashing a latter-day Hiroshima on a Muslim city, we would incite fanatical terrorism against ourselves for a generation.<sup>79</sup>

Binoy Kampmark writing in *Contemporary Review* summed up the argument that deterrence is no longer credible in the current strategic environment:

Traditional deterrence is theoretically implausible since September 11 scenarios put pay to the doctrine. Deterrence is premised on creating in the opponent a fear of harm in case it launches an attack. In the words of international relations writer George H. Quester (Oct 2000) 'Each side would hit the other's homeland, and thus each side might hold back as long as the other held back'. This traditional notion assumed that self-preservation marks the outer limits of an attack. Such deterrence theory fails to provide an assurance against the attacks of September 11 where both the attacker and the victims perished [...]

Where the attacker destroys himself, the theory of rational deterrence falls apart since the attacker is not intent on minimizing destruction to himself. Self-immolation is essential to the nature of September 11 and, on a smaller scale, Palestinian suicide bombers. Deterrence theory, since it is framed on the level of rational state actors, is anomalous against non-state actors who have dynamic patterns of engagement with their foe in circumstances where their use of force may not be rational at all.

The attacker furthermore, will not be deterred if he cannot be identified. In being cellular and amorphously drawn across societies, groups such as Al-Qaeda can only work in deterrence theory if they know they can be found and duly attacked. One cannot attack mere methods and tactics. A lack of identification ensures that the target is confused and unclear. In Quester's words, 'it will not be clear against whom retaliation should be launched'.<sup>80</sup>

The Campaign for Nuclear Disarmament has also highlighted the argument that deterrence is irrelevant as a means of defending against terrorism. In a September 2006 briefing it stated:

It is widely agreed that one of the main security threats facing Britain today is terrorism carried out by non-state actors [...] Nuclear weapons cannot have a role to play in responding to such a threat for several reasons. Principally, we already know from the terrible attacks in New York and London that possession of nuclear weapons by a nuclear weapon state does not dissuade terrorists. Secondly, terrorists could never present any accurately located target for such a weapon of indiscriminate devastation.<sup>81</sup>

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<sup>79</sup> Robin Cook, MP, 'Worse Than Irrelevant', *The Guardian*, 29 July 2005

<sup>80</sup> Binoy Kampmark, "America's nuclear deterrence in the age of terrorism", *Contemporary Review*, April 2003

The briefing went on to state:

rather than providing insurance against an unspecified future threat, replacing Trident will increase the danger of nuclear proliferation and will contribute to a new nuclear arms race [...]

If the UK envisages at least another 50 years of British security being based on threatening other populations with mass destruction then we encourage other states to do the same and thus paradoxically we increase our security risk rather than decrease it [...]

In effect, by choosing nuclear weapons ourselves we are practically increasing the likelihood that they will be used as more states will follow our example and the destructive capability and numbers of nuclear weapons will increase thus leading to a nuclear arms race. Whether by accident or intention as long as there are nuclear weapons there is always the danger they will be used.<sup>82</sup>

Those favouring UK disarmament argue that dispensing with nuclear weapons would serve as a positive example for other states to follow and would bolster the UK's authority and standing internationally. While it is improbable that UK disarmament would persuade countries such as Pakistan, Israel or North Korea to dispense with nuclear weapons, it could be argued that UK leadership on this issue would provide a boost to the faltering nuclear Non-Proliferation Treaty,<sup>83</sup> as was the case when South Africa unilaterally renounced such weapons in the early 1990s, and would encourage other states to sign up to the strengthened International Atomic Energy Agency safeguards regime. The latter, referred to as the 'Additional Protocol', serves to bind countries in to the NPT by making it more difficult for them to develop a covert weapons programme and break out from the Treaty in the future.

Others take the view that retaining a nuclear deterrent should be condemned on moral grounds, or argue that the money to be spent on a Trident replacement would be better used elsewhere. A group of bishops wrote in a letter to *The Independent* in July 2006 that:

[It] is morally corrupting to threaten the use of weapons of mass destruction even when there is no real intention of using them. [...] Trident and other nuclear arsenals threaten long-term and fatal damage to the global environment and its peoples. As such their end is evil and both possession and use profoundly anti-God acts. Nuclear weapons are a direct denial of the Christian concept of peace and reconciliation, which are social and economic as well as physical and spiritual. [...]

At the Gleneagles summit a year ago the G8 pledged to "Make Poverty History" and to end the debt burden on the world's poorest countries. The costs involved in the maintenance and replacement of Trident could be used to address pressing environmental concerns, the causes of terrorism, poverty and debt, and enable humanity and dignity to be the right of all, and would go a long way towards helping Make Poverty History.<sup>84</sup>

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<sup>81</sup> Campaign for Nuclear Disarmament, *No Trident Replacement*, September 2006

<sup>82</sup> *ibid.*

<sup>83</sup> See Section III B below for more detail on the NPT.

<sup>84</sup> 'Letter: Nuclear weapons challenge the very core of our faith', *Independent*, 10 July 2006

Advocates of retaining the British nuclear deterrent take a different position regarding the utility of nuclear weapons in the security environment of the twenty first century. They argue that the deterrent continues to have a crucial role in guaranteeing national security, and believe that deterrence as a concept remains viable, although it should be revised to take account of potential adversaries. In particular, they argue that the existence of non-state actors and rogue states with the intent and capability to develop a WMD capability, coupled with the threat posed by the proliferation of know-how and technology, make it imperative that nuclear weapons be retained. Some also question the view that in the coming decades there will be no potential threat from an existing major nuclear power that combines both the capability and intent to strike the UK. Some point to the growing military and economic power of China or the risk of future instability or increased authoritarianism in Russia, for example.<sup>85</sup> Supporters of this position also point out that there can be no guarantee that other nuclear weapon states or rogue states with nuclear intentions would give up their arsenals or plans purely because the UK has forgone its nuclear deterrent capability. Furthermore, it has been argued that our ability to foresee emerging threats is extremely limited and that no-one in 1906 could have foreseen the developments that occurred over the ensuing decades of the twentieth and early twenty-first centuries.

In March 2003 the MoD's Joint Doctrine and Concepts Centre (JDCC) published its assessment of the future threats, risks and challenges that the UK and its Armed Forces may face within the next 30 years. The JDCC argued that the greatest risk to UK security would derive from the strategic environment changing faster than the UK could acquire and/or apply resources to meet that threat. Among the trends identified as having a direct bearing on the UK's defence and security policy up to 2030, was the likely emergence of new nuclear powers and states with WME capabilities. The JDCC concluded:

Weapons of mass effect, and their means of delivery, will proliferate significantly by 2015. It is judged that North Korea, Iran and Iraq will develop nuclear weapons before 2015 in the absence of external intervention [...] Ballistic delivery systems will proliferate and extend in range; non-ballistic systems including cruise missiles, sleeper devices, and asymmetric delivery mechanisms will become more prevalent, especially if US ballistic missile defence becomes a reality.

Non-state actors are likely to acquire weapons of mass effect before 2015 and will be much harder to deter than state proliferators, making this a key security threat [...]

Alliance nuclear deterrence will be key in preventing coercion by states armed with weapons of mass effect. Consequently, the UK and France are likely to retain small numbers of capable nuclear systems. Meanwhile, China will continue to increase the effectiveness and number of its systems and of the other P5

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<sup>85</sup> See for example Defence Committee, *The Future of the UK's Strategic Nuclear Deterrent: the Strategic Context*, HC 986, Session 2005-06, Ev.20 and 21.

nuclear weapon states, the US and Russia are likely to retain a significant numerical advantage over other states.<sup>86</sup>

The threat of proliferation of WMD/WME was subsequently presented in the 2003 Defence White Paper, *Delivering Security in a Changing World*, as one of the most direct threats to UK security. The potential asymmetric use of WMD by both state and non-state actors was highlighted as a particular concern.<sup>87</sup>

The European Union's *European Security Strategy*, the revised text of which was also published in December 2003, reached similar conclusions in its assessment of the future strategic environment. In particular, the threat of a nuclear arms race in the Middle East and the potential for terrorists to acquire and use WMD were raised as concerns.<sup>88</sup>

Dr Colin Gray in his book *Another Bloody Century: Future Warfare* argues that "warfare has a healthy future" and that "we cannot know who in the future will fight whom, when, with what, and over exactly which issues".<sup>89</sup> Specifically, he points out that "irregular warfare may well be the dominant mode in belligerency for some years to come, but interstate war, including great power conflict, will enjoy a healthy future".<sup>90</sup> On the role of nuclear weapons in future warfare in particular, Gray makes the following observations:

Nuclear proliferation is far from comprising an insuperable challenge to those who are: well funded, sufficiently determined; cunning in using the global black market in nuclear material, equipment and expertise; and not overly concerned about the technical excellence, or otherwise, of the end product. This discussion ignores, of course, the possibility that nuclear weapons may be stolen, bought, or acquired by gift [...]

[There] may, eventually are well nigh certain to be, [terrorist] organizations that actually want to use nuclear weapons. Al Qaeda and others of an apocalyptic kind, especially when liberated and encouraged to commit mass murder by religious sanction, cannot be deterred. This is not to say that deterrence is irrelevant. Terrorists must have the support or acquiescence of states. There will be friends of catastrophic terror who should prove eminently persuadable as to the wisdom of distancing themselves from the use of nuclear, and other, WMD [...]

Also, there will be states, so-called rogue as well as others of more sober character, who will have few nuclear weapons, will lack many, if not all, of the

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<sup>86</sup> Joint Doctrine and Concepts Centre, *Strategic Trends*, March 2003. This is available online at: <http://www.jdcc-strategictrends.org/>

<sup>87</sup> More information on the conclusions of the Defence White Paper is available in Library Research Paper RP04/71, *The Defence White Paper*, 17 September 2004. The position of the British Government on the issue of retaining a nuclear deterrent is also examined in section III F.

<sup>88</sup> More information on the European Security Strategy is available in Library Research Paper RP06/32, *European Security and Defence Policy: Developments Since 2003*, 8 June 2006. This is available online at: [http://www.parliament.uk/parliamentary\\_publications\\_and\\_archives/research\\_papers/research\\_papers\\_2\\_006.cfm#21-40](http://www.parliament.uk/parliamentary_publications_and_archives/research_papers/research_papers_2_006.cfm#21-40)

<sup>89</sup> Colin Gray, *Another Bloody Century: Future Warfare*, Weidenfeld & Nicolson, 2005, p.55

<sup>90</sup> *ibid*, p.382

safety technologies and procedures pioneered during the Cold War, and who will almost certainly exist in an international political context of acute hostility [...]

Future warfare will see the use of WMD, including those of a nuclear variety.<sup>91</sup>

An article in the International Institute for Strategic Studies' *Strategic Comments* in February 2006 concurred with this view:

Given the terrorist threat and the porousness of non-proliferation measures, existing nuclear-weapons states still need a robust nuclear arsenal in order to deter those who might acquire a more primitive nuclear capability.<sup>92</sup>

Tim Hare, writing in the *RUSI Journal* in 2005, commented:

The cliché that we live in an uncertain world holds very true and decisions on nuclear weapons capability ... are very long term (e.g. twenty to thirty years). As Sir Michael Quinlan observes:

*History is full of profoundly unpleasant surprises and we need to be careful that we do not lead ourselves in a position of weakness in the future that we might regret.*<sup>93</sup>

He continued:

[It] must be understood that any decision to do away with our nuclear capability would be irrevocable. On relinquishing our capability, nuclear expertise and the supporting infrastructure would fritter away very quickly and the cost of re-establishing a capability would be astronomical such that it would be out of the question.

[T]here would be significant political fallout from such a unilateral decision with impact on friends, allies and potential aggressors. Any argument supporting a domino effect – that is Russia, the US, India, Pakistan etc, would all immediately give up their nuclear weapons too – remains unconvincing. Sadly, we live in an all-too-cynical age. Such nations would laud Britain's decision but argue that their nuclear weapons are for their own regional use and that therefore there is no logic that says that they should go too.<sup>94</sup>

Conservative Defence Spokesman, Dr Julian Lewis, supports this view. In a Westminster Hall debate on 8 March 2005 he stated:

Nuclear weapons are not a deterrent to all forms of aggression, but the nuclear deterrent undoubtedly works against certain forms of aggression that exist when one country has weapons of mass destruction and another does not [...]

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<sup>91</sup> Colin Gray, *Another Bloody Century: Future Warfare*, Weidenfeld & Nicolson, 2005, p. 265 and 276

<sup>92</sup> "The future of nuclear deterrence: perversely indispensable?", *Strategic Comments*, February 2006

<sup>93</sup> "What next for Trident?", *RUSI Journal*, April 2005

<sup>94</sup> *ibid.*

Nuclear weapons are good in the hands of democracies faced with dictatorships in the world; they are bad in the hands of dictatorships, as are other potential means of waging war. I have no difficulty at all in saying that Britain giving up nuclear weapons would not make a scrap of difference to whether a dictatorship continued to possess them. In those debates for so many years, I challenged again and again those who said that we should give up our nuclear weapons with the simple question: "Who are you saying would follow our example? Name a specific country". Nobody ever did.<sup>95</sup>

Furthermore, advocates of the nuclear deterrent have presented the simple argument that the mere existence of nuclear weapons technology warrants the retention of a British capability. As David Omand writing in *RUSI Journal* in 1996 commented:

A world without nuclear weapons is not the same as a world without the knowledge of nuclear weapons. This fact must be an important factor in determining the long term requirement for any form of nuclear deterrent posture.<sup>96</sup>

The decision by North Korea to conduct what appeared to be its first nuclear weapons test on 9 October 2006, in the face of near unanimous international opposition, has been seen by nuclear supporters as a vindication of their position.<sup>97</sup>

## **B. Treaty Considerations**

The Ministry of Defence declared in a Memorandum to the Defence Committee in January 2006 that:

were a decision taken to acquire a successor system, we foresee currently that the most relevant international obligations would be: a) the Treaty on the Non-Proliferation of Nuclear Weapons; b) the Comprehensive Nuclear Test-Ban Treaty; c) the Hague Code of Conduct; d) the Missile Technology Control Regime [MTCR]; and e) the Nuclear Weapons Free Zones treaties. The Government will continue to comply fully with these international legal and political commitments.<sup>98</sup>

### **Comprehensive Test Ban Treaty (CTBT)**

The UK has maintained a moratorium on nuclear testing since 1991 and it ratified the Comprehensive nuclear Test Ban Treaty (CTBT) in April 1998. The Treaty has yet to enter into force as it is still awaiting ratification by the US and China, but the UK has said it will maintain its moratorium on testing. The implication of the Government's decision to

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<sup>95</sup> HC Deb 8 March 2005, c404-5WH

<sup>96</sup> David Omand, "Nuclear deterrence in a changing world: the view from a UK perspective", *RUSI Journal*, June 1996

<sup>97</sup> Further discussion on North Korea's suspected nuclear weapons capability and reactions to the October 2006 test is available in Library Standard Notes SN/IA/3817, *State Possession of Nuclear Weapons*, 10 October 2006 and SN/IA/3814, *North Korea: the Nuclear Issue and Prospects for Change*, 9 October 2006.

<sup>98</sup> Memorandum submitted by the Ministry of Defence, Annex A (Possible Constraints on future UK decision-making on any replacement for Trident), 19 January 2006  
<http://www.parliament.the-stationery-office.co.uk/pa/cm200506/cmselect/cmdfence/835/835m03.htm>

ratify the CTBT is that it believes the UK can maintain the safety and reliability of its weapons through computer modelling and sub-critical tests (whereby components are tested without causing a full nuclear explosion).

### Controls on Ballistic Missiles

The MTCR and the Hague Code of Conduct relate primarily to technology transfer and inhibiting the proliferation of ballistic missile capabilities. The former imposes a strong presumption to deny transfer of missiles between member states, but the Government holds that there is an exemption for transfers between NATO states.<sup>99</sup> The Hague Convention seeks mainly to increase the transparency of missile capabilities and ensure advance notification of testing. In addition, it includes an undertaking by member states to reduce, where possible, national holdings of ballistic missiles.

### Nuclear Weapons Free Zones

As a consequence of its ratification of the Protocols to the three nuclear weapons free zones in South America, Africa and the South Pacific, the UK has given an undertaking not to test or station nuclear weapons on territories within the zones.<sup>100</sup>

### Non-Proliferation Treaty (NPT)

Arguably the most significant obligation in relation to the decision about replacing Trident is the *Treaty on the Non-Proliferation of Nuclear Weapons 1968* (the Non-Proliferation Treaty, or NPT). At the heart of the treaty is an implicit bargain between the five recognised states with nuclear weapons and those without. Those without agree to forego nuclear weapons in return for access to civilian nuclear technology and a commitment from the nuclear weapons States to pursue nuclear disarmament. This is enshrined in Article VI of the Treaty, which states that:

Each of the Parties to the Treaty undertakes to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a Treaty on general and complete disarmament under strict and effective international control.<sup>101</sup>

The bargain agreed in 1968 rested on an assumption by the non-nuclear weapons states that retention of nuclear weapons by the five powers was a temporary condition, pending moves towards eventual abolition.<sup>102</sup>

The language of Article VI was reinforced at the 1995 Treaty Review and Extension Conference when the Treaty was extended indefinitely. At the conference, the nuclear

<sup>99</sup> Memorandum submitted by the Ministry of Defence, Annex A (Possible Constraints on future UK decision-making on any replacement for Trident), 19 January 2006

<http://www.parliament.the-stationery-office.co.uk/pa/cm200506/cmselect/cmdfence/835/835m03.htm>

<sup>100</sup> *ibid*

<sup>101</sup> The full text of the NPT is available at <http://www.state.gov/www/global/arms/treaties/npt1.html>

<sup>102</sup> Defence Committee, *The Future of the UK's Strategic Nuclear Deterrent: the Strategic Context*, HC 986, Session 2005-06, Ev.22

weapons States reaffirmed “their commitment, as stated in article VI, to pursue in good faith negotiations on effective measures to nuclear disarmament”, and agreed a programme of action that included concluding a Comprehensive Test Ban Treaty, progressing towards a ban on the production of fissile material for nuclear weapons, and pursuing systematic and progressive efforts to reduce nuclear weapons globally.<sup>103</sup>

The following year, the International Court of Justice issued a non-binding advisory opinion on the legality of the threat or use of nuclear weapons.<sup>104</sup> The Court concluded that the threat or use would “generally be contrary to the rules of international law applicable in armed conflict, and in particular the principles and rules of humanitarian law”, but added that it could not conclude definitively whether the threat or use “would be lawful or unlawful in an extreme circumstance of self-defence, in which the very survival of a State would be at stake.” However, it did conclude unanimously that:

There exists an obligation to pursue in good faith and *bring to a conclusion* negotiations leading to nuclear disarmament in all its aspects under strict and effective international control [emphasis added].<sup>105</sup>

Article VI of the NPT was further reinforced at the conclusion of the 2000 NPT Review Conference when the nuclear weapons States gave:

An unequivocal undertaking [...] to accomplish the total elimination of their nuclear arsenals leading to nuclear disarmament to which all States parties are committed under Article VI.<sup>106</sup>

These commitments were seen by many of the non-nuclear weapons states as critical to securing their continued support for the Treaty.

Some observers contend that replacing or upgrading Trident would constitute a violation of the NPT.<sup>107</sup> A Commons Early Day Motion tabled by Neil Gerrard on 9 February 2006 and signed, to date, by 60 Members stated:

That this House notes that the Government when elected in 1997 committed itself to working for multilateral nuclear disarmament; further notes that the Non-Proliferation Treaty (NPT) commits nuclear weapon states to negotiate the elimination of their nuclear arsenals and that the [1996] advisory opinion of the International Court of Justice<sup>108</sup> on the use or threatened use of nuclear weapons affirms an obligation `to negotiate in good faith and bring to a conclusion

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<sup>103</sup> ‘Principles and Objectives for Nuclear Non-Proliferation and Disarmament’, *Decision Paper from the NPT Review and Extension Conference*, 17 April - 12 May 1995

<sup>104</sup> More detail on the ICJ Advisory Opinion can be found in Section III of Library Research Paper 96/90, *Defence Update*, 8 October 1996.

<sup>105</sup> ICJ case summary, ‘Legality of the Threat or Use of Nuclear Weapons’, Advisory Opinion of 8 July 1996, 2(F), <http://www.icj-cij.org/icjwww/idocuments/isummaries/iunanaummary960708.htm>

<sup>106</sup> Para 15, Point 6, ‘Final Document Issued by 2000 Review Conference’, 20 May 2000

<sup>107</sup> Further background on the NPT can be found in Library Standard Note SN/IA/491, *Treaty on the Non-Proliferation of Nuclear Weapons*, 21 February 2005

<sup>108</sup> The July 1996 advisory opinion of the International Court of Justice (ICJ) recommended progress towards general nuclear disarmament as the best means of resolving the dispute over the legality of nuclear weapons. For more information on the ICJ ruling see Library Research Paper 96/90, *Defence Update*, October 1996, Section III.

negotiations leading to nuclear disarmament'; further notes that any programme to replace Trident nuclear weapons systems would pre-empt and undermine the effectiveness of such negotiations; and calls upon the Government to support the international rule of law by implementing the obligations of the NPT which would preclude a replacement of Trident.<sup>109</sup>

In December 2005 Rabinder Singh QC and Professor Christine Chinkin of Matrix Chambers provided a legal opinion for the conflict-resolution NGO, Peace Rights, on whether a Trident replacement would breach customary international law and Article VI of the NPT. In their opinion:

- (1) The use of the Trident system would breach customary international law, in particular because it would infringe the "intransgressible" requirement that a distinction must be drawn between combatants and non-combatants.
- (2) The replacement of Trident is likely to constitute a breach of article VI of the NPT.
- (3) Such a breach would be a material breach of that treaty.<sup>110</sup>

In particular, they argue that:

The linkage between the principles of non-proliferation and the obligation to negotiate towards disarmament shown by the negotiation history [of the NPT at the five yearly review conferences] indicate that Article VI is a provision 'essential to the accomplishment of the object or purpose of the treaty.' The non-nuclear weapon states required commitments from the nuclear weapon states as part of their willingness to accept non-nuclear status under the NPT and failure to comply with article VI thus, in our view, constitutes material breach.<sup>111</sup>

Other commentators interpret the language of Article VI differently. Sir Michael Quinlan, a former Permanent Under-Secretary of State at the Ministry of Defence and now a consulting senior fellow at the International Institute of Strategic Studies, argued in a memorandum to the Defence Committee in March 2006 that:

several considerations tell against claims that the commitment entails a categorical bar to the UK's continuing to possess nuclear weapons:

- a. The Article says nothing about the speed at which, or the conditions under which, eventual elimination is to be achieved. No state has maintained, nor could any reasonably do so, that the commitment is to be interpreted regardless of the world's political and security environment.
- b. The Article sets the elimination of nuclear weapons alongside "general and complete disarmament" by all parties. Nothing in the text puts the two obligations on different footings. We are not remotely in sight of "general and complete disarmament".

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<sup>109</sup> EDM 1614, 9 February 2006. The number of signatories to this EDM was correct as of 24 October 2006.

<sup>110</sup> 'The Maintenance and Possible Replacement of the Trident Nuclear Missile System', Joint Opinion of Rabinder Singh QC and Professor Christine Chinkin of Matrix Chambers, 19 December 2005, <http://www.acronym.org.uk/docs/0512/doc06.htm>

<sup>111</sup> *ibid*

c. There is neither evidence nor likelihood that all the other four recognised nuclear-weapon states (to say nothing of non-recognised ones) will be willing to abandon their armouries in the foreseeable future. It would be wholly unreasonable to interpret Article VI as imposing unilateral and total obligations upon the UK regardless of what others do.<sup>112</sup>

He concluded therefore that:

while Article VI is undoubtedly in a general way a consideration weighing against renewal, especially at the current scale, and should be taken into account accordingly, it is nowhere near constituting an unconditional imperative in either legal or political terms.<sup>113</sup>

The Government also disputed the findings expressed in the Matrix Chambers opinion. The then Defence Secretary, Dr John Reid, declared in February 2006:

I am content that the current nuclear deterrent meets the Government's legal obligations. The Government will ensure that any decisions taken on a replacement for our current nuclear deterrent system will also be fully consistent with our international legal obligations, including those under the Nuclear Non-Proliferation Treaty.<sup>114</sup>

Previously in June 2005 he was asked to confirm that a replacement for Trident would be compatible with the UK's obligations under the NPT, to which he replied:

the answer depends on what we do: if we replace the existing system with a massive increase in our capability, that may not be compatible; if we reduce capability, that may well be compatible. So the answer to the question is precisely as I said: it could well be in line with our existing obligations.<sup>115</sup>

The issue then is could the British nuclear capability be reduced further without undermining its credibility? Sir Michael Quinlan has revealed that, during his time at the Ministry of Defence in the early 1980s, he advocated reducing the number of submarines from four to three,<sup>116</sup> although others argue that might undermine the UK's ability to maintain a continuous at sea deterrent. The Government said in the SDR that it had considered other ways of reducing the deterrent further, by for example taking submarines off deterrent patrol or removing warheads from their missiles and storing them separately ashore. However, it concluded that such moves would undermine the credibility of the minimum deterrent and create the risk of crisis escalation if it proved necessary to sail a Trident submarine during a period of rising tension.<sup>117</sup> Alternative

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<sup>112</sup> Memorandum submitted to the Defence Committee by Sir Michael Quinlan, SND 76, 12 March 2006, <http://www.parliament.the-stationery-office.co.uk/pa/cm200506/cmselect/cmdfence/uc986-i/ucm0502.htm>

<sup>113</sup> Ibid

<sup>114</sup> HC Deb 27 February 2006, c1-2w

<sup>115</sup> HC Deb 6 June 2005, c987

<sup>116</sup> Defence Committee, *The Future of the UK's Strategic Nuclear Deterrent: the Strategic Context*, HC 986, Session 2005-06, Ev.9 and 10

<sup>117</sup> *Strategic Defence Review: Supporting Essays*, July 1998, Supporting Essay Five: Deterrence, Arms Control and Proliferation, p.5-5, para.13.

approaches might involve further reductions in the number of active warheads, cuts in the size of the overall stockpile, or perhaps a reduction in the number of ballistic missiles in the UK's inventory.

Another option suggested by some would be to extend the current nuclear capability while simultaneously pushing for progress in multilateral negotiations aimed at reducing the capabilities of all the nuclear powers.<sup>118</sup> It is argued that the UK should not unilaterally give up its capability in isolation, without securing similar commitments from other states. David Broucher, the former UK permanent representative at the Conference on Disarmament (CD), has said the Government should take a lead in reinvigorating the moribund negotiations at the CD, with a particular focus on agreeing a treaty that bans the future production of fissile, bomb-making material (the so-called Fissile Material Cut-Off Treaty) and ensuring that uranium enrichment is governed by international treaty and used for peaceful purposes only.<sup>119</sup>

## C. Options

In light of these considerations the Government is faced with two broad choices with respect to the UK's strategic nuclear deterrent beyond the life of the current system: procure a successor system or move towards disarmament. Once that fundamental question is resolved, a number of options present themselves for consideration.

The following sections examine the technical feasibility and cost implications of each of these options.

### 1. Procurement of a Successor System

The procurement of a successor system to Trident is likely to be made within the context of two overarching considerations:

- **The Defence Industrial Strategy** – The MOD's Defence Industrial Policy which was published in 2002 sets out the commitment of the UK to retaining certain key strategic capabilities, including nuclear technology, within the domestic manufacturing base.<sup>120</sup>

In December 2005 that commitment was reiterated with the publication of the Defence Industrial Strategy (DIS).<sup>121</sup> The aim of the DIS was to build upon the framework and principles of the Defence Industrial Policy by setting out, in detail,

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<sup>118</sup> Defence Committee, *The Future of the UK's Strategic Nuclear Deterrent: the Strategic Context*, HC 986, Session 2005-06, Ev.33

<sup>119</sup> The UK announced in 1995 that it had stopped the production of fissile material for nuclear weapons or other nuclear explosive devices. The Government says it "continually press for negotiations to begin on a fissile material cut-off treaty at the conference on disarmament in Geneva." Sources: HL Deb 16 March 2006, c254-5WA and HL Deb 29 June 2005, c244-5

<sup>120</sup> More information on the Defence Industrial Policy is available in Library Standard Note SN/IA/3759, *Defence Industrial Strategy*, 23 September 2005

<sup>121</sup> Ministry of Defence, *Defence Industrial Strategy*, Cm 6697, Session 2005-06. A copy of the Defence Industrial Strategy is available [online](#).

what industrial capabilities (including infrastructure, skills, intellectual property, and capacity) would be essential to retain onshore in the long term. Technologies associated with the nuclear deterrent were identified in the document as capabilities essential for “strategic assurance”, i.e. important for safeguarding the State.

The DIS also set out a fundamental shift in policy with regard to warship building. It stated that, in future, not all key maritime capabilities would have to be exercised onshore and would be judged on a case-by-case basis.<sup>122</sup> Despite this general reversal of policy, however, all capabilities associated with the design, development, support, operation and decommissioning of submarines were highlighted as strategic capabilities for retention onshore. Indeed, some analysts have suggested that the long-term future of the submarine industrial base in the UK will entirely depend upon any decisions taken in relation to a future nuclear deterrent.<sup>123</sup>

- **The Defence Procurement Budget** – This has remained relatively static at approximately £6bn per annum.<sup>124</sup> Between 2008 and 2015 the current forward equipment plan is already expected to create a “bow wave” when the delivery of the procurement programmes currently underway far exceeds available funding. Among those programmes are the Future Carrier (CVF), A400M strategic airlift, the Future Rapid Effects System (FRES), the Joint Combat Aircraft (Joint Strike Fighter) and potentially tranche 3 of the Eurofighter Typhoon.<sup>125</sup> One of the potential consequences of this could be to push several procurement programmes into later years, thereby introducing further pressure on the defence budget well into 2020. The knock-on effect of financial constraints may inform the debate on the procurement of a successor system for Trident and indeed whether it would be funded from the MOD’s budget or from a Special Reserve established by the Treasury.<sup>126</sup>

On the basis of these considerations, there are theoretically several options available with regard to the procurement of a successor platform and delivery system for the UK’s nuclear deterrent:

- Extend the in-service life of the Vanguard-class submarine and Trident II D5 missile in the near term.
- Procure a direct replacement for the Trident system in line with the current UK-US agreement. This could either involve the procurement of a complete submarine **and** missile system from the US or the procurement of a future US

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<sup>122</sup> Prior to the publication of the Defence Industrial Strategy the UK had a 100% domestic warship building policy.

<sup>123</sup> See “Can UK nuclear submarine industry retain critical mass?”, *Jane’s Navy International*, 1 July 2006 for a comprehensive look at this issue.

<sup>124</sup> HM Treasury, *2004 Spending Review*, Cm 6237, July 2004, p.129

<sup>125</sup> A decision on tranche 3 of the Eurofighter typhoon is expected in 2007.

<sup>126</sup> This is examined in section III E.

missile system for incorporation onto either an existing or newly developed British-built submarine.

- Procure an entirely brand new capability. This could be either a submarine-based capability or an alternative system such as a ground or air-launched capability.

Procuring either a new capability or a new US missile for incorporation onto a British-built platform would also offer the possibility of combining the nuclear deterrent with that of a conventional hunter-killer submarine, thereby providing a multi-role capability to any successor system.

It is also worth noting that within all of these options scope potentially exists for reducing the number of available operational warheads and the number of warheads carried by a Trident submarine on deterrent patrol, without undermining the credibility of the nuclear deterrent.<sup>127</sup> Reductions of this type would be in keeping with decisions on the nuclear deterrent force structure that have periodically been taken since the end of the Cold War.

#### **a. Service Life Extension**

In 2002 the US Navy awarded Lockheed Martin a contract for the Trident II D5 Service Life Extension Programme (SLEP). Under the contract it is expected that some 300 missiles will be upgraded to the D5 (A) version by 2020 and that these missiles will remain in service until 2042 to match the extended life of the US Ohio-class Trident submarine.

According to an article in *Jane's Missiles and Rockets* in September 2000, the programme is not envisaged to be “a major re-design, but would involve the replacement of specific components, especially those that are dependent on older technologies which in many cases are no longer being manufactured”.<sup>128</sup> In addition, a service life extension programme for the Mk4 re-entry vehicle, which carries the warheads on the Trident missile, is planned through 2020 in order to support Trident operations up to 2042.

The development of a new Trident variant within the 2020-2042 timeframe presents the UK with a feasible solution for the missile element of any successor system, at least in the short term. The UK already shares in the pool of Trident missiles that are manufactured and maintained in the US. Therefore the ability of the UK to involve itself in this programme would be relatively straightforward. For the UK this solution would also be potentially more cost-effective in terms of in-service support of the missile because the infrastructure and technical agreements, as at present, will already be in place.

If the UK were to pursue this option then a major upgrade of the Vanguard-class submarine would also be required to extend its service life by a further 10-15 years. Indeed, an article in *Jane's Navy International* in May 2005 suggested that this option is

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<sup>127</sup> The Government's position is that it currently maintains a posture of minimum deterrence and as examined below, it would be considered difficult to maintain a Continuous At Sea Deterrent with fewer than four submarines.

<sup>128</sup> “US navy to extend life of Trident force”, *Jane's Missiles and Rockets*, 1 September 2000

already under active consideration.<sup>129</sup> However, the technical feasibility of extending the platform by that amount of time has been questioned,<sup>130</sup> while major upgrade programmes have historically proven to be costly and subject to serious delays due to their complexity. The Nimrod MR4A upgrade programme for example is currently £995m over budget and seven and a half years late.<sup>131</sup>

Pursuing this option may, therefore, negate any cost savings achieved from involvement in the Trident II D5 (A) upgrade programme and could increase the risks considerably for the UK.

Another disadvantage is that a service life extension to 2042 would keep the Trident capability in service for only a further 10-15 years beyond the expected decommissioning date of the Vanguard-class submarines. The procurement of a whole new system for 2042 onwards would have to be considered again in the mid 2020s.

In its Memorandum to the Defence Select Committee in January 2006 the MOD indicated its interest in the US Service Life Extension Programme, although it confirmed that “the UK Government has yet to decide whether or not to participate in this programme”. On the issue of extending the life of the Vanguard-class submarine, the Memorandum went on to state;

A series of studies have considered whether it would be practicable and cost effective to continue to operate the submarines beyond the original design intent. We now believe that, if required, this would be possible, albeit with gradually increasing cost and some increasing risk of reduced availability, perhaps out to the mid-2020s.<sup>132</sup>

## **b. Direct Replacement**

### **Complete US System**

US Navy plans to procure a new class of submarine armed with nuclear warheads to replace the Trident system are unclear at present. However, it has reportedly called for funding to be assigned from 2014 with a view to a replacement entering service in 2029-2030 when the oldest of the extended Ohio-class is decommissioned.

According to the *Bulletin of the Atomic Scientists*:

The navy has extended the service life of the Trident from 30 to 44 years. The oldest submarine will retire in 2029; the Pentagon is studying two options for a new SSBN to be introduced the same year. One option is a variant of the *Virginia*-class nuclear-powered attack submarine (SSN); the other is a dedicated

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<sup>129</sup> “UK faces decisions on submarine design base”, *Jane’s Navy International*, 1 May 2005

<sup>130</sup> Defence Committee, *The Future of the UK’s Strategic Nuclear Deterrent: the Strategic Context*, HC 986, Session 2005-06, Ev.38

<sup>131</sup> National Audit Office, *Major Projects Report 2005*, HC 595-II, Session 2005-06

<sup>132</sup> MOD Memorandum to the Defence Select Committee, HC 835, Session 2005-06. This assumes a service life of the submarine of 25 years.

SSBN based on either a new design or a Trident derivative. The new project would begin in 2016.<sup>133</sup>

In October 2003 the US Navy's Strategic Subsystems Programs Office reportedly issued a request for information for a submarine-launched intermediate-range ballistic missile. Although not expected to lead to a procurement programme in the near future, it is considered to be an assessment of industry's ability to meet the Navy's future requirements in this area. *Jane's Missiles and Rockets* considered that any new missile could have the potential to replace Trident, although its range would be much shorter.<sup>134</sup>

Given the links between the UK and US nuclear deterrent systems and the relatively close timeframe for the introduction of a new US system and the decommissioning of the UK's Vanguard-class fleet, it has been considered likely by some that the UK will associate itself closely with the US Navy's SSBN programme.

An article in *Disarmament Diplomacy* in April 2004 commented:

It would be extremely difficult and expensive for Britain even to maintain its existing Trident system, let alone to develop and build a new nuclear weapon system and its associated infrastructure without extensive help from the United States [...]

In reality, if the UK decides to go ahead with a replacement for Trident, it is unlikely to choose anything that would not be identical (or very nearly) with an American nuclear weapon system.<sup>135</sup>

Indeed, a number of analysts have advocated the possibility of procuring the US Navy's SSBN solution "wholesale" or "commercially off the shelf", thereby offering even greater cost savings and fewer risks to the UK. However, such a decision would seriously undermine the UK's defence industrial strategy, which stated that submarine capabilities should be retained onshore. Writing in *Jane's Defence Weekly*, Howard Wheeldon, a senior columnist with Dow Jones, supported this potential approach. He argued:

If the UK decides to continue the nuclear option post 2024 it could buy US-designed nuclear submarines. While this might leave UK defence industrial strategy in tatters, it would be taken as another useful sign of defence industry collaboration worldwide. And it would go some way to addressing greater interoperability requirements of the allies.<sup>136</sup>

Pursuing this approach would, however, prompt a number of concerns. On a technological level it would pose questions over the through-life maintenance of the system and to what degree there would have to be dependence upon the US. Reassurances would have to be sought from the US, for example, over the issue of

<sup>133</sup> 'NRDC: Nuclear Notebook: U.S. nuclear forces 2005', *Bulletin of the Atomic Scientists*, January-February 2005, pp. 73-75 (vol. 61, no. 01),

[http://www.thebulletin.org/article\\_nn.php?art\\_ofn=jf05norris](http://www.thebulletin.org/article_nn.php?art_ofn=jf05norris)

<sup>134</sup> "USN issues RFI for sub-launched IRBM", *Jane's Missiles and Rockets*, 1 November 2003

<sup>135</sup> "US-UK nuclear weapons cooperation up for renewal", *Disarmament Diplomacy*, April 2004

<sup>136</sup> "Opinion: Trident upgrade could reshape UK industry", *Jane's Defence Weekly*, 16 November 2005

technology transfer, which many observers believe has created significant obstacles in the Joint Strike Fighter programme.

In turn, any dependence upon the US in terms of procurement, maintenance and support would inevitably raise questions over the political independence of that deterrent capability. As Lee Willetts points out in his article in the *RUSI Journal*:

The UK needs to be able to build, operate and maintain its strategic deterrent on a sovereign platform and to have complete autonomy over use. While there are common design elements in the existing programme and while the UK draws its missiles from a joint pool [...] the *Vanguard*-class boats are UK-designed and built, the warhead is UK-designed and built and, crucially, the UK retains total autonomy in the decision to use the system. The UK will always insist on at least a degree of political independence, so that it can make its own choices on an issue so critical to national survival. Thus, all full joint programmes are unlikely.<sup>137</sup>

In addition, the US Navy is not expected to begin its SSBN procurement until 2016, while the UK realistically needs to make a decision on a successor for Trident within the next few years. Consequently one possible scenario could see the UK extend the in-service life of Trident in the short term, as outlined above, with a view to procuring a system largely based upon the US Navy programme in the longer term.

## US Missile System

An alternative to participating in, or procuring, a complete submarine and missile system from the US could be to procure any successor missile developed by the US, for incorporation into either a new class of British-built submarine or a converted Astute-class hunter-killer submarine.

- **Astute Conversion**

Platform conversion to accommodate new munitions is not without precedent. The US Navy is, for example, currently converting some of its older Ohio-class submarines to carry the conventional Tomahawk cruise missile or conventionally-armed Trident missiles. However, conversion on this scale is costly and the US programme is currently estimated to be £1.2bn.<sup>138</sup>

The feasibility of this proposal for the UK would largely depend upon the design of the missile, including its size and weight, and would also be contingent upon the timing of any new US missile programme. At present three Astute-class submarines are on order, although the MOD has retained the option to procure a further four, bringing the eventual size of the Astute-class to seven.<sup>139</sup> Those three submarines are expected to enter service by 2011.<sup>140</sup> The production of additional vessels in the Astute-class is then

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<sup>137</sup> "Questions for the debate on the future of the UK strategic deterrent", *RUSI Journal*, December 2005

<sup>138</sup> <http://www.globalsecurity.org/military/systems/ship/ssgn-726.htm>

<sup>139</sup> "Astute class submarine programme", *Jane's Defence Weekly*, 22 March 2006

<sup>140</sup> HMS *Astute*, the First of Class, is expected to enter service in 2008, HMS *Ambush* in 2010 and HMS *Artful* in 2011.

expected to adhere to a two-year cycle.<sup>141</sup> On that assumption a class of seven boats could be expected to be in service in approximately 2019-2020. On the basis of this timeframe, the production of four additional Astute-class submarines to fulfil the requirement for the strategic deterrent could feasibly be undertaken in the 2020-2030 timeframe within which the current Vanguard-class is expected to be decommissioned.<sup>142</sup>

Adapting the design of an Astute-class submarine to carry a successor missile system would have a number of advantages. The overall cost of a deterrent force based on a pre-existing platform would undoubtedly bring savings, despite the expected costs of conversion. In addition, this proposal would enable the UK to sustain critical elements of the submarine design and manufacturing base for the foreseeable future.

However, the disadvantage of this proposal is that a US successor missile system would have to be introduced in a timeframe that would allow for the design adaptation of the Astute to be undertaken and any risks associated with that re-design to be addressed before production could take place. In addition, the manufacture of four additional Astute-class submarines, outside of the MOD's planned class of seven, would be subject to a tight, although not unfeasible, timescale. Consequently there could be no room for error in the delivery timeframe of this capability on the part of the contractor BAE Systems.

The question of whether an Astute-class submarine could be adapted with enough flexibility to carry a Trident II D5 A missile in the short term, and any successor US missile in the longer term, is one worth posing.<sup>143</sup>

One further consideration is the possibility of adapting four of the current planned Astute-class submarines to carry both conventional-armed and nuclear-armed missiles. The arguments for and against the development of a multi-role capability are examined below.

- **New class of submarine**

Designing a new class of British submarine within which to incorporate a successor US missile system would pose similar benefits and problems to an Astute conversion in terms of the timescale within which any new US missile would have to be introduced and the long term support it would provide to the UK submarine industrial base.

In relative contrast to a converted Astute, however, the design and development of an entirely new class of vessel would be significantly more expensive. Those costs may or may not be considered sustainable throughout the life of the programme, while the

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<sup>141</sup> "Astute class submarine programme", *Jane's Defence Weekly*, 22 March 2006

<sup>142</sup> On the assumption of a 30-year in-service life HMS *Vanguard* is expected to be decommissioned in 2024, while the final boat of class, HMS *Vengeance* is due to be decommissioned in 2031.

<sup>143</sup> The Future Carrier, for example, is being designed with sufficient flexibility to adapt the carrier in the future in order to accommodate other potential types of aircraft such as unmanned aerial vehicles or conventional aircraft that would require catapults and arrestor gear for take-off and landing. However, it is acknowledged that this level of design adaptability has been planned from the outset of the programme.

technical risks associated with the design, manufacture and support of any new capability, would increase.<sup>144</sup>

**c. New Capability**

**Submarine-Based**

The Defence Procurement Agency's Maritime Underwater Future Capability (MUFC) is currently assessing the UK's capability requirements for the underwater battlespace post-2015. A number of analysts have suggested that a successor to the Trident system could be defined within the context of that assessment.

The two main options for an entirely new submarine-based system would be the procurement of both a new class of submarine and missile system devoted to the nuclear deterrent; or combining the nuclear deterrent with the current role of the hunter-killer submarine into a new single class of multi-role nuclear-powered submarines.

As outlined above, the design and development of a new-class of submarine would have cost, time and risk implications offset against the obvious advantages to the UK industrial base. The procurement of a new missile system in addition to a new class of submarine could conceivably increase those disadvantages to the UK exponentially. Inclusion in the Trident programme from the outset was taken on the basis of the through-life cost savings that could be achieved by the UK. The development and in-service support of a new, national or collaborative European missile capability would require levels of funding significantly higher than that currently allocated to the Trident missile programme, while de-risking such a programme could have implications for the ability to introduce a successor deterrent system within the requisite timeframe.

Alternatively, combining the role of the nuclear deterrent with that of a conventionally-armed hunter-killer submarine has received increasing attention. Under this proposal, either a new class of submarine or a converted Astute would be fitted with vertical-launch missile tubes to allow them to fire both nuclear-armed long-range missiles and conventionally-armed Tomahawk cruise missiles. As the current limits placed on the number of warheads leave considerable spare capacity within the British Trident system, adopting a multi-role capability for the submarine is considered feasible.

However, the practicality of combining the strategic nuclear deterrent with a conventional role has been questioned. The Government has argued that, in order to retain one trident submarine on patrol at any one time, four submarines must be dedicated to the deterrent cycle.<sup>145</sup> In order to maintain this commitment, any multi-role submarine would probably have to be procured in greater numbers, with requisite cost implications. The

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<sup>144</sup> The Astute programme for example is currently three and a half years late entering service and £900m over budget (National Audit Office, *Major Projects Report 2005*, HC595, Session 2005-06) due to the high level of risk and the technical complexity of the programme in its initial stages. In February 2003 the contract with BAE Systems had to be amended to take these issues into account.

<sup>145</sup> In order to maintain a posture of Continuous At Sea Deterrence, four submarines are required in order fill the deterrent cycle, with one vessel on patrol, one in major refit and two in maintenance or training but retained at a relatively high level of readiness.

Government has reportedly ruled out the deployment of conventional warheads on existing Trident submarines, which would provide them with a multi-role capability.<sup>146</sup>

An article in *The Times* in August 2002 reported:

Ministers have rejected a Royal Navy proposal to convert the four Trident ballistic-missile submarines into a more flexible force capable of launching Tomahawk land attack cruise missiles – as well as providing Britain's nuclear deterrent patrol [...] Ministers decided that to guarantee one Trident submarine was always on patrol, all four had to be committed to the nuclear deterrent cycle.<sup>147</sup>

From a political perspective, concerns over effective advance notification procedures to ensure other countries do not mistake a conventional missile launch for a nuclear strike have also been raised. Several members of the US Congress, including the House Armed Services Committee, have already expressed unease over a 2007 budget request by the Pentagon for two nuclear missiles to be removed from each of the US Navy's ballistic missile submarines and replaced with modified conventionally-armed Trident missiles.<sup>148</sup> Concerns were raised over the potential of such a multi-role capability to create misunderstandings between nations were the US to launch long-range ballistic missiles, albeit armed with a conventional warhead, during times of conflict or crisis. As Amy Wolf of the US Congressional Research Service outlined in a report in March 2006:

The resemblance to nuclear-armed ballistic missiles would... raise questions and create concerns. If the United States were to launch them during a conflict, nations with minimal launch notification system (such as China) or degraded launch notification systems (such as Russia) could conclude that they were under attack with nuclear missiles [...] The potential for misunderstanding is compounded by the short time of flight of these missiles, giving these nations little time to evaluate the event, assess the threat, and respond with their own forces.<sup>149</sup>

Indeed, rather than grant the budget request, the final version of the US *National Defense Authorization Act for Fiscal Year 2007*, which was signed into law on 17 October 2006, placed an obligation upon the Pentagon to provide Congress by February 2007 with a detailed evaluation of the potential use of conventionally-armed Trident ballistic missiles.

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<sup>146</sup> "Conventionally armed Trident", *RUSI Journal*, February 2002

<sup>147</sup> "Missile Plan is Rejected", *The Times*, 12 August 2002, p.6

<sup>148</sup> "Conventional Trident missiles will aid terror war", American Forces Press Service, 8 June 2006. The Conventional Trident Modification Programme has largely grown out of the 2001 US Nuclear Posture Review which called for the integration of conventional weapons with strategic nuclear forces to provide a new category of offensive weapon. Since 2001 the Pentagon has periodically requested funding for this initiative, which has received a mixed response in the US Congress. Further detail is available in the CRS report "Conventional Warheads for Long-Range Ballistic Missiles", March 2006 which is available online at: <http://www.fas.org/sqp/crs/nuke/RL33067.pdf>

<sup>149</sup> Amy Wolf, "Conventional Warheads for Long-Range Ballistic Missiles", Congressional research Service, 13 March 2006

The Act states:

SEC. 219. REPORT ON PROGRAM FOR REPLACEMENT OF NUCLEAR WARHEADS ON CERTAIN TRIDENT SEA-LAUNCHED BALLISTIC MISSILES WITH CONVENTIONAL WARHEADS.

(a) REPORT REQUIRED.—Not later than February 1, 2007, the Secretary of Defense shall submit to the congressional defense committees a report setting forth a proposal to replace nuclear warheads on 24 Trident D–5 sea-launched ballistic missiles with conventional kinetic warheads for deployment on submarines that carry Trident sea-launched ballistic missiles. The report shall be prepared in consultation with the Secretary of State.

(b) ELEMENTS.—The report required by subsection (a) shall include the following:

(1) A description of the types of scenarios, types of targets, and circumstances in which a conventional sea-launched ballistic missile might be used.

(2) A discussion of the weapon systems or weapons, whether current or planned, that could be used as an alternative for each of the scenarios, target types, and circumstances set forth under paragraph (1), and a statement of any reason why each such weapon system or weapon is not a suitable alternative to a conventional sea-launched ballistic missile.

(3) A description of the command and control arrangements for conventional sea-launched ballistic missiles, including launch authority and the use of Permissive Action Links (PALs).

(4) An assessment of the capabilities of other countries to detect and track the launch of a conventional or nuclear sea-launched ballistic missile.

(5) An assessment of the capabilities of other countries to discriminate between the launch of a nuclear sea-launched ballistic missile and a conventional sea-launched ballistic missile, other than in a testing scenario.

(6) An assessment of the notification and other protocols that would have to be in place before using any conventional sea-launched ballistic missile and a plan for entering into such protocols.

(7) An assessment of the adequacy of the intelligence that would be needed to support an attack involving conventional sea-launched ballistic missiles.

(8) A description of the total program cost, including the procurement costs of additional D–5 missiles, of the conventional Trident sea-launched ballistic missile program, by fiscal year.

(9) An analysis and assessment of the implications for ballistic missile proliferation if the United States decides to go forward with the conventional Trident sea-launched ballistic missile program or any other conventional long-range ballistic missile program.

(10) An analysis and assessment of the implications for the United States missile defense system if other countries use conventional long-range ballistic missiles.

(11) An analysis of any problems created by the ambiguity that results from the use of the same ballistic missile for both conventional and nuclear warheads.

(12) An analysis and assessment of the methods that other countries might use to resolve the ambiguities associated with a nuclear or conventional sea-launched ballistic missile.

(13) An analysis, by the Secretary of State, of the international, treaty, and other concerns that would be associated with the use of a conventional sea-launched ballistic missile and recommendations for measures to mitigate or eliminate such concerns.

(14) A joint statement by the Secretary of Defense and the Secretary of State on how to ensure that the use of a conventional sea-launched ballistic missile will not

result in an intentional, inadvertent, mistaken, or accidental reciprocal or responsive launch of a nuclear strike by any other country.<sup>150</sup>

### **Air-Launched or Ground-Launched Capability**

In assessing the feasibility of procuring an entirely new capability, it is also necessary to consider the potential for procuring either an air-launched or ground-launched system, as opposed to a submarine-based one.

Giving evidence to the Defence Select Committee in November 2005 Dr John Reid commented:

We have always maintained that as long as some other nuclear state which is a potential threat has nuclear weapons we will retain ours. That is the assumption from which we start but it has to be tested in discussions with others and it will be. Even if we decide that we want to keep the nuclear deterrent, we then have to ask whether we want to keep it in the same form, submarine launched, sea launched, or in air launched or land-based nuclear weapons; and then we have to ask ourselves about the cost, and we will work through those points.<sup>151</sup>

An air-launched capability, like the current submarine-based system, would have the strategic benefit of flexibility, rapid deployability and stealth. However, achieving these advantages would require the procurement of a new aircraft, along the lines of the US Air Force's B-2 Spirit stealth bomber which is capable of delivering both conventional and nuclear munitions.<sup>152</sup> Considerable investment would also have to be made in associated infrastructure in the UK. Overseas basing when necessary and over-flight rights for most operations would also have to be secured, which could pose diplomatic problems.

A ground-launched capability, on the other hand, is considered to offer few advantages over either of the other two options. A nuclear deterrent based in the UK would require a significant level of infrastructure investment and lead to disputes over its location. Furthermore, in order to overcome the limitations that would inevitably be imposed upon the global reach of the deterrent, the UK would be required to develop, or procure in partnership, an Intercontinental Ballistic Missile (ICBM) capability.

While the overriding consideration in pursuing either of these different platform options would undoubtedly be the significant costs that they would incur, both an air-launched and a ground-launched capability would also be more vulnerable to attack than a submarine-based system, thereby undermining the effectiveness of the deterrent.<sup>153</sup>

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<sup>150</sup> *National Defense Authorization Act for Fiscal Year 2007* (HR 5122), Section 219

<sup>151</sup> Defence Select Committee, General evidence session with the Secretary of State for Defence, HC 556-I, Session 2005-06, Q.1-19

<sup>152</sup> More information on this capability is available from the US Air Force at:  
<http://www.af.mil/factsheets/factsheet.asp?fsID=82>

<sup>153</sup> These ideas are examined in greater detail by Lee Willetts, "questions for the debate on the future UK strategic deterrent", *RUSI Journal*, December 2005

In an interview with *Jane's Defence Weekly* in early February 2006 the former Chief of the Naval Staff, Admiral Sir Alan West, advocated the retention of a submarine-based deterrent. He stated:

I am convinced that we should maintain a minimum deterrent and am equally convinced that the navy should continue to operate that deterrent from submarines [...] we don't need a new deterrent as such because the Trident missile has a long life ahead of it and we have already made significant investment in the supporting infrastructure.

What we will need are new submarines to replace the Vanguard class and I think now is the time to start design work on that next deterrent boat if we are to maintain the minimum deterrent.<sup>154</sup>

## 2. Virtual Arsenal or Complete Disarmament

In contrast to the procurement of a successor system, an alternative approach mooted by some would involve complete unilateral disarmament by the UK, either immediately or when Trident reaches the end of its service life.

The implications of such a move would depend in large part on the nature of the political decision taken. In one scenario, a British government opposed to nuclear energy *per se* might divest the UK completely of its military nuclear capability and its civilian nuclear power reactors. Such an approach would make it more difficult and costly for a future government to reverse that decision and reconstitute a nuclear weapon capability.

A second scenario might involve a compromise position, whereby the UK would retain its civilian nuclear facilities, its stockpile of fissile material, and its technical and industrial capacity. That would keep open the option for a future British government to reconstitute a limited nuclear arsenal within a matter of months or years, if that was deemed to be in the country's national interest.

Some observers have referred to this option as a 'virtual arsenal'. A number of states with advanced civilian nuclear power programmes are believed to have the technical capability and the nuclear fuel cycle technology to develop a nuclear weapon programme within a comparatively short space of time. All that would be required is the political decision to do so. Japan, a non-nuclear state within the NPT that has a significant stockpile of safeguarded fissile material, is cited by some observers as an example. Estimates range from 6-24 months for the length of time it might take Japan to build an operational nuclear capability if it so wished.<sup>155</sup>

From a British perspective, the future of AWE Aldermaston would be a key factor here. Developing a nuclear weapon programme from scratch requires considerable investment, both in financial terms and in terms of developing the necessary technical

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<sup>154</sup> "Interview with Admiral Sir Alan West, Royal Navy Chief of Naval Staff and First Sea Lord", *Jane's Defence Weekly*, 8 February 2006

<sup>155</sup> See Memorandum submitted to the Defence Committee by Dr Andrew Dorman of Kings College London, SND 63, 8 March 2006, p.4, <http://www.parliament.the-stationery-office.co.uk/pa/cm200506/cmselect/cmdfence/uc986-iii/ucm302.htm>

capacity and skills base. Any timeline for reconstituting a British nuclear deterrent could be shortened if key personnel and skills were retained at AWE Aldermaston.

Some believe that, in the event of UK disarmament, the focus of work at Aldermaston could be switched completely from supporting the British nuclear arsenal to developing defensive measures against nuclear weapons and engaging in verification work to assist the enforcement and verification of international treaties, such as the Comprehensive Nuclear Test Ban Treaty (CTBT). A report in 2002 by the British Pugwash Group suggested that “AWE could develop its work in a way parallel to that of [the British chemical and biological weapons centre at] Porton Down” following the 1956 UK decision that it would no longer develop chemical and biological weapons:

Following that decision, the chemical and biological weapons facilities concentrated their work entirely on defence against such weapons, including treaty enforcement work. This has enabled the UK to contribute significantly to limiting the threat of chemical and biological warfare. [...]

Whereas the emphasis at Porton has been more on defensive measures than verification, however, the main body of work in an AWE-based programme would be on verification and treaty enforcement, which is seen both as more manageable in the nuclear than in the CBW area, and more important in view of the potential seriousness of a treaty breach.<sup>156</sup>

Were the UK to give up its nuclear weapons unilaterally, absent a broader international process of disarmament, then it would probably seek to be reclassified as a non-nuclear weapon state under the Non-Proliferation Treaty. As a consequence, the UK would have to expand the IAEA’s safeguards coverage to all its nuclear sites and either melt down all weapon-grade fissile material, as South Africa did in the early 1990s, or place it under safeguards. As a non-nuclear weapon state, any subsequent attempt to reconstitute a nuclear weapon capability would require British withdrawal from the NPT, as set out under Article X of the Treaty. At present there are no mandatory penalties imposed on a state that withdraws, although there is growing pressure for withdrawal to be made more difficult and costly.

A further consideration for the UK would be the issue of delivery system. Scrapping Trident would remove the one truly strategic delivery system from the British inventory, unless it was decided to retain a conventionally-armed Trident, with all the costs that would entail. Submarine-launched Tomahawk missiles in the British arsenal could be armed with small nuclear warheads, but they are cruise, not ballistic, missiles, and have a much shorter range than Trident. Their comparatively low speed and altitude also make them more vulnerable to missile defence systems. Air-dropped or air-launched nuclear weapons would also be hindered by the short range of the aircraft currently in RAF service, as the UK has no long-range bombers like the US B-2 Spirit.

Advocates of a virtual arsenal argue that keeping such a capability would help insure the UK against the emergence of direct strategic threats to its national security in the coming

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<sup>156</sup> T Milne, H Beach, J L Finney, R S Pease, J Rotblat, ‘An End to UK Nuclear Weapons’, British Pugwash Group, 2002

decades. Others question whether the lead-time of months or years would be sufficiently quick to counter a rapidly emerging threat, and argue that the cost of reconstitution would be so high as to be prohibitive.

## **D. Warhead Development and Implications for AWE Aldermaston**

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 said in the SDR 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>157</sup> This position was reiterated in the December 2003 Defence White Paper<sup>158</sup> and in subsequent PQs, with the Government saying it would seek “sustainment of capabilities” at Aldermaston.<sup>159</sup>

A new programme of investment at the Aldermaston and Burghfield facilities was announced by Dr 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>160</sup>

Further details on the focus 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

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<sup>157</sup> *Strategic Defence Review: Supporting Essays*, July 1998, Supporting Essay Five: Deterrence, Arms Control and Proliferation, p.5-5, para 14

<sup>158</sup> *Delivering Security in a Changing World*, Defence White Paper, December 2003, Cm 6041-I, chapter I, para 1.2

<sup>159</sup> See for example HC Deb 14 June 2005, c337w

<sup>160</sup> HC Deb 19 July 2005, c59WS

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.

[...] 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>161</sup>

It 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>162</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>163</sup>

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<sup>161</sup> Memorandum submitted by the Ministry of Defence, Annex C (Investment at the Atomic Weapons Establishment), 19 January 2006, paras 7-8

<sup>162</sup> *ibid*, paras 9-10

<sup>163</sup> *ibid*, para 11

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>164</sup>

There is little public information available about the timing or factors involved in developing new warhead designs for a potential Trident replacement. Dr John Reid declared on 21 March 2006 that there was “no programme at Aldermaston to develop a new warhead”<sup>165</sup> and the Ministry of Defence declared in its Memorandum to the Defence Committee in 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>166</sup>

A new design 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 options, perhaps to allow more “useable” smaller weapons to be deployed against more “precise” targets.<sup>167</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.

## E. Potential Costs

The level of expenditure on a successor system will depend entirely upon the option that is chosen and any changes that may be made to the size and/or readiness of the UK’s nuclear deterrent. A solution involving changes to the payload of the warhead or the number and type of platform upon which it is deployed would, for example, incur additional developmental costs and infrastructure costs.

Consequently, attempts to estimate the cost of a Trident replacement have varied considerably. In his article in *RUSI Journal*, Lee Willetts suggested that “perhaps £15-£20bn over thirty years is a reasonable estimate”,<sup>168</sup> while an article in *Jane’s Defence*

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<sup>164</sup> Memorandum submitted by the Ministry of Defence, Annex C (Investment at the Atomic Weapons Establishment), 19 January 2006, para 13

<sup>165</sup> HC Deb 21 March 2006, c364w

<sup>166</sup> Memorandum submitted by the Ministry of Defence, Annex B (The Expected Life of the Trident System), 19 January 2006, para 2a

<sup>167</sup> ‘Secret plan for N-bomb factory’, *The Observer*, 16 June 2002

<sup>168</sup> “Questions for the debate on the future of the UK strategic deterrent”, *RUSI Journal*, December 2005

*Weekly* in November 2005 placed a cost estimate of “in excess of £20 billion” on a Trident replacement.<sup>169</sup>

An article in *The Guardian* in September 2006 reported that the cost of replacing and operating the nuclear deterrent would be “at least” £76bn.<sup>170</sup> This estimate was based on the acquisition cost of the Trident programme and the annual running costs of maintaining the system over its 30-year life. This estimate assumes that:

- *The annual maintenance expenditure will remain at between 5% - 5.5% of the annual defence budget.*

The Trident maintenance budget has been between 3% – 4.5% of the defence budget in each year since 1994 and has only increased to 5 - 5.5% due to the extra expenditure necessary to keep the current system safe and reliable. It is not realistic to assume that the maintenance budget would remain at this 5 – 5.5% level over a 30-year period.

Over the next few years Trident maintenance costs are likely to remain high as the Vanguard-class submarines undertake a refit which is expected to be completed by 2012. As any new system would not be in operation until approximately 2024, such expenditure has little bearing on discussions surrounding future maintenance costs.

- *The defence budget will remain at its estimated 2007/08 level.*

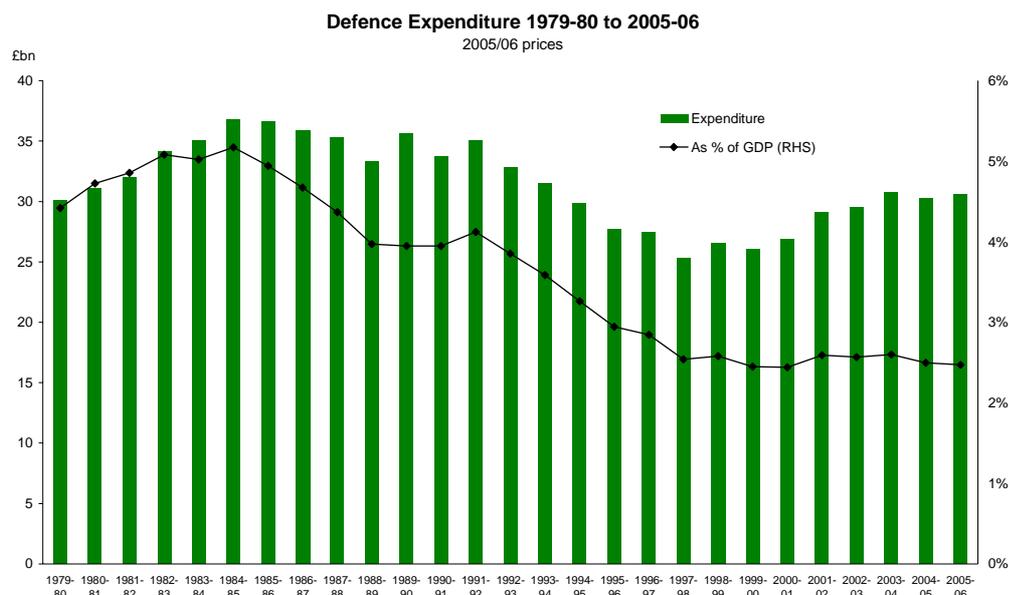
Defence expenditure varies over time depending on the spending plans set as part of the Government's Spending Review process.

The chart below shows how real terms defence expenditure has varied since the 1980's. It is not realistic to base calculations on the assumption that the defence budget will remain at its current level.

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<sup>169</sup> “Trident upgrade could reshape UK industry”, *Jane's Defence Weekly*, 16 November 2005

<sup>170</sup> *New Trident system may cost £76bn, figures show*, *The Guardian*, 21 September 2006



Critics of acquiring a Trident replacement argue that the money would be better spent on improving the UK's conventional forces and gaining new capabilities for counter-terrorist operations.

Former foreign secretary Robin Cook wrote in July 2005:

Trident cost us more than £12.5bn - roughly half the whole defence budget for a year. Even if its successor did not have a higher price tag, it could not be bought without cutting back on the conventional capacity of our armed forces. It will be more difficult this time to find the funds for a new nuclear weapons system without those cuts being painful, because the defence budget as a percentage of GDP is now much less than the level that accommodated the Polaris and Trident programmes.

Our army is already shedding both troops and tanks. Yet Britain's most valuable role in global stability is the professional, experienced contribution of our soldiers to peacekeeping missions, which earns us much more goodwill round the world than our nuclear submarines prowling the seas. The world would be less stable and Britain would be less secure if we were to trade in even more of those army units for son-of-Trident. It is not just peaceniks who would oppose such a choice. I suspect a clear majority of the officer corps would vote against diverting the defence budget into another generation of nuclear weapons.<sup>171</sup>

Former defence secretary Michael Portillo concurred with the view that diverting funds to nuclear weapons would leave less money for other more "useful" defence projects, arguing that: "We could be more powerful and a more useful ally for America if we did not waste money on renewing the nuclear deterrent."<sup>172</sup>

<sup>171</sup> Robin Cook, MP, 'Worse Than Irrelevant', *Guardian*, 29 July 2005

<sup>172</sup> Michael Portillo, 'Does Britain need nuclear missiles? No. Scrap them', *Sunday Times*, 19 June 2005

As outlined in section III A, a number of opponents have also argued that this level of expenditure could be put to greater use in addressing issues such as environmental concerns, poverty, disease and debt.

Others argue that as the ultimate guarantor of the country's security, the price is comparatively small when compared to the risks involved in renouncing nuclear weapons.<sup>173</sup> One view is that, as nuclear weapons are primarily a political rather than a military tool, the cost of replacing Trident should be paid for by the Government as a whole, and not taken from the defence budget.<sup>174</sup>

At present it is unclear how any replacement of Trident will be funded. On 24 July 2006 the Secretary of State for Defence, Des Browne, replied to a question on funding:

**Mark Hunter:** Given that the combined capital expenditure and through-life running costs of a Trident replacement could ultimately exceed some £40 billion, according to some experts, can the Minister say specifically where those funds will come from? Can he further assure the House that the funding for the UK's conventional armed forces, which are already overstretched in many instances, will not be adversely affected as a consequence?

**Des Browne:** I have no doubt that in the context of the debate that will take place, the hon. Gentleman will have an opportunity to make clear, individually and on behalf of his party, when we understand what his party's position is on the matter, where they stand. Clearly, the hon. Gentleman, like his colleagues, will have to live with the financial consequences of any decision that we make, just as we on the Government side, and no doubt the official Opposition, will be prepared to do, but he can be reassured that the timetable set for the decision is such that the decisions about the costs can be incorporated in the comprehensive spending review considerations, and decisions about costs will be made once we work out which option we want to adopt and what the costs of that option are.<sup>175</sup>

## F. Position of the British Government

Successive British Governments have, since the 1950s, supported the retention of a strategic nuclear deterrent. Current British defence doctrine states:

At the heart of the UK's defence posture is the notion of deterrence, the purpose of which is to persuade a potential adversary away from a course of action that threatens British interests. It is applied at all levels, from the strategic down to the tactical, and in defence of all national interests, be they essential, vital or marginal [...]

The term 'strategic deterrence' has been especially associated since the 1950s with the threatened use of nuclear weapons to deter attacks on the UK and the NATO Allies. The possession of nuclear weapons is lawful and is judged so far to

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<sup>173</sup> See memorandum submitted by Dr Colin S Gray to the Defence Committee, *The Future of the UK's Strategic Nuclear Deterrent: the Strategic Context*, HC 986, Session 2005-06, Ev.80-81

<sup>174</sup> *ibid*, memorandum submitted by Dr Lee Willett, Ev.66-71

<sup>175</sup> HC Deb 24 July 2006, c586

have been the most effective means of deterring attack by others who possess similar capabilities. Nuclear strategic deterrence represents a particular and legitimate means of achieving deterrence at the strategic level in response to a particularly extreme form of threat. It has also probably had the effect of deterring conventional aggression because of the risk of escalation across the nuclear threshold inherent in general war between nuclear powers.<sup>176</sup>

Consequently, the MOD's 2003 Defence White Paper concluded:

The Government's policy on nuclear weapons remains as set out in the SDR. We are committed to working towards a safer world in which there is no requirement for nuclear weapons and continue to play a full role in international efforts to strengthen arms control and prevent proliferation of chemical, biological and nuclear weapons. However, the continuing risk from proliferation of nuclear weapons, and the certainty that a number of other countries will retain substantial nuclear arsenals, means that our minimum nuclear deterrent capability, currently represented by Trident, is likely to remain a necessary element of our security. The SDR noted the need to ensure that Trident could remain an effective deterrent for up to 30 years, and the New Chapter noted the continuing role of nuclear weapons as the ultimate guarantor of the UK's national security.<sup>177</sup>

The Labour Party pledged in its manifesto for the General Election in May 2005 that: "we [...] are committed to retaining the independent nuclear deterrent".<sup>178</sup> Since the election ministers have reiterated that position, advocating that nuclear weapons remain an important part of the country's force balance despite the fact that threats to the UK have evolved. Dr John Reid stated in January 2006:

As our last manifesto made clear, our minimum nuclear deterrent capability, currently represented by Trident, is likely to remain a necessary element of our security while there continues to be any risk from the proliferation of nuclear weapons, and while other countries retain substantial nuclear arsenals [...]

It is perfectly true that there are new threats arising from terrorism, but that does not mean that the old threats have disappeared. It is equally true that the type of forces that we would need to develop to counter terrorism, such as special forces, extra surveillance and extra mobility, are not necessarily nuclear weapons. That nuclear weapons are not a response to the threat of terrorism does not mean, however, that we should, for instance, get rid of special forces because they are not a response to the threat of nuclear weapons. The truth is that we need a range of responses to a range of threats.<sup>179</sup>

More recently both the Prime Minister and the Chancellor of the Exchequer, Gordon Brown, have reiterated that position. In his Mansion House speech on 21 June 2006 the

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<sup>176</sup> Ministry of Defence, *British Defence Doctrine*, JWP 0-01, October 2001, p.5-1 and 5-2

<sup>177</sup> Ministry of Defence, *Delivering Security in a Changing World*, Cm6041-I, December 2003, p.9

<sup>178</sup> *The Labour Party Manifesto 2005*,

[http://www.labour.org.uk/fileadmin/manifesto\\_13042005\\_a3/flash/manifesto\\_2005.swf](http://www.labour.org.uk/fileadmin/manifesto_13042005_a3/flash/manifesto_2005.swf)

<sup>179</sup> HC Deb 23 January 2006, c1153-4

Chancellor indicated his support for retaining the nuclear deterrent “in this Parliament and the long term”.<sup>180</sup>

In an interview with *The Sunday Times* on 29 October 2006 the Foreign Secretary, Margaret Beckett, supported calls for a public debate on the issue of retaining the nuclear deterrent. She commented:

The nature and shape of the nuclear deterrent we have and are maintaining and keeping up to date was dictated in the cold war circumstances of decades ago. The security situation today across the world is very, very different.

But whether it is less dangerous, and what decisions that leads you to, is quite another matter. And I think that is something people deserve to have laid out before them and to be able to think about it for themselves [...]

Obviously whenever you look at these issues the question is: do we go on with this? And, if we do, in what way? And why? And what are the issues the government is taking into account when they are considering what their decision should be?<sup>181</sup>

## G. Backbench and Opposition Views

Despite the firm stance of the Government, many MPs within the Labour party have criticised its position. Indeed, Gordon Brown’s comments during his Mansion House speech reportedly angered several backbench Labour MPs. The former International Development Secretary, Clare Short, suggested, on the back of Mr Brown’s comments, that “she and other leftwingers were no longer prepared to support his succession to the Labour leadership”.<sup>182</sup> An article in *The Times* reported Gordon Prentice as commenting that:

[Brown] is jeopardising the support he might have been expected to take for granted – not just in the unions but among MPs and the constituency parties. This is very disappointing indeed. Many MPs will be looking for a candidate who gives the clearest commitment to non-proliferation of nuclear weapons.<sup>183</sup>

During Question Time on 12 July 2006 Jeremy Corbyn also raised the issue of replacing the strategic nuclear deterrent and asked the Prime Minister:

Will the Prime Minister assure the House that the Government are committed to the terms of the 1970 non-proliferation treaty, which requires the five declared nuclear weapons states to engage in a process of long-term disarmament? Does he accept that rearmament by any of the five reduces any moral clout we might

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<sup>180</sup> The full text of the Chancellor’s speech is available online at:

[http://www.hm-treasury.gov.uk/newsroom\\_and\\_speeches/press/2006/press\\_44\\_06.cfm](http://www.hm-treasury.gov.uk/newsroom_and_speeches/press/2006/press_44_06.cfm)

<sup>181</sup> “Beckett: we may not nuclear missiles”, *The Sunday Times*, 29 October 2006

<sup>182</sup> “Brown under fire after he pledges to replace Trident”, *The Guardian*, 23 June 2006. In October 2006 Clare short resigned as a Labour MP, although she will remain a member of the party.

<sup>183</sup> “Britain to buy new nuclear deterrent”, *The Times*, 22 June 2006

have in encouraging other states not to develop their own nuclear weapons, which makes the world a more dangerous place?<sup>184</sup>

The Conservative Party has consistently supported the retention of a nuclear deterrent. Writing in the July 2006 edition of *International Affairs*, Conservative Defence Spokesman, Dr Julian Lewis, set out the reasons that would justify such a position. Among others, he highlighted the unpredictability of the international security environment in future generations as one of the main reasons for retention. He stated:

From time to time wars break out in circumstances which were anticipated; but more often that not, they occur totally unexpectedly. The Yom Kippur War in 1973 took even hypersensitive Israel by surprise. The Falklands War, nine years later, took Britain by surprise. The invasion of Kuwait in 1990 took everyone by surprise. And the attacks of 11 September 2001 took the world's only superpower by surprise [...]

The actual replacement of the Trident system, if it occurs, will not even begin for at least another 15 years. No one can possibly foretell what dangers will face us between 2020 and 2050, just as the threats facing us today would have seemed bizarre to politicians and military planners at the height of the Cold War [...]

Quite apart from the prospect of unpredictable major threats in the longer term, the current enmity towards Britain on the part of near-nuclear regimes like Iran suggests that unilateralism would be fraught with danger [...] Several [rogue regimes] are already nuclear powers or on the verge of becoming so. The notion that they will abandon such a course indefinitely in response to unilateral British nuclear disarmament is totally unrealistic. Those who subscribe to it continually make the error of projecting civilized values onto extremist governments which actually hold such values in contempt.<sup>185</sup>

This position on rogue regimes was also reiterated by the Shadow Defence Secretary, Dr Liam Fox, in the aftermath of the North Korean nuclear test on 9 October 2006. In a press statement Dr Fox commented:

North Korea's actions in defiance of the international community show the necessity of retaining Britain's nuclear deterrent... No one can predict the erratic actions of rogue states and what irrational actions totalitarian leaders may take. That is why the onus is on the nuclear abolitionists to tell us why they believe the threat to Britain will disappear between now and 2050, the lifespan of Trident and its replacement.<sup>186</sup>

The Liberal Democrats have not, to date, advocated wholehearted support for the retention of the nuclear deterrent, but neither have they supported full-scale disarmament. A consultation paper circulated before the party's autumn conference in 2006, set out the main arguments for and against retention of a nuclear deterrent.

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<sup>184</sup> HC Deb 12 July 2006, c1388

<sup>185</sup> Dr Julian Lewis, "Disarmament v. peace in the twenty-first century", *International Affairs*, July 2006

<sup>186</sup> Conservative Party Press Release, "North Korea demonstrates need for British nuclear deterrent", 10 October 2006

In its conclusion the paper stated that any decision must be based:

on full consideration of the international political and strategic context, threat assessment, cost assessments, proliferation implications and alternative option. It must address the future role and relevance of nuclear deterrence in the light of future threats, its geopolitical impact and the consequences for international peace and security. We believe any replacement must also strictly conform with UK international legal obligations.<sup>187</sup>

The Scottish National Party, on the other hand, have stated their unequivocal opposition to the replacement of Trident. During Oral Questions on 24 July 2006 the Defence Spokesman for the SNP, Angus Robertson, commented:

I do not want to be helpful to the Secretary of State but it is obvious to me that the Government will be in favour of a new generation of weapons of mass destruction, that the Conservative Opposition will support the new generation of weapons of mass destruction and that the Scottish National Party will oppose them.<sup>188</sup>

## H. Timing of a Decision and Parliamentary Involvement

The Government had initially stated that a decision on replacing Trident would have to be taken at some stage during this Parliament. Dr John Reid commented in the House of Commons on 4 July 2005 that:

Decisions on any replacement of the United Kingdom's nuclear deterrent are likely to be necessary in the lifetime of the current parliament, which will of course last some years.<sup>189</sup>

In June 2006 the Leader of the Commons, Jack Straw, indicated that once a decision on any replacement of Trident had been taken, those decisions would be presented to Parliament in a White Paper.<sup>190</sup> That was reiterated by the Prime Minister during Question Time on 28 June during which he also confirmed that a decision would be taken before the end of 2006.<sup>191</sup> Suggestions that Parliament could be given a vote on the Trident replacement decision were subsequently made by the Prime Minister<sup>192</sup> and Mr Straw<sup>193</sup> during questions in the House in July.

Indeed, during Oral Questions on 24 July 2006 the Secretary of State for Defence, Des Browne, confirmed that the House would have an opportunity to vote on the replacement of the UK's strategic nuclear deterrent.

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<sup>187</sup> Liberal Democrats, *Future of the Trident System Consultation Paper*, July 2006

<sup>188</sup> HC Deb 24 July 2006, c593

<sup>189</sup> HC Deb 4 July 2005, c5

<sup>190</sup> HC Deb 22 June 2006, c1468

<sup>191</sup> HC Deb 28 June 2006, c253

<sup>192</sup> HC Deb 12 July 2006, c1389

<sup>193</sup> HC Deb 20 July 2006, c469

He was asked:

**Danny Alexander (Inverness, Nairn, Badenoch and Strathspey) (LD):** Whether the House will have an opportunity to vote on the replacement of the UK's strategic nuclear deterrent. [87190]

**The Secretary of State for Defence (Des Browne):** The answer is yes.

**Danny Alexander:** I welcome the decision to allow Parliament a vote. I hope that its timing will allow for not only a full and informed debate in Parliament but proper public consultation. Given that a vote solely on options for a nuclear deterrent would be inadequate, will the Secretary of State clarify whether it will be on the substantive question of whether the UK retains a nuclear deterrent?

**Des Browne:** I can give the hon. Gentleman a specific and clear answer: there will be a vote. I have not at this stage determined the question. I will not be in a position to help him until the threats, risks, options and costs are worked out and the Government reach a view to inform the debate that is already taking place.

I hope that the hon. Gentleman will not join all the other people who suggest that the Government should not reach a view and that we will have a remarkable debate in this country in which Ministers or the Government are the only ones who are not allowed a view. Every time one expresses anything that approximates a view, everybody suggests that the debate has been closed down. There will be a debate—indeed, it is already taking place—the question will emerge, and there will be a vote on it.

**Mr. Brian Jenkins (Tamworth) (Lab):** My right hon. Friend is right that we should have a vote following a debate. However, the debate should be informed. He has been asked once what estimates he will contribute to the debate. Although he may not have them now, what is his prediction for the month when we will get estimates that allow us all to take part in an informed debate?

**Des Browne:** A substantial amount of information about the current position is in the public domain. Almost every day, I answer a raft of questions that are designed to tease out individual pieces of information that can inform the debate. The Government's position could not be clearer. We have set a timetable for around the end of the year and we will have an open and transparent debate. The Government have said that we will publish a White Paper to inform the debate. In my view, it must contain the components to answer all the questions, but only once the risks, threats, options and costs have been worked out.<sup>194</sup>

Although the question to be put to a vote has yet to be determined, the Government has confirmed that the vote will be on a substantive motion.<sup>195</sup>

Despite the fact that the opportunity for a vote has been welcomed across the House, a number of MPs have expressed concern over the approach that the Government has taken on this issue, and called for a Green Paper setting out all of the options and

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<sup>194</sup> HC Deb 24 July 2006, c592-4

<sup>195</sup> Leader of the House of Commons Lobby Briefing, 20 July 2006. This is available online at: <http://www.commonleader.gov.uk/output/page1662.asp>

potential costs, instead of a White Paper that simply sets out the Government's decision and choices. EDM 2702, tabled by Gordon Prentice on 10 October 2006, states:

That this House recalls the promise made by the Prime Minister to the House last year that he would listen to the views of hon. Members before any decision is made on Trident; notes that the Defence Select Committee called in June for a full public debate before any decision is made on the future of Britain's nuclear weapons; further notes that the Committee believed the Ministry of Defence had failed to co-operate fully in its inquiry; regrets that the Government has not made any serious attempt to educate hon. Members or the wider public on the options available; considers the Prime Minister's statement in June that a decision would be made by the end of the year to be a wholly unnecessary straitjacket on the timetable and that his promise of a White Paper setting out the Government's view to be entirely the wrong approach; and believes the Government should instead publish a Green Paper setting out all the options and costings, inviting comment and debate, before submitting its proposals to the House on a free vote.<sup>196</sup>

In the event that a motion on the replacement of the UK's nuclear deterrent is introduced and defeated, the Government, under its prerogative powers, would not be under any constitutional obligation to change its policy. However, there would undoubtedly be great political pressure for the view of the House to be taken into account.<sup>197</sup>

For comparison, parliamentary involvement in the original Trident decision in the early 1980s is set out in section II E and a copy of the voting record for Division No. 89 of 3 March 1981 is available in Appendix One.

## I. Public Opinion

### 1. Attitudes toward the UK's Nuclear Deterrent at the end of the Cold War

Over the latter stages of the Cold War and into the post-Soviet era, the proportion of British adults who felt that both the siting of American nuclear missiles in Britain and the maintenance of an independent British nuclear deterrent made Britain a safer place declined. Generally speaking, most British adults felt that American nuclear weapons in Britain made it a less safe place while at the same time the maintenance of an independent British nuclear deterrent made Britain safer. Over time the strength of opinion sharpened on the first question while weakening on the second. In 1983 48% of British adults thought that the siting of US nuclear weapons on British soil made Britain less safe, rising to 60% by 1994. Conversely, the proportion favouring an independent nuclear deterrent fell from 61% to 45% over the same period.

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<sup>196</sup> EDM 2702, Session 2005-06

<sup>197</sup> A discussion of the Royal Prerogative is available in Library Research Paper RP05/56, *Armed Forces (Parliamentary Approval for Participation in Armed Conflict) Bill*, 8 August 2005. This is available online at: <http://www.parliament.uk/commons/lib/research/rp2005/rp05-056.pdf>

*Q: Do you think that the siting of American nuclear missiles in Britain makes Britain a safer or a less safe place to live?*

	<b>1983</b>	<b>1984</b>	<b>1985</b>	<b>1986</b>	<b>1987</b>	<b>1989</b>	<b>1990</b>	<b>1994</b>
Make Britain safer	38%	36%	36%	29%	39%	36%	35%	21%
Make Britain less safe	48%	51%	53%	60%	50%	52%	50%	60%
No difference	0%	3%	2%	3%	2%	2%	1%	14%
Don't know	12%	9%	10%	9%	10%	11%	13%	5%
Not applicable	2%	1%	0%	0%	0%	0%	0%	0%

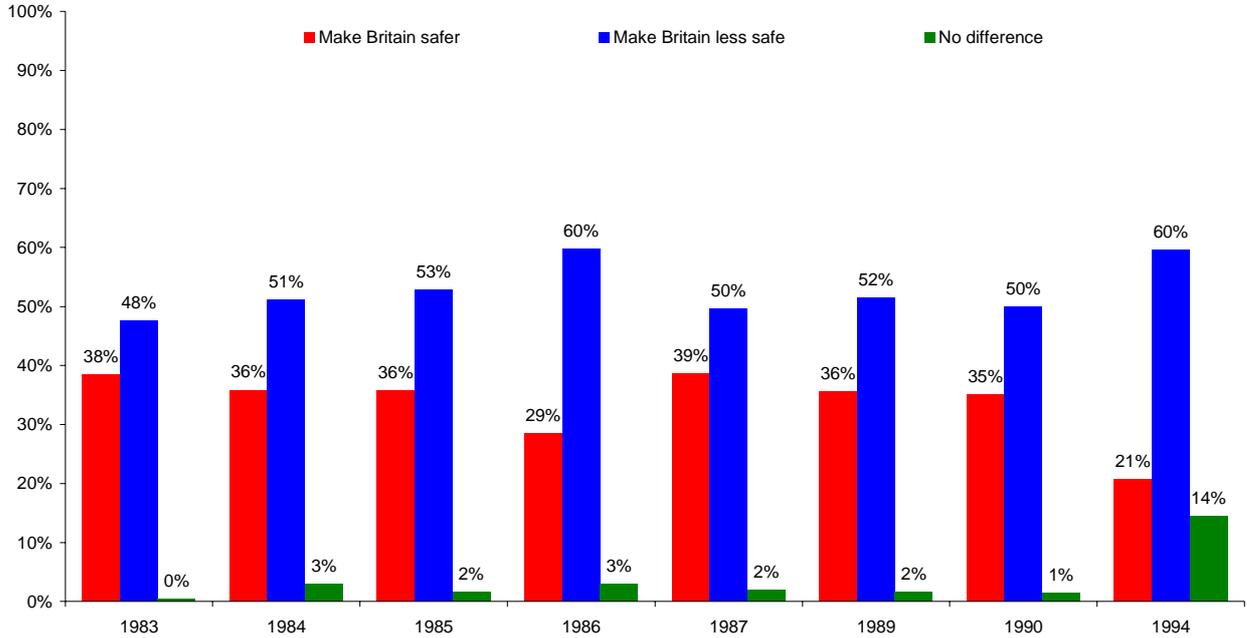
Source: British Social Attitudes Survey

*Q: And do you think that having our own independent nuclear missiles makes Britain a safer or a less safe place to live?*

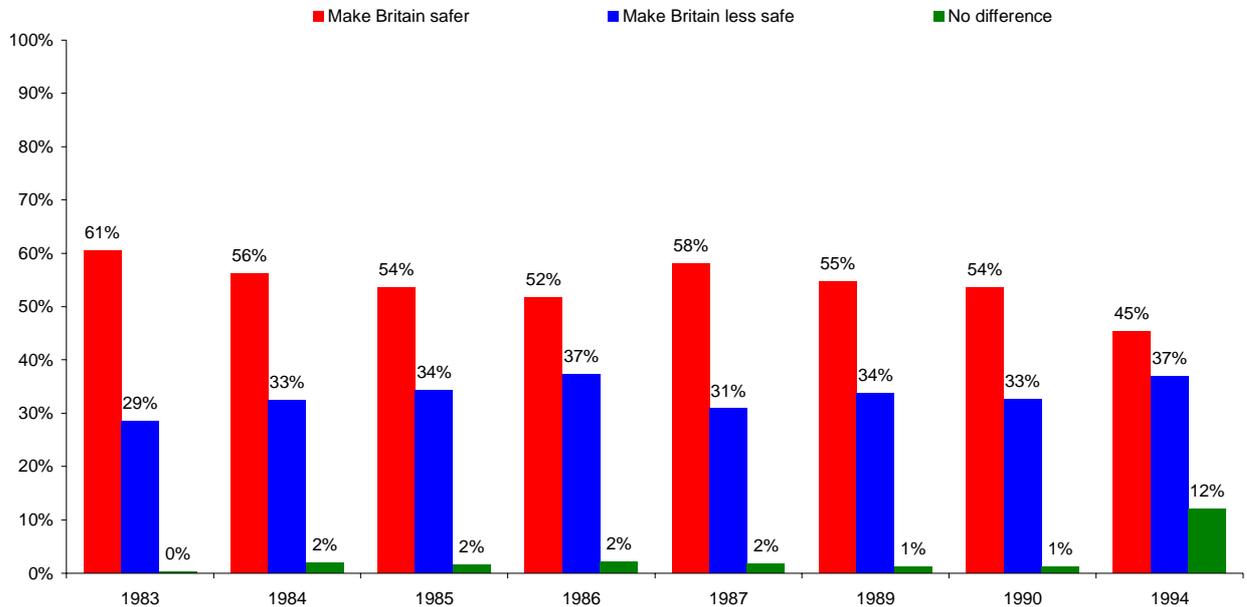
	<b>1983</b>	<b>1984</b>	<b>1985</b>	<b>1986</b>	<b>1987</b>	<b>1989</b>	<b>1990</b>	<b>1994</b>
Make Britain safer	61%	56%	54%	52%	58%	55%	54%	45%
Make Britain less safe	29%	33%	34%	37%	31%	34%	33%	37%
No difference	0%	2%	2%	2%	2%	1%	1%	12%
Don't know	9%	9%	10%	9%	9%	10%	12%	5%
Not applicable	1%	1%	0%	0%	0%	0%	1%	0%

Source: British Social Attitudes Survey

**Do you think that the siting of American nuclear missiles in Britain makes Britain a safer or a less safe place to live?**  
*British Social Attitudes Survey 1983-94*



**And do you think that having our own independent nuclear missiles makes Britain a safer or a less safe place to live?**  
*British Social Attitudes Survey 1983-94*



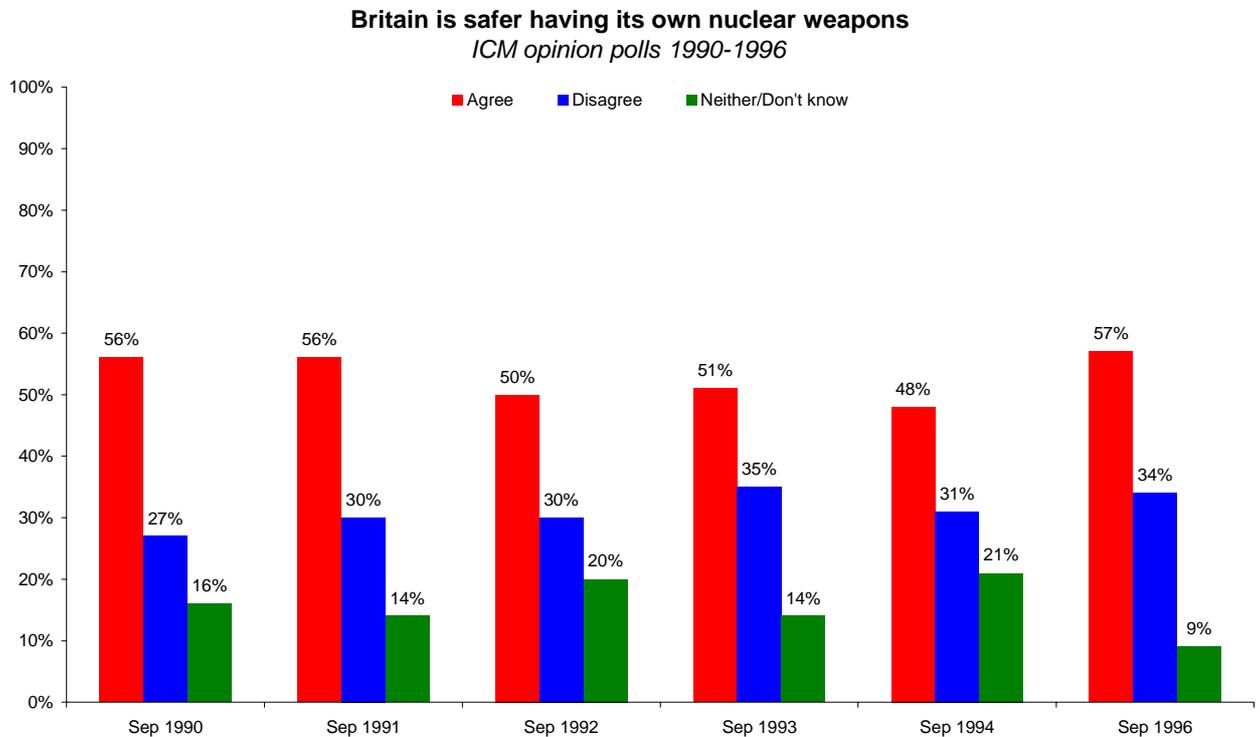
The pollsters ICM also asked a series of questions during the early and mid-1990s on whether respondents felt that, by having an independent nuclear arsenal, Britain was a safer place. Similar to the responses to the British Social Attitudes Survey, a majority of people felt that an independent nuclear deterrent made Britain safer. The strength of this opinion remained relatively constant over the period, although in 1996 – the last occasion on which this question was routinely asked – opinion appeared to weaken as

fewer respondents either agreed or disagreed strongly. Nonetheless, by 1996 it remained the case that more people thought that Britain was a safer place by retaining an independent nuclear force than thought it was less safe.

Q: Britain is safer having its own nuclear weapons

	Sep 1990	Sep 1991	Sep 1992	Sep 1993	Sep 1994	Sep 1996
Agree strongly	28%	26%	24%	24%	25%	15%
Agree slightly	28%	30%	26%	27%	23%	42%
Neither agree nor disagree	10%	8%	10%	10%	13%	6%
Disagree slightly	11%	13%	11%	12%	11%	24%
Disagree strongly	16%	17%	19%	23%	20%	10%
Don't know	6%	6%	10%	4%	8%	3%

Source: ICM



## 2. Attitudes toward the Potential Replacement of Trident

Three recent opinion polls sampled adults on their views towards the replacement of the Trident missile system. An ICM poll conducted by telephone in July 2006 identified that a slim majority (51%) of adults favoured the replacement of Trident. This contrasted with public opinion twelve months earlier. In a MORI poll conducted in September 2005, 46% of adults felt that the UK should not replace the Trident system and, when those polled were told that the estimated cost could be as high as £25 billion or equivalent to the building of 1,000 new schools, the level of opposition to the replacement of Trident rose to 54%. Either way, it appears that public opinion remains quite evenly divided on the subject.

*Q: You may have seen or heard that the government is considering plans to replace Britain's nuclear weapons system, Trident, which is coming to the end of its operational lifetime. Do you think Britain should replace the nuclear weapons system with a new one or should it no longer have any nuclear deterrent?*

Should replace it with a new one	51%
Should no longer have a nuclear deterrent	39%
Don't know	10%

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Source: ICM Telephone poll 21-23 July 2006 (sample n=1,001 adults)

*Q: The UK's 'Trident' nuclear weapons are now aging and will become unusable in about 20 years' time. This means that, for the UK to maintain effective nuclear weaponry, the government needs to decide soon on whether to develop a replacement*

*On balance, do you think the UK should replace its nuclear weapons or not?*

Yes, should	44%
No, should not	46%
Don't know	10%

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Source: MORI face-to-face survey 8-13 September 2005 (sample n=1,016 adults)

*Q: The UK's 'Trident' nuclear weapons are now aging and will become unusable in about 20 years' time. This means that, for the UK to maintain effective nuclear weaponry, the government needs to decide soon on whether to develop a replacement*

*The total cost of replacing 'Trident' missiles, submarines and base facilities is likely to be around £25 billion. This is equivalent of building around 1,000 new schools at current prices.*

*On balance, do you think the UK should replace its nuclear weapons or not?*

Yes, should	33%
No, should not	54%
Don't know	13%

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Source: MORI face-to-face survey 8-13 September 2005 (sample n=957 adults)

Respondents to the MORI survey in September 2005 were also asked what the appropriate ways would be for the public to be consulted on the issue of replacing Trident. 43% of respondents favoured a full national debate including organisations such as Greenpeace and the Campaign for Nuclear Disarmament, 42% wanted a national referendum, and 39% felt that the Government should give Parliament and the public access to all the information it has as to the advantages and disadvantages of building a new nuclear weapons system.

However, most British adults remain opposed to using nuclear weapons against a country that the UK is at war with. 84% of respondents to the MORI survey opposed the use of nuclear weapons against a country which, itself, does not have a nuclear arsenal and 72% opposed the use of nuclear weapons against a country that had never used

them. Opinion was only marginally in favour (53%) of the UK using its own nuclear weapons to retaliate against a country which had used them against the UK.

Finally, a poll undertaken by Populus for the BBC's *Daily Politics* show in June 2006 found similar views to those in other polls towards the replacement of Trident and the maintenance of an independent nuclear deterrent. When asked whether Britain should maintain a nuclear arsenal as long as other countries continued to have their own nuclear capabilities, 65% agreed that Britain should have its own, up-to-date weapon system, whatever the cost. 57% of those polled could not be confident that the United States would defend the UK in the event of nuclear hostilities and disagreed with the suggestion that the money needed for the replacement of Trident could be better spent on other things. However, 64% of respondents agreed that the £25 billion estimated cost of replacing Trident was hard to justify given other demands on public spending.<sup>198</sup>

*Q: There is a political debate going on whether or not Britain should replace its Trident nuclear weapon system when it has to be decommissioned in a few years time. Please say if you agree or disagree with each of the following statements*

	Agree	Disagree	Don't Know
<i>America would defend us so we don't need to replace our nuclear weapons and the money could be better spent on other things</i>	41%	57%	2%
<i>Replacing Trident could cost up to £25 billion, this is hard to justify given all the other demands on public spending</i>	64%	33%	3%
<i>As long as there are other countries with nuclear weapons Britain should have its own, up-to-date nuclear deterrent whatever the cost</i>	65%	33%	2%
<i>Now that the main threat to Britain's security comes from terrorists rather than foreign superpowers like the Soviet Union, nuclear weapons are no longer the best form of defence</i>	59%	37%	4%

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Source: Populus telephone poll 28-29 June 2006 (sample n=1,003 adults)

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<sup>198</sup> [http://news.bbc.co.uk/2/shared/bsp/hi/pdfs/23\\_06\\_06dpolitics\\_nuclear.pdf](http://news.bbc.co.uk/2/shared/bsp/hi/pdfs/23_06_06dpolitics_nuclear.pdf)

## Appendix One – Voting Record for Division No. 89, 3 March 1981

### AYES

Adley, Robert  
 Aitken, Jonathan  
 Alexander, Richard  
 Amery, Rt Hon Julian  
 Ancram, Michael  
 Arnold, Tom  
 Atkins, Rt Hon H. (*S'thorne*)  
 Atkins, Robert (*PrestonN*)  
 Atkinson, David (*B'm'th,E*)  
 Baker, Kenneth (*St.M'bone*)  
 Baker, Nicholas (*N.Dorset*)  
 Banks, Robert  
 Beaumont-Dark, Anthony  
 Bell, Sir Ronald  
 Bendall, Vivian  
 Bennett, Sir Frederic (*T'bay*)  
 Benyon, Thomas (*A'don*)  
 Benyon, W. (*Buckingham*)  
 Best, Keith  
 Bevan, David Gilroy  
 Biffen, Rt Hon John  
 Biggs-Davison, John  
 Blackburn, John  
 Bonsor, Sir Nicholas  
 Bottomley, Peter (*W'wich W*)  
 Bowden, Andrew  
 Boyson, Dr Rhodes  
 Bradford, Rev R.  
 Braine, Sir Bernard  
 Bright, Graham  
 Brinton, Tim  
 Brittan, Leon  
 Brooke, Hon Peter  
 Brotherton, Michael  
 Brown, Michael (*Brigg&Sc'n*)  
 Browne, John (*Winchester*)  
 Bruce-Gardyne, John  
 Bryan, Sir Paul  
 Buchanan-Smith, Alick  
 Buck, Antony  
 Budgen, Nick  
 Bulmer, Esmond  
 Burden, Sir Frederick  
 Butcher, John

Butler, Hon Adam  
Cadbury, Jocelyn  
Carlisle, John (*Luton West*)  
Carlisle, Kenneth (*Lincoln*)  
Carlisle, Rt Hon M. (*R'c'n*)  
Chalker, Mrs. Lynda  
Channon, Rt. Hon. Paul  
Chapman, Sydney  
Churchill, W. S.  
Clark, Hon A. (*Plym'th, S'n*)  
Clark, Sir W. (*Croydon S*)  
Clarke, Kenneth (*Rushcliffe*)  
Cockeram, Eric  
Colvin, Michael  
Cope, John  
Cormack, Patrick  
Corrie, John  
Costain, Sir Albert  
Cranborne, Viscount  
Crouch, David  
Dean, Paul (*North Somerset*)  
Dickens, Geoffrey  
Dorrell, Stephen  
Douglas-Hamilton, Lord J.  
Dover, Denshore  
du Cann, Rt Hon Edward  
Dunlop, John  
Dunn, Robert (*Dartford*)  
Durant, Tony  
Dykes, Hugh  
Eden, Rt Hon Sir John  
Eggar, Tim  
Elliott, Sir William  
Emery, Peter  
Eyre, Reginald  
Fairgrieve, Russell  
Farr, John  
Fell, Anthony  
Fenner, Mrs Peggy  
Finsberg, Geoffrey  
Fisher, Sir Nigel  
Fletcher, A. (*Ed'n'b'gh N*)  
Fookes, Miss Janet  
Forman, Nigel  
Fowler, Rt Hon Norman  
Fox, Marcus  
Fraser, Rt Hon Sir Hugh  
Fraser, Peter (*South Angus*)  
Fry, Peter  
Galbraith, Hon T. G. D.

Gardiner, George (*Reigate*)  
 Gardner, Edward (*S Fylde*)  
 Garel-Jones, Tristan  
 Gilmour, Rt Hon Sir Ian  
 Glyn, Dr Alan  
 Goodhart, Philip  
 Goodlad, Alastair  
 Gorst, John  
 Gow, Ian  
 Gower, Sir Raymond  
 Grant, Anthony (*Harrow C*)  
 Gray, Hamish  
 Greenway, Harry  
 Grieve, Percy  
 Griffiths, E. (*B'ySt. Edm'ds*)  
 Griffiths, Peter (*Portsm'thN*)  
 Grist, Ian  
 Grylls, Michael  
 Gummer, John Selwyn  
 Hamilton, Hon A.  
 Hamilton, Michael (*Salisbury*)  
 Hampson, Dr Keith  
 Hannam, John  
 Haselhurst, Alan  
 Hastings, Stephen  
 Havers, Rt Hon Sir Michael  
 Hawkins, Paul  
 Hawksley, Warren  
 Hayhoe, Barney  
 Heath, Rt Hon Edward  
 Heddle, John  
 Henderson, Barry  
 Heseltine, Rt Hon Michael  
 Hicks, Robert  
 Higgins, Rt Hon Terence L.  
 Hogg, Hon Douglas (*Gr'th'm*)  
 Holland, Philip (*Carlton*)  
 Hooson, Tom  
 Hordern, Peter  
 Howe, Rt Hon Sir Geoffrey  
 Howell, Rt Hon D. (*G'ldf'd*)  
 Howell, Ralph (*N Norfolk*)  
 Hunt, David (*Wirral*)  
 Hunt, John (*Ravensbourne*)  
 Hurd, Hon Douglas  
 Irving, Charles (*Cheltenham*)  
 Jenkin, Rt Hon Patrick  
 Johnson Smith, Geoffrey  
 Jopling, Rt Hon Michael  
 Joseph, Rt Hon Sir Keith

Kaberry, Sir Donald  
Kellett-Bowman, Mrs Elaine  
Kershaw, Anthony  
Kimball, Marcus  
King, Rt Hon Tom  
Kitson, Sir Timothy  
Knight, Mrs Jill  
Knox, David  
Lamont, Norman  
Lang, Ian  
Langford-Holt, Sir John  
Latham, Michael  
Lawrence, Ivan  
Lawson, Rt Hon Nigel  
Lee, John  
Lennox-Boyd, Hon Mark  
Lewis, Kenneth (*Rutland*)  
Lloyd, Peter (*Fareham*)  
Loveridge, John  
Luce, Richard  
Lyell, Nicholas  
McCrinkle, Robert  
Macfarlane, Neil  
MacGregor, John  
MacKay, John (*Argyll*)  
Macmillan, Rt Hon M.  
McNair-Wilson, M. (*N'bury*)  
McNair-Wilson, P. (*New F'st*)  
McQuarrie, Albert  
Madel, David  
Major, John  
Marland, Paul  
Marlow, Tony  
Marshall, Michael (*Arundel*)  
Mates, Michael  
Mather, Carol  
Maude, Rt Hon Sir Angus  
Mawby, Ray  
Mawhinney, Dr Brian  
Maxwell-Hyslop, Robin  
Mayhew, Patrick  
Mellor, David  
Meyer, Sir Anthony  
Miller, Hal (*B'grove*)  
Mills, Iain (*Meriden*)  
Mills, Peter (*West Devon*)  
Miscampbell, Norman  
Mitchell, David (*Basingstoke*)  
Moate, Roger  
Molyneaux, James

Monro, Hector  
 Montgomery, Fergus  
 Moore, John  
 Morgan, Geraint  
 Morris, M. (*N'hampton S*)  
 Morrison, Hon C. (*Devizes*)  
 Morrison, Hon P. (*Chester*)  
 Mudd, David  
 Murphy, Christopher  
 Myles, David  
 Neale, Gerrard  
 Needham, Richard  
 Nelson, Anthony  
 Neubert, Michael  
 Newton, Tony  
 Normanton, Tom  
 Nott, Rt Hon John  
 Onslow, Cranley  
 Oppenheim, Rt Hon Mrs S.  
 Osborn, John  
 Page, John (*Harrow, West*)  
 Page, Rt Hon Sir G (*Crosby*)  
 Page, Richard (*SW Herts*)  
 Parkinson, Cecil  
 Parris, Matthew  
 Patten, Christopher (*Bath*)  
 Patten, John (*Oxford*)  
 Pattie, Geoffrey  
 Pawsey, James  
 Peyton, Rt Hon John  
 Pollock, Alexander  
 Porter, Barry  
 Powell, Rt Hon JE (*S Down*)  
 Prentice, Rt Hon Reg  
 Price, Sir David (*Eastleigh*)  
 Prior, Rt Hon James  
 Proctor, K. Harvey  
 Pym, Rt Hon Francis  
 Raison, Timothy  
 Rathbone, Tim  
 Rees, Peter (*Dover & Deal*)  
 Rees-Davies, W. R.  
 Renton, Tim  
 Rhodes James, Robert  
 Rhys Williams, Sir Brandon  
 Ridley, Hon Nicholas  
 Ridsdale, Julian  
 Rifkind, Malcolm  
 Rippon, Rt Hon Geoffrey  
 Roberts, M. (*Cardiff NW*)

Roberts, Wyn (*Conway*)  
Ross, Wm. (*Londonderry*)  
Rossi, Hugh  
Rost, Peter  
Royle, Sir Anthony  
Sainsbury, Hon Timothy  
St. John-Stevas, Rt Hon N.  
Scott, Nicholas  
Shaw, Giles (*Pudsey*)  
Shaw, Michael (*Scarbr'gh*)  
Shelton, William (*Str'tham*)  
Shepherd, Colin (*Hereford*)  
Shepherd, Richard  
Shersby, Michael  
Silvester, Fred  
Sims, Roger  
Skeet, T. H. H.  
Smith, Dudley  
Speed, Keith  
Speller, Tony  
Spence, John  
Spicer, Jim (*West Dorset*)  
Spicer, Michael (*S Worcs*)  
Sproat, Iain  
Squire, Robin  
Stainton, Keith  
Stanbrook, Ivor  
Stanley, John  
Steen, Anthony  
Stevens, Martin  
Stewart, Ian (*Hitchin*)  
Stewart, A (*E Renfrewshire*)  
Stokes, John  
Stradling Thomas, J.  
Tapsell, Peter  
Taylor, Robert (*Croyd'nNW*)  
Taylor, Teddy (*S'end E*)  
Temple-Morris, Peter  
Thatcher, Rt Hon Mrs M.  
Thomas, Rt Hon Peter  
Thompson, Donald  
Thornton, Malcolm  
Townend, John (*Bridl'n'ton*)  
Trippier, David  
Trotter, Neville  
van Straubenzee, W. R.  
Vaughan, Dr Gerard  
Viggers, Peter  
Waddington, David  
Wakeham, John

Waldegrave, Hon William  
Walker, Rt Hon P (*W'cester*)  
Walker, B. (*Perth*)  
Walker-Smith, Rt Hon Sir D.  
Wall, Patrick  
Waller, Gary  
Walters, Dennis  
Ward, John  
Warren, Kenneth  
Watson, John  
Wells, John (*Maidstone*)  
Wells, Bowen  
Wheeler, John  
Whitelaw, Rt Hon William  
Whitney, Raymond  
Wickenden, Keith  
Wiggin, Jerry  
Williams, D. (*Montgomery*)  
Wolfson, Mark  
Young, Sir George (*Acton*)  
Younger, Rt Hon George

Tellers for the Ayes:

Mr. Spencer Le Marchant and  
Mr. Anthony Berry

NOES

Abse, Leo  
Adams, Allen  
Allaun, Frank  
Alton, David  
Anderson, Donald  
Archer, Rt Hon Peter  
Ashley, Rt Hon Jack  
Atkinson, N. (*H'gey*)  
Bagier, Gordon A.T.  
Barnett, Guy (*Greenwich*)  
Barnett, Rt Hon Joel (*H'wd*)  
Beith, A. J.  
Benn, Rt Hon A. Wedgwood  
Bennett, Andrew (*St'kp'tN*)  
Bidwell, Sydney  
Booth, Rt Hon Albert  
Bottomley, RtHon A (*M'b'ro*)  
Bradley, Tom  
Bray, Dr Jeremy

Brown, Hugh D. (*Provan*)  
Brown, Ron (*E'burgh, Leith*)  
Brown, Ronald W (*H'ckn'yS*)  
Callaghan, Jim (*Midd't'n&P*)  
Campbell, Ian  
Campbell-Savours, Dale  
Canavan, Dennis  
Cant, R. B.  
Carmichael, Neil  
Carter-Jones, Lewis  
Cartwright, John  
Clark, Dr David (*S Shields*)  
Cocks, Rt Hon M. (*B'stol S*)  
Cohen, Stanley  
Coleman, Donald  
Concannon, Rt Hon J. D.  
Cook, Robin F.  
Cowans, Harry  
Cox, T. (*W'dsw'th, Toot'g*)  
Craigie, J. M.  
Crowther, J. S.  
Cryer, Bob  
Cunliffe, Lawrence  
Cunningham, G. (*IslingtonS*)  
Cunningham, Dr J. (*W'h'n*)  
Dalyell, Tam  
Davidson, Arthur  
Davies, Rt Hon Denzil (*L'li*)  
Davies, Ifor (*Gower*)  
Davis, Clinton (*Hackney C*)  
Davis, T. (*B'ham, Stechf'd*)  
Deakins, Eric  
Dean, Joseph (*Leeds West*)  
Dempsey, James  
Dewar, Donald  
Dixon, Donald  
Dobson, Frank  
Dormand, Jack  
Douglas, Dick  
Douglas-Mann, Bruce  
Dubs, Alfred  
Duffy, A. E. P.  
Dunn, James A.  
Dunnett, Jack  
Dunwoody, Hon Mrs G.  
Eadie, Alex  
Eastham, Ken  
Edwards, R. (*W'hampt'nSE*)  
Ellis, R. (*NE D'bysh're*)  
Ellis, Tom (*Wrexham*)

English, Michael  
 Evans, Ioan (*Aberdare*)  
 Evans, John (*Newton*)  
 Ewing, Harry  
 Field, Frank  
 Fitch, Alan  
 Fitt, Gerard  
 Flannery, Martin  
 Fletcher, Raymond (*Ilk'ston*)  
 Fletcher, Ted (*Darlington*)  
 Foot, Rt Hon Michael  
 Ford, Ben  
 Forrester, John  
 Foster, Derek  
 Fraser, J. (*Lamb'th, N'w'd*)  
 Freeson, Rt Hon Reginald  
 Freud, Clement  
 Garrett, John (*Norwich S*)  
 George, Bruce  
 Ginsburg, David  
 Golding, John  
 Gourlay, Harry  
 Graham, Ted  
 Grant, George (*Morpeth*)  
 Grant, John (*Islington C*)  
 Grimond, Rt Hon J.  
 Hamilton, James (*Bothwell*)  
 Hamilton, W. W. (*C'tral Fife*)  
 Hardy, Peter  
 Harrison, Rt Hon Walter  
 Hattersley, Rt Hon Roy  
 Haynes, Frank  
 Healey, Rt Hon Denis  
 Heffer, Eric S.  
 Hogg, N. (*E Dunb't'nshire*)  
 Holland, S. (*L'b'th, Vauxh'll*)  
 Home Robertson, John  
 Hooley, Frank  
 Horam, John  
 Howell, Rt Hon D.  
 Howells, Geraint  
 Huckfield, Les  
 Hudson Davies, Gwilym E.  
 Hughes, Mark (*Durham*)  
 Hughes, Robert (*AberdeenN*)  
 Hughes, Roy (*Newport*)  
 Janner, Hon Greville  
 John, Brynmor  
 Johnson, James (*Hull West*)  
 Johnston, Russell (*Inverness*)

Jones, Barry (*East Flint*)  
Jones, Dan (*Burnley*)  
Kaufman, Rt Hon Gerald  
Kerr, Russell  
Kilfedder, James A.  
Kilroy-Silk, Robert  
Kinnock, Neil  
Lambie, David  
Lamborn, Harry  
Lamond, James  
Leighton, Ronald  
Lewis, Arthur (*N'ham NW*)  
Litherland, Robert  
Lofthouse, Geoffrey  
Lyon, Alexander (*York*)  
Lyons, Edward (*Brad' d W*)  
Mabon, Rt Hon Dr J Dickson  
McCartney, Hugh  
McDonald, Dr Oonagh  
McKay, Allen (*Penistone*)  
McKelvey, William  
MacKenzie, Rt Hon Gregor  
Maclennan, Robert  
McMahon, Andrew  
McNally, Thomas  
McNamara, Kevin  
McTaggart, Robert  
McWilliam, John  
Magee, Bryan  
Marks, Kenneth  
Marshall, D (*G'gow S'ton*)  
Marshall, Dr Edmund (*Goole*)  
Marshall, Jim (*Leicester S*)  
Martin, M (*G'gow S'burn*)  
Mason, Rt Hon Roy  
Maxton, John  
Maynard, Miss Joan  
Meacher, Michael  
Mellish, Rt Hon Robert  
Mikardo, Ian  
Millan, Rt Hon Bruce  
Miller, Dr M. S. (*E Kilbride*)  
Mitchell, Austin (*Grimsby*)  
Mitchell, R C (*Soton Itchen*)  
Morris, Rt Hon C. (*O'shaw*)  
Morris, Rt Hon J (*Aberavon*)  
Moyle, Rt Hon Roland  
Mulley, Rt Hon Frederick  
Newens, Stanley  
O'Halloran, Michael

O'Neill, Martin  
Orme, Rt Hon Stanley  
Owen, Rt Hon Dr David  
Palmer, Arthur  
Park, George  
Parker, John  
Pavitt, Laurie  
Pendry, Tom  
Penhaligon, David  
Powell, Raymond (*Ogmore*)  
Prescott, John  
Price, C. (*Lewisham W*)  
Race, Reg  
Radice, Giles  
Rees, Rt Hon M (*Leeds S*)  
Richardson, Jo  
Roberts, Albert (*Normanton*)  
Roberts, Allan (*Bootle*)  
Roberts, Ernest (*HackneyN*)  
Roberts, Gwilym (*Cannock*)  
Robertson, George  
Robinson, G. (*Coventry NW*)  
Rodgers, Rt Hon William  
Rooker, J. W.  
Roper, John  
Ross, Ernest (*Dundee W*)  
Ross, Stephen (*Isle ofWight*)  
Rowlands, Ted  
Ryman, John  
Sandelson, Neville  
Sever, John  
Sheerman, Barry  
Sheldon, Rt Hon R.  
Shore, Rt Hon Peter  
Silkin, Rt Hon J. (*Deptford*)  
Silkin, Rt Hon S C (*Dulwich*)  
Silverman, Julius  
Skinner, Dennis  
Smith, Cyril (*Rochdale*)  
Smith, Rt Hon J. (*N Lanark*)  
Snape, Peter  
Soley, Clive  
Spearing, Nigel  
Spriggs, Leslie  
Stallard, A. W.  
Steel, Rt Hon David  
Stewart, Rt Hon D. (*W Isles*)  
Stoddart, David  
Stott, Roger  
Strang, Gavin

Straw, Jack  
Summerskill, Hon Dr Shirley  
Taylor, Mrs Ann (*Bolton W*)  
Thomas, Dafydd (*Merioneth*)  
Thomas, Jeffrey (*Abertillery*)  
Thomas, Mike (*NewcastleE*)  
Thorne, Stan (*Preston S*)  
Tilley, John  
Tinn, James  
Torney, Tom  
Urwin, Rt Hon Tom  
Varley, Rt Hon Eric G.  
Wainwright, E. (*Dearne V*)  
Walker, Rt Hon H. (*D'caster*)  
Watkins, David  
Weetch, Ken  
Wellbeloved, James  
Welsh, Michael  
Whitehead, Phillip  
Whitlock, William  
Wigley, Dafydd  
Willey, Rt Hon Frederick  
Williams, Rt Hon A (*S'seaW*)  
Williams, Sir T (*W'ton*)  
Wilson, William (*C'try SE*)  
Woodall, Alec  
Woolmer, Kenneth  
Wrigglesworth, Ian  
Young, David (*Bolton E*)

Tellers for the Noes:

Mr. George Morton and  
Mr. Frank R. White

*Question accordingly agreed to.*

*Resolved,*

That this House endorses the Government's decision to maintain a strategic nuclear deterrent and the choice of the Trident missile system as the successor to the Polaris force.

## Appendix Two – Suggested Reading

### Documents relating to MOD Freedom of Information (FOI) Requests

1. Documents dealing with the replacement of Polaris with Trident (disclosed 28 November 2005), including:

*The Future UK Strategic Nuclear Deterrent Force*

*UK Trident Programme*

*Trident and the alternatives: modernising the UK strategic Nuclear Deterrent Force.*

<http://www.mod.uk/DefenceInternet/FreedomOfInformation/DisclosureLog/SearchDisclosureLog/2005/11/TheReplacementOfPolarisWithTrident2xtifRequired.htm>

2. Control of the UK nuclear arsenal (disclosed 19 July 2005):

<http://www.mod.uk/NR/rdonlyres/E2054A40-7833-48EF-991C-7F48E05B2C9D/0/nuclear190705.pdf>

### Parliamentary Papers and Evidence

MOD Memorandum to the Defence Select Committee, HC 835, Session 2005-06, 19 January 2006. This includes annexes on the possible international constraints on any decision for a successor system to Trident; the expected lifespan of the Trident system and investment at the Atomic Weapons Establishment. Available online at:

<http://www.publications.parliament.uk/pa/cm200506/cmselect/cmdfence/835/835m01.htm>

Defence Select Committee, *The Future of the UK's Strategic Nuclear Deterrent: the Strategic Context*, HC 986, Session 2005-06. Available online at:

<http://www.publications.parliament.uk/pa/cm200506/cmselect/cmdfence/986/98602.htm>

Defence Select Committee, *The Future of the UK's Strategic Nuclear Deterrent: the Strategic Context: Government response to the Committee's Eighth Report of Session 2005-06*, HC1558. Available online at:

<http://www.publications.parliament.uk/pa/cm200506/cmselect/cmdfence/1558/155802.htm>

### Articles and Books

Brian Wicker and Hugh Beach, *Britain's bomb: what next?*, SCM-Canterbury Press, 2006 (due for publication on 6 November 2006)

Campaign for Nuclear Disarmament, *No Trident Replacement*, September 2006 (<http://www.cnduk.org/pages/binfo/ntr06.pdf>)

"Britain's nuclear weapons debate", *International Affairs*, July 2006

"We need less tosh and more facts for a decision on Trident", *The Guardian*, 17 July 2006 (<http://www.guardian.co.uk/comment/story/0,,1822060,00.html>)

"Prestige purchase: replacing the British nuclear deterrent", *The World Today*, May 2006

Rebecca Johnson, "End of a nuclear weapons era: can Britain make history?", *Arms Control Today*, April 2006  
([http://www.armscontrol.org/act/2006\\_04/coverstoryUKnuclear.asp](http://www.armscontrol.org/act/2006_04/coverstoryUKnuclear.asp))

Tony Skinner, 'Nuclear debate', *Jane's Defence Weekly*, 12 April 2006

"MOD tests water on Trident replacement", *The Financial Times*, 4 April 2006  
(<http://www.ft.com/cms/s/e10563c2-c376-11da-a381-0000779e2340.html>)

"Legality of nuclear deterrence", *RUSI Defence Systems*, spring 2006

Greenpeace, *Why Britain should stop deploying Trident*, March 2006  
(<http://www.greenpeace.org.uk/contentlookup.cfm?CFID=1437354&CFTOKEN=&ucidparam=20060425164402>)

"The future of Britain's nuclear weapons: experts reframe the debate", *Oxford Research Group*, March 2006

Dan Plesch, "The future of Britain's WMD", *The Foreign Policy Centre*, March 2006  
(<http://fpc.org.uk/publications/>)

'The future of Britain's nuclear deterrent: decisions ahead', *IJSS Strategic Comments*, Vol. 12, Issue 2, March 2006

"The future of nuclear deterrence: perversely indispensable?", *IJSS Strategic Comments*, February 2006, Vol. 12, Issue 1, February 2006

Rabinder Singh QC and Professor Christine Chinkin (Matrix Chambers), 'The maintenance and possible replacement of the Trident nuclear missile system: joint opinion', *Peace Rights*, 19 December 2005 (<http://www.peacerights.org/reports/195>)

Hugh Beach, 'Tactical nuclear weapons: a British view', *Pugwash Colloquium*, 10 December 2005

Lee Willett, 'Questions for the debate on the future of the UK strategic deterrent', *RUSI Journal*, December 2005

'Nuclear deterrence tomorrow: value for money?', *RUSI Defence Systems*, autumn 2005

'Opinion: Trident upgrade could reshape UK industry', *Jane's Defence Weekly*, 16 November 2005

'The Future of the British Bomb', *WMD Awareness Programme*, October 2005  
(<http://www.comeclean.org.uk/articles.php?articleID=132>)

Lord Garden, 'The future of UK nuclear weapons', *RUSI Defence Systems*, 22 September 2005<sup>199</sup>

Michael Codner, 'Britain's nuclear deterrent: keeping the options open', *RUSI Newsbrief*, August 2005

Tim Hare, 'What next for Trident?', *RUSI Journal*, April 2005

Michael Clarke, 'Does my bomb look big in this?: Britain's nuclear choices after Trident', *International Affairs*, 80 (1), 2004

T Milne, H Beach, J L Finney, R S Pease, J Rotblat, *An End to UK Nuclear Weapons*, British Pugwash Group, 2002<sup>200</sup>

Charles Moxley, *Nuclear Weapons and International Law in the post-Cold War World*, 2000

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<sup>199</sup> Lord Garden is the Liberal Democrat spokesman for defence in the House of Lords. This article is available via his website at: <http://www.tgarden.demon.co.uk/>

<sup>200</sup> Available online at: <http://www.pugwash.org/uk/documents/end-to-uk-nuclear-weapons.pdf>