

Iran's Nuclear Weapon Program is Still a Threat

As I have written previously, a pure bombing campaign would not be able to stop Iran's nuclear weapon program.² This is true even after the U.S. bombed Iran's underground enrichment site at Fordo with GBU-57 bombs ("bunker-busters"). The reason for this outcome is the near impossibility of destroying Iran's large stock of 60% enriched uranium by bombing, which means that Iran still has the capability to produce the 90% enriched uranium desired for nuclear weapons even if only a small fraction of Iran's advanced centrifuges survived.

Before the attacks, Iran had a stockpile of about 440 kilograms of 60% enriched uranium.³ This material can easily be further enriched to produce 90% enriched uranium. Assuming 20 kilograms of 90% enriched uranium per weapon, this Iranian stockpile could produce between 8 and 12 nuclear weapons depending on how efficiently the further enrichment process is performed.⁴

The current whereabouts of this stockpile are unknown and there are concerns that Iran may have hidden this stockpile at some protected sites before the bombing began. However, it is not recognized that even if this stockpile were at one of the sites that was bombed, **the stockpile is still very likely to have survived.**

This stockpile is stored as solid uranium hexafluoride in cylinders.⁵ To limit the risk of an accidental critical nuclear reaction, the uranium hexafluoride cylinders are only about three feet high and five inches in diameter. The amount of uranium in each cylinder is limited to about 17 kilograms (in the form of about 25 kilograms of uranium hexafluoride). Since the empty cylinder weight is also about 25 kilograms, the weight of a filled cylinder is about 50 kilograms.

The stockpile of 60% enriched uranium would fit into about 26 cylinders. The cylinders are made out of either nickel or Monel (a nickel/copper alloy) with quarter inch thick walls. The cylindrical shape and sturdy metal construction means that the blast from a bomb would be very

¹ This paper is the product of the author's personal research and the analysis and views contained in it are solely his responsibility. Though the author is also a part-time adjunct staff member at the RAND Corporation, this paper is not related to any RAND project and therefore RAND should not be mentioned in relation to this paper. I can be reached at GregJones@proliferationmatters.com

² Gregory S. Jones, "Israel's Bombing Campaign Against Iran's Centrifuge Enrichment Program Will Not By Itself Stop an Iranian Nuclear Weapon," June 17, 2025. <https://nebula.wsimg.com/449e810324df53b4d242f023e3b71f1a?AccessKeyId=40C80D0B51471CD86975&disposition=0&alloworigin=1>

³ The International Atomic Energy Agency (IAEA) reported that on May 17, 2025, Iran's stockpile of 60% enriched uranium was 409 kilograms and that Iran was producing about 39 kilograms per month. "Verification and monitoring in the Islamic Republic of Iran in light of United Nations Security Council resolution 2231 (2015), IAEA, GOV/2025/24, May 31, 2025. <https://www.iaea.org/sites/default/files/25/06/gov2025-24.pdf>

⁴ The efficient enrichment would have tails of 20% enriched uranium and require using two cascades. Using a single cascade would be less efficient, resulting in tails of 40% enriched uranium.

⁵ These would be model 5 cylinders. See: "Uranium Hexafluoride: A Manual of Good Handling Practices," USEC-651 (Revision 7), United States Enrichment Corporation, January 1995. <https://www.osti.gov/servlets/purl/205924>

unlikely to rupture any of the cylinders. Yet it would take the contents of only two or three cylinders to produce a sufficient amount of 90% enriched uranium for a nuclear weapon. At best, the bombing attacks buried the cylinders at one of Iran's nuclear sites but the cylinders could still be dug out intact.

The survival of Iran's 60% enriched uranium stockpile greatly increases the need to destroy Iran's uranium enrichment centrifuges. Before the bombing began, Iran had 82 cascades of advanced centrifuges.⁶ Yet it would take only two cascades to efficiently convert the 60% enriched uranium to 90% enriched uranium sufficient for 12 nuclear weapons.⁷

Even if Iran were to use just one cascade, the conversion process, though less efficient, could still produce enough 90% enriched uranium for eight nuclear weapons. Therefore at least 98% to 99% of the cascades needed to be destroyed. Further each cascade consists of around 170 centrifuges. Even if a cascade is disabled, it is unlikely that all of its centrifuges would be destroyed. The intact centrifuges could be removed and used to create new cascades.

The combination of the intact 60% enriched uranium stockpile and the likely surviving centrifuges means that Iran very probably still has the capacity to produce 90% enriched uranium for manufacturing multiple nuclear weapons. The loss of electric power at the centrifuge enrichment sites means that Iran could not undertake this process for at least several months. Still, the elimination of the Iranian nuclear weapon threat will require Iran to give up its entire enriched uranium stockpile and permanently shut down its centrifuge enrichment program.

⁶ IR-6, IR-4 or IR-2m.

⁷ It would take about two and one half weeks in order to produce sufficient 90% enriched uranium for a nuclear weapon.