



US-UK Mutual Defence Agreement

**A Nuclear Information Service
Briefing**

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Nuclear Information Service
July 2024

Nuclear Information Service (NIS) is an independent, not-for-profit research organisation, founded in 2000. We investigate the UK nuclear weapons programme and publish accurate and reliable information to stimulate informed debate on disarmament and related issues.

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Introduction

This briefing gives an overview of 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 Cooperation on the Uses of Atomic Energy for Mutual Defense Purposes*, commonly known as the Mutual Defence Agreement (MDA).

The MDA is the treaty that governs the relationship between the nuclear weapons programmes of the United Kingdom (UK) and United States (US), which is unique amongst nuclear armed states for the level of dependency and technical integration involved.

The treaty allows for the exchange of information about nuclear technologies between the two states, and for the US to provide the UK with nuclear materials, such as uranium and plutonium, components of nuclear weapons, and submarine reactor technology. Staff from the nuclear enterprises in both countries coordinate activities through Joint Working Groups and are sometimes seconded to work in the other country for some time. Until 1992, cooperation under the MDA included use of each others' sites for nuclear testing, particularly the UK testing nuclear weapons in Nevada.

The UK currently operates a submarine-launched nuclear weapons system. The reactors that power the UK's four nuclear-armed submarines, and other submarine technologies on board, are based on US designs. The UK's warheads are believed to be very close in design to weapons in the US stockpile. US designed and manufactured Trident missiles carry the UK's warheads. The UK's use of the Trident system is governed by an updated version of the Polaris Sales Agreement, which is a separate treaty from the MDA.

In 2014 David Lidington, a UK Foreign Office Minister, said the treaty 'helps to provide the maintenance and servicing required to ensure the safety, security and reliability' of the UK's nuclear weapons 'at a substantial reduction on the costs that would otherwise be incurred'. Sharing of nuclear material and other components under the MDA is due to be extended for 10 years before the end of 2024.

CREDIT: POA(PHOT) JULIAN MERRILL/OGL



HMS Victorious, one of the UK's nuclear-armed submarines, alongside at Faslane in 2007.

History of the MDA²

The UK and US worked together on the Manhattan Project, which produced the first nuclear weapons. The basis for nuclear cooperation during the Second World War was the 1943 Quebec Agreements and the 1944 Hyde Park aide memoire. Both were executive agreements between Churchill and Roosevelt, rather than treaties, and were not subject to Congressional approval.

After the use of nuclear weapons in Hiroshima and Nagasaki, the US Congress, which was not aware of the extent of UK involvement in the Manhattan Project, passed the 1946 McMahon Act. The act prevented US citizens from sharing information about nuclear weapons with foreign nationals, immediately curtailing cooperation with the UK.³

Due to differing interpretations of the Act amongst US government agencies some collaboration on intelligence sharing and uranium supply continued to take place. As the Cold War began to take hold, US nuclear bombers were also deployed in the UK, and the practicalities of military cooperation would in time place a strain on the strict conditions of the McMahon Act.

The UK had responded to the Act by deciding to develop its own nuclear weapons. The US, at the time still the only nuclear-armed state, made a proposal in 1948 for a resumed integrated nuclear weapons programme which would have seen the UK having custody of a stockpile of 20 nuclear bombs. A similar proposal was floated in 1953, following the UK's first nuclear test in 1952, but the two states did not come to an agreement. The UK was the third state to develop its own nuclear weapons, the Soviet Union having carried out a nuclear test in 1949.

In 1954 the McMahon Act was replaced with the Atomic Energy Act, a compromise which allowed exchanges of knowledge for civil nuclear purposes and allowed some basic information about the yields and military characteristics of US nuclear weapons to be shared with NATO states. This would allow these states, including the UK, to field delivery systems for the weapons. A new UK-US agreement in 1955, brokered under the new regime, covered the supply of

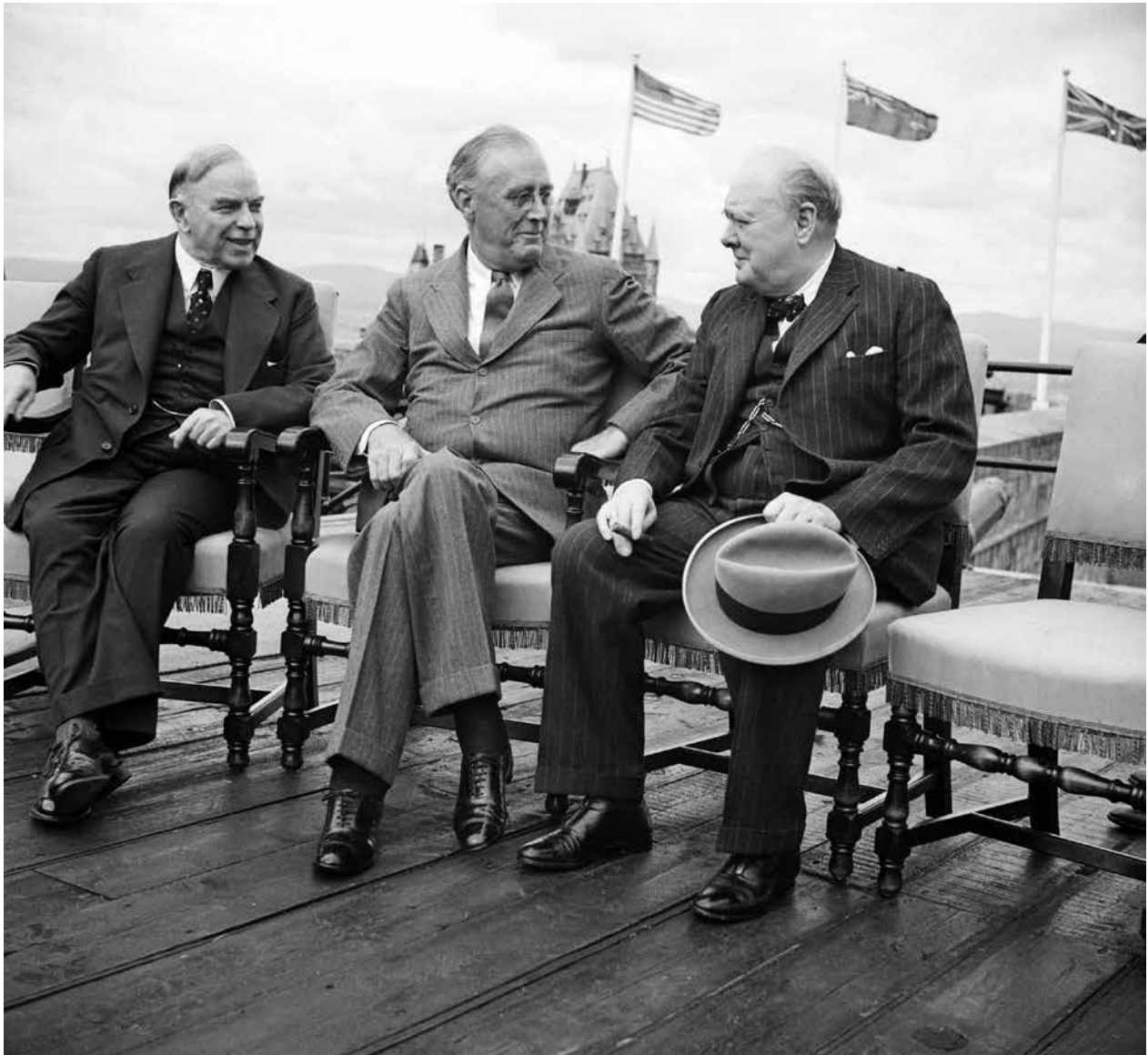
uranium 235 for civil use, more intelligence sharing and joint nuclear war planning. Uranium 235 is the highly radioactive isotope used in reactor fuel and nuclear weapons. An agreement on the UK being supplied with nuclear submarine technology followed in 1956.

The UK's production capacity for aircraft capable of carrying nuclear weapons soon outstripped the speed at which it could produce nuclear material for the weapons themselves. Informal discussions began in 1957 on the US providing highly enriched uranium (HEU) to allow the UK to increase its stockpile faster, although the transfers were not permitted under the 1954 Act.

The UK's nuclear weapons at this time were all fission designs, utilising the destructive power of a critical mass of fissile material, compressed using explosives. Modern US and UK weapon designs are thermonuclear weapons where the energy from a fission weapon, made of uranium 235 or plutonium, is used as a 'primary' to implode a 'secondary': a fuel which undergoes nuclear fusion, releasing an even greater destructive power.

The UK producing its own independent thermonuclear weapons is often portrayed as the trigger for the US deciding that it was willing to resume nuclear cooperation,⁴ but this is not the case. The UK carried out tests on thermonuclear weapons in May and June 1957, but the tests were not successful. At the time the US was publicly calling for an international ban on both nuclear testing and the further production of nuclear weapons, in response to domestic and international protests against atmospheric testing. The UK was keen to produce a working thermonuclear design before this happened. After the thermonuclear tests failed the UK told the US it would only support the proposed ban if it had independent access to a stockpile of modern weapon designs.

The launch of the Sputnik satellite in October 1957 changed the political environment, as it demonstrated that Soviet rocket technology could theoretically launch a nuclear weapon as far as the continental



CREDIT: IMPERIAL WAR MUSEUM

Canadian Prime Minister Mackenzie King, President Franklin D Roosevelt and Winston Churchill during the Quebec Conference, 18 August 1943. Canada hosted the conference but was not party to the Quebec Agreement.

US. A US-UK leaders' summit was quickly arranged, which resulted in the US National Security Council approving a full exchange of information and a commitment from the US to amend the 1954 Act. While discussions were ongoing about the shape of future cooperation, the UK carried out a successful test of a thermonuclear design in November 1957.

The MDA reflected the priorities of both states, but it more closely resembles the form envisaged by the US at the beginning of negotiations. Congressional hearings on amending the 1954 Act began in early 1958, but controversies around an exchange of plutonium and HEU, and a proposal for nuclear warheads under joint US-UK control, meant that these measures

were set aside to allow matters to progress. President Eisenhower eventually signed an updated Atomic Energy Act in July 1958 and the MDA was signed the following day.

The treaty has been repeatedly amended, often to extend the time period for sharing nuclear material and non-nuclear components, but there have been several amendments that demonstrate that it is a living document, regularly updated to reflect the realities of the working relationship. Regular 'stocktake' meetings are held to discuss and plan the functioning of the treaty.⁵

The Treaty

The initial form of the treaty allowed for the sharing of intelligence and sale of a submarine reactor and fuel to the UK, covered in *Article II* and *Article III* of the treaty respectively. Despite its prominence in bilateral discussions leading up to the treaty, the transfer of complete nuclear weapons between the two states was explicitly prohibited in the treaty text. An amendment to the treaty in 1959 added *Article III bis*, which enabled the transfer of nuclear material and non-nuclear components of nuclear weapons, but initially only for a 10-year period. Most of the amendments to the treaty have extended this period, and since 1984 the extensions have been for additional periods of 10 years.

Other amendments have made more substantial changes to the treaty. In 1984, the first amendment after the US sale of the Trident missile system to the UK had been agreed, text was added enlarging the scope of information sharing under the treaty and to allow for the transfer of enriched uranium for any purpose.⁶ In 2014 the amendments added a reference to the dangers of proliferation in the preamble, and allowed for the UK to purchase more submarine reactors, reactor parts and fuel.⁷

Smaller amendments have also been made, for example in 1994 a change was made to allow the US to arrange uranium enrichment for the UK, rather than directly providing it.⁸ In 1979 a paragraph was added to stipulate that sharing under the agreement should be for defence purposes in the mutual interests of the two states,⁹ but in 2014 this paragraph was amended to state that these purposes include evaluating the capabilities of enemy states.¹⁰

An annotated copy of the key treaty sections in their current form can be found on page 16 of this briefing. The treaty is written using US English spellings, and contains some stylistic inconsistencies arising from amendments over the years. *Article IX*, which deals with intellectual property issues, and *Article X*, which brings earlier cooperation between the two states under the terms of the MDA, have not been included for reasons of space. Neither article has been substantially amended since the original treaty was signed.

Legality

A 2004 legal advice prepared by Rabinder Singh QC and Professor Christine Chinkin said it was 'strongly arguable' that the role of the MDA in the UK's ongoing nuclear weapons programme was a breach of the country's obligations under the Nuclear Non-Proliferation Treaty (NPT), under which the nuclear-armed states agreed to eliminate their nuclear weapons.¹¹

The position of the UK government, as stated in a 2014 parliamentary debate, is that the MDA does not breach the NPT because it prohibits transfer of complete nuclear weapons and only allows for the transfer of knowledge and weapon components between two nuclear-weapon states. At the time it was also stated that the UK was complying with its obligations under the NPT by reducing the numbers of its nuclear weapons.¹² However, since then government policy has changed and in 2021 a planned reduction in the UK's stockpile to 180 warheads was reversed and instead the stockpile size was increased to 260.¹³

*Facing page:
Mushroom cloud from the
US Dominic Truckee nuclear
test, 9 June 1962, Kiritimati.*



Activities under the MDA

Nuclear Testing

Although one of the drivers for the treaty was concern about a ban on nuclear testing,¹⁴ access to testing facilities was one of the UK's priorities in the original negotiations. After the 1958 moratorium on nuclear testing was breached by the USSR in 1961, the UK and US both resumed testing, with the UK carrying out tests at the Nevada Test Site (NTS), and the US carrying out most of their Dominic test series in Kiritimati (then known as 'Christmas Island'),¹⁵ which was at that time a British colonial holding.

The UK carried out 24 underground tests at the NTS between 1962 and 1991. The final test, known as 'Julin/Bristol', is believed to have been testing the lower-yield variant of the UK Trident warhead.¹⁶ The US Dominic test series involved 25 atmospheric nuclear tests at or near Kiritimati.¹⁷ Indigenous people in both Nevada¹⁸ and Kiritimati,¹⁹ and armed forces veterans,²⁰ are still dealing with the consequences of nuclear tests.

Since 1992 both states have observed a moratorium on nuclear testing and have signed the Comprehensive Nuclear Test Ban Treaty, however the US has not ratified the treaty.

Both the UK and US have active development and research programmes and are upgrading their nuclear weapons systems. This work does not involve live testing of nuclear weapons, but instead research using high energy lasers, computer simulation and sub-critical tests, which only use smaller quantities of fissile material than the amount needed to reach a critical mass. Through the MDA the UK and US research programmes are deeply intertwined and many of their research facilities have been designed to be complementary.²¹ The vast majority of countries worldwide have expressed concerns about countries upgrading their nuclear weapons.²²



CREDIT: NNSA

Craters from underground nuclear tests at Yucca Flat, in the Nevada Test site.

Figure A. Transfer of non-nuclear components under the MDA 2020–2023

Calendar year	Transfers from US to UK (single items)	Transfers from UK to US (single items)
2020	128	14
2021	271	25
2022	302	31
2023	254	38
Total	955	108

Transfer of nuclear material

The acquisition of nuclear material from the US was a major initial goal for the UK, and the purchase of HEU for submarine reactors and tritium for nuclear weapons took place soon after the treaty was signed. Subsequently, barter exchanges of nuclear material were carried out between 1960 and 1979, with the UK sending plutonium in exchange for HEU and tritium. The UK sent 0.5 tonne of plutonium to the US between 1960 and 1969 under Barter A, 4.1 tonnes between 1964 and 1969 under Barter B and 0.8 tonne between 1975 and 1979 under Barter C. In return, the UK received a total of 6.7kg of tritium and 7.5 tonnes of HEU from the US.²³

Transfers of plutonium also took place outside of these disclosed barter arrangements, with a total of 0.47 tonne being sent from AWE Aldermaston to the US and received back prior to March 1999. The timing of these plutonium ‘loans’ and in which direction the initial transfer took place has not been disclosed.²⁴

No information about plutonium transfers after March 1999 or transfers of HEU and tritium outside the three barter exchanges has been made public, and the MOD has rejected Freedom of Information Requests for information about more recent transfers. However, the 2014 amendments to the MDA and nuclear road convoy movements suggest that transfer of HEU fuel for UK submarines is ongoing. The UK and US also have a joint programme to calibrate their nuclear forensic laboratories by testing the same samples, and the transfer of nuclear material in these samples is likely also carried out under the MDA.

Transfer of non-nuclear components

There is little information in the public domain about the quantity and nature of transfers of non-nuclear components under the MDA. It is known that the Mk4A upgrade to the UK’s nuclear warhead, completed in 2023, involved changing the arming, fusing and firing system, neutron initiators and the gas transfer system, with these components being imported from the US.²⁵ The submarine reactor used in the current Astute and Vanguard nuclear submarines is a UK-specific design and may only use domestically produced parts. However, the PWR3 reactor used in the forthcoming Dreadnought submarines is based on a US design²⁶ and it is possible that some parts for these reactors are being imported under the MDA.

In response to a Freedom of Information Request by NIS the MOD stated that transfers of non-nuclear parts of nuclear weapon systems under the MDA between 2020 and 2023 had amounted to 955 individual items being transferred from the US to the UK and 108 individual items being transferred from the UK to the US.²⁷ The breakdown of these transfers by year can be found in Figure A.

Joint Working Groups and Secondment

The primary method for US-UK cooperation under the MDA is through Joint Working Groups (JOWOGs). These are thematic committees comprised of subject matter experts from the nuclear enterprises of both countries. Each JOWOG focusses on a particular research area that has been identified during stocktake meetings and meets periodically. JOWOG meetings include presentations on specific areas of research, but can also agree research priorities, review progress and determine how work should be divided between different agencies or laboratories.

Figure B shows the activity of JOWOGs since 1959. Initially 15 JOWOGs were created, but most of these have been retired as their remit was no longer deemed relevant. At least 48 JOWOGs have been created since 1959, and 15 are currently active, as of June 2024.²⁸ Some JOWOGs appear to have been retired and reactivated at a later date, but this seems to be comparatively rare. Some of the JOWOGs have subcommittees for further specialisation within the subject area. These are known as SUBWOGs.

Figure B shows the JOWOGs known to have been active at different times during the operation of the MDA. Of the original 15, only one is known to still be active: JOWOG 9, which coordinates research on 'Energetic Materials', meaning explosives. Some JOWOGs have undergone name changes over the years. The titles of two of the original 15 JOWOGs have been partially redacted. The full title of JOWOG 2 appears to have been '500 to 600-pound megaton warhead'.²⁹

Of the 15 JOWOGs currently active, the MOD refused to disclose the names of six.³⁰ As a consequence it is not clear whether the JOWOGs looking into 'Radiation Simulation and Kinetic Effects', 'Warhead Electrical Components and Technologies', 'Nuclear Counter-Terrorism Technology', 'Aircraft, Missile and Space System Hardening', and 'Methodologies for Nuclear Weapon Safety Assurance' are still active.

The title of JOWOG 47 has not been made public,³¹ and it can be surmised that at least one other new JOWOG has been created since 2009. One or more of these new groups are probably working on the planned



Warhead handling during the US W76-1 warhead upgrade, which involved many components used in the UK Mk4A upgrade.

new US W93 and UK Astrea warheads, which have been described as 'parallel' projects, and their re-entry bodies.

Aside from JOWOGs the two states also arrange Exchange of Information by Visit Report, which are one-off information exchange events and Channels, which are more often used for management coordination and the exchange of regular information.³² Between 2007 and 2009 over 2,000 visits by AWE staff were made to US nuclear facilities.³³

Secondment of staff from one state to the nuclear enterprise of the other also takes place, building up reciprocal knowledge and allowing for deployment of specific expertise. In response to a Freedom of Information request in June 2024 the Atomic Weapons Establishment (AWE) said that the numbers of its employees seconded to the US and of US employees seconded to AWE was 'very low', so disclosing the actual numbers risked identifying individuals.³⁴ In response to a parliamentary question in 2018 the government said that 43 employees of the US government and General Dynamics Electric Boat company were seconded with the Dreadnought programme and 20 UK government employees working on the Dreadnought programme were seconded to the US.³⁵

Future of the MDA

The 2014 amendment to the MDA extended the sunset clause for *Article III bis* until December 31 2024. It is expected that the two governments will agree and publish a proposed amendment that will further extend the operation of the treaty until 2034. The amendment will need to be approved by the US Congress before it can come into force. Under the 2010 Constitutional Reform and Governance Act the UK Government has to publish any treaty it plans to ratify 21 days ahead of time, and Parliament can vote to block ratification, potentially indefinitely.³⁶

Nuclear Information Service calls on the UK Parliament to properly scrutinise amendments to the MDA through select committee hearings and/or debates, in order to ensure that any extension of the treaty is geared towards both nations fulfilling their disarmament commitments under the Nuclear Non-Proliferation Treaty, rather than avoiding them.

Figure B. Active Joint Working Groups 1959–2024³⁷

JOWOG	1959	1973	1995	1997
1	Antimissile missile defence systems			
2	500 to 600-pound [redacted] warhead			
3	150-pound [redacted] warhead			
4	Methods of predicting one-point detonation yields			
5	External neutron sources	Neutron sources		
6	Irradiation effects on materials and components		Irradiation effects on materials and components	Radiation Simulation and Kinetic Effects Technology
7	Mixing in gas-boosted weapons			
8	Shock-initiation of explosives			
9	Safety of HMX explosives			Energetic Materials
10	Nonnuclear and hydrodynamic testing			
11	Analysis and specification of materials*			
12	Compatability of materials		Chemistry and Compatability of materials	
13	Underground and outer space testing			
14	Weapons effects for future tests			
15	Joint test facilities			
16?		Test Diagnostics		
17?			Test monitoring	
18?			Metallurgy of Weapons Materials	
19?			Non-Nuclear Components	
20?			Underground Effects Testing	
21?			Non-Metallic Materials	
22				Nuclear Materials
23				Warhead Electrical Components and Technologies
?			Weapons Material Management	
28				Non-Nuclear Materials
29				Nuclear Counter-Terrorism Technology
30				Facilities
31			Nuclear Weapons Engineering	
32			Physics Design	Nuclear Warhead Physics
33			Weapons Hydrodynamics	
34			Computational Technology	
35			Penetration Aid Technology	
36			Aircraft Hardening	Aircraft, Missile and Space System Hardening
37			Nuclear Weapons Physics	Laboratory Plasma Physics
38			Nuclear Forces and Counter Proliferation Studies	
39			Manufacturing Technology	
40			Experimental Activities	
41			Nuclear Warhead Accident Response Technology	
42			Nuclear Weapon Computer Code Development	Nuclear Weapon Code Development
43			Nuclear Weapon Environment and Damage Effects	
44				
45				
46				
47				
48				
?				

JOWOG	1959	1973	1995	1997
1	Antimissile missile defence systems			
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4	Methods of predicting one-point detonation yields			
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8	Shock-initiation of explosives			
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17?			Test monitoring	
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19?			Non-Nuclear Components	
20?			Underground Effects Testing	
21?			Non-Metallic Materials	
22				Nuclear Materials
23				Warhead Electrical Components and Technologies
?			Weapons Material Management	
28				Non-Nuclear Materials
29				Nuclear Counter-Terrorism Technology
30				Facilities
31			Nuclear Weapons Engineering	
32			Physics Design	Nuclear Warhead Physics
33			Weapons Hydrodynamics	
34			Computational Technology	
35			Penetration Aid Technology	
36			Aircraft Hardening	Aircraft, Missile and Space System Hardening
37			Nuclear Weapons Physics	Laboratory Plasma Physics
38			Nuclear Forces and Counter Proliferation Studies	
39			Manufacturing Technology	
40			Experimental Activities	
41			Nuclear Warhead Accident Response Technology	
42			Nuclear Weapon Computer Code Development	Nuclear Weapon Code Development
43			Nuclear Weapon Environment and Damage Effects	
44				
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Treaty Series No. 41 (1958)

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

Washington, July 3, 1958

[The Agreement entered into force on August 4, 1958]

The Government of the **United Kingdom of Great Britain and Northern Ireland** and the Government of the United States of America,

Reference to the United Kingdom Atomic Energy Authority (UKAEA) removed in 1974.

Considering that their mutual security and defense require that they be prepared to meet the contingencies of atomic warfare;

Considering that both countries have made substantial progress in the development of atomic weapons;

Reaffirming that the spread of atomic weapons technology, potentially including State and sub-State actors, imperils the defense and security of both nations;

Text added to preamble in 2014 referencing proliferation risks.

Considering that they are participating together in international arrangements pursuant to which they are making substantial and material contributions to their mutual defense and security;

Recognizing that: their common defense and security will be advanced by the exchange of information concerning atomic energy and by the transfer of equipment and materials for use therein;

Believing that such exchange and transfer can be undertaken without risk to the defense and security of either country; and

Taking into consideration the United States Atomic Energy Act of 1954, as amended, which was enacted with these purposes in mind,

Have agreed as follows:

ARTICLE I

General Provision

While the United States and the United Kingdom are participating in an international arrangement for their mutual defense and security and making substantial and material contributions thereto, each Party will communicate to and exchange with the other Party information, and transfer materials and equipment to the other Party, in accordance with the provisions of this Agreement provided that the communicating or transferring Party determines that such cooperation will promote and will not constitute an unreasonable risk to its defense and security.

ARTICLE II

Exchange of Information

A. Each Party will communicate to or exchange with the other Party such classified information, sensitive nuclear technology, and controlled nuclear information as is jointly determined to be necessary to:

1. the development of defense plans;
2. the training of personnel in the employment of and defense against: atomic weapons and other military applications of atomic energy;
3. the evaluation of the capabilities of potential enemies in the employment of atomic weapons and other military applications of atomic energy;
4. the development of delivery systems compatible with the atomic weapons which they carry; and
5. research, development and design of military reactors to the extent and by such means as may be agreed.

Amended in 1984 to clarify that technology and controlled information will also be exchanged.

B. In addition to the co-operation provided for in paragraph A of this Article each Party will exchange with the other Party other classified information concerning atomic weapons, sensitive nuclear technology, and controlled nuclear information, including special nuclear materials properties and production or processing technology, when, after consultation with the other Party, the communicating Party determines that the communication of such information is necessary to improve the recipient's atomic weapon design, development and fabrication capability.

Additional paragraph added in 1984, enlarging scope of information sharing.

ARTICLE III

Transfer of Submarine Nuclear Propulsion Plant and Materials

A. The Government of the United States may authorize, subject to terms and conditions acceptable to the Government of the United States, persons (1) to transfer by sale to the Government of the United Kingdom or persons designated by the Government of the United Kingdom submarine nuclear propulsion plants and parts thereof, including spare parts, replacement cores, and fuel elements, as may be agreed by the Parties, and (2) to communicate to the Government of the United Kingdom or persons designated by the Government of the United Kingdom (or to both) information as is necessary for the design, manufacture, and operation of submarine nuclear propulsion plants.

Paragraph changed in 2014 from the 1958 text allowing sale of a single submarine reactor to allow sale of multiple reactors or parts of reactors.

B. The Government of the United States will transfer by sale agreed amounts of U-235 contained in uranium enriched in the isotope U-235 as needed for use in any submarine nuclear propulsion plant transferred pursuant to paragraph A of this Article, on such terms and conditions as may be agreed. If the Government of the United Kingdom so requests, the Government of the United States will reprocess any material sold under the present paragraph in facilities of the Government of the United States, on terms and conditions to be agreed, or authorize such reprocessing in private facilities in the United States. Enriched uranium recovered in reprocessing such materials by either Party may be purchased by the Government of the United States under terms and conditions to be agreed. Special nuclear material recovered in reprocessing such materials and not purchased by the Government of the United States may be returned to or retained by the Government of the United Kingdom and any U-235 not purchased by the Government of the United States will be credited to the amounts of U-235 to be transferred by the Government of the United States under this Agreement.

Amendments in 2014 to allow for transfer of uranium 235 for any submarine reactors transferred from the US.

C. The Government of the United States shall be compensated for enriched uranium sold by it pursuant to this Article at a price based on the fair market price of comparable enriched uranium sold in the U.S. domestic market at the time of the sale. Any purchase of enriched uranium by the Government of the United States pursuant to this Article shall be at the applicable price of the United States Atomic Energy Commission for the purchase of enriched uranium in effect at the time of purchase of such enriched uranium.

Amendments in 2014 to allow for transfer of multiple submarine reactors, including an updated formula for pricing.

D. The Parties may exchange classified information on methods of reprocessing fuel elements of the type utilized in any propulsion plant transferred under this Article, including classified information on the design, construction and operation of facilities for the reprocessing of such fuel elements.

E. The Government of the United Kingdom shall indemnify and hold harmless the Government of the United States against any and all liabilities whatsoever (including third-party liability) for any damage or injury occurring after any propulsion plant or parts thereof, including spare parts, replacement cores or fuel elements, transferred under this Article are taken outside of the United States, for any cause arising out of or connected with the design, manufacture, assembly, transfer or utilization of the propulsion plant, spare parts, replacement cores or fuel elements transferred pursuant to paragraph A of this Article.

Article III bis, which was added to the treaty in 1959, contains the operative text for the transfer of non-nuclear components and nuclear material.

ARTICLE III BIS

Transfer of Materials and Equipment

A. The Government of the United States shall transfer to the Government of the United Kingdom the following in such quantities, at such times prior to December 31, 2024, and on such terms and conditions as may be agreed:

1. non-nuclear parts of atomic weapons which parts are for the purpose of improving the United Kingdom's state of training and operational readiness;
2. other non-nuclear parts of atomic weapons systems involving Restricted Data which parts are for the purpose of improving the United Kingdom's state of training and operational readiness when in accordance with appropriate requirements of applicable laws;

Article III bis sharing has a sunset clause, initially December 31 1969, but repeatedly extended. Since 1984 extensions have been for ten years at a time. The last amendment changed all dates in the Article from 2014 to 2024.

3. source, by-product and special nuclear material, and other material, for research on, development of, or use in atomic weapons when, after consultation with the Government of the United Kingdom, the Government of the United States determines that the transfer of such material is necessary to improve the United Kingdom's atomic weapon design, development or fabrication capability.

In 1968 the reference to 'other material' was added, and this text moved to a separate paragraph. 'Utilization facility' is a technical term for a nuclear reactor.

B. The Government of the United States shall transfer to the Government of the United Kingdom special nuclear material, and authorize the transfer of other material, for research on, development of, production of, or use in utilization facilities for military applications, in such quantities, at such times prior to December 31, 2024, and on such terms and conditions as may be agreed.

Paragraph added in 1984 to allow for the transfer of enriched uranium for any purpose, instead of just to improve weapon design or fabrication.

C. The Government of the United States shall transfer enriched uranium, and shall arrange enrichment and other uranium services for the Government of the United Kingdom, for military purposes, in such quantities, at such times prior to December 31, 2024, and on such terms and conditions as may be agreed.

Text amended in 1994 to allow for the US to arrange enrichment for the UK as well as providing it directly.

D. The Government of the United Kingdom shall transfer to the Government of the United States for military purposes such source, by-product and special nuclear material, and equipment of such types, in such quantities, at such times prior to December 31, 2024, and on such terms and conditions as may be agreed.

E. 1. With respect to by-product material, special nuclear material and other material transferred from one Party to the other under this Article, the recipient Party agrees not to use any such material for purposes other than those for which it was received, provided that material which has lost its identity as a result of commingling with other material of the recipient Party may be put to other uses if the recipient Party retains an equivalent amount of its own material for the purpose for which the other Party's material was received.

2. For material or equipment transferred from one Party to the other Party, the recipient Party shall pay or reimburse, as may be agreed, all packaging, transportation and related costs. Packaging, shipping containers and methods of shipment shall be as may be agreed.

3. Should either Party desire to acquire materials or components for use in the manufacture or in preparation for manufacture of atomic weapons from any source within the jurisdiction of the other Party, the procuring Party shall inform the other Party of the proposed procurement in order that such other Party may determine whether the proposed procurement involves classified information and if so whether the proposed procurement is in compliance with its applicable laws and regulations.

ARTICLE IV

Responsibility for use of Information, Material, Equipment and Devices

The application or use of any information (including design drawings and specifications), material or equipment communicated, exchanged or transferred under this Agreement shall be the responsibility of the Party receiving it, and the other Party does not provide any indemnity, and does not warrant the accuracy or completeness of such information and does not warrant the suitability or completeness of such information, material or equipment for any particular use or application.

ARTICLE V

Conditions

A. Cooperation under this Agreement will be carried out by each of the Parties in accordance with its applicable laws.

B. Under this Agreement there will be no transfer by either Party of atomic weapons.

C. Except where specifically authorized by this Agreement or, as may be agreed for civil uses, the recipient Party agrees not to use the information communicated or exchanged, or the materials or equipment transferred, by either Party pursuant to this Agreement for other than the preparation or implementation of defense plans, including the evaluation of potential enemy capabilities, in the mutual interests of the two countries

D. Nothing in this Agreement shall preclude the communication or exchange of classified information, sensitive nuclear technology, or controlled nuclear information, which may be transmissible under other arrangements between the Parties.

Paragraph added in 1979 to specify that information and material should be used for defence plans in mutual interest. Text added in 2014 to specify the inclusion of evaluating enemy capabilities.

Amended in 1984 to state that sharing of technology and controlled information is allowed under other agreements.

ARTICLE VI

Guaranties

A. Classified information, materials and equipment communicated or transferred pursuant to this Agreement shall be accorded full security protection under applicable security arrangements between the Parties and applicable national legislation and regulations of the Parties. In no case shall either Party maintain security standards for safeguarding classified information, materials or equipment made available pursuant to this Agreement less restrictive than those set forth in the applicable security arrangements in effect on the date this Agreement comes into force.

B. Sensitive nuclear technology and controlled nuclear information transferred pursuant to this Agreement shall be accorded at least the same level of protection by the recipient party as that accorded to such information by the transferring Party. The Parties shall consult with each other regarding the appropriate protections for such information.

C. Adequate physical security shall be maintained with respect to any source material, special nuclear material and equipment transferred pursuant to the Agreement, and with respect to any special nuclear material used in or produced through the use of any material or reactor so transferred. Such protection shall be commensurate with the importance of the material or equipment involved.

D. Classified information, sensitive nuclear technology, and controlled nuclear information communicated or exchanged pursuant to this Agreement will be made available through channels existing or hereafter agreed for the communication or exchange of such information between the Parties.

Additions in 1984 including protections for nuclear technology, nuclear material and controlled information, alongside the original protection for classified information.

References to controlled information and nuclear technology added in 1984.

E. Classified information, sensitive nuclear technology, and controlled nuclear information communicated or exchanged, and any materials or equipment transferred, pursuant to this Agreement shall not be communicated, exchanged or transferred by the recipient Party or persons under its jurisdiction to any unauthorized persons, or, except as provided in Article VII of this Agreement, beyond the jurisdiction of that Party. Each Party may stipulate the degree to which any of the information, materials or equipment communicated, exchanged or transferred by it or persons under its jurisdiction pursuant to this Agreement may be disseminated or distributed; may specify the categories of persons who may have access to such information, materials or equipment; and may impose such other restrictions on the dissemination or distribution of such information, materials or equipment as it deems necessary.

F. Adequate materials control and accountability shall be maintained with respect to any nuclear material (including source material and special nuclear material) transferred pursuant to the Agreement, and with respect to any nuclear material used in or produced through the use of any nuclear material or equipment transferred pursuant to the Agreement. Each Party guarantees adequate materials control and accountability shall be maintained so long as such nuclear material or equipment remains under its jurisdiction or control. As may be mutually agreed, the Parties shall consult with each other regarding methods and technology for providing such materials control and accountability.

Paragraph on controlling and accounting for nuclear materials added in 1994.

ARTICLE VII

Dissemination

Nothing in this Agreement shall be interpreted or shall operate as a bar or restriction to consultation or cooperation in any field of defense by either Party with other nations or international organizations. Neither Party, however, shall communicate classified information, sensitive nuclear technology, and controlled nuclear information, or transfer or permit access to or use of materials, or equipment, made available by the other Party pursuant to this Agreement to any nation or international organization unless:

Minor amendments including reference to sharing nuclear technology and controlled information added in 1984.

A. it is notified by the other Party that all appropriate provisions and requirements of such other Party's applicable laws, including authorization by competent bodies of such other Party, have been complied with as necessary to authorize such other Party directly so to communicate to, transfer to or permit access to or use by such other nation or international organization; and further that such other Party authorizes the recipient Party so to communicate to, transfer to or permit access to or use by such other nation or international organization; or

More detailed conditions on the sharing of information with other states and international organisations added in 1959.

B. in the case of communication of classified information, sensitive nuclear technology, and controlled nuclear information, and access to materials or equipment, such other Party has informed the recipient Party that such other Party has so communicated such classified information to, or permitted access to such materials or equipment by, such other nation or international organization; or

C. in the case of material which has lost its identity as a result of commingling with other material of the recipient Party, the recipient Party retains an amount under its jurisdiction equivalent to that made available to it by the other Party under this Agreement.

ARTICLE VIII

Classification Policies

Agreed classification policies shall be maintained with respect to all classified information, materials or equipment communicated, exchanged or transferred under this Agreement. The Parties intend to continue the present practice of consultation with each other on the classification of these matters.

ARTICLE XI

Definitions

For the purposes of this Agreement:

A. 'Atomic weapon' means any device utilizing atomic energy, exclusive of the means for transporting or propelling the device (where such means is a separable and divisible part of the device), the principal purpose of which is for use as, or for development of, a weapon, a weapon prototype, or a weapon test device.

B. 'Classified information' means information, data, materials, services or any other matter with the security designation of United Kingdom 'Restricted' or equivalent or United States Confidential or higher applied under the legislation or regulations of either the United Kingdom or the United States, including that designated by the Government of the United States as 'Restricted Data' or 'Formerly Restricted Data' and that designated by the Government of the United Kingdom as 'ATOMIC.'

Reference to additional equivalent UK classification categories added in 2014.

C. 'Sensitive nuclear technology' means any information (including information incorporated in a production or utilization facility or important component part thereof) which is not available to the public and which is important to the design, construction, fabrication, operation or maintenance of a uranium enrichment or nuclear fuel reprocessing facility or a facility for the production of heavy water, but shall not include information designated as Restricted Data by the Government of the United States.'

Definitions of sensitive nuclear technology and controlled information added in 1984.

D. 'Controlled nuclear information' means information protected by the Government of the United States from unauthorized dissemination pursuant to sections 57.b. or 148 of the United States Atomic Energy Act of 1954, as amended.

E. 'Equipment' means any instrument, apparatus or facility and includes any facility, except an atomic weapon, capable of making use of or producing special nuclear material, and component parts thereof, and includes submarine nuclear propulsion plant, reactor and military reactor. 'Equipment' also includes non-nuclear parts of atomic weapons and other non-nuclear parts of atomic weapons systems involving Restricted Data.

Definition of 'equipment' enlarged to include non-nuclear weapon components in 1959.

F. 'Military reactor' means a reactor for the propulsion of naval vessels, aircraft or land vehicles and military package power reactors.

G. 'Person' means:

1. any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, government agency or government corporation other than the United Kingdom Ministry of Defence and the United States Department of Energy and
2. any legal successor, representative, agent or agency of the foregoing

Agency names removed in 1979 and replaced with government departments.

H. 'Reactor' means an apparatus, other than an atomic weapon, in which a self-supporting fission chain reaction is maintained and controlled by utilizing uranium, plutonium or thorium, or any combination of uranium, plutonium or thorium.

I. 'Submarine nuclear propulsion plant' means a propulsion plant and includes the reactor, and such control, primary, auxiliary, steam and electric systems as may be necessary for propulsion of submarines.

Paragraph referring to the UKAEA deleted in 1974.

J. 'Non-nuclear parts of atomic weapons' means parts of atomic weapons which are specially designed for them and are not in general use in other end products and which are not made, in whole or in part, of special nuclear material; and 'other non-nuclear parts of atomic weapons systems involving 'Restricted Data' means parts of atomic weapons systems, other than non-nuclear parts of atomic weapons, which contain or reveal atomic information and which are not made, in whole or in part, of special nuclear material.

Definitions of non-nuclear parts and atomic information added in 1959.

K. 'Atomic information' means information designated 'Restricted Data' or 'Formerly Restricted Data' by the Government of the United States and information designated 'ATOMIC' by the Government of the United Kingdom.

ARTICLE XII

Duration

This Agreement shall enter into force on the date on which each Government shall have received from the other Government written notification that it has complied with all statutory and constitutional requirements for the entry into force of this Agreement, and shall remain in force until terminated by agreement of both Parties, except that, if not so terminated, Article II may be terminated by agreement of both Parties, or by either Party on one year's notice to the other to take effect on December 31, 1969, or thereafter on one year's notice to take effect at the end of any succeeding term of five years.

Some more complex wording on terminating the agreement was removed in 1984.

In 1959 a reference to a 10 year duration was replaced with an initial end date for Article II of 1969.

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