

The Naval Nuclear Reactor Threat to the NPT

- [Policy White Papers](#)

By Greg Thielmann and Serena Kelleher-Vergantini
July 24, 2013

ACA Threat Assessment Brief
THE ARMS CONTROL ASSOCIATION *Analysis on Effective Policy Responses to Weapons-Related Security Threats*

BY GREG THIELMANN, SENIOR FELLOW, and SERENA KELLEHER-VERGANTINI
JULY 24, 2013

The Naval Nuclear Reactor Threat to the NPT

The nuclear Nonproliferation Treaty (NPT) has long been a critical bulwark against the spread of nuclear weapons. Although preventing the production and accumulation of fissile material is an important part of this effort, the NPT does not explicitly regulate the production, use, and disposition of highly enriched uranium (HEU) for naval nuclear reactors. This exclusion poses a growing risk to achieving the nonproliferation goals of the treaty. While seeking to advance prospects for a fissile material cutoff treaty, the United States is continuing to design naval reactors for the world's largest nuclear submarine fleet that are powered with weapons-grade uranium. While proclaiming its renunciation of any nuclear weapons ambitions, Brazil plans to build six nuclear submarines powered by uranium fuel that may be close to weapons grade. Neither the International Atomic Energy Agency (IAEA) nor important NPT member states have fully confronted the proliferation implications of excluding naval reactor fuel from safeguards. The IAEA and NPT members should take steps to minimize the use of HEU for any reason—a goal they declared just this month at a nuclear security conference in Vienna.

HIGHLIGHTS

- Because acquiring fissile material is the biggest technical obstacle to building nuclear weapons, discouraging uranium enrichment above levels used in civilian power reactors is an important barrier to proliferation.
- But the NPT allows states to use uranium enriched to higher levels to fuel naval propulsion reactors, free from the IAEA safeguards that would otherwise apply.
- This exclusion confers legitimacy on enriching uranium beyond the level needed for civilian power reactors and could potentially be exploited by aspiring nuclear-weapon states to provide a shield for diversion of that material for use in a nuclear weapons program.
- Brazil, poised to become the first NPT non-nuclear-weapon state with nuclear-powered submarines, could create a dangerous precedent for states seeking to enrich uranium to weapons-grade or near-weapons-grade levels.
- Iran is a case in point. With six world powers trying to negotiate limits on the size and enrichment level of Iranian uranium hexafluoride stockpiles, senior Iranian naval officers say they are considering their own nuclear submarines, using fuel enriched to "45-56 percent."
- Meanwhile, as Russia and France dramatically reduce the enrichment levels required by their newer submarine reactors, the United States and United Kingdom are still designing reactors for the next half-century that require weapons-grade uranium.
- The U.S. Defense and Energy Departments should urgently consider options for building future U.S. submarine reactors fueled by uranium that is not highly enriched.
- The IAEA should seek enhancements to safeguards agreements that tighten monitoring measures for uranium designated for naval nuclear reactors.

Revised Threat Assessment Brief, Greg Thielmann, Director
Arms Control Association, 1313 Street, NW, 20004, Washington, DC 20004

[Download PDF](#)

The nuclear Nonproliferation Treaty (NPT) has long been a critical bulwark against the spread of nuclear weapons. Although preventing the production and accumulation of fissile material is an important part of this effort, the NPT does not explicitly regulate the production, use, and disposition of highly enriched uranium (HEU) for naval nuclear reactors. This exclusion poses a growing risk to achieving the nonproliferation goals of the treaty. While seeking to advance prospects for a fissile material cutoff treaty, the United States is continuing to design naval reactors for the world's largest nuclear submarine fleet that are powered with weapons-grade uranium. While proclaiming its renunciation of any nuclear weapons ambitions, Brazil plans to build six nuclear submarines powered by uranium fuel that may be close to weapons grade. Neither the International Atomic Energy Agency (IAEA) nor important NPT member states have fully confronted the proliferation implications of excluding naval reactor fuel from safeguards. The IAEA and NPT members should take steps to minimize the use of HEU for any reason—a goal they declared just this month at a nuclear security conference in Vienna.

The Naval Nuclear Reactor Threat to the NPT

Published on Arms Control Association (<https://www.armscontrol.org>)

- [Greg Thielmann](#)
- [Fissile Material](#)
- [Nuclear Nonproliferation](#)
- [Nuclear Nonproliferation Treaty](#)

Source URL: <https://www.armscontrol.org/policy-white-papers/2013-07/naval-nuclear-reactor-threat-npt>