Non-Proliferation at a glance

CTBT at a glance

The Comprehensive Test Ban Treaty (CTBT) prohibits “any nuclear weapon test explosion or any other nuclear explosion” anywhere in the world. The treaty was opened for signature in September 1996, and [has been signed by](http://disarmament.un.org/treaties/t/ctbt) 184 nations and ratified by 168. The treaty cannot enter into force until it is ratified by 44 specific nations, eight of which have yet to do so: China, India, Pakistan, North Korea, Israel, Iran, Egypt, and the United States. The U.S. Senate voted against CTBT ratification in 1999, and though in 2009 President Barack Obama announced his intention to seek Senate reconsideration of the treaty, he did not pursue the initative, though the United States did see through [UN Security Council Resolution 2310](https://www.armscontrol.org/ACT/2016_10/News/UN-Security-Council-Backs-CTBT), which was the first UN Security Council resolution to support the CTBT.

The 2018 Trump administration Nuclear Posture Reviews notes, "Although the United States will not seek ratification of the Comprehensive Nuclear Test Ban Treaty, it will continue to support the Comprehensive Nuclear Test Ban Treaty Organization …The United States will not resume nuclear explosive testing unless necessary to ensure the safety and effectiveness of the U.S. nuclear arsenal, and calls on all states possessing nuclear weapons to declare or maintain a moratorium on nuclear testing."

In order to verify compliance with its provisions, the treaty establishes a global network of monitoring facilities and allows for on-site inspections of suspicious events.

**Fissile Material Cut-off Treaty (FMCT) at a Glance**

A fissile material cut-off treaty (FMCT) is a proposed international agreement that would prohibit the production of the two main components of nuclear weapons: highly-enriched uranium (HEU) and plutonium. Discussions on this subject have taken place at the UN Conference on Disarmament (CD), a body of 65 member nations established as the sole multilateral negotiating forum on disarmament. The CD operates by consensus and is often stagnant, impeding progress on an FMCT.

Those nations that joined the nuclear Nonproliferation Treaty (NPT) as non-weapon states are already prohibited from producing or acquiring fissile material for weapons. An FMCT would provide new restrictions for the five recognized nuclear weapon states (NWS—United States, Russia, United Kingdom, France, and China), and for the four nations that are not NPT members (Israel, India, Pakistan, and North Korea).

**Background**

Efforts to curb the spread of nuclear material and technology began only a short time after the world was introduced to the destructive potential of atomic weaponry. In 1946 the [Acheson-Lilienthal](https://www.armscontrol.org/print/2064) Report, authored in part by Manhattan Project physicist J. Robert Oppenheimer, advocated for an Atomic Development Agency to regulate fissile material and ensure that state rivalries over the technology did not occur. Ultimately, neither Dean Acheson or David Lilienthal presented the U.S. plan to the United Nations Atomic Energy Commission (UNAEC). Instead, Bernard Baruch presented [the Baruch Plan](http://history.state.gov/milestones/1945-1952/BaruchPlans), which also would have established an Atomic Development Authority that answered to the UN Security-Council. The plan called for the United States to disassemble its nuclear arsenal, but only after an agreement had been reached assuring the United States that the Soviets would not be able to acquire a bomb. The plan failed to achieve consensus within the UNAEC.

Much later, [UN resolution 78/57 L](http://www.un.org/documents/ga/res/48/a48r075.htm), which passed unanimously in 1993, called for a “non-discriminatory, multi-lateral and internationally and effectively verifiable treaty banning the production of fissile material for nuclear weapons or other nuclear explosive devices.”

In March 1995, the CD took up a mandate presented by Canadian Ambassador Gerald Shannon. [The Shannon Mandate](https://www.armscontrol.org/act/2007_12/Meyer) established an *ad hoc*committee that was directed to negotiate an FMCT by the end of the 1995 session. A lack of consensus over verification provisions, as well as desires to hold parallel negotiations on outer space arms control issues, prevented negotiations from getting underway. China and Russia articulated a desire to hold parallel negotiations on Preventing an Arms Race in Outer Space (PAROS), a point which has further stalled efforts to begin FMCT negotiations.

**The U.S. and an FMCT**

The George W. Bush administration submitted an FMCT proposal at the CD in 2006 which proposed a fifteen year ban on the production of HEU and plutonium, two key components of nuclear weapons. The proposal did not include any verification measures, and would have applied to only the five recognized NWS.

The Obama administration’s support of an FMCT was displayed prominently in a speech President Obama [delivered in Prague in 2009](https://cz.usembassy.gov/our-relationship/president-obamas-speech-in-prague/), including dropping the previous administration’s opposition to FMCT verification. Obama stated that, “the United States will seek a new treaty that verifiably ends the production of fissile materials intended for use in state nuclear weapons.” A group of governmental experts issued a [report](http://fissilematerials.org/library/gge15.pdf) in 2015 making recommendations on taking forward an FMCT. In March 2016, the United States formulated a [proposal](https://www.armscontrol.org/ACT/2016_03/News/US-Floats-New-Fissile-Talks-Formula) at the Conference on Disarmament to establish a working group to negotiate an FMCT.

The Trump administration [stated](https://www.armscontrol.org/blog/2018/reporting-2018-npt-prepcom) that it would support the negotiation of an FMCT at the 2018 NPT Preparatory Committee.

**Global Fissile Stockpile Estimates**

The United States, the United Kingdom, France, and Russia have all declared that they have stopped producing fissile material for nuclear weapons. It is widely believed that China has also stopped producing fissile material for nuclear weapons, [ceasing production](http://isis-online.org/uploads/isis-reports/documents/chinese_military_inventories.pdf) of highly enriched uranium (HEU) in 1987, and plutonium in 1991.

According to the International Panel on Fissile Material’s (IPFM) 2015 [Global Fissile Material Report](http://fissilematerials.org/library/gfmr11.pdf), the global stockpile of HEU in 2015 consisted of roughly 1,340 ± 125 tons, which would be enough material to create 76,000 first simple, first generation nuclear weapons. Roughly 99% of the HEU stock is owned by nuclear weapon states, and Russia and the United States have the largest stocks. India, Pakistan, and North Korea are believed to have ongoing production operations for HEU.

IPFM estimates the global stockpile of separated plutonium at 520 ± 10 tons, of which, less than half was produced for use in weapons. About 88% of plutonium is held by states with nuclear weapons that are NPT signatories, and most of the remaining 12% is held by Japan, which has over 47 tons of plutonium. Though the five NWS no longer produce weapons-grade plutonium, production continues in India, Israel, North Korea and Pakistan.

**Fissile Material Production End Dates**

|  |  |  |
| --- | --- | --- |
|   | Highly Enriched Uranium (HEU) | Weapon Grade Plutonium |
| United States | 1992 | 1987 |
| Russia | 1987-88 | 1994 |
| United Kingdom | 1963 | 1989 |
| France | 1996 | 1992 |
| China | 1987-89\* | 1990\* |
| India | Ongoing | Ongoing |
| Israel | Status Unknown | Ongoing |
| Pakistan | Ongoing | Ongoing |
| North Korea\*\* | Status Unknown | Ongoing |

**The Nuclear Suppliers Group (NSG) at a Glance**

Established in 1975, the Nuclear Suppliers Group (NSG) is comprised of [48 states](http://www.nuclearsuppliersgroup.org/en/participants1) that have voluntarily agreed to coordinate their export controls to non-nuclear-weapon states. The NSG governs the transfers of civilian nuclear material and nuclear-related equipment and technology. The participants are: Argentina, Australia, Austria, Belarus, Belgium, Brazil, Bulgaria, Canada, China, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Kazakhstan, Latvia, Lithuania, Luxembourg, Malta, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, and the United States.

The NSG aims to prevent nuclear exports for commercial and peaceful purposes from being used to make nuclear weapons. In order to ensure that their nuclear imports are not used to develop weapons, NSG members are expected to forgo nuclear trade with governments that do not subject themselves to confidence-building international measures and inspections. The NSG has two sets of Guidelines listing the specific nuclear materials, equipment, and technologies that are subject to export controls.

**History**

Negotiated in 1968, the nuclear Nonproliferation Treaty (NPT) granted non-nuclear-weapon states access to nuclear materials and technology for strictly peaceful purposes.

Recognizing peaceful nuclear programs could turn into weapons programs, several NPT nuclear supplier states sought to determine the conditions for sharing specific equipment and materials with non-nuclear-weapon states. In 1971, these supplier states formed the Zangger Committee in order to require states outside the NPT to institute International Atomic Energy Agency (IAEA) safeguards before importing certain items that could be used to pursue nuclear weapons—referred to as the "Trigger List."

India's explosion of a nuclear device in 1974 reaffirmed the fact that nuclear materials and technologies acquired under the guise of peaceful purposes could be diverted to build weapons. In response to India's action, several Zangger Committee members, along with France—who was not a member of the NPT at that time—established the NSG to further regulate nuclear-related exports. The NSG also added supplemental technologies to the original Zangger Committee's "Trigger List," becoming Part I of the NSG Guidelines. In addition, NSG members agreed to apply their trade restrictions to all states, not just those outside the NPT.

**Guidelines and Operation**

The [NSG Guidelines](http://www.nuclearsuppliersgroup.org/en/guidelines) require that importing states provide assurances to NSG members that proposed deals will not contribute to the creation of nuclear weapons. Potential recipients are also expected to have physical security measures in place to prevent theft or unauthorized use of their imports and to promise that nuclear materials and information will not be transferred to a third party without the explicit permission of the original exporter. In addition, final destinations for any transfer must have IAEA safeguards in place. The IAEA is charged with verifying that non-nuclear-weapon states are not illicitly pursuing nuclear weapons. To prevent nuclear material or technology from being stolen or misappropriated for weapons, IAEA safeguards include inspections, remote monitoring, seals, and other measures.

The Guidelines are comprised of two parts, each created in response to significant proliferation events that highlighted shortcomings in the export control systems.

**The Intermediate-Range Nuclear Forces (INF) Treaty at a Glance**

The 1987 Intermediate-Range Nuclear Forces (INF) [Treaty](https://www.state.gov/t/avc/trty/102360.htm#text) required the United States and the Soviet Union to eliminate and permanently forswear all of their nuclear and conventional ground-launched ballistic and cruise missiles with ranges of 500 to 5,500 kilometers. The treaty marked the first time the superpowers had agreed to reduce their nuclear arsenals, eliminate an entire category of nuclear weapons, and employ extensive on-site inspections for verification. As a result of the INF Treaty, the United States and the Soviet Union destroyed a total of [2,692](http://www.latimes.com/opinion/op-ed/la-oe-pifer-russia-missile-test-20140731-story.html) short-, medium-, and intermediate-range missiles by the treaty's implementation deadline of June 1, 1991.

The United States first alleged in its [July 2014 Compliance Report](https://www.state.gov/documents/organization/230108.pdf) that Russia was in violation of its INF Treaty obligations “not to possess, produce, or flight-test” a ground-launched cruise missile having a range of 500 to 5,500 kilometers or “to possess or produce launchers of such missiles.” Subsequent State Department [assessments](https://www.state.gov/t/avc/rls/2017/276361.htm) in 2015, 2016, 2017, and 2018 repeated these allegations. In March 2017, a top U.S. official confirmed press reports that Russia had begun deploying the noncompliant missile. Russia has [denied](http://www.mid.ru/en/web/guest/foreign_policy/news/-/asset_publisher/cKNonkJE02Bw/content/id/1428135) that it is in violation of the agreement and has accused the United States of being in noncompliance.

On Dec. 8, 2017, the Trump administration released an integrated [strategy](https://www.state.gov/r/pa/prs/ps/2017/12/276363.htm) to counter alleged Russian violations of the treaty, including the commencement of research and development on a conventional, road-mobile, intermediate-range missile system. On Oct. 20, 2018, President Donald Trump announced his intention to “terminate” the INF Treaty, citing Russian noncompliance and concerns about China’s intermediate-range missile arsenal. On Dec. 4, 2018, Secretary of State Mike Pompeo announced that the United States found Russia in “material breach” of the treaty and would suspend its treaty obligations in 60 days if Russia did not return to compliance in that time. On Feb. 2, the Trump administration declared a suspension of U.S. obligations under the INF Treaty and formally announced its intention to withdraw from the treaty in six months. Shortly thereafter, Russian President Vladimir Putin also announced that Russia will be officially suspending its treaty obligations as well.