Arms Control and Proliferation Profile: The United Kingdom

Updated: July 2019

The United Kingdom maintains an arsenal of 215 nuclear weapons and has reduced its deployed strategic warheads to 120, which are fielded solely by its Vanguard-class submarines under its maritime-only deterrence strategy. The UK is actively reducing its nuclear stockpile and plans to reach 180 nuclear weapons by the mid-2020s, which will represent a 65 percent reduction since the height of the Cold War. The British government’s standard practice is to have one submarine on deterrent patrol at any given time, though it claims the missiles are not on alert and would take several days of preparation before launching.

Contents

Major Multilateral Arms Control Agreements and Treaties

Export Control Regimes, Nonproliferation Initiatives, and Safeguards

Nuclear Weapons Programs, Policies, and Practices

- The Nuclear Arsenal, an Overview
- Delivery Systems
- Ballistic Missile Defense Systems
- Fissile Material
- Proliferation Record
- Nuclear Doctrine

Biological Weapons

Chemical Weapons

Other Arms Control and Nonproliferation Activities

- Conference on Disarmament (CD)
- Nuclear Weapons Free Zones
- Nuclear Security Summits
- Joint Comprehensive Plan of Action (JCPOA)

<table>
<thead>
<tr>
<th>Major Multilateral Arms Control Agreements and Treaties</th>
<th>Signed</th>
<th>Ratified</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nuclear Nonproliferation Treaty</td>
<td>1968</td>
<td>1968</td>
</tr>
<tr>
<td>Comprehensive Test Ban Treaty</td>
<td>1996</td>
<td>1998</td>
</tr>
</tbody>
</table>
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CPPNM 2005 Amendment --- 2010
Chemical Weapons Convention 1993 1996
Biological Weapons Convention 1972 1975

Export Control Regimes, Nonproliferation Initiatives, and Safeguards

<table>
<thead>
<tr>
<th>Group</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia Group</td>
<td>Member</td>
</tr>
<tr>
<td>Missile Technology Control Regime</td>
<td>Member</td>
</tr>
<tr>
<td>Nuclear Suppliers Group</td>
<td>Member</td>
</tr>
<tr>
<td>Wassenaar Arrangement</td>
<td>Member</td>
</tr>
<tr>
<td>International Atomic Energy Agency (IAEA)</td>
<td>Signatory, entered into force in 2004</td>
</tr>
<tr>
<td>Additional Protocol</td>
<td></td>
</tr>
<tr>
<td>Global Initiative to Combat Nuclear Terrorism</td>
<td>Participant</td>
</tr>
<tr>
<td>Hague Code of Conduct against Ballistic Missile Proliferation</td>
<td>Participant</td>
</tr>
<tr>
<td>Proliferation Security Initiative</td>
<td>Participant</td>
</tr>
<tr>
<td>UN Security Council Resolutions <strong>1540</strong> and <strong>1673</strong></td>
<td>The United Kingdom has filed the requested reports on its activities to fulfill the resolutions and volunteered to provide assistance to other states</td>
</tr>
</tbody>
</table>

Nuclear Weapons Programs, Policies, and Practices

The Nuclear Arsenal, an Overview

The United Kingdom (UK), as of July 2019, maintains a military stockpile of 200 nuclear weapons for its sea-only deterrent, with 120 of those warheads deployed, of which no more than 40 are at sea on Vanguard-class submarines at any given time.

The UK has the smallest deployed arsenal of the nuclear weapons states and has committed to reducing its nuclear stockpile. In October 2010, the UK government announced plans to reduce its total nuclear weapons stockpile to 180 weapons by the mid-2020s. It reaffirmed this commitment in its 2015 Strategic Defence and Security Review (SDSR), which outlines the UK’s strategy through 2025, and is currently iterated on the UK government nuclear deterrence fact sheet which was last updated in February 2018.
Upon successful reduction down to 180 nuclear warheads, the UK will have achieved a 65 percent reduction in the size of its overall nuclear stockpiles since the height of the Cold War. The UK is currently undergoing a nuclear arsenal modernization program, primarily to replace its Vanguard-class submarines with the Dreadnought-class submarines by the early 2030s.

Delivery Systems

**Intercontinental Ballistic Missiles (ICBM)**

- The United Kingdom does not possess ICBMs.

**Submarines and Submarine-Launched Ballistic Missile (SLBM)**

**Submarines:**

- The British military currently operates four Vanguard-class nuclear-powered ballistic missile submarines (SSBNs). Each submarine is capable of carrying 16 Trident D5 missiles and each of these missiles carry up to three 100 kiloton warheads. As of 2019, each submarine carries a maximum of eight Trident II D5 submarine-launched ballistic missiles (SLBMs).
- One submarine is always out at sea on deterrent patrol. The missiles aboard the Vanguard, however, are not on alert and require several days of preparation prior to launching.
- The Vanguard SSBNs are housed at Her Majesty's Naval Base (HMNB) Clyde off the shore of Gare Loch in Scotland.
- At the cornerstone of the UK’s nuclear weapons modernization ambitions, the British government is to replace the Vanguard-class submarines with what was formerly known as the Successor submarine program. This new submarine was named the Dreadnought-class in October 2016, and is expected to have a lifespan of at least 30 years. According to a November 2018 report by BASIC Institute, the UK government has estimated that the Dreadnought program will cost £31 billion with an additional £10 billion contingency. Over the 30-year lifetime of a new system that emerges into service in 2031, the total in-service costs could range between £71.4 billion and £140.5 billion.
- In June 2012, the British government awarded a contract to Rolls-Royce to build two new nuclear submarine reactor cores. The second of these cores is for the first Successor class vessel.
- In October 2016, construction of the first new submarine began under BAE Systems and has been named the HMS Dreadnought. The Dreadnought will be the Royal Navy’s largest-ever submarine at 17,200 metric tons, 1,300 metric tonnes heavier than the Vanguard. It will be only be fitted with 12 missile tubes for the Trident D5 instead of 16.
- The British Royal Navy has announced that the Dreadnought-class ballistic missile submarines will be named: HMS King George VI, HMS Dreadnought, HMS Valiant, and HMS Warspite.
- There exists debate over whether or not to carry out this program. Opposition to modernization plans are chiefly due to its high cost (it is slated to be the largest British military project in history), time commitment, prevailing pro-disarmament sentiments, and safety concerns.
- Scottish, Welsh, and Irish nationalist parties are also generally pro-disarmament. In addition, the future of the UK’s nuclear weapons could have been jeopardized by the Scottish independence referendum in 2014 as its nuclear submarines are housed at HMNB Clyde in Scotland and the Scottish Nationalist Party vowed to scrap the Vanguard-class submarines if Scotland obtained independence.

**Submarine-Launched Ballistic Missiles (SLBMs):**
British nuclear warheads are only deployed on submarine-launched ballistic missiles (SLBMs). The United Kingdom maintains one type of ballistic missile system in its arsenal for delivering nuclear warheads: the U.S.-leased Trident II (D5) SLBM, which has an estimated range of roughly 7,400-12,000 kilometers. The UK’s Trident D5 missiles are equipped with British warheads similar to the United States’ W76 100 kilotons warheads.

The Trident D5 is planned to remain in service until the early 2040s following a life extension program. Decisions for a replacement warhead have been deferred until later this decade and the current warhead is expected to last into the late 2030s.

**Strategic Bombers**

- The United Kingdom does not possess nuclear capable aircraft.
- Britain’s dismantlement of the Royal Air Force’s gravity based nuclear bombs in 1998 marked the beginning of its maritime-only deterrence strategy.

**Ballistic Missile Defense Systems**

The United Kingdom is part of the European Phased Adaptive Approach (EPAA), a collective missile defense system operated by NATO allies. To learn more, see: "The European Phased Adaptive Approach at a Glance."

**Fissile Material**

- In April 1995, the UK ceased production of separated plutonium and the British government declared that it no longer produces fissile material for weapons.

**Highly Enriched Uranium (HEU)**

- The UK halted the production of highly enriched uranium (HEU) in 1963. As of January 2019, the British government is estimated to maintain a military stockpile of approximately 3.2 metric tons of plutonium and 21.2 metric tons of HEU.
- The UK's civilian stockpile of HEU is roughly 1.4 metric tons.

**Plutonium**

- The United Kingdom possesses the world’s largest stockpile of civilian plutonium, with over 110.3 metric tons designated for this purpose, as of February 2018.
- As of 2018, the UK has two reprocessing plants. The B205 plutonium reprocessing plant, which reprocesses fuel from the Magnox reactors in Sellafield, England, is expected to be fully decommissioned by 2020. The Thermal Oxide Reprocessing plant (THORP) which reprocesses mixed oxide fuel is on track to be shut down, as announced by the UK government in November 2018.
- According to the Houses of Parliament 2016 report, “Managing the UK Plutonium Stockpile,” the country stores approximately 23 metric tons of foreign-owned plutonium, the majority of which belongs to Japan.

**Proliferation Record**

- The UK is not known to have deliberately or significantly contributed to the spread of biological, chemical, or nuclear weapons to other states.
- The UK is, officially, an active promoter of nonproliferation and is a leading member in the Nuclear Suppliers Group, the Australia Group, the Missile Technology Control Regime, and the Zangger Committee as well as the Proliferation Security Initiative.
- The UK has been involved in both Iranian and Libyan nonproliferation processes and...
continues to support the creation of an effective and verifiable chemical, biological, radiological, and nuclear-free zone in the Middle East.

**Nuclear Doctrine**

In its [2015 Strategic Defense and Security Review](https://www.armscontrol.org) document, the British government reaffirmed a commitment not to use nuclear weapons against non-nuclear-weapon states-parties to the nuclear Nonproliferation Treaty (NPT) subject to certain conditions regarding their behavior and alliances. Nevertheless, this 2015 document notes that the government reserves the right to “review this assurance if the future threat, development or proliferation of these weapons make it necessary.”

The document also states that “We will continue to keep our nuclear posture under constant review in the light of the international security environment and the actions of potential adversaries.”

London refuses to rule out the first use of nuclear weapons, but has stated that it would only employ such arms in self-defense and “even then only in extreme circumstances.”

The 2015 Strategic Defense and Security Review also states that “we will remain deliberately ambiguous about precisely when, how and at what scale we would contemplate their use, in order to not simplify the calculations of any potential aggressor.”

The British government’s standard practice is to have one submarine on deterrent patrol at any given time. The government claims the missiles aboard the submarine are not on alert and that launching a missile would take several days of preparation.

*Testing* The United Kingdom has conducted 45 nuclear weapon tests. The first test occurred on October 3, 1952, and the last took place November 26, 1991. The United Kingdom was the third country to conduct a nuclear test.

**Biological Weapons**

- The United Kingdom had an active [biological warfare program](https://www.armscontrol.org) from 1934 to 1956.
- As part of that program, the United Kingdom weaponized anthrax and researched plague, typhoid fever, and botulinum toxin.
- The United Kingdom ratified the Biological and Toxin Weapons Convention (BWC) in March 1975 and has reaffirmed its support for the BWC in 2005.
- Today, the British government [operates](https://www.armscontrol.org) an extensive and sophisticated defensive program that includes research on potentially offensive pathogens.

*Back to Top*

**Chemical Weapons**

- During World War I, the United Kingdom produced an arsenal of chlorine and mustard gases.
- In 1957 the UK [abandoned](https://www.armscontrol.org) its chemical weapons program and has since eradicated its stockpiles.
- The UK ratified the Chemical Weapons Convention (CWC) in 1996 and has provided [financial assistance](https://www.armscontrol.org) to countries such as Russia, in 2001, to destroy their chemical weapons stockpiles.

*Back to Top*

**Other Arms Control and Nonproliferation Activities**

**Conference on Disarmament (CD)**

The United Kingdom regularly participates in the CD, established in 1979 by the international community as a multilateral disarmament negotiating forum. In July 2009, the British government announced its report on nuclear nonproliferation entitled “The Road to 2010” at the CD. In 2010, the UK [called for negotiations](https://www.armscontrol.org) on a Fissile Material Cutoff Treaty (FMCT) to be moved to the United Nations General Assembly where it could be endorsed by a majority vote.
In 2016, the UK proposed the creation of a working group and program of work to discuss effective disarmament measures. In 2019, at the first CD session in February the United Kingdom was the president of the Conference, the first time since 2008. Following the conclusion of its presidency, the UK Ambassador to the CD noted in a blog that the proposal to adopt “Subsidiary Bodies” for each of the ‘core items’ of CD business failed due to six nations who refused to endorse it. He lamented that, “A third of the way through the 2019 session, there's no plan in place for conducting detailed discussions on the core issues.”

**Nuclear Weapons Free Zones**
The United Kingdom has ratified protocols to the Latin American and the Caribbean, South Pacific, African, and Central Asian nuclear weapons free zone treaties pledging not to use or threaten to use nuclear weapons against the treaty's member states. However, the UK maintains reservations to each of these protocols. It has not ratified the Southeast Asia nuclear weapons free zone treaty. At a March 19 event, Ambassador David Hall stressed the UK’s continued commitment towards the establishment of the zone free of nuclear weapons and all other weapons of mass destruction (WMDFZ) in the Middle East as well as its readiness to engage in a “renewed, inclusive, balanced, and results-orientated dialogue,” highlighting a option to reconvene a regional conference based on the 2010 NPT mandate, while emphasizing that the UK would not support initiatives which excluded “any states in the region.”

**Nuclear Security Summits**
British participation in the Nuclear Security Summits includes the 2010 Nuclear Security Summit (NSS) in Washington, DC, the 2012 NSS in Seoul, the 2014 NSS in The Hague, and the 2016 NSS held again in Washington, DC.

**Joint Comprehensive Plan of Action (JCPOA)**
London has engaged in a series of nonproliferation negotiations with Iran, including the most recent rounds of the P5+1 talks over Iran’s nuclear activities. The British government supported ratcheting up sanctions on Iran to persuade it to halt certain activities, particularly uranium enrichment. This included a European Union-wide ban on importing Iranian oil that went into effect July 1, 2012. The UK participated in negotiations on the JCPOA in July 2015 which both limits Iran’s nuclear program and puts in place more intrusive monitoring mechanisms in exchange for sanctions relief. Then Prime Minister David Cameron said that the deal would “make our world a safer place.” Despite the Trump Administration’s decision to withdraw from the JCPOA, British Prime Minister Theresa May said the deal “should stay in place.”

In January 2019, France and Germany and the United Kingdom established the Instrument in Support of Trade Exchanges (INSTEX) to facilitate trade with Iran. INSTEX was designed to create a financial channel to Iran immune from U.S. sanctions reimposed when the Trump administration withdrew from the deal.

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