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REFORM NOT
RENEWAL

THE US-UK MUTUAL
DEFENCE AGREEMENT,
HOW IT WORKS, AND WHY
IT NEEDS TO BE REFORMED

EXECUTIVE SUMMARY

The US-UK Mutual Defence Agreement (MDA) was first signed in 1958 to allow the exchange of classified nuclear information, nuclear weapon technology, and scientific expertise, with the aim of helping both nations to develop their nuclear weapons systems. The Agreement - a formal treaty between the two nations - has been amended a number of times over its 56 year history, and most recently has been renewed on a regular ten year cycle to allow arrangements for the transfer of special nuclear materials and non-nuclear components of nuclear weapons to be extended.

The Mutual Defence Agreement was last renewed on 14 June 2004 in Washington and is scheduled to be renewed again in 2014. The Agreement will be extended until December 2024.

To all appearances the current government intends to follow the practice of its predecessors and push renewal of the Mutual Defence Agreement through with minimal Parliamentary oversight, rather than allowing debate and discussion on the aims and consequences of renewing the treaty.

US - UK nuclear co-operation over the period 2014 - 2024

Significant new developments are planned in the nuclear weapons programmes of both the UK and the USA over the next ten year period from 2014 to 2024, and renewal of the Mutual Defence Agreement will be an important step in allowing the two nations to co-operate in delivering these programmes. Collaboration is expected to take place in the following areas:

- Nuclear warhead development and modernisation, including the current UK Trident warhead upgrade programme and studies intended to inform a future decision to whether to develop a new warhead design to replace the current Trident warhead.
- Submarine reactor design and development, including co-operation on development of a new reactor for the planned 'Successor' Trident replacement submarine.
- Exchange of special nuclear materials, particularly procurement from the USA of tritium required in nuclear warheads and highly enriched uranium submarine reactor fuel.
- Construction of new nuclear infrastructure, including a major investment programme at the Atomic Weapons Establishment which will allow construction of new generation warheads.
- Warhead stockpile stewardship research.

The US Congress is given an opportunity to scrutinise and veto renewal of the Mutual Defence Agreement, but there has never been a debate on the treaty in Government time in the British Parliament.

How the Mutual Defence Agreement works

The Mutual Defence Agreement allows a series of technical exchanges to take place between the Atomic Weapons Establishment, where Britain's nuclear weapons are designed and manufactured, and laboratories and sites in the USA which are involved in the American nuclear weapons programme. The Los Alamos National Laboratory, Lawrence Livermore National Laboratory, and Sandia National Laboratories are the key US institutions involved in these exchanges. More than 1,500 visits by AWE staff were made to 48 different US nuclear facilities between

2007 and 2009. Such visits and exchanges allow scientists to share data, expertise, and equipment and review each others' work and calculations. The scientific appetite of the nuclear laboratories is a major driver underpinning both the Mutual Defence Agreement and broader co-operation between the USA and UK over nuclear weapons.

Legal objections to renewal of the Mutual Defence Agreement

The Mutual Defence Agreement and the relationship and activities that it enables suggest that the USA and the UK share an ongoing and indefinite commitment to collaborate on nuclear weapons technology which is not compatible with their obligations as signatories to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT).

In a legal opinion released in July 2004, Rabinder Singh QC and Professor Christine Chinkin of Matrix Chambers concluded that "it is strongly arguable that the renewal of the Mutual Defence Agreement is in breach of the Nuclear Non-Proliferation Treaty". They reasoned that "assertions about the importance of renewal of the Mutual Defence Agreement are not in conformity with the obligations of Article VI and the commitments made in the 2000 Review Conference".

Conclusions

Co-operation through the Mutual Defence Agreement assists both nations in modernising and improving their existing nuclear weapons and developing new nuclear weapon systems, but in so doing serves to boost the proliferation of nuclear arms. As well as directly allowing the US and UK to advance their own nuclear capabilities, such co-operation undermines the norms which underpin the international treaties designed to control the spread of nuclear weapons.

Most of the activities conducted under the Mutual Defence Agreement are cloaked in secrecy, and lawmakers have only the most limited of opportunities to review and scrutinise work conducted under the terms of the Agreement.

The nuclear relationship between the USA and the US is not a partnership of equals. The UK relies on unique US facilities and capabilities for support to the extent that its nuclear weapons programme cannot be regarded as technically independent from the USA.

Co-operation under the terms of the Mutual Defence Agreement appears to be expanding. As work conducted under the terms of the Agreement expands, so too should measures to allow elected representatives to control and oversee such work.

Recommendations

- Work should begin now towards the long term aim of reforming the Mutual Defence Agreement so that it is seen to reinforce the NPT, rather than undermine it, by increasing US -UK co-operation on disarmament verification, confidence building measures, and decommissioning instead of collaboration on the development of new nuclear weapons.
- The Mutual Defence Agreement should be extended for an interim period of just five years, until December 2019, rather than the customary ten years, to quell suspicions that work undertaken through the Agreement is pre-empting key Parliamentary decisions relating to design of a new nuclear warhead.

- The government should publish a legal opinion to show how it considers the Mutual Defence Agreement can be extended without breaching the NPT.
- There should be a Parliamentary debate on renewal of the Mutual Defence Agreement in government time.
- The amended Agreement, together with appendices, should be published when it has been signed by both governments.
- The US and UK governments should produce an unclassified joint annual report to Parliament and Congress on activities undertaken under the auspices of the Mutual Defence Agreement and the related Polaris Sales Agreement.

INTRODUCTION: THE MUTUAL DEFENCE AGREEMENT

The 'special relationship' between the United States of America and the United Kingdom is the subject of regular discussion in media and political circles, but the nuclear relationship between the two nations is far less frequently discussed. The close political, cultural, and economic links between the USA and the UK are matched by an equally close security relationship, and the depth of this security relationship is defined by the exceptional level of co-operation between the two allies on the most sensitive of military matters: nuclear weapons. This military nuclear collaboration is brokered largely by a unique treaty between the USA and the UK which has quietly slipped into its sixth decade. Every ten years the terms of this singular treaty are renewed, and in 2014 they are scheduled to be renewed again.

The 'Agreement between the Government of the United Kingdom of Great Britain and Northern Ireland and the Government of the United States of America for Co-operation on the Uses of Atomic Energy for Mutual Defence Purposes'¹ - usually known as the Mutual Defence Agreement (MDA) was first signed in 1958 as the Cold War slowly intensified. The treaty was designed to allow the exchange of classified nuclear information, nuclear weapon technology, and scientific expertise, with the aim of helping both nations to develop their nuclear weapons systems. Alongside the Polaris Sales Agreement, which outlines the terms under which the USA agreed to provide the Polaris - and later Trident - nuclear missile system to the UK, it defines the military nuclear relationship between the two allies.

The Mutual Defence Agreement has been amended a number of times over its 56 year history, and most recently has been renewed on a regular ten year cycle to allow arrangements for the transfer of special nuclear materials and non-nuclear components of nuclear weapons to be extended. The treaty was last extended in 2004 and will be extended by a further ten years from 2014. The US Congress is given an opportunity to scrutinise and veto renewal of the Mutual Defence Agreement, but there has never been a debate on the treaty in government time in the British Parliament.

To all appearances the current government intends to follow the practice of its predecessors and push renewal of the Mutual Defence Agreement through with minimal Parliamentary oversight

This briefing is written from a British perspective, but aims to explain why the Mutual Defence Agreement is important on both sides of the Atlantic. It explains what the Mutual Defence Agreement is and how it works; outlines the main areas of work which are expected to take place under the auspices of the treaty over the next ten years; and makes recommendations aimed at improving the transparency and oversight with which work under the Mutual Defence Agreement takes place. Our aim in writing the briefing is not only to shine a spotlight on the secretive workings of the Mutual Defence Agreement, but to put the case for its reform so that it will be fit for purpose over future years, when non-proliferation and arms control can be expected to overtake the development of new weapon systems in importance.

1 Published by the UK government as Cmnd. 537. A copy of the Agreement, including amendments made up until May 1994, is available online at: http://www.nti.org/media/pdfs/56_4.pdf?_=1316627913 (Accessed 20 May 2014). The amendment made in the 2004 renewal round to extend treaty arrangements for a further ten years until 2014 is available at <http://www.acronym.org.uk/docs/O406/doc14.htm> (Accessed 20 May 2014).

HISTORY AND RENEWAL OF THE MUTUAL DEFENCE AGREEMENT

Although the UK has formal agreements encompassing a wide range of military activities with the USA, the Mutual Defence Agreement is among the most significant of these. The UK's military and political 'special relationship' with the USA is based heavily on three pillars of co-operation through which the two nations extend privileges to each other above and beyond those granted to other allies. The three pillars are:

- Co-operation on intelligence matters (under the auspices of another secretive bilateral framework known as the UKUSA agreement²).
- Military basing rights for US forces on UK territories in strategic locations (enabled through a more fragmented and diffuse set of legal arrangements).
- Co-operation on nuclear weapons through the Mutual Defence Agreement and the Polaris Sales Agreement (for which, unlike the Mutual Defence Agreement, there are no formal legal arrangements for review or mechanism for Parliamentary scrutiny).

As one of the key agreements underpinning the 'special relationship', retaining and actively using the Mutual Defence Agreement is of particular importance to the UK political establishment.

The Mutual Defence Agreement was drawn up in order to allow the UK and the USA to share atomic weapons technology and knowledge during the Cold War period. In the immediate aftermath of World War II the USA was reluctant to share its knowledge of atomic weaponry with other nations, and a legal ban on sharing such information was imposed by the United States Atomic Energy Act 1946, usually known as the McMahon Act³. In 1954 the McMahon Act was amended to allow exchange of information on civil aspects of atomic energy and more limited exchanges on defence aspects, and in 1958 the Act was amended again to allow greater cooperation in the military field with the USA's allies, and in particular with those which had made "substantial progress" in the development of nuclear weapons.

The Eisenhower administration in the USA and the Macmillan government in Britain were open to co-operation on the development of nuclear weapons to counter the perceived Cold War threat from the Soviet Union, and the Mutual Defence Agreement was negotiated in parallel to amendments to the McMahon Act to allow co-operation between the two nations to take place on a formal footing. The Mutual Defence Agreement was signed on 3 July 1958, three days after amendments to the McMahon Act were passed, and entered into force on 4 August 1958.

In its original form the Mutual Defence Agreement allowed the sharing of classified information covering a number of fields relating to nuclear capabilities. These included the development of defence plans, training for the use of and defence against atomic weapons, evaluation of the atomic capabilities of potential enemies, development of delivery systems, and research, development, and design of military nuclear reactors. It also allowed the sale to the UK of one complete nuclear submarine propulsion plant, plus the uranium needed to fuel it over a ten year period. Technical co-operation arrangements under the Mutual Defence Agreement allowed the UK to exchange data and conduct joint nuclear tests at US facilities from 1962 onwards, avoiding many of the costs and complications of an independent test programme and allowing the UK to introduce warhead systems into service with far fewer nuclear tests than any other nuclear-weapon state.

2 Richard Norton-Taylor: 'Not so secret: deal at the heart of UK-US intelligence'. Guardian, 25 June 2010: <http://www.guardian.co.uk/world/2010/jun/25/intelligence-deal-uk-us-released> Accessed 20 May 2014.

3 Paul Bowers: 'UK-USA Mutual Defence Agreement'. House of Commons Library Standard Note SN/IA/3147. 30 July 2004.

The Agreement has been amended a number of times over the years to add further clauses and articles. The most important of these was the introduction of Article III *bis* (ie a new Article to go after the existing Article III), which was introduced in an amendment to the Mutual Defence Agreement in 1959 to allow the transfer of nuclear materials and equipment between the USA and the UK over a time-limited period of ten years. It is because the two nations have wished to extend the Article III *bis* arrangements for successive periods that the Mutual Defence Agreement is renewed on a regular ten year cycle. The Mutual Defence Agreement as a whole is not time-limited, and can continue in force indefinitely until the parties agree to terminate it under the provisions of Article XII.

In its current format, the Mutual Defence Agreement consists of the original treaty text plus a number of amendments and a series of classified appendices which set out the detail for exchanges anticipated over the period of the treaty. When the Mutual Defence Agreement was renewed in 2004 the Article III *bis* deadline was extended until December 2014 and the classified appendices were amended, but no substantive amendments were made to the wording of the Mutual Defence Agreement itself.

ARRANGEMENTS FOR THE 2014 RENEWAL OF THE MUTUAL DEFENCE AGREEMENT

The Mutual Defence Agreement was last amended on 14 June 2004 in Washington and is scheduled to be renewed again in 2014. The Article III *bis* deadline will be extended until December 2024, but it is not yet known whether any other amendments will be made to the Agreement.

It is expected that the government will inform Parliament of arrangements for renewing the treaty shortly before the summer recess. On previous occasions the amended treaty has been ratified in accordance with the 'Ponsonby Rule', a Parliamentary convention which allows scrutiny of treaties before they are ratified by the government. The Constitutional Reform and Governance Act 2010 has since formalised arrangements under the Ponsonby Rule, and requires a treaty subject to ratification to be published and laid before Parliament for a period of 21 days in which Parliament is sitting. There is no automatic requirement for the government to allocate time for a debate over this period, although both houses have the authority to resolve that the treaty should not be ratified. If the 21 sitting days expire with no such resolution being passed by either house, the government can proceed to ratify the treaty.

The amendments must also be placed before the US Congress where they must lie for 60 days in accordance with US procedures, which allow Congress an opportunity to veto the ratification. Assuming there are no objections to the amended treaty, entry into force is then completed by an exchange of ratification instruments between the two governments.

It is clear that the ratification arrangements provide limited opportunity for debate of amendments to the Mutual Defence Agreement, and on previous occasions when the treaty has been renewed the government has gone to significant lengths to prevent scrutiny of the ratification process. In 1994 debate on renewal of the Mutual Defence Agreement was restricted to the small hours of the very last session before the Christmas recess and was tagged onto a Consolidated Fund Bill debate, which started at 1.56 am on 15 December 1994⁴. No debate at all took place in 2004, even though 51 MPs signed an Early Day Motion requesting such a debate⁵.

The government has been reluctant to provide details of the timetable for renewing the Mutual Defence Agreement in 2014, although on the basis of previous occasions it is likely that the amended treaty will be signed in mid June and laid before Parliament a week or so later. To all appearances the current government intends to follow the practice of its predecessors and push renewal of the Mutual Defence Agreement through with minimal Parliamentary oversight, rather than allowing debate and discussion on the aims and consequences of renewing the treaty.

Significant new developments are planned in the nuclear weapons programmes of both the UK and the USA over the next ten years, and renewal of the Mutual Defence Agreement will be an important step in allowing the two nations to co-operate in delivering these programmes.

⁴ 'Anglo-American Mutual Defence Agreement. Orders of the Day - Consolidated Fund Bill'. Commons debate, 15 December 1994: <http://www.theyworkforyou.com/debates/?id=1994-12-15a.1222.0> Accessed 20 May 2014.

⁵ 'US - UK Mutual Defense Agreement renewal and the NPT'. Early Day Motion 1407 tabled 24 June 2006: <http://www.parliament.uk/edm/2003-04/1407> Accessed 20 May 2014.

US - UK NUCLEAR CO-OPERATION OVER THE PERIOD 2014 - 2024

Significant new developments are planned in the nuclear weapons programmes of both the UK and the USA over the next ten year period from 2014 to 2024, and renewal of the Mutual Defence Agreement will be an important step in allowing the two nations to co-operate in delivering these programmes.

Nuclear warhead development and modernisation

The US and the UK both have ongoing life extension programmes for warheads in their arsenals and by the end of the decade will both have made decisions on whether to embark on new warhead development programmes. Technical exchanges under the terms of the Mutual Defence Agreement can be expected to inform these decisions and contribute to design and development of new warheads.

The USA's National Nuclear Security Administration (NNSA) last year announced the Obama administration's preferred nuclear warhead stockpile strategy. Known as the '3+2' strategy, it would see extensions to the service life of five nuclear warhead types, at least one of which would be interoperable on land and sea based ballistic missiles⁶. Work on the early stages of this strategy will take place over the next ten years of the Mutual Defence Agreement cycle.

Over the same period work on the ongoing life extension programme for the Navy's W76 submarine-launched ballistic missile (SLBM) warhead will continue and is scheduled to be completed in 2019. A life extension programme for the B61 warhead, which is intended to extend the weapon's life by 30 years and modify it for compatibility with the new Joint Strike Fighter, has recently commenced and is scheduled for completion in 2022-23.

On current timetables a new cruise missile warhead is planned to be available in 2027 and the first interoperable warhead, the IW-1, will enter service in 2030 to replace the current W78 and W88 warheads. Research and development work on these warheads will therefore be taking place in the second part of the 2014-2024 Mutual Defence Agreement cycle, if the next US administration decides to continue with the programmes.

The 3+2 strategy is seen as an ambitious programme. Its funding has been delayed and both Congress and the US Navy have expressed concern over the scope, risks, and expense of the programme. However, even if the programme does not go ahead in its current form it is almost certain that it will be replaced by a variety of alternative refurbishment programmes to extend the lives of existing warheads in the US arsenal.

The UK is currently upgrading its Trident warheads to match the Mk4A upgrade programme for the US W76 warhead⁷, to which the UK Trident warhead is generally considered to be closely related. A new arming, fuzing, and firing system is being introduced to the warhead which, with other modifications made under the programme, will increase the destructive capability of the weapon and allow it to remain in service through the 2020s. The arming, fuzing and firing system, neutron initiators, gas transfer system, and other non-nuclear components for the upgraded warhead are purchased from US suppliers⁸.

⁶ Tom Z. Collina: 'NNSA's '3+2' Nuclear Warhead Plan Does Not Add Up'. Arms Control Today, Volume 5, Issue 6. Arms Control Association 6 May 2014: <http://armscontrol.org/issuebriefs/NNSAs-3%202-Nuclear-Warhead-Plan-Does-Not-Add-Up> Accessed 20 May 2014.

⁷ 'Trident Missiles'. Parliamentary written answer by Des Browne. Official Report (Hansard), 28 March 2007, column 1524W: <http://www.publications.parliament.uk/pa/cm200607/cmhansrd/cm070328/text/70328w0002.htm#07032871000435> Accessed 20 March 2014.

⁸ 'Trident Missiles'. Parliamentary written answer by Bob Ainsworth. Official Report (Hansard), 3 December 2009, column 911W: <http://www.publications.parliament.uk/pa/cm200910/cmhansrd/cm091203/text/91203w0014.htm#09120373000543> Accessed 20 May 2014.

Ministers have announced that a replacement for the UK Trident warhead will not be required until at least the late 2030s, and so a decision on whether or not to replace or refurbish the UK Trident warhead will not be needed until the next Parliament⁹. However, studies to inform the replacement decision are currently under way, with £54.6 million spent on such work up to 30 November 2012 (the latest date for which figures have been published)¹⁰. Validation experiments using US facilities and peer review and technical advice from US experts will without doubt play an important role in these studies, with British scientists contributing on a similar basis to US warhead modernisation programmes.

Submarine reactor design and development

Although the Mutual Defence Agreement when originally signed in 1958 allowed the UK to purchase a single nuclear submarine propulsion plant and fuel from the USA, the US Navy for many years refused to allow further co-operation with the UK on submarine reactor technology¹¹. This was intended to force the British to develop their own reactor production capability and expertise, rather than show dependence on highly advanced, classified American technology. Over recent years it has been acknowledged that the UK has indeed developed such a capability, and that there is value to both parties in exchanging technical information on nuclear propulsion plants for submarines. Such exchanges now take place regularly under Mutual Defence Agreement arrangements.

In the USA, the US Navy is currently planning to replace its Ohio class Trident missile submarines with a new replacement submarine, currently known as SSBNX. Twelve submarines are planned to be built, with the first scheduled to be purchased in 2021 and enter into service in 2031. Early phase design work for the SSBNX, including development of a new-design nuclear propulsion system for the submarine, has now commenced and the bulk of the design work will take place during the 2014-24 Mutual Defence Agreement cycle¹².

The US authorities will doubtless learn valuable lessons from experience with the design, procurement, and construction of the UK's Successor submarine.

In the UK work is well under way on design of the 'Successor' submarine which will replace the Vanguard class submarines which carry Trident missiles, and a 'Main Gate' decision on whether to proceed with construction of new submarines will be made in 2016. The new submarine will be powered by the US-designed PWR3 third generation pressurised water reactor which drives the US Ohio class Trident submarines currently in service. Modelling and design work on the reactor is well under way in the UK as part of the Successor programme, and the first PWR is intended to have been built by Rolls-Royce by 2023¹³. Technical exchanges will take place between engineers at Rolls-Royce and their colleagues in the USA during the reactor design and construction period, alongside broader co-operation over other elements of submarine design. As the British Successor programme leads the American SSBNX programme by a few years, the US authorities will doubtless learn valuable lessons from experience with the design, procurement, and construction of the Successor submarine¹⁴.

9 'Securing Britain in an Age of Uncertainty: The Strategic Defence and Security Review'. Cm 7948. Cabinet Office, October 2010. Paragraph 3.12, page 39: http://www.direct.gov.uk/prod_consum_dg/groups/dg_digitalassets/@dg/@en/documents/digitalasset/dg_191634.pdf Accessed 20 May 2014.

10 'Trident'. Parliamentary written answer by Philip Dunne. Official Report (Hansard), 14 January 2014, Column 601W: <http://www.publications.parliament.uk/pa/cm201213/cmhansrd/cm130114/text/130114w0006.htm#1301159002590> Accessed 20 May 2014.

11 Steve Ludlam: 'The Role of Nuclear Submarine Propulsion'. In 'U.S. - UK Nuclear Co-operation After 50 Years' Ed. Jenifer Mackby and Paul Cornish, p179. Centre for Strategic and International Studies, 2008.

12 Tom Z. Collina: 'U.S. Nuclear Modernization Programs'. Arms Control Association factsheet, January 2014: <http://www.armscontrol.org/factsheets/USNuclearModernization> Accessed 20 May 2014.

13 'Nuclear submarines' Parliamentary written answer by Peter Luff. Official Report (Hansard), 2 July 2012, Column 470W: <http://www.publications.parliament.uk/pa/cm201213/cmhansrd/cm120702/text/120702w0003.htm#12070253000285> Accessed 20 May 2014.

14 Rear Admiral Andrew Mathews: 'Showing the US the way?' Defence Equipment and Support presentation, 17 January 2008.

Special nuclear materials

Arrangements for the transfer of special nuclear materials between the USA and the UK is one of the most secretive areas covered by the Mutual Defence Agreement and only a limited amount of information about such exchanges is available in the public domain.

Special nuclear materials comprise the fissile nuclear material that is required to manufacture nuclear weapons and fuel for the reactors which power submarines, namely plutonium, tritium, and highly enriched uranium. Historical documents placed in the National Archives reveal complex arrangements over past decades for the sale, barter, borrowing, and enrichment of special nuclear materials for military purposes between the US and the UK¹⁵. Special nuclear materials are transferred by air between US nuclear sites and the UK Atomic Weapons Establishment by RAF flights between Dover Air Force Base, Delaware, and RAF Brize Norton in Oxfordshire¹⁶.

Weapons grade plutonium is needed to construct the fissile pit of a nuclear weapon. The UK produced large quantities of plutonium at the Calder Hall nuclear reactor and civil nuclear reactors in the 1950s and 1960s and over the period 1960 - 1979 plutonium was bartered with the USA in exchange for tritium and highly enriched uranium¹⁷. In 1979 it was agreed in principle that the UK could borrow around half a tonne of plutonium from the USA for the Trident warhead programme, and it is likely that this material was borrowed in the early 1980s and the same quantity returned several years later. Both the UK and the USA have reduced their nuclear arsenals and dismantled warheads over recent years and thus have a surplus of plutonium in their respective inventories. It is therefore unlikely that plutonium exchanges will take place during the next ten year Mutual Defence Agreement cycle for the purposes of warhead manufacturing, although there is a possibility that small quantities of plutonium-242 may be exchanged for research purposes¹⁸.

“However friendly we are with the Americans, continued reliance on them for HEU fuel makes us dependent in a key area and could narrow our defence options if difficulties arose”

**- Francis Pym,
Defence Secretary 1979**

Tritium is a radioactive hydrogen isotope used to ‘boost’ the explosive yield of a nuclear weapon. Tritium was produced in the UK until 2004 at the Chapelcross nuclear power plant, which has now closed. As the isotope has a short half-life of 12.3 years tritium in nuclear weapons regularly needs to be replenished. The UK has no indigenous means of producing tritium and will therefore probably need to obtain a quantity from the USA over the next ten year cycle of the Mutual Defence Agreement.

Highly enriched uranium is a component of the ‘secondary’ assembly of a modern nuclear fusion warhead, but, more significantly, is also the fuel burnt in the reactors which drive nuclear powered submarines. Over the period 2014-2024 the UK intends to construct four new Astute class attack submarines and, if Parliament gives the go-ahead to continue with the Trident replacement programme, construction work will also have commenced on at least one, and probably two of the new ‘Successor’ submarines intended to replace the current Vanguard class submarines. Highly enriched uranium fuel will be required for the reactors of each of these submarines.

¹⁵ John Ainslie: ‘Special Nuclear Materials for the UK Trident Programme’. Scottish CND, April 2010: <http://www.banthebomb.org/ne/images/stories/pdfs/tridentsnm.pdf> Accessed 20 May 2014.

¹⁶ ‘Special Nuclear Material flights between the UK and US’. Campaign for Nuclear Disarmament briefing: <http://www.cnduk.org/trident-briefings/102-special-nuclear-material-flights-between-the-uk-and-us> Accessed 20 May 2014.

¹⁷ ‘Plutonium and Aldermaston: An Historical Account’. Ministry of Defence, 2000. Paragraph 24: <http://www.fas.org/news/uk/000414-uk2.htm> Accessed 20 May 2014.

¹⁸ For an account of the role of plutonium 242 in warhead research see ‘Los Alamos to use PU-242 in Explosives Tests at DARHT’. Nuclear Weapons & Materials Monitor, Los Alamos Study Group. 1 February 1999: <http://www.lasg.org/technical/article-pu242.htm> Accessed 20 May 2014.

The UK does not have the capability to enrich uranium to the degree needed for use as fuel in the Royal Navy's PWR reactor design, so enrichment will be required in the USA. Under an amendment to the Mutual Defence Agreement which was agreed in 1984, the US is able to enrich uranium on behalf of the UK. It is likely that the US has supplied highly enriched uranium to the UK under a toll-enrichment contract in exchange for a similar quantity of uranium 235 in the form of low enriched uranium for many years, and this practice will continue over the next ten year Mutual Defence Agreement cycle.

Supply of highly enriched uranium to the UK has been a particularly sensitive issue under the terms of the Mutual Defence Agreement. In a top secret memorandum to Prime Minister Margaret Thatcher in 1979, Defence Secretary Francis Pym conceded that "however friendly we are with the Americans, continued reliance on them for HEU fuel makes us dependent in a key area and could narrow our defence options if difficulties arose"¹⁹. American concerns that provision of enrichment services represented a hidden subsidy to the UK's commercial uranium enrichment operations, and Administration and Congressional insistence that the agreement for the supply of special nuclear materials to the UK must be limited to a fixed term made it "uncomfortable" for the UK to be relying on such arrangements. These concerns probably remain to this day, especially in the light of the Obama Administration's arms control aims and commitment to prevent nuclear proliferation.

Nuclear infrastructure

Both the USA and the UK are modernising their nuclear warhead research and production infrastructure so that they will be able to develop, manufacture, and maintain nuclear weapons over the coming decades. In the UK, a £1 billion per annum investment programme known as the Nuclear Weapons Capability Sustainment Programme²⁰ commenced in 2005 and is scheduled to end in the early 2020s with the aim of developing infrastructure at the Atomic Weapons Establishment (AWE) to ensure that the Establishment continues to have the capacity to support the UK's nuclear weapons programme and, if asked by a future government, design and build a new nuclear warhead. Centrepieces of the programme are a new warhead assembly / disassembly facility currently under construction at the AWE Burghfield site (Project Mensa) and a new enriched uranium processing facility at AWE Aldermaston (Project Pegasus), together with a number of smaller construction projects and re-kit programmes for existing facilities²¹.

In the USA the National Nuclear Security Administration (NNSA) is embarking on the 'Complex 2030' programme to transform the nation's ageing nuclear weapons production complex into a modern, smaller, and more secure group of facilities²². As part of the programme a new Uranium Processing Facility will be constructed at the Y-12 plant at Oak Ridge, Tennessee. The programme will also include measures to improve the US warhead complex's plutonium handling capabilities, although concern over costs has led to questions over plans to construct a new Chemistry and Metallurgy Research Replacement Facility (CMRR) at the Los Alamos National Laboratory which had been intended to secure this function.

The two nations are collaborating over their nuclear infrastructure modernisation programmes through Mutual Defence Agreement arrangements. Documents released under the Freedom of Information Act reveal that a "collaborative programme" is under way between AWE and Y-12 to jointly review the AWE enriched uranium project and the Y-12 Uranium Processing Facility and share

19 Memorandum to the Prime Minister: 'Supplies of highly enriched uranium (HEU)'. 3 July 1979. The National Archives, PREM19/685.

20 'Trident'. Parliamentary written answer by Philip Dunne. Official Report (Hansard), 28 November 2012, column 353W. Available online at http://www.publications.parliament.uk/pa/cm201213/cmhansrd/cm121128/text/121128w0001.htm#121128w0001.htm_wqn47 Accessed 20 May 2014.

21 'AWE'. Parliamentary written answer by Peter Luff. Official Report (Hansard), 22 November 2011, column 272W. Available online at <http://www.publications.parliament.uk/pa/cm201011/cmhansrd/cm111122/text/111122w0002.htm#11112214002932> Accessed 20 May 2014.

22 Press release, National Nuclear Security Administration, 2 February 2007.

<http://nnsa.energy.gov/mediaroom/pressreleases/nnsa-releases-report-plans-future-nuclear-weapons-complex> Accessed 20 May 2014.

information on design, process development and machining, and security and safety arrangements. Co-operation has taken the form of exchange visits and tours, peer review, and personnel exchange, with exchanges governed by a memorandum of understanding drawn up between Y-12 and AWE²³.

Following a £272 million re-kit project for the A90 plutonium components manufacturing facility at AWE Aldermaston, senior UK technical representatives undertook a joint review of the Technical Area 55 Reinvestment Project at the Los Alamos National Laboratory (which is similar in scope to the A90 re-kit project) to allow US colleagues to learn from the UK experience and make improvements in project management arrangements²⁴.

Co-operation between the USA and UK on upgrading nuclear warhead production infrastructure is likely to continue for at least the first five years of the 2014 - 2024 Mutual Defence Agreement cycle. Each partner will retain a watching brief on developments on the other side of the Atlantic, and aim to share good practice and learn lessons from parallel development programmes.

Stockpile stewardship

Both the USA and the UK undertake stockpile stewardship programmes to deliver research considered necessary to manage their existing nuclear arsenals and ensure that their nuclear weapons remain safe and secure and will detonate reliably with the destructive power that they have been designed to generate. Stockpile stewardship experiments also allow increased understanding of nuclear warhead science, assist in detecting potential problems as warheads age, and provide information needed to refurbish and remanufacture weapons and components. These experiments have increased in significance since 1992, when a moratorium on nuclear testing was imposed in the USA. Although stockpile stewardship is usually presented as being about the maintenance of existing warhead types, in practice much of the information gained from stockpile stewardship experiments will also be of value in the design of new warhead types.

Both the UK and the USA maintain sophisticated scientific facilities to enable them to conduct stockpile stewardship experiments. These include high energy lasers, hydrodynamics test facilities, and pulsed power resources. Some of these are complementary in nature, such as the National Ignition Facility superlaser at the Lawrence Livermore National Laboratory in the USA and AWE's Orion laser in the UK. The US and UK facilities were designed to complement each other by accessing "different parts of the temperature and pressure space relevant to the operation of nuclear warheads," and are intended to "allow experiments designed for one laser to be investigated further on a second laser".²⁵

Hydrodynamics facilities at AWE are reported to have been used to conduct "very valuable" research work in support of the Bush administration's Reliable Replacement Warhead programme

Until recently UK hydrodynamics research facilities and AWE's superior expertise have served to give the UK an advantage in this area of science. This is probably no longer the case, as in 2009 experiments commenced at the Dual Axis Radiographic Hydrodynamic Test (DARHT) facility at the Los Alamos National Laboratory, allowing US researchers the opportunity to catch up with their British colleagues. In the past US scientists have reportedly been able to bypass domestic laws

23 'Exchange reports reveal extent of US-UK co-operation on AWE's Project Pegasus'. Nuclear Information Service: <http://nuclearinfo.org/article/awe-aldermaston/exchange-reports-reveal-extent-us-uk-co-operation-awes-project-pegasus> Accessed 20 May 2014.

24 Richard Hedley, Jerry N. McKamy, and Mark Nuckols: 'Manufacturing / Production Steering Committee Meeting'. Presentation given at JOWOG 30 meeting, Kansas City Plant, 13-14 August 2012: <http://permalink.lanl.gov/object/tr?what=info:lanl-repo/lareport/LA-UR-12-2411> Accessed 20 May 2014.

25 Keith O'nions, Roy M Anderson, and Robin Pitman: 'Reflections on the Strength of the 1958 Agreement'. In Jenifer Mackby and Paul Cornish, op cit. p179

prohibiting certain types of hydrodynamic experiment involving plutonium isotopes by drawing upon the UK's ability to conduct such tests using AWE's research facilities²⁶. Hydrodynamics facilities at AWE are also reported to have been used to conduct "very valuable" research work in support of the Bush administration's now abandoned Reliable Replacement Warhead programme²⁷.

The USA has unique stockpile stewardship research facilities which have no equivalent in the UK, including the 'Z machine' at Sandia National Laboratories and a range of facilities at the Nevada National Security Site, where sub-critical nuclear test explosions can also be conducted. Although Ministers have acknowledged that UK personnel from the Ministry of Defence and AWE participate in experiments at these and other US sites, further details are considered to fall within the bounds of national security²⁸. Such experiments may be of major significance for the UK's warhead research programme: according to a Sandia National Laboratories publication dated March 2011, "the first W76-1 [UK Trident warhead modification] United Kingdom trials test was performed at WETL [Weapon Evaluation Test Laboratory], providing qualification data critical to the UK implementation of the W76-1"²⁹.

A recent study by the Royal United Services Institute concluded that "Since ratifying the Comprehensive Nuclear Test-Ban Treaty (CTBT) in 1998, the UK has been able to draw upon the US's more extensive database of nuclear test results, its facilities for hydrodynamic and subcritical tests, and the expertise of its scientists to better assure the safety, effectiveness and longevity of the UK's nuclear warheads without recourse to testing". Renewal of the Mutual Defence Agreement will be pivotal in enabling the UK to continue to reap such benefits over the next ten years³⁰.

26 Tara Callaghan: Interview with Stanley Orman. In Jenifer Mackby and Paul Cornish, op cit. p350.

27 Matthew Taylor and Richard Norton-Taylor: 'US using British atomic weapons factory for its nuclear programme'. Guardian, 9 February 2009: <http://www.guardian.co.uk/world/2009/feb/09/us-uk-atomic-weapons-nuclear-power> Accessed 20 May 2014.

28 'USA'. Parliamentary written answer from Philip Dunne. Official Report (Hansard), 28 November 2012, column 355W: http://www.publications.parliament.uk/pa/cm201213/cmhansrd/cm121128/text/121128w0001.htm#121128w0001.htm_wqn55 Accessed 20 May 2014.

29 'Labs Accomplishments'. Sandia National Laboratories, March 2011: http://www.sandia.gov/news/publications/lab_accomplishments/_assets/documents/lab_accomp-2011.pdf Accessed 20 May 2014.

30 Hugh Chalmers and Malcolm Chalmers: 'The Future of the UK's Co-operative Nuclear Relationships', p3. Royal United Services Institute, June 2013: https://www.rusi.org/downloads/assets/201306_OP_Chalmers_and_Chalmers.pdf Accessed 20 May 2014.

HOW THE MUTUAL DEFENCE AGREEMENT WORKS

The Mutual Defence Agreement allows a series of technical exchanges to take place between the Atomic Weapons Establishment, where Britain's nuclear weapons are designed and manufactured, and laboratories and sites in the USA which are involved in the American nuclear weapons programme. The Los Alamos National Laboratory (LANL), Lawrence Livermore National Laboratory (LLNL), and Sandia National Laboratories are key institutions involved on the US side, but the Agreement encompasses relationships with a wide range of government bodies, research laboratories, and production sites.

At the senior level the Chief Scientific Advisor at the UK Ministry of Defence jointly manages Mutual Defence Agreement interactions and administrative arrangements with the Department of Energy's National Nuclear Security Administration and the Office to the Assistant to the Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs. A high level review of the programme takes place on a roughly annual basis at two-day 'Stocktake' meetings where senior personnel from government and laboratories of both nations set out a strategic roadmap and issue guidance for future collaboration. 'Second Level' meetings are held every six to nine months to review technical information, manage the day-to-day business of collaboration, and prepare material for Stocktake meetings. However, the Agreement operates at the working level mainly through regular dialogue between technical practitioners and scientists which is usually conducted through a variety of working groups and focal points dealing with specific topics which operate in different ways depending on the sensitivity of information exchanged³¹. Exchange takes place through the following routes:

- **Joint working groups (JOWOGs):** JOWOGs are forums for ongoing scientific and technical co-operation in specific topic areas, co-chaired by a representative from the USA and a representative from the UK. As of June 2012 17 JOWOGs were active³² (see Appendix 1 for list), with groups working on nuclear counter-terrorism technology, nuclear warhead physics, laboratory plasma physics, and manufacturing practices being particularly active. JOWOG 32 (nuclear warhead physics) has five sub-joint working groups (SUBWOGs) investigating particular areas of interest. JOWOGs meet periodically to agree avenues for investigation, propose division of work between participating laboratories or agencies, and review progress. Classified information is shared where it is considered to meet the objectives of both the USA and the UK and visits between laboratories or agencies can take place through a JOWOG as part of a particular project.
- **Exchange of Information by Visit Report (EIVR):** EIVRs differ from JOWOGs in that the US authorities do not generally permit continuous authorization for the exchange of information using this route. Specific authorization to exchange classified US information within the remit of an EIVR must be granted from the US Joint Atomic Information Exchange Group on a case-by-case basis. Recent EIVR topics have included non-proliferation and arms control technology, safety and security, and nuclear intelligence.
- **Channels:** A channel grants blanket approval for the exchange of specific project/program-type information which is predictable and repetitive. Channels are reserved for management executives and a few specific project-type data exchanges. Currently approved channels between the US and the UK include the US Air Force Channel, the Nuclear Threat Reduction Channel, and the Trident Warhead Project Group Channel.

31 'The Nuclear Matters Handbook'. Office of the Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs. Chapter 8: http://www.acq.osd.mil/ncbdp/nm/nm_book_5_11/index.htm Accessed 20 May 2014.

32 'USA: Military Alliances'. Parliamentary written answer from Peter Luff. Official Report (Hansard), 18 June 2012, column 656W: http://www.publications.parliament.uk/pa/cm201213/cmhansrd/cm120618/text/120618w0002.htm#120618w0002.htm_wqn2 Accessed 20 May 2014.

- **Enhanced collaborations:** The exchange of letters in December 2006 between Prime Minister Tony Blair and President George W. Bush³³ relating to the UK's Trident replacement programme opened the possibility of enhanced collaboration on nuclear weapon programmes. Enhanced collaboration initiatives have a more specific focus than exchanges undertaken through JOWOGs, and are intended to result in concrete deliverables. Little has been published to date on enhanced collaborations, although programmes were under way in 12 areas as of June 2012³⁴. These relate principally to nuclear weapons physics but also include development of a next generation fuze by the US Air Force, US Navy, and United Kingdom³⁵.

The importance of these working groups and exchanges should not be underestimated. More than 1,500 visits by AWE staff were made to US nuclear facilities at 48 different sites between 2007 and 2009³⁶ (see Appendix 2 for a full list). The lion's share of these visits were to the three main US nuclear weapon laboratories: Los Alamos National Laboratory, Lawrence Livermore National Laboratory, and Sandia National Laboratories. Such visits and exchanges allow scientists to share data, expertise, and equipment and review each others' work and calculations to the point where the United Kingdom has "essentially become almost like a third weapons laboratory" for the USA, according to Admiral Pete Nanos, a former Director of the Los Alamos National Laboratory and Commander of the US Navy's strategic nuclear program³⁷. The scientific appetite of the nuclear laboratories is a major driver underpinning both the Mutual Defence Agreement and broader co-operation between the USA and UK over nuclear weapons.

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33 'House of Commons Defence Committee: 'Annex 2: Exchange of Letters between the Prime Minister and the President of the United States of America' 7 December 2006. In 'House of Commons Defence Committee - Ninth Report Session 2006-7': <http://www.publications.parliament.uk/pa/cm200607/cmselect/cmdfence/225/22514.htm> Accessed 20 May 2014.

34 'USA: Military Alliances'. Parliamentary written answer from Peter Luff. Official Report (Hansard), 18 June 2012, column 656W: http://www.publications.parliament.uk/pa/cm201213/cmhansrd/cm120618/text/120618w0002.htm#120618w0002.htm_wqn2 Accessed 20 May 2014.

35 Jeffery H. Richardson: 'UK - U.S. Air Force Collaboration.' In Jenifer Mackby and Paul Cornish, op cit. p350.

36 'Nuclear Weapons'. Parliamentary written answer from Peter Luff. Official Report (Hansard), 20 January 2011, column 909W: <http://www.publications.parliament.uk/pa/cm201011/cmhansrd/cm110120/text/110120w0001.htm#11012056001705> Accessed 20 May 2014.

37 Tara Callahan: Interview with Pete Nanos. In Jenifer Mackby and Paul Cornish, op cit. p282.

LEGAL OBJECTIONS TO RENEWAL OF THE MUTUAL DEFENCE AGREEMENT

The Mutual Defence Agreement and the relationship and activities that it enables suggest that the USA and the UK share an ongoing and indefinite commitment to collaborate on nuclear weapons technology which is not compatible with their obligations as signatories to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT).

In a legal opinion released in July 2004, Rabinder Singh QC and Professor Christine Chinkin of Matrix Chambers concluded that “it is strongly arguable that the renewal of the Mutual Defence Agreement is in breach of the Nuclear Non-Proliferation Treaty”³⁸.

Article I of the NPT does not allow the transfer of nuclear weapons between states, and does not allow nuclear-weapon states to “in any way assist, encourage, or induce” any non-nuclear-weapon state to acquire nuclear weapons. Both the USA and the UK were nuclear-weapon states at the time the NPT was signed and so academic lawyers have argued that “this leaves open the possibility that nuclear-weapon states could “assist” each other in ways that do not amount to transfer, again leading commentators to suggest that article 1 is not breached by the Mutual Defence Agreement”³⁹.

However, Article VI of the NPT obliges signatories 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 control.”⁴⁰ At the NPT Review Conference which took place in 2000 nuclear-weapon states party to the treaty gave an “unequivocal undertaking” to accomplish the total elimination of their nuclear arsenals. Singh and Chinkin argued that the importance of Article VI in the NPT is demonstrated by the negotiation history of the NPT, the reaffirmation at the Review Conference in 2000, and also by the Advisory Opinion on the legality of the threat or use of nuclear weapons given by the International Court of Justice in 1996 which stated 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 control”⁴¹.

“It is strongly arguable that the renewal of the Mutual Defence Agreement is in breach of the Nuclear Non-Proliferation Treaty”

- Rabinder Singh QC and Professor Christine Chinkin

They reasoned that “assertions about the importance of renewal of the Mutual Defence Agreement are not in conformity with the obligations of Article VI and the commitments made in the 2000 Review Conference” as clauses in the Mutual Defence Agreement directed towards ‘improving the UK’s state of training and operational readiness’ (article 3 (1) (2)) and ‘improving the UK’s atomic weapon design, development or fabrication capability’ (article 3 (3) *bis*) both imply “continuation and indeed enhancement of the nuclear programme, not progress towards its discontinuation”.

Singh and Chinkin did not consider whether renewal of the Mutual Defence Agreement is compatible with the UK’s obligations under the Comprehensive Nuclear-Test-Ban Treaty (CTBT), but there

38 ‘Mutual Defence Agreement and the Non-Proliferation Treaty. Joint Advice’. Rabinder Singh QC and Professor Christine Chinkin. Matrix Chambers, July 20, 2004. Available online at: <http://www.acronym.org.uk/dd/dd78/78news02.htm> Accessed 20 May 2014.

39 M. Willrich, ‘The Treaty on Non-proliferation of Nuclear Weapons: Nuclear Technology Confronts World Politics’. 77 Yale Law Journal (1968) 1447, 1477. Cited in Singh and Chinkin, op cit.

40 ‘Treaty on the Non-Proliferation of Nuclear Weapons (NPT)’: <http://www.un.org/disarmament/WMD/Nuclear/NPTtext.shtml> Accessed 20 May 2014.

41 ‘Legality of the Threat or Use of Nuclear Weapons. Summary of the Advisory Opinion of 8 July 1996’. International Court of Justice: <http://www.icj-cij.org/docket/files/95/7497.pdf> Accessed 20 May 2014.

are grounds for considering that it is not. The CTBT has not yet entered into force, and has not yet been ratified by the USA, but it has been ratified by the UK and is thus binding upon the UK government.

The Preamble to the CTBT recognises the disarmament value of “constraining the development and qualitative improvement of nuclear weapons and ending the development of advanced types of nuclear weapons”⁴². The Final Document agreed at the 2010 NPT Review Conference reaffirms this and calls for “all States to refrain from any action which would defeat the object and purpose of the Comprehensive Nuclear-Test-Ban Treaty pending its entry into force”⁴³. It is difficult to see how the clause in Mutual Defence Agreement directed towards “improving the UK’s atomic weapons design, development or fabrication capability” can be consistent with the aims of the CTBT.

Since Singh and Chinkin gave their legal opinion in 2004, state parties represented at the NPT Review Conference in 2010 - including the UK and the USA - have agreed to reaffirm their commitment to Article VI of the NPT and have established an Action Plan committing to take steps towards nuclear disarmament. If anything, the case that the Mutual Defence Agreement breaches the NPT has increased since the 2004 legal opinion was given.

42 ‘Comprehensive Nuclear-Test-Ban Treaty’. http://www.ctbto.org/fileadmin/content/treaty/treaty_text.pdf Accessed 20 May 2014.

43 ‘2010 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons. Final Document.’ Para 83: <http://www.reachingcriticalwill.org/images/documents/Disarmament-fora/npt/revcon2010/FinalDocument.pdf> Accessed 20 May 2014.

CONCLUSIONS

Advocates of the Mutual Defence Agreement often give the impression that the Agreement is a benign, neutral example of co-operation between two allies which helps guarantee security in a dangerous world⁴⁴. However, the Agreement enables deep co-operation between the USA and UK across the full range of their nuclear weapons programmes. This co-operation assists both nations in modernising and improving their existing nuclear weapons and developing new nuclear weapon systems. It serves to boost the proliferation of nuclear arms - not just by directly allowing the US and UK to advance their own nuclear capabilities, but also by undermining the norms which underpin the international treaties designed to control the spread of nuclear weapons.

The Mutual Defence Agreement is also an enemy of accountability in nuclear weapons programmes. Most of its activities are cloaked in secrecy, and lawmakers have only the most limited of opportunities to review and scrutinise work conducted under the terms of the Agreement. It is impossible for them to know whether research on nuclear warhead science currently being conducted under the auspices of the Mutual Defence Agreement is pre-empting the decision to be made by a future Parliament on whether to develop a new UK warhead to replace the current UK Trident warhead.

The Mutual Defence Agreement has allowed the nuclear weapons programmes of the two nations to become integrated in many respects, but the relationship is not a partnership of equals. The UK obtains special nuclear materials, warhead components, test facilities, and technical expertise from the US to an extent which it cannot reciprocate. The UK relies on unique US facilities and capabilities for support to the extent that its nuclear weapons programme cannot be regarded as technically independent from the USA. The UK will not be able to bring a replacement for its current Trident nuclear weapons system into service without assistance from the USA.

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As a junior partner, the UK benefits from a cheaper and more advanced weapons programme than it could otherwise support, but it must have something to 'trade' with the USA in return for this. In part, this is provided by the peer review arrangements the Mutual Defence Agreement provides and the opportunity that USA has to learn from experience with projects where the UK's schedule is running ahead of a similar US initiative. What appears to be more important to the USA is the political cover provided by having an ally willing to adopt similar policies and share criticism in the international arena from the large majority of nations which are opposed to nuclear weapons. In the words of Frank Miller, a Special Assistant to President George W. Bush and Senior Director for Defense Policy and Arms Control on the National Security Council staff who is credited with having done much to develop the role of the Mutual Defence Agreement, "It's enormously helpful when operating in the world of government to have a friend."⁴⁵

Co-operation under the terms of the Mutual Defence Agreement appears to be expanding, with increased sharing of information and development of new channels for collaboration. According to Glen Mara, Principal Associate Director for Weapons Programs at Los Alamos Laboratory, "There has generally been an increasing slope through all the international agreements to enhance and expand collaboration ... as we approach this 50th anniversary and discuss enhanced collaboration

⁴⁴ See, for example, Gerald Howarth: '2011/07/26 - 1958 UK/US Mutual Defence Agreement Stocktake. Speech delivered by Minister for International Security Strategy at 1 Carlton Gardens, London on Tuesday 26 July 2011.': <https://www.gov.uk/government/speeches/2011-07-26-1958-uk-us-mutual-defence-agreement-stocktake> Accessed 20 May 2014.

⁴⁵ Jessica Yeats: Interview with Franklin C. Miller. In Jenifer Mackby and Paul Cornish, op cit. p302.

I think it is just going to accelerate.”⁴⁶ A key issue is the exchange of experimental data between the US and the UK and, according to Mara, “there are attempts now to speed up the process.” As work conducted under the terms of the Agreement expands, so too should measures to allow elected representatives to control and oversee such work.

⁴⁶ Interview with Glen Mara. Project on Nuclear Issues, Center for Strategic International Studies, 2008: <http://csis.org/program/us-uk-nuclear-cooperation-after-50-years> Accessed 20 May 2014.

RECOMMENDATIONS

In the UK arrangements for making the Mutual Defence Agreement accountable to Parliament and the public are minimal, and they are scarcely much better in the USA. Action is needed to bring the Mutual Defence Agreement within the accountability and transparency mechanisms which are at the heart of good governance – and which have been highlighted as being necessary to create the climate of confidence necessary to allow nuclear disarmament⁴⁷. To this effect we make the following recommendations.

1. The Mutual Defence Agreement needs reform to ensure that it is fit for purpose to meet the security challenges which the next decade is likely to pose and unambiguously supports non-proliferation goals. Development of new nuclear weapons – the rationale for the Mutual Defence Agreement during the Cold War – has been replaced as a priority on the global security agenda by the need to counter nuclear proliferation and nuclear terrorism over the past decade. Over the next decade pressure for nuclear disarmament is likely to increase dramatically as a result of the ‘humanitarian initiative’ to recognise the impacts of nuclear weapons⁴⁸ and pressure from non-nuclear weapon states, civil society, and the Secretary General of the United Nations to agree an international treaty which would ban the use of nuclear weapons⁴⁹. Work should begin now towards the long term aim of reforming the Mutual Defence Agreement so that it is seen to reinforce the NPT, rather than undermine it, by increasing US - UK co-operation on disarmament verification, confidence building measures, and decommissioning instead of collaboration on the development of new nuclear weapons.

2. The Mutual Defence Agreement should be extended for an interim period of just five years, until December 2019, rather than the customary ten years. Over the next five years key decisions affecting the UK’s nuclear weapons programme will be made. Following the 2015 general election Parliament will take the ‘main gate’ vote on how or whether to proceed with the Trident replacement programme, and later in the life of the Parliament a decision will be taken on whether or not to develop a new successor warhead to the existing UK Trident warhead. An interim five year extension to the Mutual Defence Agreement would not pre-empt these decisions in the same way that a formal ten year commitment would, and would help provide reassurance that work on development of a new warhead is not proceeding in secret without a clear mandate from Parliament.

In the UK arrangements for making the Mutual Defence Agreement accountable to Parliament and the public are minimal

3. The government should publish a legal opinion to show how it considers the Mutual Defence Agreement can be extended without breaching the NPT. Lawyers outside government have presented a plausible case arguing that renewal of the Mutual Defence Agreement would breach the NPT. By publishing its own assessment the government would demonstrate that it takes its NPT obligations seriously and has been careful to confirm that there is no conflict between the NPT, CTBT, and other international legal instruments relating to nuclear weapons.

4. There should be a Parliamentary debate on renewal of the Mutual Defence Agreement in government time. Both nuclear weapons and Britain’s relationship with the USA are controversial issues and the Mutual Defence Agreement raises important issues about the independence of

⁴⁷ See, for example, paragraph 94 of the Final Document for the 2010 Review Conference of the Parties to the Treaty on Non-Proliferation of Nuclear Weapons: <http://www.reachingcriticalwill.org/images/documents/Disarmament-fora/hpt/revcon2010/FinalDocument.pdf> Accessed 20 May 2014.

⁴⁸ ‘Humanitarian impact of nuclear weapons’. Reaching Critical Will website: <http://www.reachingcriticalwill.org/disarmament-fora/others/hinw/> Accessed 20 May 2014.

⁴⁹ ‘Proposed Nuclear Weapons Convention (NWC). Nuclear Threat Initiative website: <http://www.nti.org/treaties-and-regimes/proposed-nuclear-weapons-convention-nwc/> Accessed 20 May 2014.

nuclear weapons. It is reasonable to allow elected representatives an opportunity to debate these issues, as well as being in the interests of openness and transparency.

5. The amended Agreement, together with appendices, should be published when it has been signed by both governments. Parliament and Congress need to know what has been agreed by their governments if there is to be meaningful debate on renewal of the treaty. Sensitive information in appendices to the Mutual Defence Agreement (for example, prices, quantities and composition of special nuclear materials) should be redacted applying exemptions specified in Freedom of Information legislation.

6. The US and UK governments should produce an unclassified joint annual report to Parliament and Congress on activities undertaken under the auspices of the Mutual Defence Agreement and the Polaris Sales Agreement to assist in oversight and scrutiny of such activities. The report should include both narrative and quantitative information, including, for example:

- A list of programmes within which co-operation has taken place.
- Numbers of joint experiments conducted at major scientific facilities in each nation.
- Numbers of exchange visits which have taken place, institutions visited, and expenditure on exchange visits.
- A list of working group meetings which have taken place over the year.
- The agenda and a summary of proceedings at the annual Stocktake meeting.

All of this information could be released without harming the security of either nation. Disclosure of such information would be consistent with commitments given in the Action Plan agreed at the 2010 NPT for increased transparency in nuclear weapons programmes, and would help in quelling suspicions that work undertaken under the authority of the Mutual Defence Agreement and Polaris Sales Agreement is flaunting the NPT and CTBT.

Work should begin now towards the long term aim of reforming the Mutual Defence Agreement so that it is seen to reinforce the NPT, rather than undermine it

APPENDIX 1

List of currently active US - UK Mutual Defence Agreement Joint Working Groups (JOWOGs)

| 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 |
| 28 | 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 |
| 44 | Methodologies for nuclear weapon safety assurance |

APPENDIX 2

US Establishments visited by AWE personnel under the terms of the US-UK Mutual Defence Agreement, 2007-2009.⁵⁰

- US Department of Defence, Pentagon
- Los Alamos National Laboratory
- National Nuclear Security Agency (NNSA) HQ Washington DC
- Sandia National Laboratory, New Mexico
- Sandia National Laboratory, California
- Lawrence Livermore National Laboratory
- Honeywell Kansas City Plant
- Nevada Test Site
- Y12 Plant Oak Ridge
- ITT Crystal City
- BAE Washington DC
- Defence Threat Reduction Agency Washington
- NNSA Nevada Operations Office
- B&W Pantex Plant
- Lockheed Martin Missiles and Space Sunnyvale
- Strategic Systems Programme US Navy
- Strategic Weapons Facility Atlantic
- Savannah River National Laboratory
- Defence Intelligence Agency
- Southern Research Institute
- Remote Sensing Laboratory Nevada
- Nevada Intelligence Centre
- Naval Surface Warfare Centre
- Pax River Naval Air Systems Command
- Oak Ridge National Laboratory
- Naval Research Laboratory
- DTI Associates
- Fort Bragg
- Systems Planning and Analysis
- Air Force Technical Applications Centre Patrick Air Force Base
- Pacific Northwest National Laboratory
- Kirtland Air Force Base
- Miramar Air Station
- Federal Bureau of Investigation Quantico
- National Security Agency Fort George
- Cape Canaveral Air Force Station
- Wright Patterson Air Force Base
- Tonopah Test Range
- NNSA Service Centre Albuquerque
- Applied Physical Laboratory
- Northrop Grumman
- Lockheed Martin Missile and Space Company Cocoa Beach
- Idaho National Laboratory
- Strategic Weapons Facility Pacific
- Defence Threat Reduction Agency Albuquerque
- Applied Research Associates
- Central Intelligence Agency
- Savannah River Site

50 'Nuclear Weapons'. Parliamentary written answer from Peter Luff. Official Report (Hansard), 20 January 2011, column 909W:
<http://www.publications.parliament.uk/pa/cm201011/cmhansrd/cm110120/text/110120w0001.htm#11012056001705>
Accessed 20 May 2014.

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