The Future of Britain's WMD

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To the memory of Robin Cook who worked with me to publish this report and with thanks to Jim Devine MP for helping me complete the research.

"Dan Plesch documents in an impressive forthcoming report that all levels of the Trident system depend on US cooperation."

Rt Hon Robin Cook PC MP, the Guardian 29 July 2005

About the Author

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Disclaimer

The views in this paper are not necessarily those of the Foreign Policy Centre.

We must beware, lest the Stone Age return upon the gleaming wings of science.

Winston Churchill

Executive summary

This report discusses the successor to Britain's Trident nuclear missile system. It examines British dependence on the United States and concludes that most of the discussion on the replacement is based on the false premise that the UK has an independent nuclear weapon. To support this conclusion, the report reviews the history of Britain's involvement with nuclear weapons from 1940 to the present day to show a sixty-year-old pattern of British dependence on the US for Weapons of Mass Destruction (WMD).

The report also concludes that Trident should not be replaced and should be phased out now, as neither Trident nor any US-supported successor would meet the '1940 requirement' for a system that the nation can rely on if it stands alone as in 1940. Back in the Second World War, the British government concluded it could not be a nuclear power without US support. Half a century later, the dependence remains decisive: President George Bush Snr ordered his officials to 'produce additional nuclear weapons parts as necessary for transfer to the United Kingdom' (page 14). For fifty years, successive governments have concluded that Britain cannot afford an independent nuclear deterrent. An independent system is not an option.

The nuclear relationship will continue 'to tie the UK to US policy' according to Admiral Raymond Lygo, former Chairman of British Aerospace and director of strategic systems modernisation for the Royal Navy (Page 26). Not replacing Trident is essential for Britain to reclaim freedom of action for the twenty first century, for a Trident replacement may be expected to last until 2060.

The UK should renew the multilateral disarmament agenda which achieved so much in the 1980s and 1990s. It is unrealistic to consider that the world can continue indefinitely with uncontrolled nuclear armaments and not see a nuclear war.

The government should also address a number of technical questions on Britain's WMD and associated technologies:

1. How can the WMD operated by Britain be used should the United States withdraw its support or act preventively?
2. Were any reassurances required by the Bush Administration before it renewed the US-UK Mutual Defence Agreement in 2004 concerning the direction of British defence and civil nuclear policy?
3. How near to production is the US-assisted nuclear weapon the Conservative government tested and developed after Trident and cancelled in October 1993?
4. How much of the spending at Aldermaston is on equipment and services from US companies?

Contents

Introduction

The UK government has stated that, during the 2005-2010 Parliament, a decision will need to be made on a successor to what it calls the UK's Independent Nuclear Deterrent.[1] The current system is the American Trident submarine-launched ballistic missile fitted with nuclear weapons, which is expected to be worn out by the late 2020s.

This study explains the key issues of the UK WMD programme in their historical context. It details the UK's unique dependence on the US for supplying and using WMD, and its importance in modern politics. As Chris Bellamy writes:

> the British deterrent is probably the least independent of any…could this be one reason why Prime Minister Tony Blair has been at such pains to support US foreign and strategic policy over the past eight years?[2]

I also review the current debate in Britain over the Trident renewal.

The UN,[3] governments and the media describe nuclear, chemical and biological weapons and ballistic missiles[4] as Weapons of Mass Destruction. The term WMD will be used in this study to describe UK operated nuclear weapons and the weapon systems that carry them. Only nuclear weapons blow things up and poison through radiation, making them far more powerful and reliable than both biological

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[1] UK Defence White Paper, 2003, Cm6041-1 Par 3.11, http://www.acronym.org.uk/docs/0312/doc08.htm.

[2] 'British Nuclear Forces, the decision that dare not speak its name', C. Bellamy, *The World Today*, May 2005.

[3] UN Security Council Resolution 1540 on Weapons of Mass Destruction refers to: 'nuclear, chemical and biological weapons, as well as their means of delivery … Means of delivery: missiles, rockets and other unmanned systems capable of delivering nuclear, chemical, or biological weapons, that are specially designed for such use.'

[4] Ballistic missiles follow a curved bullet-like trajectory. Cruise missiles are small pilotless aircraft relying on their aerodynamic qualities to keep them in the air.

weapons which rely on the deliberate use of disease and chemical weapons which are poisons.[5]

Perspectives on possessing Weapons of Mass Destruction

For some people, the question of keeping Britain's Weapons of Mass Destruction should be answered with a clear 'Yes'. These people believe that we should have an Independent Nuclear Deterrent, the ultimate guarantee of the nation's safety against enemies known and unknown – essential in case the nation ever finds itself alone, as it was in 1940. They argue that Trident (and its predecessors and succesors) meets what I call the '1940 requirement' for a system that the nation can rely on if it stands alone.

The main argument of this report is that past, present and future system can never meet this requirement because of UK dependence on the US.

However, even if one believes that Britain did have an Independent Nuclear Deterrent, there are arguments for and against maintaining it. The South African minister Abdul Minty expressed the view of the majority of nations that::

> Those who rely on nuclear weapons to demonstrate and exercise power should recognise that such dependence on weapons of mass destruction only serves to increase insecurity rather than promote security, peace and development.[6]

The most authoritative rejection of deterrence as a delusion masking irrationality and instability has come from General Lee Butler who commanded all US nuclear forces and drew up the US plan for a possible nuclear attack on Iraq in 1991.[7]

Sir Michael Quinlan has expressed the pro-nuclear argument as a choice between a nuclear free world and a war free world.[8] General Butler was presented with Quinlan's work at a meeting with the then Chief of the Defence Staff, General Sir Charles Guthrie and Kevin

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[5] See for example, 'What Next For Trident?', T. Hare, Journal of the Royal United Services Institute, April, 2005, Vol 150, No 2.
[6] South African Statement to the Nuclear Non-Proliferation Treaty Review Conference, 2005, http://www.un.org/events/npt2005/statements/npt03southafrica.pdf
[7] http://www.cdi.org/issues/armscontrol/butler.html
[8] 'Thinking About Nuclear Weapons', M. Quinlan, Whitehall Papers, Royal United Services Institute, London, 1997.

Tebbit, the then MoD Permanent Secretary. Butler handed the work back, saying that he had taught elementary logic at the staff college and the proposition was simply a syllogism,[9] that is to say there is no logical reason why 'nuclear free' and 'war free' should be contradictory. For Butler, a world free of WMD was arguably both practical to achieve and far safer than a world of nuclear armed states. For Butler, deterrence is a slippery word used to sanctify any manner of otherwise nonsensical ideas for the potential use of nuclear weapons.

An example of what Butler describes is the argument made by Sir Malcolm Rifkind, that wars can only be prevented if we declare that we are ready to turn a conventional war into a nuclear war. 'I remain deeply sceptical that NATO, or the United Kingdom, should make a declaration of no-first-use of nuclear weapons. The clear implication of any such declaration would be that conventional aggression could be undertaken without the fear of crossing the nuclear threshold. Put crudely, it implies, if it is believed, that conventional war is a safe option. For all its superficial moral attraction, therefore, a no-first-use declaration would take us out of the realm of war prevention into the realm of war limitation.'[10] Deterrence boils down to arguing that the more dangerous things are the safer we are. Rifkind also argues simultaneously *against* small, accurate war-winning nuclear weapons and *for* small nuclear weapons to send political signals to end war.

More recently, it has become fashionable to say that the Communists were rational and could be deterred but deterrence is no use against religious fanatics, who must be fought – if necessary, pre-emptively.[11] In fact, during the Cold War, Western and Communist leaders portrayed each other as fanatics, Ronald Reagan famously characterising the Soviet Union as the 'Evil Empire' who had no respect for human life. Winston Churchill was concerned that the Americans might launch preventive war against the USSR in the 1950s.[12]

There is also a strong argument that possessing nuclear weapons is illegal. The advisory opinion of the International Court of Justice

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[9] Private information.
[10] Malcom Rifkind, 16 November 1993.
[11] National Security Strategy of the United States, 2002.
[12] 'The Secret State', P. Hennessy, Allen Lane/Penguin, 2002.

states that nations with nuclear weapons had a legal obligation to eliminate them through multilateral negotiation.[13] This undermines the argument that nuclear weapons are needed for Britain to keep its seat on the UN Security Council. As a non-nuclear state, the UK would enjoy more, not less, support from the international community.

Many states such as South Africa point out the indirect transfer of nuclear weapons from the US to the UK detailed in this study is a violation of Article 1 of the nuclear Non-Proliferation Treaty which prohibits such transfers.[14]

Regardless of the power-political considerations, nuclear weapons are immoral. Peregrine Worsthorne, once editor of the *Sunday Telegraph* argued in 1998:

> That an individual could proudly say this - give me liberty or give me death - is more than understandable. But we armchair Cold War warriors in the West were saying more than this. We were saying that the whole human race, the greater part of which was neutral in the Cold War, should be put at risk to preserve Western liberty. How could we have believed anything so preposterous?[15]

Perhaps the most common view of nuclear weapons is that simply by having them we will never have to use them, rather like the thug who ends up in court, arguing that he never meant to use his gun, and only had it as a status symbol. The head of the RAF bomber command in the 1960s put it bluntly:

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[13] 'It follows from the above-mentioned requirements that the threat or use of nuclear weapons would generally be contrary to the rules of international law applicable in armed conflict, and in particular the principles and rules of humanitarian law; however, in view of the current state of international law, and of the elements of fact at its disposal, the Court cannot conclude definitively whether the threat or use of nuclear weapons would be lawful or unlawful in an extreme circumstance of self-defence, in which the very survival of a State would be at stake; 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', 'Legality of the threat or use of nuclear weapons, International Court of Justice, Advisory Opinion, 8 July 1996, http://www.fas.org/nuke/control/icj/text/index.html .

[14] http://www.comeclean.org.uk/articles.php?articleID=125

[15] 'The Old Bombers who are now for Banning the Bomb', P. Worsthorne, *Spectator*, 7 March 1998.

> It is no good taking refuge in the claim that the job of a deterrent is to deter, not to fight; nothing could be more dangerous than to base a policy on bluff, on a threat you don't really believe you will ever have actually to implement.[16]

Weapons of Mass Destruction in the world today

Today, thousands of American and Russian nuclear weapons are ready to fire in less than 45 minutes,[17] although the UK reduced the operational readiness of its submarines following the 1998 Strategic Defence Review.[18] Robert Joseph, now President Bush's Under Secretary of State for Arms Control, wrote in 1998 that no action should be taken to make an agreement with Russia to ensure greater safety and security since:

> De-alerting undermines a basic principle of deterrence; namely, the ability to retaliate promptly so as to prevent any aggressor from assuming it can achieve a 'fait accompli.' In this context, assertions that de-alerting of U.S. strategic forces would eliminate fear of surprise attack have not been demonstrated…. De-alerting should not be allowed to become a back door to unilateral nuclear disarmament.[19]

Perhaps the most dangerous aspect of the continuation of the hair trigger alert is the risk of Armageddon by accident, a problem made worse since the public and political leaders alike are mostly unaware that the nuclear threat still hangs over them (see Figure 1).

The US continues to build Trident missiles, Russia has introduced the Topol 26 and 27, France the new M-51 and China may have new missiles. India, Israel and Pakistan are also all adding to their nuclear arsenals. Other states, perhaps Japan[20] or Egypt,[21] may

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[16] *The Times*, J. Slessor, 6 January 1963.
[17] http://www.ippnw.org/RXDealert.html; http://www.ieer.org/russian/pubs/dlrtbk-e.html
[18] In 1994, Presidents Clinton and Yeltsin and Prime Minister Major announced that their weapons had been 'de-targeted', a meaningless gesture since in war the first action is to re-check the targets that weapons are pointed at. When a former US launch control officer, Bruce Blair pointed this out in the Washington Post, Clinton flew into a rage with the advisors who had convinced him that de-targeting would have real effect.
[19] 'US Nuclear Policy in the 21st Century, Final Report', R.G. Joseph, R.F. Lehman, Project Directors, National Defense University/Lawrence Livermore National Laboratory, Washington, D.C., 1998.
[20] 'The Beauty Queen's Guide to World Peace', D. Plesch, Politico's, London, 2004, Chapters 2 and 8.

Figure 1: World Nuclear Weapons 2005[22]

	Number of nuclear weapons
China	100+
France	300
India	50
Israel	200
North Korea	6?
Pakistan	50
Russia*	14,000
UK**	200
US***	10,600

*Some 10,000 of these weapons are in storage

**The UK's weapons are US-sourced

***Some 5,000 of these weapons are in storage

choose the nuclear option. There is considerable public and official concern over the possibility that terrorist groups may obtain WMD. This proliferation problem is a serious matter. Indeed, as is discussed below, both America and Britain are prepared to use their own WMD – nuclear weapons – against such groups, possibly pre-emptively. Nevertheless, the great difficulty of finding a terrorist target to shoot at with nuclear weapons effectively removes this issue as a justification for the UK's own WMD. Prevention and police-type actions are the principal means of tackling the problem of terrorist access to WMD.

Arms control and disarmament has been an international priority since the Second World War. Between 1987 and 1996, a range of treaties came into force that regulated and removed tens of thousands of tanks, guns, warplanes and missiles, banned nuclear testing and chemical weapons. Now these achievements have been forgotten. No new agreements are underway. Instead, a programme of sanctions and possible military action is being contemplated against the nuclear small fry – Iran and North Korea. There is an

[21] The International Atomic Energy Agency (IAEA) discovered that Egypt had secretly created a plant capable of making weapons grade radioactive material. The IAEA and the US are both satisfied with Egypt's assurances.

[22] Natural Resources Defense Council and International Institute for Strategic Studies

urgent need to restart the multilateral disarmament process, and without leadership from Washington, European states must take a lead. I discuss how this might be done in my paper A Strategic Concept for the Regulation and Removal of Arms and Proliferation.[23]

A history of American support for Britain's Weapons of Mass Destruction

British dependence on the US for nuclear weapons started in the Second World War. This history shows that it is incorrect to think that the UK was ever an independent nuclear state like France, Russia or China.

In 1940, Churchill initiated work on a British atomic bomb, rejecting a suggestion of cooperation from the US President, Franklin Roosevelt in October 1941.[24] He soon realised that Britain did not have the resources to go it alone and sought to get involved with the US, but it was not until the 1943 Quebec Agreement that Britain joined the Manhattan project that built the Hiroshima and Nagasaki bombs.

Margaret Gowing, the official historian of Britain's nuclear weapons explains that: 'Britain had then become only a junior partner in the business, contributing significantly in various ways but present largely on American sufferance'.[25] In 1946, the US Congress passed the MacMahan Act to stop nuclear collaboration with any state. British scientists returned home with information on how to build an atom bomb but without detailed knowledge of the industrial production processes.

Some nuclear sharing quickly restarted, as the US needed supplies of British controlled uranium ore from the Congo, despite the MacMahan Act.[26] Until 1952, the US intermittently provided the UK with nine categories of information mostly on the construction of nuclear reactors for making nuclear explosives.[27] Congressional

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[23] http://www.psr.org/documents/psr_doc_0/program_4/scrrap.pdf
[24] 'British Thinking about Nuclear Weapons', A.J.R. Groom, Pinter, 1974, Chapter 1
[25] 'Independence and Deterrence', Margaret Gowing, Macmillan, 1974, Vol 1 p.3
[26] 'Nuclear Rivals: Anglo-American Atomic relations 1941-1952', S. Paul, Ohio University Press, 2000, passim.
[27] Ibid.

leaders brought into the negotiations threatened to withdraw the Marshal Aid programme to get the Attlee government to give up joint control over the use of nuclear weapons agreed by Churchill and Roosevelt during the war.[28]

In 1947, the British atomic bomb project was restarted by the Labour government. In Peter Hennessy's account, it was the Foreign Secretary Ernest Bevin's intervention that swung the discussion amongst ministers.[29] And the need to have a 'Union Jack' on top of the bomb, in Bevin's famous phrase, was driven by the humiliating way that Bevin had just been spoken to by the US Secretary of State James Byrnes. The programme was mentioned in Parliament in 1948, with more detail only provided shortly before the first British atomic test in 1952 under Winston Churchill's premiership.[30] Churchill privately expressed surprise at how much money and work had been done in secret by the Labour government.

From 1948, the US began to base nuclear capable bombers in Britain. One of Churchill's last political acts was to try to reach out to the Soviet leadership after the death of Stalin in order to control the hydrogen bomb. He found he had no influence in Washington and, shortly before retiring, Churchill began the UK hydrogen bomb programme, while privately expressing greater concern over the future of the world than he had even in 1940.

Despite the great effort to produce the atomic bomb and jet bombers to carry them, the development of hydrogen bombs and ballistic missiles to carry them by both the US and Russia in the 1950s made it impossible for the UK to afford an independent nuclear weapons system.

In 1957, with great difficulty and expense, the UK exploded its first hydrogen bomb and, shortly thereafter, the US agreed to provide full support for the British nuclear weapons programme. As both Lorna Arnold and Peter Hennessy describe in their studies of the British hydrogen bomb programme, the key purpose in the mind of the Prime Minister, Harold Macmillan, was to show the Americans that

[28] Groom, op. cit., p.31.
[29] Hennessy, op. cit.
[30] Gowing, op. cit.

the British were important enough a nuclear power to help, rather than to have an independent weapon.

In 1958, the US-UK Mutual Defence Agreement (MDA) was signed, although very little was known about it in public. It has been renewed periodically ever since, the last time in 2004. The MDA allows the US to provide the UK with nuclear weapons designs, nuclear weapons manufacturing and nuclear reactor technology, designs and materials.

A secret British government assessment of 'The Dangers of Becoming an American Satellite', only released after 1988, stated:

> The UK, in its relatively weak position, is already greatly dependent upon United States support. It would be surprising if the United States did not exact a price for the support, and to some extent it does so…the more we rely upon them, the more we shall be hurt if they withhold it.[31]

Nuclear explosive materials

Tons of uranium and plutonium were traded between the UK and he US during the Cold War. This was flatly denied at the time. In 1997, the Clinton Administration revealed the extent of this exchange (details in the Appendix). Ross Hesketh wrote that the 5.4 tonnes of plutonium sent to the USA amounted to 'the entire production of plutonium from all the UK civil nuclear power stations, up to April 1969, according to official sources'.[32] This trade was helpful to the Americans, but vital to the British nuclear weapons programme.

Today, renewed British interest in nuclear energy should be examined closely for any commercial, political or technical connection to nuclear weapons. How, for example, can the British government be serious about being a nuclear weapons power if it is not going to have a modern nuclear industry?

Nuclear warhead design and construction

The 1958 MDA created the Joint Atomic Information Exchange Group and dozens of Joint Working Groups (JOWOGs). Documents

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[31] 'Planning Paper on Interdependence', Foreign Office, SC (58)8, Steering Committee, 27 January 1958, PRO FO371/132330, quoted in J. Baylis, 'Anglo-American defence relations 1939-1984', 2nd edition, Macmillan, London 1984.

[32] http://www.timesonline.co.uk/article/0,,60-1091224.00.html 29 April 2004, accessed 1 July 2005.

obtained by the US Natural Resources Defense Council show that the US supplied the designs of many weapons to the British. The UK national archives on the JOWOGs, even from 1960, are still sealed. The titles of some documents from that era show that the UK was briefed on the use of beryllium, plutonium and uranium and the Americans were presented with the results of British experiments using US supplied bomb parts. US officials also benefit from the exchanges because of the innovative and skilful approach of their resource-starved British counterparts.

In the early 1960s, public concern over the nuclear arms race focused on the test explosions of nuclear weapons in the atmosphere and the accumulation of radiation in milk. After the 1963 UK/US/USSR agreement of the atmospheric test ban, the UK was only able to carry out test explosions jointly with the US at the underground test site in Nevada. Then, President Clinton's support for a test ban forced John Major's government to follow suit and sign the Comprehensive Test Ban Treaty in 1996. The last US/UK tests at Nevada were codenamed Barnwell (1989), Houston (1990) and Bristol (1991).

For many years, the JOWOGs were secret and were only obliquely referred to in the open literature. Thus, two of the main British academic studies on Anglo-American defence relations and nuclear weapons make no more than a passing reference to them.[33] It was only through the work of the Natural Resources Defence Council in Washington, D.C., Greenpeace UK and BASIC, that the JOWOGs were first discussed in public. Subsequent activity by MPs such as Frank Cook and Alan Simpson led to the British government providing occasional lists of the JOWOGs to Parliament.[34]

The principal role of the JOWOGs is to assist the British in producing nuclear warheads. Since the mid-1960s, the UK has deployed four types of nuclear weapon, some with variants. These are the WE-177, Polaris, Chevaline/Polaris and Trident. Only Trident is in service today.

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[33] 'The Independent Nuclear State', J. Simpson, MacMillan, London, 1986 and 'Anglo American Relations since 1939', J. Baylis, Manchester University Press, 1997.
[34] Alan Simpson MP, House of Commons, Hansard, 15 December 1994, c 1222.

The RAF and Royal Navy used the WE-177 free-fall bomb with three versions for different military tasks. However, the British only conducted three nuclear tests in the period when the weapon was developed, making a British-only design most unlikely. Quite how the warhead was designed remains a secret. However, an analysis by the Natural Resources Defense Council (NRDC) concludes that the WE177 was probably based on US designs (Mark 57 and B61). A declassified US document from 1960 obtained by the NRDC says that the UK: 'plans to produce several versions of the Mark 57.'[35]

The US supplied the design for Polaris (the W-58). In heated exchanges in the House of Commons between the Prime Minister Lord Home and Harold Wilson, Home confusingly said that the Polaris warhead was probably 'both' the US design and a British design of the same size.[36] Further evidence that the Polaris warhead was not a British design was that Home saw no need to test it at all, although Harold Wilson did get US permission to conduct one.

In the early 1970s, the US stopped the key part of the JOWOG cooperation when the Labour government said that would not have a new nuclear weapon. There was consternation at Aldermaston at the loss of access to US bomb-makers. US support resumed when, under the premierships of Edward Heath and Harold Wilson, a secret programme to put a new warhead on Polaris was begun. This programme, known as Chevaline or 'Super-Antelope' in Britain, was based on Lockheed's US Antelope project. Technically, its function was to defeat Soviet missile defences, but politically its function was to keep US nuclear support.[37]

In 1979, Margaret Thatcher's new Defence Secretary, Francis Pym, announced Chevaline in Parliament. This caused much infighting in the Labour Party, whose members had known nothing of this programme, which was in violation of the decisions of the party conference.[38]

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[35] 'Safety of British Nuclear Weapon Designs', W. Peden, British American Security Information Council, 1991.
[36] House of Commons, Hansard, 12 May 1964, c222-223
[37] 'Aldermaston and British Nuclear Weapons Development: Testing the "Zuckerman Thesis"', G. Spinardi, *Social Studies of Science,* Vol 27, 1997, pp547-582.
[38] House of Commons, Hansard, 15 February 1989, c 383.

Missiles

Forty years ago, Harold Macmillan had to deal with the fact that not only could the government not afford independent bombs, it could not afford independent missiles either. His government first sought a US air-launched missile, Skybolt, and, when this was cancelled, was offered the US Navy's Polaris missile.

The December 1962 Nassau agreement to provide the UK with Polaris provided the UK with missiles, submarine and reactor technology. President Kennedy offered a similar deal to the French President Charles de Gaulle.[39] In January 1963, De Gaulle made a speech rejecting the US offer of Polaris to France and vetoing British membership of the Common Market on the grounds that the British had now come under US control.

Macmillan's Permanent Secretary, Sir Robert Scott, recorded that the decision has 'put us in America's pocket for a decade.'[40] The commander of the Royal Air Force nuclear bomber force wrote privately that the deal had been done to sustain the 'myth' of an independent force.[41]

The two key agreements on US support made by Macmillan (the MDA and Polaris) were made because Britain was too weak to act independently. This underlying fact has meant that no government has sought to change the framework of agreements established by Macmillan, rather, they have been anxious to ensure that the US keeps renewing them.

The Labour government of Harold Wilson came to power in 1964. Its manifesto said that Polaris: 'will not be independent and it will not be British and it will not deter.' Nevertheless, with most of the money committed, the Wilson Cabinet, with the support of Parliament, continued the programme, although even in retirement he said: 'I never believed that we had a really independent deterrent.'[42]

Air Vice Marshal Stuart Menaul wrote in 1980 that:

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[39] http://news.bbc.co.uk/onthisday/hi/dates/stories/december/21/newsid_3815000/3815251.stm

[40] Cited in I. Clark, op. cit., p 413.

[41] Cited in I. Clark, op. cit., p 418.

[42] Hennessy, op. cit., p70 ff.

> Britain no longer has an independent nuclear deterrent…strategic considerations as far as Britain is concerned are no longer relevant…it could only be used after authority for the use of nuclear weapons had been conveyed from the President of the United States to SACEUR [the US general at NATO].[43]

Trident and its possible successor

> Britain's ability to continue with nuclear weapons without US support becomes very slim to the point of invisibility.[44]
>
> - Julian Lewis MP

James Callaghan, in contradiction of Labour party policy, sought a private understanding with the US President Jimmy Carter that the US would supply the Trident system (comprising submarines incorporating missiles and nuclear warheads) as a successor to Polaris. He explained how, in 1979, at a summit in Guadeloupe, he had a chat with Carter in his beach bungalow and informally secured the deal.[45]

When Margaret Thatcher became Prime Minister, Trident was a natural choice. Proud of the policy, she held a debate in parliament. It has a launch to target time of seven to thirty minutes, 'a range of over 4,000 nautical miles and an accuracy, which can be measured in metres.'[46]

US management and technology, including nuclear materials, is involved throughout the Trident weapons system (see Figure 2). According to the National Audit Office report of 1987:

> The US will supply the missiles and associated strategic weapon systems equipment, certain warhead-related components and services, and missile preparation and refurbishment services: the remainder of the programme will be carried out by the UK.[47]

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[43] 'Countdown', S. Menaul, Hale, London, 1980, p 7 and 172.
[44] Remarks by Julian Lewis MP at the Royal United Services Institute, 6 July 2005.
[45] This is discussed in Hennessy, op. cit.
[46] Royal Navy description, http://www.royal-navy.mod.uk/static/pages/177.html.
[47] 'Ministry of Defence and Property Services Agency: Control and Management of the Trident Programme', National Audit Office, 1987, par 1.1.

A former British official engaged in the acquisition of Trident recently explained that the Royal Navy assessment in the 1980s was that the system would remain functional for eighteen months if the US withdrew support. Since then, US corporations have extended their management of the programme, probably reducing this period.[48]

The supply of Trident commanded a political price from the government in London. In his seminal study 'Nuclear Weapons: Who's in Charge?', Hugh Miall records comments from two British officials on the state of US influence in the mid 1980s. 'Sir Frank Cooper, the Permanent Under Secretary of Defence, said, "if you ask me whether the Americans have an undue degree of influence over British defence policy I would have to say yes".'

Figure 2: UK Trident dependence on the US

Trident component	***Nature of US dependence***
Warhead design	Based on the US W-76
Warhead nuclear components	Some imported from US
Warhead nuclear factory	A copy of the US TA-55 at Los Alamos built by the US Fluor corporation
Warhead non-nuclear parts	Some imported from US
Firing system	Designed and built in the US
D-5 Missiles	"Although specific missiles in the pool of such missiles held at King's Bay, Georgia, will not be identifiably British, the UK Government will take title to the missiles it purchases."[49]
Missile guidance	Imported from the US
Submarines	British designed and built with the import of US components and reactor technology
Aldermaston	Management – 33.3% Lockheed Martin Technology – much US sourced[50]
Maintenance base	Management/ownership– 51% Halliburton[51]

[48] Private conversation.

[49] The Progress of the Trident Programme, Defence Committee 6th Report, 16 June 1993, HC 549.

[50] See, for example, the table of Joint Working Groups and the provisions of the Mutual Defence Agreement.

[51] In-service support and refurbishment for Britain's nuclear submarines is provided by the Devonport Management (DML) group, 51 per cent owned by Halliburton, www.devonport.co.uk.

Clive Ponting, a former MoD official said:

> Client state is putting it a bit strongly but there are very clear signs I think that it's not far short of that…They clearly do have an undue degree of influence because when the chips are down we side with the Americans because we think the American nuclear and intelligence material is so important to us that we are prepared to pay that price to keep the material flowing.[52]

One area where the price was paid was in support for the US Star Wars programme which was strongly opposed by Foreign Office and Ministry of Defence officials. Initial doubts were expressed by the Foreign Secretary, Geoffrey Howe, only for the Prime Minister to bring the UK into line with Washington, a pattern familiar in recent years.

The Trident warheads

In June 1991, President George Bush Snr issued National Security Directive 61, now partly de-classified. He ordered that the Department of Energy 'shall produce additional nuclear weapons parts as necessary for transfer to the United Kingdom pursuant to the Agreement of Cooperation' for a period up until 1997.[53]

According to a UK National Audit Office statement on warhead development and production, 'Most of the development and production expenditure is incurred in the US'. These costs included the cost of testing the weapons in Nevada. '[Regarding] special materials ... in 1982 Ministers decided…that a substantial proportion [of the explosive nuclear material] should be purchased in the UK [from British Nuclear Fuels plc]'.[54] Therefore, the remaining portion of the nuclear materials in the warheads comes from the US. Baylis describes how, in the mid-1980s, Britain was 'dependent for "vital materials" for warhead production'.[55] The ostensibly British warhead was test-fired at the US underground test-site in Nevada.

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[52] 'Oxford Research Group', H. Miall, Macmillan, London, 1987, p77.
[53] http://bushlibrary.tamu.edu/research/directives.html
[54] 'Ministry of Defence and Property Services Agency: Control and Management of the Trident Programme', National Audit Office, 1987, appendix 4, pars 1-4; 'Progress of the Trident Programme', HC 1987-1988, Defence Committee, Third Report, p 22.
[55] Baylis, op. cit., p.195.

The Aldermaston A-90 manufacturing facility, where the Trident warheads are made, 'appears to be a direct copy of the Plutonium Processing Facility (TA-55) at Los Alamos'.[56]

The US provided Britain with details of its Trident nuclear warhead design[57] and sells Britain its cone-shaped casing.[58] The US Sandia plant 'also designs the arming-fusing-firing mechanisms for all of the United Kingdom's nuclear weapons'.[59]

Trident missile and submarine system

The British version of the US Trident system consists of four submarines built at Barrow in Furness, each fitted with sixteen missiles. The submarines can sail to any part of the world's oceans. Powered by nuclear reactors they can stay underwater, undetected, for months at a time.

The submarines must collect the missiles from a US port in Georgia on the Atlantic coast under a lease-purchase arrangement.[60] The extra missiles for Trident's predecessor Polaris were British-owned and stored at a base in Scotland, making Britain less dependent on the US. Denis Healey heaped derision on the arrangement:

> Under the rent-a-rocket agreement we have to swap these Moss Bros missiles every seven or eight years for other missiles in the American stockpile…[there are] some serious political disadvantages, which can be summed up as a period of prolonged and humiliating dependence on the United States.[61]

The Trident D-5 missiles are occasionally test-fired from the submarines using a US naval facility.

Each Trident submarine carried 16 missiles. Each missile can carry up to 14 nuclear weapons able to hit separate targets hundreds of miles apart. However, as a result of political pressure to reduce armaments and improved international circumstances, each missile

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[56] Norris, op. cit., p.72 ff
[57] Annual Historical Summary [U], Joint Atomic Information Exchange Group, HQ Defence Nuclear Agency, 1 October 1982-30 September 1983.
[58] 'Annual Summary', Joint Atomic Information Exchange Group, 1983-1984.
[59] 'Inside Energy / with Federal Lands', D. Kramer, May 1994, cited in W. Peden, 'The Next Chevaline Scandal', Campaign for Nuclear Disarmament, London, 1999.
[60] http://www.subasekb.navy.mil/TRIDENT%20REFIT%20FACILITY/MISSION.htm
[61] 'A Special Relationship', J. Dumbrell, Palgrave Macmillan, 2000, p 145.

carries a much smaller load than its theoretical maximum, with a total of no more than 48 nuclear weapons per submarine – 200 in total.

Firing Trident

This section discusses whether Britain could engage in a nuclear war independently of Washington and how the British and American governments prepare in peacetime for using their nuclear weapons.

The British public has been told that Trident and its successors are intended to be the independent nuclear deterrent.

Dr. John Reid, the UK Defence Secretary, explained that, 'the United Kingdom's independent nuclear deterrent can be targeted and used without the approval of any other country'.[62] However, if one asks 'Can it be used if the United States disapproves?', we can see from the previous analysis that this is most unlikely. Half a century ago, at Suez, the British had to abandon a military operation under economic pressure from Washington. In any crisis where the US and the UK were at odds, the US would be able to prevent its use even if the US does not have to be asked for permission.

Even in the days before Polaris, it was obvious that the US did not regard the UK as an independent nuclear force. In 1962, Robert McNamara, the US Defense Secretary, spoke out about the 'dangerous' contribution of small nuclear powers. This created headlines in Britain and was seen as an attack on the UK nuclear force. McNamara and his advisors sought to soothe the British press by explaining that they were only talking about the French, since the British 'did not operate independently'.[63]

Both governments state that the UK weapons are assigned to NATO. What does this mean in practice? According to sources familiar with the process, the US is aware, through the NATO command structure and the US Strategic Command (STRATCOM), of the location and deployments of Trident submarines. US communications and satellite facilities are normally used for keeping in touch with the submarines and for targeting the missiles.

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[62] House of Commons, Hansard, 31 Oct 2005, Column 720W.
[63] 'Nuclear Diplomacy and the Special Relationship: Britain's deterrent and America, 1957-1962', I. Clark, Clarendon Press, Oxford, 1994, pp 334-337.

The command chain from the British Prime Minister to the submarine captains does not involve the Americans. Yet the UK makes use of US satellites to aim Trident. Former UK Trident launch control officers have said that it would be very difficult to fire the missiles without the use of the satellites.[64] John Ainslie has provided the details of the British reliance on US computer software, satellite generated targeting information and related systems that would permit the US to interfere with a British Trident launch.[65]

The British and American governments are at pains to point out that they abhor the idea that nuclear weapons could ever be used emphasising their deterrent role. But there is evidence from official policies, the building of weapons and government behaviour in crisis that the US and UK are prepared to use nuclear weapons in a wide variety of circumstances, known in Britain as the 'sub-strategic' role for nuclear weapons.

The Labour government strategic defence review in 1998 stated:

> 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.[66]

After 9/11, the British government added a 'New Chapter' to the Strategic Defence Review that extended the role of nuclear weapons further to include deterring terrorist organisations:

> The UK's nuclear weapons have a continuing use as a means of deterring major strategic military threats, and they have a continuing role in guaranteeing the ultimate security of the UK. But *we also want it to be clear, particularly to the leaders of states of concern and terrorist organisations, that all our forces play a part in deterrence,* and that we have a broad range of responses available. (emphasis added)

The Bush Administration's policies on using nuclear weapons are illuminated in its 2002 Nuclear Posture Review[67] and in the subsequent policy on combating WMD.[68]

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[64] Private information.
[65] http://www.comeclean.org.uk/articles.php?articleID=132
[66] UK Strategic Defence Review, 1998.
[67] http://www.globalsecurity.org/wmd/library/policy/dod/npr.htm.
[68] http://www.armscontrolwonk.com/index.php?id=512.

Rogers recalls a conversation in the mid 1990s with what he described as 'a serving British Admiral' in which the admiral cited, as an example of the use of sub-strategic Trident, a future confrontation with a nuclear-armed state in the Middle East, believing it to be eminently practicable to use a Trident missile with a single warhead to fire a small 'demonstration' shot or, if necessary, use a combination of missiles and warheads in a pre-emptive strike against opponent's nuclear facilities.

Less powerful warheads than the original hydrogen bombs carried by Trident – for the 'sub-strategic' role – were first produced under the government of John Major.[69] This was achieved not by producing a new nuclear weapon but by reducing the power of the warhead.[70] The possibility of two explosive sizes is confirmed in 'A New Beginning', AWE Annual Report 2000.[71] Three sizes are mentioned by the NRDC, as low as 300 tons and as high as 20 kilotons. Several sources indicate that this has been achieved by removing the larger bomb and adjusting the power of the primary.[72] Paul Rogers[73] and Milan Rai[74] discuss sub-strategic Trident.

Geoff Hoon, then the British Defence Minister, said:

> we have always made it clear that we would reserve the right to use nuclear weapons in conditions of extreme self-defence. Saddam can be absolutely confident that in the right conditions we would be willing to use nuclear weapons.[75]

William Arkin, long a leading expert on US nuclear weapons, wrote about US nuclear war planning for Iraq in January 2003:

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[69] One of the few discussions of the purpose of this system is found in 'Sub Strategic Trident: A Slow-Burning Fuse', Paul Rogers, London Defence Studies, No 34, Centre for Defence Studies, London, 1996.
[70] http://www.nrdc.org.
[71] 'A New Beginning', AWE Annual Report, 2000, p.14.
[72] Private information and 'An End to UK Nuclear Weapons', T. Milne, H. Beach, J. Finney, R. Pease and J. Rotblat, A Report from the British Pugwash Group, 3 October 2002, http://www.pugwash.org/uk/documents/end-to-uk-nuclear-weapons.pdf.
[73] 'Sub Strategic Trident: A Slow-Burning Fuse', P. Rogers, *London Defence Studies*, No. 34, Centre for Defence Studies, London, 1996.
[74] 'Tactical Trident: The Rifkind Doctrine and the Third World', M. Rai, Drava Papers, London, 1995.
[75] Frost Programme, BBC, 4 February 2003.

> At the U.S. Strategic Command (STRATCOM) in Omaha and inside planning cells of the Joint Chiefs of Staff, target lists are being scrutinized, options are being pondered and procedures are being tested to give nuclear armaments a role in the new US doctrine of "pre-emption". According to multiple sources close to the process, the current planning focuses on two possible roles for nuclear weapons: attacking Iraqi facilities located so deep underground that they might be impervious to conventional explosives and thwarting Iraq's use of Weapons of Mass Destruction. The current nuclear planning, revealed in interviews with military officers and described in documents reviewed by the Los Angeles Times, is being carried out at STRATCOM's Omaha headquarters, among small teams in Washington and at Vice-President Dick Cheney's "undisclosed location" in Pennsylvania.[76]

In his memoirs, Colin Powell explained how, in 1991, Dick Cheney ordered him, despite his objections, to prepare a plan for using nuclear weapons on Iraq. Powell regarded the plans as disastrous and unusable and had them burned.

Iran has been a focus of US peacetime war-planning for a decade. Kristensen describes how: 'Iran became the first test case for the new doctrine, with STRATCOM performing an in-depth study in the fall of 1995 of how to target nuclear and chemical targets in Iran with U.S. nuclear weapons'.[77]

Attacks like this seem far-fetched, so it is worth concluding the discussion of Firing Trident by illustrating that it is routine in peacetime to plan for using nuclear weapons. The US Joint Chiefs of Staff Joint Doctrine for Theater Nuclear Operations regarding nuclear war planning in peacetime:

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[76] 'The Nuclear Option in Iraq: The US has lowered the bar for using the ultimate weapon', W. Arkin, *Los Angeles Times*, 26 January 2003.

[77] 'Targets of Opportunity: How nuclear planners found new targets for old weapons', H. Kristensen, *Bulletin of the Atomic Scientists*, Vol. 53, No. 5, September/October 1997: Kristensen draws on the U.S. Strategic Command that was partially declassified and released under the Freedom of Information Act, 'Minutes of the Fifty-Fourth United States Strategic Command Strategic Advisory Group Meeting (U), 19-20 October 1995, Offutt AFB, Nebraska', Secret/rd, January 1996, pp. 4, 11.

US Procedures for planning nuclear war in peacetime

> Proper joint operation planning increases the commander's flexibility and facilitates the package approval and release process.
>
> *Peacetime Planning*
>
> Given an operation plan within an area of responsibility and/or joint operations area and a threat, it is advantageous to plan as many potential operations as possible in peacetime. [78]

Present US support for UK WMD

The US supports the UK in keeping its weapons ready to explode and helping to develop new weapons. This technological and scientific support is currently organised through a number of Joint Working Groups (see Figure 3).

In order to prepare for a UK decision on a successor to Trident, the UK government has already spent around £300 million refitting the factory at Aldermaston, an investment equal to some 60% of the current book value of the factory, estimated by the government at about £500 million.[79] The refit includes a new high-powered laser and a supercomputer. The history of collaboration on nuclear weapons between the US and the UK suggests that much of this expenditure will have invested in US technology. In addition, Lockheed Martin part-manage the factory. The activist group the Nuclear Information Service tracks the ongoing construction of new facilities and the recruitment of staff to make the next generation of nuclear weapons.[80]

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[78] JP-3-12-1, available at www.globalsecurity.org.
[79] House of Commons, Hansard, 11 Jan 2005.
[80] http://www.nuclearinfo.org.

Figure 3: US/UK Joint Working Groups[81]

Joint Working Group	Title
6	Radiation Simulation and Kinetic Effects
9	Energetic Materials
22	Nuclear Materials
23	Warhead Electrical Components and Technologies
28	Non-Nuclear Materials
29	Nuclear Counter-Terrorism Technology
30	Facilities
31	Nuclear Weapons Engineering
32	Nuclear Warhead Physics
34	Computational Technology
36	Aircraft, Missile and Space System Hardening
37	Laboratory Plasma Physics
39	Manufacturing Practices
41	Nuclear Warhead Accident Response
42	Nuclear Weapon Code Development
43	Nuclear Weapon Environment and Damage Effects
	Methodologies for Nuclear Weapon Safety Assurance

The debate so far on a successor to Trident

Mike Gapes**:** You do not know what the options are?

Mr Hoon: Yes, I do.

Mike Gapes: You do know what the options are. At this point is there anything you would like to say about what those options are?

Mr Hoon: No.[82]

Since the 2005 election, some debate has begun in the House of Commons about the various options. There are four US-sourced options for a successor to Trident being discussed inside and outside

[81] House of Commons, Hansard, 22 Feb 2005, column 601.

government. These are: to keep Trident going by building new submarines for the existing missiles; to adapt Cruise missile-carrying submarines; to provide the RAF with an air-launched missile; and lastly, to wait and join the currently secret American programme for a replacement for Trident.

There is no solely British option. Hoon and his officials ruled out a European option as a successor to Trident because it is prohibited by the nuclear Non-Proliferation Treaty.[83]

The Trident replacement decision is likely to follow US decisions, as happened in the 1970s at the time of replacing Polaris. Then, the UK at first envisaged simply keeping Polaris going, which seemed an easy and acceptable option for parliament and the public to accept. Later, when it appeared that the US was scrapping US Polaris and building a new system, it was more difficult to argue against replacing British Polaris.

Inter-service rivalry is also a feature of the current debate, as happened at the time of the decision to replace Polaris. Then and now, the Army sees the expenditure as a diversion from the need for 'boots on the ground' soldiering. The Air Force (which had a nuclear force in the Polaris era) argues it can do the job better than the Navy (now favouring a nuclear missile for the new Typhoon/Eurofighter[84]) and the rest of the Navy suggests that something cheaper than big new submarines would be sufficient.

The US decision on a Trident successor will have a major influence on the UK decision, because the British need American technology, and need to ensure that they do not acquire technology that the Americans are phasing out. Early indications are that the US will choose a ballistic missile submarine that is a conventional/nuclear hybrid. The precedent is Trident itself. The UK was forced to acquire the more expensive Trident D5 when the US decided to phase out the earlier Trident C4 around 2000, meaning it would no longer offer the UK participation in the Trident C4 programme. The decision about phasing out Trident C4 was made in 1981, twenty years in

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[83] The Americans have made a condition of their support since the late 1940s that the UK not even share information with France, despite the French role in the British and US programmes of the early 1940s.

[84] 'Trident: the done deal', R. Fox, *New Statesman,* 13 June 2005

advance of the actual replacement and ten years after the discussion on a Polaris replacement began. The technical choices are discussed in more detail below.

In their recent articles, the former MoD nuclear planning director, Tim Hare, and Michael Clarke of King's College, London, note the UK's dependence on the US for the technology, but neither draw any policy conclusions from it. Their assessments of the geopolitical universe of British policy do not account for the gravitational pull from Washington. In contrast, Admiral Raymond Lygo has observed that, 'we should not think of it [Trident and its replacement] as independent' and that the nuclear relationship will continue 'to tie the UK to US policy'.[85]

Michael Clarke argues against a decision to replace UK Trident with a another system of the same capability. There is, he argues:

- no current or near-term threat from another nation;
- any chemical or biological attack on the UK from the Middle East would not be responded to with nuclear weapons because of the political hostility this would create;
- sub-strategic Trident – and perhaps any sub-strategic weapon – is not usable in the Third World;
- there is no plausible emerging nuclear competitor to the US even by 2050, unless, he is careful to point out, the US creates such a threat through overly aggressive pursuit of the war on terror.

These are convincing arguments, but presume a UK independence that does not exist.

There are those who believe that Britain should get rid of its nuclear capability altogether. Michael Portillo makes similar arguments to Michael Clarke, but concludes that the UK should depend totally on the United States.[86] There is still also the traditional antinuclear argument from within the Labour and Liberal parties.

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[85] Admiral Raymond Lygo, remarks at the Royal United Services Institute, July 2005.
[86] 'Does Britain Need Nuclear Missiles? No. Scrap them', Michael Portillo, *Sunday Times*, 19 June 2005.

In the end, the UK government is likely to opt for the best US technology it can afford – a point made in Hennessy's review of the topic. As Clarke observes about the present Trident system, 'it is credible because it is the most sophisticated currently available.'[87]

President Bush's support for UK WMD

A key objective for the Blair government during 2003 was to ensure the renewal in 2004 of the Mutual Defence Agreement (MDA) with minor amendment that permits the US to share nuclear weapons technology with Britain. The present Bush Administration prides itself on its tough pursuit of US interests. One can logically deduce that the Bush Administration would not have renewed the MDA without being certain that the UK will continue to provide reliable support.

In a formal letter to his officials endorsing the renewal, President Bush said that the UK is:

> making substantial and material contributions to the mutual defense and security. The proposed Amendment will permit cooperation that will further improve our mutual defence posture and support our interests under the North Atlantic Treaty Organization.[88]

He explained to Congress that that agreement will continue to:

> permit the transfer of nonnuclear parts, source, byproduct, special nuclear materials, and other material and technology for nuclear weapons and military reactors. … In the light of our previous close cooperation and the fact that the United Kingdom has committed its nuclear forces to the North Atlantic Treaty Organization, I have concluded that it is in our interest to continue to assist them in maintaining a credible nuclear force.

For George Bush, his decision appears to makes Britain's nuclear force credible. Would he do so free of charge? US support does not, in fact, make the idea of British independence more credible - quite the opposite.

Had the UK not gone to war with the US in Iraq, neither President Bush nor the Congress are likely to have agreed that cooperation

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[87] 'Does My Bomb Look Big In This? Britain's nuclear choices after Trident', M. Clarke, *International Affairs*, January 2004.
[88] June 14 2004

was close, especially in the climate of 'you are either with us or against us' that has prevailed since 9/11.

However, it is reasonable to assume that nuclear weapons technology is supplied with a quid pro quo, although this is not publicly acknowledged.

The ease with which Britain acquires American nuclear weapons technology is not matched by special treatment when it comes to the supply of conventional armaments. The Blair government failed to persuade the US Congress and the Bush Administration to exempt the UK from the International Traffic in Arms Regulations (ITAR) which restricts American export of conventional weapons.

Future nuclear systems

There are several options for the warhead that may succeed Trident. It is not commonly known that Britain quietly developed a new nuclear weapon at the end of the Cold War. With the usual US assistance, the UK apparently carried out three tests of a Tactical Air To Surface Missile Warhead in 1989, 1990 and 1991. In 1993, the Conservative government told Parliament that a new tactical warhead was well underway although a year later the weapon was cancelled. The UK may have a new US-tested nuclear warhead on the shelf ready to be manufactured, provided the US is prepared to supply parts and management.

The US has already begun funding the design work on a new generation of nuclear weapons. The Bush Administration's policy on the future of US nuclear forces, including the Trident system, was made by the Pentagon in January 2002 in the Nuclear Posture Review.[89] It recommended that 'new capabilities must be developed

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[89] 'Today's nuclear arsenal continues to reflect its Cold War origin, characterized by moderate delivery accuracy, limited earth penetrator capability, high-yield warheads, silo and sea-based ballistic missiles with multiple independent reentry vehicles, and limited retargeting capability.'

'New capabilities must be developed to defeat emerging threats such as hard and deeply buried targets (HDBT), to find and attack mobile and relocatable targets, to defeat chemical or biological agents, and to improve accuracy and limit collateral damage. Development of these capabilities, to include extensive research and timely fielding of new systems to address these challenges, are imperative to make the New Triad a reality.' Nuclear Posture Review, US Department of Defense January 2002 www.globalsecurity.org.

to defeat emerging threats such as hard and deeply buried targets (HDBT), to find and attack mobile and relocatable targets, to defeat chemical or biological agents, and to improve accuracy and limit collateral damage'.

The *New York Times* reported that 'worried that the nation's aging nuclear arsenal is increasingly fragile, American scientists have begun designing a new generation of nuclear arms meant to be sturdier and more reliable and to have longer lives, federal officials and private experts say'.[90] These weapons are included in the Reliable Replacement Warhead programme which has widespread support in the US Congress. It is probable that the UK will participate in this programme.

There is significant political and institutional pressure in the US to restart explosive nuclear testing at the underground test-site in Nevada, despite the Comprehensive Test Ban Treaty. The US Under Secretary of State for Arms Control, Robert Joseph, judged in a 1998 study that 'retaining the safety, reliability, and performance of the nuclear weapons stockpile in the absence of underground nuclear testing is the highest-risk component of the US strategy for sustaining deterrence'.[91] Any British decision to continue with US sources of weapons will require acceptance of US resumption of testing. The US is unlikely to resume testing for several years to come, if at all, but should it do so, the UK would not be in a position to oppose it.

New submarines take some fifteen years to build and as the oldest UK Trident submarine, Vanguard, will end its planned service life in 2023, a replacement will have to be started in 2008. The US Nuclear Posture Review explained that 'the Navy has extended the Trident hull life to 44 years. This in turn will require the DoD [the Pentagon] to extend the service life of the D-5 [missile]'. A similar decision in the UK would mean that the oldest submarine, Vanguard, would cease to operate in 2038 rather than 2023 as planned at present.

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[90] 'US redesigning atomic weapons', W.J. Broad, *New York Times*, 7 February 2005.
[91] Joseph and Lehman op.cit.

US plans for new missiles and submarines

A British decision to continue with its existing trend of obtaining the most advanced US system would mean buying into a new submarine and missile that would be available for use about twenty years from now and which would continue in service for a further thirty or forty years up to 2060.

According to the Nuclear Posture Review, the Pentagon will build a replacement for Trident system to be ready around 2029 - in time for the UK to share the technology:

> The Navy is currently studying two options for future follow-on SSBNs [nuclear submarines]:
>
> a variant of Virginia-class nuclear attack submarines (SSN);
>
> a dedicated SSBN (either a new design or a derivative of the Trident SSBN) ... If the decision is made to develop a new dedicated SSBN, a program would have to be initiated around 2016 to ensure that a new platform is available in 2029.[92]

There has been some discussion in both the UK and the US of producing a new multi-purpose submarine capable of using both conventional and nuclear-armed missiles as a successor to Trident, in the UK's case, a version of the Astute submarines. This would fit the description of the US first option discussed in the Nuclear Posture Review. A detailed study by the Massachusetts Institute for Technology on the Future of the Trident Force provides an indication of some of the extra weapons that might be fitted alongside or instead of a Trident-style missile.[93] These could include 500km ballistic missiles, 2000+km Cruise Missiles, armed robot-planes,[94] mini-submarines and special forces.

In addition, the US may be pursuing a classified programme to meet the requirement of the second option in the Nuclear Posture Review and this will not see the light of day for some years yet. Only long range ballistic missiles give the capability to destroy any target on earth in five to thirty minutes from the order to fire. This capability is

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[92] http://www.globalsecurity.org/wmd/library/policy/dod/npr.htm
[93] http://web.mit.edu/ssp/Publications/pubs.html
[94] The US ground-based units already use the Predator Unmanned Aerial Vehicle armed with Hellfire Missiles.

consider vital in US policy and the second option is designed to provide it.

Conclusions and recommendations

The UK does not, and never has had fully independent nuclear capability. The UK does have a nuclear weapons programme, but it is and always has been dependent on US technology and supplies. Even between 1946 and 1958, US information acquired during the war was the basis of the programme and the US provided secret support. The UK cannot afford to go it alone.

In general, the British public believes that the UK is protected by an independent nuclear deterrent. No government wishes to admit to the weakness that dependence implies.

In return for US support for the UK nuclear weapons programme, the UK is compelled to support, broadly, US international policy. Where there is agreement there is no problem.

Today though, with widespread concern over the long term direction of US policy it is essential that the public understand the underlying connection between the special nuclear relationship and the special political relationship.

On present trends the UK will continue to reject initiatives for multilateral disarmament and adhere to a policy based on the threatened use of nuclear weapons in ever more unlikely circumstances.

It also means that the UK, if it continues to have nuclear weapons, it is likely to be committed to acquiring whatever the US chooses to replace its own Trident missiles from 2029. What the US will choose is not yet known. This course of action will not supply Britain with a weapon it could use if it ever stood alone as in 1940.

The unfortunate reality for the British people is that, unknown to them, they have a nuclear weapon that is not independent and is committed to support unrealistic US-led policy for the military use of nuclear weapons. It is not realistic to support a replacement for Trident and also complain that Britain is too closely associated with America. The UK should cease to try to keep up appearances and adopt a policy based on the reality that it is not an independent

nuclear power. Trident should not be replaced and should be phased out now.

The government should also address a number of technical questions on Britain's WMD and associated technologies:

1. How can the WMD operated by Britain be used should the United States withdraw its support or act preventively?
2. Were any reassurances required by the Bush Administration before it renewed the US-UK Mutual Defence Agreement in 2004 concerning the direction of British defence and civil nuclear policy?
3. How near to production is the US-assisted nuclear weapon the Conservative government tested and developed after Trident and cancelled in October 1993?
4. How much of the spending at Aldermaston is on equipment and services from US companies?

With greater freedom of action to work with the US, the EU and other partners, the UK should renew the multilateral disarmament agenda which achieved so much in the 1980s and 1990s. Supporters of nuclear weapons used to argue for a 'Twin Track' of arms and arms control, of multilateral as opposed to unilateral disarmament. Now, there is no international programme of arms control and disarmament. It is unrealistic to consider that the world can continue indefinitely with uncontrolled nuclear armaments and not see a nuclear war. The UK should join the many other countries, notably South Africa, who are working to reduce and remove nuclear and other armaments.

Appendix

US-UK trade in nuclear explosive materials

DECLASSIFICATION OF THE QUANTITY OF PLUTONIUM ACQUIRED FROM THE UNITED KINGDOM UNDER BARTERS A, B, AND C OF THE 1958 UNITED STATES/UNITED KINGDOM MUTUAL DEFENSE AGREEMENT, 22 December 1997

The Department of Energy committed to provide any additional information that could be released regarding plutonium inventories. DOE, with the cooperation of the United Kingdom (UK) Government, is releasing additional information regarding nuclear materials barters, i.e., the quantity of plutonium received from the UK and the tritium and highly enriched uranium provided to the UK under each of the individual Barters (A, B, and C). In addition, the Department is releasing information regarding the quality of the plutonium in terms of Pu-240 content. The release of this information will provide the public with more information regarding plutonium inventories.

SPECIFICALLY:

	Barter A 1960 - 1969	Barter B 1964 - 1969	Barter C 1975 - 1979	Total
Plutonium Received from the UK	0.5 metric tons	4.1 metric tons	0.8 metric tons	5.4 metric tons
Tritium Delivered to the UK	6.0 kilograms	None	0.7 kilograms	6.7 kilograms
HEU Delivered to the UK	None	7.5 metric tons	None	7.5 metric tons

The Pu-240 content of the 5.4 metric tons received under the barters was as follows:

Pu - 240 content	Metric Tons Received
2%	0.1
10 - 12%	1.2
13 - 15%	1.9
16 - 20%	2.2
Total	5.4

BACKGROUND:

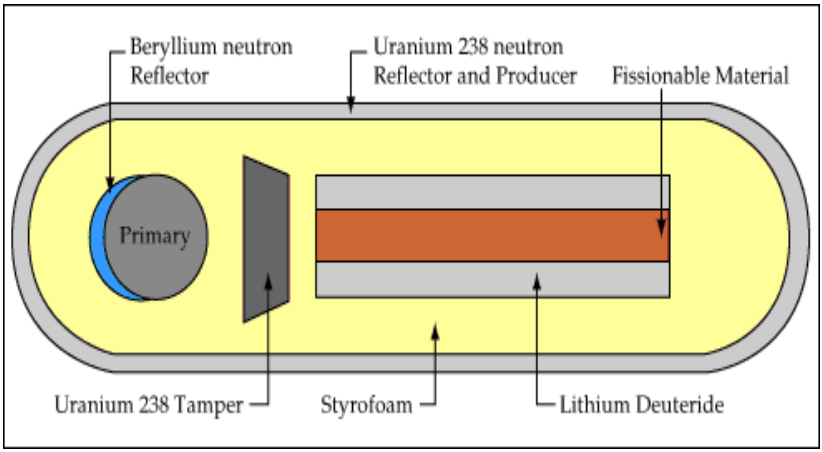
The total quantity of plutonium received by barter was announced in February 1996; today we are releasing the quantities received for each of the individual barters. Programs for mutual defense and international cooperation in the peaceful uses of atomic energy are authorized by the Atomic Energy Act of 1954, as amended. The 1958 United States/ United Kingdom Mutual Defense Agreement had barter provisions for the exchange and safeguarding of atomic material.

Most plutonium was shipped from the UK to the Hanford and Savannah River Sites. Prior to 1964, some plutonium received under Barter A was used for military purposes. In 1964, the U.S. and the UK agreed to use Barter A and Barter B plutonium for civilian programs and that an equivalent amount of U.S. plutonium could be substituted for UK plutonium in U.S. civilian programs. Civilian programs include californium production and reactor research. The Barter C was not so restricted. Some of the plutonium received under Barter C was used in U.S. nuclear weapons.

Information released is based on evaluating available records; it may be updated or revised based on re-evaluation of the methodology used originally or upon the availability of any newly discovered information.

By declassification, the United States government with the cooperation of the U.K. government is acting as a global leader in nuclear information transparency.

Hydrogen bomb outline



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