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The Need to Remove All Fissile Material from Iran

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The removal of all fissile material (highly enriched uranium [HEU] and plutonium in irradiated reactor fuel) from Iran is certainly very difficult, costly and risky.[1] Yet, this objective must be accomplished. It will likely require regime change in Iran.[2] If the fanatical clerical regime that runs Iran is allowed to have nuclear weapons, at some point it will likely use them. Even before that it will use the threat they pose to support even more deadly forms of terrorism. In light of the fact that Iran is the number one state supporter of terrorism, the targets for Iranian nuclear weapons attacks are likely to be cities. While the possession of even a single nuclear weapon creates the option to use it, the size of the arsenal is also important. Iran likely must have enough nuclear weapons to not only use one or a few but to give them some credible capability to limit the effect of a retaliatory strike through the threat of further Iranian nuclear escalation. Thus, the size of Iran's nuclear weapons inventory would be very important.

U.S. and Israeli attacks on the Iranian nuclear weapons infrastructure have dramatically reduced the potential scope of Iran's nuclear weapons inventory in the short- to mid-term, but the threat has not been completely eliminated.[3] Before the start of the attacks by the United States and Israel, as a result of the diplomatic failures of prior administrations, Iran had obtained a significant inventory of HEU for a rogue state. A May 2025 International Atomic Energy Agency (IAEA) report reportedly said "…Iran has amassed 900.8 pounds of uranium

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enriched up to 60%. That's an increase of 294.9 pounds — or almost 50% — since the IAEA's last report in February."[4] The situation may be even worse. In 2023, reportedly, "Inspectors from the United Nations nuclear watchdog found uranium particles enriched up to 83.7 percent in Iran's underground Fordo nuclear site…"[5] By comparison, the World War II Little Boy nuclear bomb dropped untested on Hiroshima used uranium enriched to 80 percent.[6]

A Congressional Research Service report states that "…HEU used in nuclear weapons typically contains about 90% u-235."[7] What is important in the context of Iran is not what is typically used but what can be used to produce nuclear weapons. Reportedly, "…40-42 kilograms (kg) of 60 percent enriched uranium…suffices to create a relatively compact nuclear explosive; further enrichment to 80 or 90 percent is not needed."[8] According to U.S. Special Envoy Steve Witkoff, Iran stated that "…its 460-kg of 60% enriched HEU could make 11 nuclear bombs."[9] Even the leftwing *Bulletin of the Atomic Scientists* published an article which said that, "If it still has access to a significant fraction of its current 60-percent HEU stockpile, Iran would have options for weaponization even if it is unable to further enrich the material."[10] The dramatic increase in Iran's nuclear weapons potential is apparently the reason that Israel and the United States launched attacks on the Iranian nuclear weapons production capability in 2025.

The Iranian potential to use plutonium from its irradiated nuclear reactor fuel, now being stored, has largely been ignored by the U.S. arms control establishment because the retention of irradiated reactor fuel is legal under the Non-Proliferation Treaty (NPT), a serious flaw. It is estimated that Iran has enough plutonium in stored irradiated reactor fuel for 200 nuclear weapons.[11] From the standpoint of assessing the Iranian nuclear threat, the legality of its retention in the abstract is irrelevant. It could facilitate Iranian violation of the NPT by building nuclear weapons with the plutonium contained in its irradiated reactor fuel. Since a critical mass of plutonium is less than for HEU, a plutonium-based nuclear weapon can be smaller and lighter than one based on HEU even if it is enriched to 90 percent or more.

The necessary Iranian bomb mechanisms may already exist. A 2012 article in the journal *Nature* reported that, "*North Korea may have conducted two covert nuclear weapons tests in 2010, according to a fresh analysis of radioisotope data.*"[12] (Emphasis in the original.) Hans Rühle, who headed the German Defense Ministry's Planning Staff from 1982 to 1988, stated that with regard to these two reported low-yield nuclear tests, "Several intelligence services believe that at least one of them was commissioned by Iran."[13] In 2012, the *Times of Israel* reported that Hans Rühle also said "…a second North Korean test was also carried out that year on Iran's behalf."[14] Reportedly, there was a September 2012 agreement between North Korea and Iran that could involve cooperation on both ballistic missiles and nuclear programs.[15]

In the development of early U.S. nuclear weapons, the fissile material component was inserted just before the bomb was to be used.[16] Iran may have done the same thing in its nuclear weapons designs. This would allow Iran to pretend it did not have nuclear weapons while being able to assemble an operational capability quickly. In 2023, then-Chairman of the Joint Chiefs of Staff General Mark Milley told Congress that Iran would only need "…several months to produce an actual nuclear weapon."[17]



Iranian HEU was stored in the form of a gas, at least when the last inspections occurred.[18] It must be converted into a solid and fabricated into a "pit," the fissile material component of a nuclear fission bomb. This is easier to do with HEU than plutonium. HEU is much less dangerous to handle than plutonium which is used in the primary (fission trigger) of most nuclear weapons in the P-5 states (China, France, Russia, the United Kingdom, and the United States). Plutonium has a smaller critical mass which means less material is necessary and, thus, it requires less high explosive to implode. This allows substantially smaller and lighter nuclear weapons.

According to a July 2026 Congressional Research Service report, the "…program's goal, according to U.S. officials and the IAEA, was to develop an implosion-style nuclear weapon for Iran's Shahab-3 ballistic missile."[19] The larger weight and size of nuclear weapons based on 60 percent HEU is not very important with regard to missiles with a large enough payload (throw weight) to carry large conventional warheads.

If Iran attempts to create thermonuclear weapons, the size and weight of the fission weapon when used as a primary could be more significant. The first U.S. thermonuclear weapons used the early large and heavy U.S. fission bombs as their primaries. Iran can do the same with nuclear weapons based on 60 percent enriched HEU. Open sources do not permit assessment of whether these weapons based on a primary using 60 percent enriched HEU could be small and light enough to be carried by the larger Iranian ballistic missiles. They certainly appear unlikely to be small and light enough to be carried by Iranian drones.

If Iran were building thermonuclear weapons designed for terrorist attacks using commercial shipping containers, there would be little doubt it could build them if it had the fissile material. However, the United States has constructed substantial defenses against such attacks under the Megaports program.[20] (According to the National Nuclear Security Administration [NNSA], the Megaports Initiative protects the world shipping network from dangerous cargo, terrorism and nuclear materials.)[21]

Thus, almost all press coverage of Iran's nuclear weapons potential is fundamentally wrong about the level of HEU enrichment required to build nuclear weapons. The nearly universal assumption that Iran has to enrich its HEU to 90 percent or more to build nuclear weapons is not true. Iran apparently already has HEU enriched to a level that can be used to build nuclear weapons quickly.

The impact of U.S. and Israeli attacks on Iran's nuclear weapons infrastructure has been very extensive and effective. The physical destruction of Iran's nuclear facilities and the decapitation of key scientists will certainly make the fabrication of nuclear weapons much more difficult. Yet, it is very likely that some capability to build nuclear weapons has survived these attacks. Conventional weapons attacks cannot eliminate fissile material. Iran's nuclear weapons production capability has been severely degraded but Iran may be attempting to rebuild it. Reportedly, Iran is attempting to restore its nuclear weapons capability at Pickaxe Mountain, a large deeply buried underground facility.[22] Such facilities are very difficult to destroy with conventional weapons.



Depending on the situation, successful conventional attacks can either disperse or bury the existing fissile material. The elimination of fissile material would either require direct nuclear strikes or its removal from Iran under threat of the destruction of Iran's economy.

Diplomacy and/or economic sanctions will not end the current Iranian problem.

Diplomacy has failed for decades and the fanatics who run Iran believe they can withstand economic sanctions. Iran will honor no significant agreement unless there is a serious threat of regime destruction. The only solution to the Iran problem is military. Reportedly, Israel believes that to remove the fissile material from Iran "…the Iranian regime must be significantly weakened."[23] That means much more serious and sustained bombing. Iran does not have to be bombed back to the Stone Age but it will probably be necessary to conduct a sustained bombing campaign the way it would have been conducted in World War II if the generals and admirals had current U.S. technology. Iran's ability to wage war must be destroyed.

Elimination of the Iranian nuclear threat may require nuclear strikes against the remaining hard-to-destroy nuclear facilities (for example, Pickaxe Mountain, which could be demolished by a Massive Ordnance Penetrator [MOP] if it were modified to carry a relatively low-yield nuclear weapon) or the destruction of the Iranian economy with large-scale conventional strikes. The first option is highly unlikely. Thus, the destruction of the Iranian industrial economy and power system is the most realistic option. It can be accomplished.

To get the fanatic Iranian regime to capitulate, it will probably be necessary to destroy its energy infrastructure, including to both its domestic power and energy export capability; render unusable its transportation system; seriously degrade the IRGC; and, continue to decapitating its vile leadership. The focus of the attacks must be on military effectiveness, not limiting collateral damage. Thus far, the United States has been unwilling to exercise these options. Victory requires military might combined with political will. Absent the political will to do what is necessary, negotiations with fanatics will not lead anywhere.

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