

The Iran Threat Geiger Counter: Moving Toward Extreme Danger

Institute for Science and International Security

May 2023

A national security threat is typically posed by a combination of hostile intentions and capabilities. The threat from Iran’s nuclear program is no exception. The Iran Threat Geiger Counter from the Institute for Science and International Security measures on a regular basis Iran’s hostile intentions toward the United States and U.S. allies, and its capability to turn these hostile intentions into action through the potential deployment and use of a nuclear weapon.

As with the radiation levels measured by a Geiger counter, any level above zero represents a degree of danger. Over the last six months, the threat posed by Iran has increased. As of May 2023, we assign Iran a total threat score of 140 out of 180, up from 130 in October 2022, and assessed as **High Danger**.



Iran Threat Geiger Counter: Methodology and Results

The Institute assigns the following threat level using a zero to 180 scale on the Iran Threat Geiger Counter:

0-30:	Least Danger
31-60:	Low Danger
61-90:	Moderate Danger
91-120:	Considerable Danger
121-150:	High Danger
151-180:	Extreme Danger

The Iran Threat Geiger Counter analyzes Iran's activities in six categories and assigns up to 30 points for each category:

- Hostile Actions (30 Points Max)
- Hostile Rhetoric (30 Points Max)
- Lack of Transparency (30 Points Max)
- Nuclear Breakout (30 Points Max)
- Sensitive Nuclear Capabilities (30 Points Max)
- Beyond Breakout (30 Points Max)

The scoring system for each category is the following:

0-5:	Least Danger
6-10:	Low Danger
11-15:	Moderate Danger
16-20:	Considerable Danger
21-25:	High Danger
26-30:	Extreme Danger

Current Threat Environment







Criteria	Hostile Actions	Hostile Rhetoric	Lack of Transparency	Nuclear Breakout	Sensitive Nuclear Capabilities	Beyond Breakout
Total Score: 140	25	28	19	30	20	18
Direction of Change	 3	 0	 2	 Max	 3	 2
Danger Level High Danger	High Danger	Extreme Danger	Considerable Danger	Extreme Danger	Considerable Danger	Considerable Danger

Figure 1. The current status of the threat Iran poses for each criterion, including point changes.

The current score of 140 is in High Danger territory. Most of the points are the result of Iran’s hostile actions (25 points) and rhetoric (28 points) against the United States and its allies, combined with the fact that Iran’s nuclear breakout time remains at zero (30 points). The rest result from Iranian progress on developing sensitive nuclear capabilities (current score of 20 points), increasing its nuclear weaponization efforts beyond breakout (current score of 18 points), and inadequate transparency over its nuclear program (19 points). The scores have increased across four criteria since October 2022, moving the overall threat score closer to Extreme Danger.

The following sections discuss the allocation of points to each category.

Hostile Actions

Score: 25 points 

Iran remained engaged in a wide range of hostile activities against the United States and its allies, indicating a high level of hostility. Iran's deepening relationship with Russia and the killing of an American contractor in Syria in a drone attack in March 2023 warrant an increase in the threat assessment score of three points to 25 points (High Danger). Significant recent developments include the following:

Iran Continues to Plot Assassinations, Bombings, and Kidnappings on U.S. and Allied Territory

In January 2023, the U.S. Department of Justice [charged](#) three members of an Eastern European organized crime group with ties to Iran in connection with an assassination plot against Iranian-American journalist Masih Alinejad. Alinejad was also the target of a 2021 kidnapping plan directed from Iran.

In August 2022, the U.S. Department of Justice [charged](#) Shahram Poursafi, a member of Iran's Islamic Revolutionary Guards Corps, with plotting to assassinate former U.S. National Security Advisor John Bolton. Former Secretary of State Mike Pompeo was [reportedly](#) a second assassination target. Poursafi remains at large.

These plots indicate that Iran has become bolder in its attempts to carry out deadly covert operations on U.S. and allied soil, following a long history of similar actions.

Iran Continues to Target Critical Infrastructure and U.S. Military Assets in the Middle East

In March 2023, a drone attack by an Iranian proxy group killed an American contractor and wounded five U.S. service members in northeast Syria. Since the beginning of 2021, U.S. forces in Syria have come under attack by Iranian proxy groups more than 70 times.

Following the U.S. drone strike on Qasem Soleimani in January 2020, Iran launched a ballistic missile strike against U.S. forces stationed in Iraq, [injuring dozens](#) of U.S. combat personnel and damaging a military base. In 2019, Iran carried out an attack against critical oil refining and processing facilities in Saudi Arabia using a swarm of kamikaze-type drones, crippling Saudi oil production capacity.

Iran has also repeatedly seized and interdicted foreign-flagged oil tankers in the Persian Gulf and engaged in dangerous and provocative maneuvers near U.S. Navy warships and maritime assets in the region.

Iran Continues to Hold U.S. and Allied Nationals Hostage

In April 2023, Iran's Supreme Court upheld the [death sentence](#) for Jamshid Sharmahd, a 68 year old German/Iranian national who had been living in the United States for years. Active as a dissident in the United States, he was allegedly kidnapped in Dubai in 2020 by Iranian intelligence agencies and taken to Iran. He has been convicted of "Corruption on Earth," a vague charge often used by the Iranian regime against its critics. He has been denied legal representation and medicines to treat his Parkinson disease.

Iran continues to hold American and other allied nationals hostage in Iranian prisons. Often the individuals are charged under false pretenses and trumped-up claims of [espionage](#) or foreign influence, and other purported crimes. Many of the hostages have been held for years in poor and often inhumane living conditions, without proper legal representation, and in some cases, captives experienced direct abuses at the hands of their captors.

Iran Continues to Engage in Cyberattacks Against U.S. and Allied Targets

In May 2023, Microsoft [noted](#) that Iran has been accelerating its cyber influence operations worldwide since at least June 2022. The top targets for these operations are Israel, the United States, the United Arab Emirates, and Saudi Arabia.

In February 2023, the director general of the Israeli National Cyber Directorate stated that the number of Iranian cyberattacks on Israel has doubled in the past year. Israel now experiences an average of 200 cyberattacks from Iran every month.

On September 9, 2022, the United States imposed sanctions against Iran's Ministry of Intelligence for its connection to a cyberattack on the Albanian government in July 2022. This cyberattack follows a [long list](#) of similar actions during the past decade, including attacks against [water infrastructure](#) in Israel in 2020 and [Boston Children's Hospital](#) in 2021.

Iran Continues to Provide Military Hardware to Russia in Support of its Invasion of Ukraine

Iran has supplied a number of different types of drones to the Russian military in violation of U.S. and EU sanctions; the most recent public evidence of its supply of drones to Russia for use in Ukraine is from February 2023. Russia regularly uses these drones in [combat operations](#) in Ukraine and has also frequently used them against civilian targets. The [first shipment](#) of drones was delivered to Russia in late August 2022 and [flew over Georgia](#). In total, Iran has agreements with Russia to supply thousands of drones across many shipments, and an Iranian delegation reportedly visited a potential site for a new drone production facility in [Yelabuga, Russia](#) in January 2023.

Evidence has emerged that Iran is also supplying Russia with artillery shells and ammunition. [Reportedly](#), hundreds of thousands of artillery shells and roughly 100 million rounds of ammunition were delivered via two cargo ships from Iran.

[The Washington Post](#) and [Reuters](#) have reported that Iran has agreed to supply hundreds of short-range surface-to-surface missiles to Russia. Such actions would further cement Iran's hostile intentions, increasing the threat assessment score. It should be noted that the UN

embargo on Iran exporting ballistic missiles will expire in October 2023 under UNSC resolution 2231.

Iran Continues to Violate Sanctions and Support Proxy Groups in the Middle East

In March 2023, the United Kingdom's Royal Navy seized a vessel destined for Yemen carrying Iranian-made munitions, including anti-tank missiles and components for medium range ballistic missiles. Iran continues to provide financial and military aid to proxy groups, including militias, U.S. designated terrorist organizations, and pariah regimes throughout the Middle East and elsewhere. Iran continues to violate national and international sanctions and exports conventional weapons to terrorist organizations and proxy forces, including Hezbollah, which maintain an estimated arsenal of more than 100,000 rockets threatening Israel.

Iran depends extensively on illicitly procuring goods for its nuclear, missile, conventional arms, and drone programs from abroad. It has a long history of breaking other countries' national trade control laws and violating sanctions. Because of its poor record, Iran ranks in the bottom five countries in the Institute's [Peddling Peril Index for 2021/2022](#), which evaluates strategic trade control systems of 200 countries and entities.

Hostile Rhetoric

Point Score: 28 points

Public statements from Iranian officials indicate an extreme level of hostility (28 points) towards the United States and its allies. Notable recent statements include the following:

Ebrahim Raisi, President, January 3, 2023: "We have not forgotten martyr Soleimani's blood and will never forget. They [Americans] should know that revenge for Soleimani is certain and his killers [...] will not have any peaceful sleep."

Ali Khamenei, Supreme Leader, October 3, 2022: "I openly state that the recent riots and unrest in Iran were schemes by the US; the usurping, fake Zionist regime; their mercenaries; and some treasonous Iranians abroad who helped them."

Hossein Salami, Revolutionary Guards commander-in-chief, August 22, 2022: "The Zionists have no safe haven in occupied Palestine and all parts of the land are within the reach of Palestinians resistance movements' firepower. When Lebanese resistance movement Hezbollah is added to this equation, the conclusion is the deployment of hundreds of thousands of missiles that are pointed at the Zionist regime."

Mohammad Marandi, adviser to the Iranian nuclear negotiations team in Vienna, following the August 12, 2022, assassination attempt against Salman Rushdie: "I won't be shedding tears for a writer who spouts endless hatred and contempt for Muslims and Islam. A pawn of empire who poses as a Postcolonial novelist."

These most recent statements must be seen against the backdrop of more than four decades of extreme anti-American, anti-Israel, and anti-Western rhetoric from Iranian officials. “Death to America! Death to Israel!” are routine utterances at state-sponsored rallies – most recently in February 2023 at the 44th anniversary of the 1979 Islamic revolution – and remain core pillars of the Iranian regime’s ideology.

Lack of Transparency

Score: 19 points 

Iran continues to deceive the International Atomic Energy Agency (IAEA) and violate its safeguards agreement. It also has reduced the monitoring required under the Joint Comprehensive Plan of Action. It promised in early March 2023 to restore surveillance measures under the JCPOA. While that task has proceeded, progress has been slower than expected. Moreover, there is no change in Iran’s refusal to share either new or old camera surveillance data with the IAEA. On balance, Iran’s transparency warrants a threat assessment score of 19 points, an overall increase of two from October 2022. This increase accounts for worsening safeguards compliance but slightly improved JCPOA monitoring (Considerable Danger).

Safeguards violations and Iranian non-cooperation

Iran has consistently violated its obligations under its comprehensive safeguards agreement (CSA), a key part of the verification of the Nuclear Non-Proliferation Treaty (NPT). It has refused to cooperate with the IAEA and fully account for its past and present nuclear activities, and obstructed IAEA inspections by razing and sanitizing related nuclear sites. For four years, [the IAEA](#) has been investigating the presence of anthropogenic (of human origin) uranium particles it detected at three Iranian sites, and was seeking information about nuclear material and activities at a fourth site. The four sites are Turqez Abad, Varamin, Marivan, and Lavisian-Shian. Out of these four sites, three were discussed in Iran’s Nuclear Archive, and all four are related to Iran’s former and possibly ongoing work on nuclear weapons. In March 2022, the IAEA found Iran in breach of its safeguards obligations for failing to declare its use of nuclear material at Lavisian-Shian. In June 2022, and again in November 2022, the IAEA’s 35-nation Board of Governors overwhelmingly passed a censure resolution against Iran for non-cooperation with the IAEA, with only China and Russia voting against.

The IAEA concluded in September 2022, it is “not in a position to provide assurance that Iran’s nuclear program is exclusively peaceful.” The situation has not improved since then. This means the IAEA continues to be unable to verify Iran’s compliance with its CSA and the NPT.

On multiple occasions, usually just before the Board of Governors quarterly meetings, Iran will seek to meet with the IAEA, promising to resolve outstanding questions under the CSA involving undeclared nuclear material. However, once the Board meeting has ended, Iran rarely implements its promises. This pattern has gone on for several years and caused many to be

skeptical about the most recent episode, which occurred right before the March 2023 Board meeting. Iran and the IAEA agreed on a written Joint Statement that in part addressed the issue of undeclared nuclear material. The statement, which references access, was, at least initially, interpreted by Grossi as allowing inspectors' access to places, individuals, and materials. Immediately after Grossi's recounting of the meetings in Tehran, Iran's Atomic Energy Organization spokesperson Behrouz Kamalvandi went public to raise [opposition](#): "During the two days that Mr. Grossi was in Iran, the issue of access to individuals was never raised." Since then, there has been no show of sincerity to address the undeclared nuclear material issues. It seems that Iran has no intention to back away from its long-standing position, best formulated by AEOI head [Mohammad Eslami](#) in September 2022: "All allegations are strictly based on fabricated and false information." Unsurprisingly, no progress has been reported by Grossi up to today.

In a new development, Iran failed to report to the IAEA the interlinking of two IR-6 cascades and went on to produce 84 percent enriched uranium at the Fordow Fuel Enrichment Plant. The 84 percent highly enriched uranium was detected following an unannounced inspection during which the IAEA discovered an undeclared change in the configuration and operation of the two interconnected IR-6 cascades. This finding increases suspicion that Iran has been testing the production of near weapon-grade uranium without IAEA detection. This whole episode represents a significant new failure of Iran to declare its activities openly and honestly to the IAEA, as set forth under its safeguard obligations.

In a bit of good news, after the surprise discovery of the near 84 percent enriched uranium at Fordow, Iran agreed that the IAEA could [conduct](#) "50 percent more inspections" at Fordow.

Reduced monitoring under the JCPOA

Iran has reduced the monitoring of advanced centrifuge production and assembly under the Joint Comprehensive Plan of Action. The IAEA has stated that due to gaps in relevant monitoring, it has concerns about its ability to verify Iran's declared centrifuge numbers even if Iran fully cooperated. This adds to the concern about Iran's ability to sneak-out to a nuclear weapon, using only a small number of secretly-produced advanced centrifuges.

In the March 2023 Joint Statement, Iran agreed to re-establish JCPOA online enrichment monitors and camera surveillance removed in June 2022. While a step in the right direction, reinstalling the cameras and other surveillance measures has gone slowly, delayed until close to the upcoming Board of Governors meeting in June. Lost in this evident progress is the more fundamental issue of whether Iran will provide the data collected by the cameras and the needed cooperation, vital to developing a complete picture of the number of advanced centrifuges Iran has produced. The latter is critical in determining whether Iran has been creating a secret stock of advanced centrifuges. So far, Iran has refused to provide stored camera data from before June 2022 or to cooperate with the IAEA in restoring information during the period after Iran removed the cameras. Without considerably more Iranian

cooperation and information, this act alone will not enable the IAEA to reestablish a continuity of knowledge over centrifuge production.

Taking Stock

With Iran's refusal to resolve outstanding NPT safeguards violations and its reductions of JCPOA monitoring, the IAEA has a significantly reduced ability to monitor Iran's complex and growing nuclear program, which in particular has unresolved nuclear weapons dimensions. The IAEA's ability to detect diversion of nuclear materials, equipment, and other capabilities to undeclared facilities remains greatly diminished. Nonetheless, the transparency situation could worsen even further, if, for example, Iran withdrew from the NPT, asked the inspectors to leave critical sites or the country, or fabricated excuses to deny inspectors access temporarily.

Nuclear Breakout

Score: 30 points

In 2022, for the first time, Iran's breakout time became zero, indicating an extreme threat and a score of 30 (Extreme Danger).

Iran has more than enough 60 percent enriched uranium, or highly enriched uranium (HEU) to directly fashion a nuclear explosive. If Iran wanted to further enrich its 60 percent enriched uranium up to 90 percent weapon-grade uranium (WGU), used in Iran's known nuclear weapons designs from the Amad Plan, it could do so quickly.

Due to the growth of Iran's 60 percent and 20 percent enriched uranium stocks, as of February 2023, Iran can break out and produce enough weapon-grade enriched uranium for a nuclear weapon in 12 days, using only three advanced centrifuge cascades and half of its existing stock of 60 percent enriched uranium. This breakout could be difficult for inspectors to detect promptly, if Iran took steps to delay inspectors' access.

Using its remaining stock of 60 percent enriched uranium and its stock of near 20 percent enriched uranium, Iran could produce enough weapon-grade uranium for an additional four nuclear weapons in a month. During the next two months, Iran could produce two more weapons' worth of weapon-grade uranium from its stock of less than five percent enriched uranium, meaning that Iran could produce enough weapon-grade uranium for five nuclear weapons in one month and seven in three months. (Five nuclear weapons were the original goal of Iran's Amad Plan.)

Moreover, over the last few years, Iran has learned important lessons in breaking out to nuclear weapons by experimenting with and practicing shortcuts in multi-step enrichment.

- Iran started from a level below 5 percent enriched uranium and enriched directly to near 60 percent in one cascade, rather than using two steps, a slower process entailing the intermediate production of 20 percent enriched uranium.
- It built and tested equipment to feed 20 percent enriched uranium and withdraw HEU, possibly enriched to higher than 60 percent; the exact level is unknown. Iran remixed the enriched product with the less enriched waste tails after measuring the product's enrichment level.
- Iran prepared advanced centrifuge cascades to switch more easily from the production of five percent enriched uranium to 20 percent enriched uranium.
- It further developed a multi-cascade set up to produce 20 percent enriched uranium from natural uranium by making 5 percent enriched uranium in advanced centrifuges and then directly feeding this product, still in gaseous hexafluoride form, into IR-1 centrifuge cascades to make near 20 percent enriched uranium. As such, Iran was practicing multi-step enrichment needed to produce weapon-grade uranium while seeking to shortcut the process.

Sensitive Nuclear Capabilities

Score: 20 points 

Iran continues taking steps to escalate its sensitive nuclear activities. Iran has a capability to produce large amounts of enriched uranium and achieve enrichment levels up to 90 percent, or weapon-grade uranium, a capability recently [implied](#) by Mohammad Eslami, head of the Atomic Energy Organization of Iran (AEOI). Since September 2022, Iran has doubled its number of advanced centrifuges, doubled its production of 60 percent enriched uranium, and reduced the breakout timeline for producing enough weapon-grade uranium for five weapons from four months to one month. These activities receive a score of 20 (High Danger), up from 17 in October 2022, reflecting actions taken over the last six months, but leaving room on the scale to account for the strong possibility that Iran's nuclear buildup could continue.

In fact, Iran has ambitious goals to increase its enrichment program, aiming for tens of thousands of advanced centrifuges, producing a range of enrichment levels, and tens of thousands of kilograms of enriched uranium. By 2030, Iran plans to have an enrichment capacity of 125,000 separative work units (SWU) per year. As Iran makes progress toward its goals, these activities will affect the score in this section even if they are allowed by a possible revived JCPOA. Likewise, if Iran's most threatening nuclear activities were reduced, the score would go down.

As of mid-February 2023, Iran continued to increase the quantity and quality of its enriched uranium stock and bolster its ability to enrich uranium. Uranium enrichment remains the most sensitive activity in Iran's nuclear program. Iran may also develop an ability to produce and separate weapon-grade plutonium, although that effort is largely dormant today.

Increased Stocks of 20 and 60 Percent Enriched Uranium and Increased Capacity to Make 60 Percent Enriched Uranium

Over the fall and winter, Iran increased its capacity to produce 60 percent highly enriched uranium by starting to produce 60 percent HEU in two cascades of advanced IR-6 centrifuges at the deeply buried Fordow enrichment plant. This led to a doubling of Iran's monthly average production of 60 percent HEU. Of note, no other country without a nuclear weapons program enriches uranium to 60 percent HEU. In addition, this change increases Iran's ability to produce HEU at a highly fortified facility, compared to the above-ground PFEP, where Iran has been enriching uranium up to 60 percent since April 2021.

It also appears that Iran continued to experiment with the production of highly enriched uranium above 60 percent; in addition to the earlier experiments using 20 percent enriched uranium as feedstock, the IAEA discovered near 84 percent HEU particles at Fordow in January 2023 (see above). The IAEA collected the environmental samples that revealed the presence of near 84 percent HEU the day after the inspectors conducted an unannounced inspection, discovering an undeclared mode of operation in the two IR-6 cascades producing near 60 percent HEU. While it does not appear that Iran accumulated uranium enriched above 60 percent HEU, Iran may have added to its knowledge about modifying their cascades to enrich beyond that level.

Increase in Enrichment Capacity

As of mid-February 2023, Iran had a total installed nominal enrichment capacity of about 29,145 SWU per year, where advanced centrifuges account for about 22,600 SWU per year and IR-1 centrifuges account for 6500 SWU per year. This enrichment capacity is an increase of nearly 11,000 SWU since September 2022, and driven primarily by the deployment of advanced centrifuges at the Natanz Fuel Enrichment Plant. The amount of separative work achieved in practice is lower, sometimes far lower, due to inefficiencies in centrifuge construction and operation.¹ Nonetheless, its enrichment output increased due to ongoing installations of additional advanced centrifuges.

Shortened Timeline to Breakout and Produce Enough Weapon-grade Uranium for Five Nuclear Weapons

An indicator of sensitive nuclear activities is a change in the amount of weapon-grade uranium Iran can produce in a breakout. As discussed in the previous section, as of February 2023, not only can Iran rapidly produce weapon-grade uranium for its first nuclear weapon in a matter of days, it can produce enough weapon-grade uranium for five nuclear weapons in one month – a dramatic shift from the four months it would have taken Iran to produce five WGU quantities in September 2022.

¹ The achieved enrichment capacity varies considerably over time. For more information, see the Institute series on surveying Iran's IR-1 and advanced centrifuges at www.isis-online.org.

Large Deployments of Advanced Centrifuges

Iran's advanced centrifuges deserve special attention because they pose a grave risk to international security, allowing Iran to produce weapon-grade uranium for a nuclear weapon more quickly, either at declared nuclear sites or at clandestine ones. The presence of advanced centrifuges at the Fordow underground enrichment plant enhances Iran's ability to break out using a declared but highly fortified facility.

Over the fall and winter of 2022, Iran deployed almost 3000 additional advanced centrifuges. As of mid-February 2023, Iran had 5763 advanced centrifuges of various types installed at its three enrichment facilities at Natanz and Fordow, up from 2780 as of September 2022, as well as 7231 installed IR-1 centrifuges. Iran further announced its intentions to install an additional 14 IR-6 centrifuge cascades at Fordow. As of mid-February 2023, Iran has not installed additional IR-6 centrifuges at Fordow; however, Iranian progress in doing so would inevitably raise the score in this section further.

Work continued on a new, large, heavily fortified underground site near the Natanz enrichment plant to assemble advanced centrifuges. This site may also be slated to hold another enrichment plant.

Iran Has Installed a Capability to Produce Highly Enriched Uranium Metal

In the last few years, Iran has developed capabilities at the Esfahan site to produce enriched uranium metal, a necessary step in building nuclear weapons. It has developed a capability to convert enriched uranium hexafluoride, the output of its centrifuge plants, into enriched uranium metal. On a small scale it has converted 20 percent enriched uranium hexafluoride into metal. This accomplishment means that Iran could do the same with weapon-grade uranium hexafluoride.

Iran Remains a Serial Violator of National Export Controls and Sanctions

Iran continued to violate international and national sanctions and strategic trade control laws as it seeks to outfit its nuclear and missile programs. These activities are crucial for Iran, since it does not produce many of the subcomponents and raw materials needed by its nuclear, arms (including drones), and missile programs. Intelligence reports, prosecutions, and sanctions listings continuously highlight Iran's ongoing and often increasing WMD-related procurement efforts.

Beyond Breakout

Score: 18 points 

So far, Iran has not turned its highly enriched uranium into nuclear weapons. Even so, it had a large-scale nuclear weapons program in the past, parts of which continue up to today, leading to a score in this category of 18 out of 30 (Considerable Danger). This score acknowledges that further steps in nuclear weaponization are possible, including building nuclear weapons or using them.

Iran Has Maintained an Organizational Structure to Preserve and Possibly Hone Nuclear Weaponization Assets and Skills

[Iran's nuclear weapons program](#) started slowly, building to a crash nuclear weapons program in the early 2000s, called the Amad Plan, to create five nuclear weapons in an industrial complex capable of producing many more. Under international pressure and fearing a military attack, the program was driven to downsize and deeper secrecy. Iran's decision to halt the Amad Plan merely served as a tactical retreat, not an abandonment of its nuclear weapons ambitions or activities, a step taken earlier by other countries, notably Taiwan and South Africa.

After the closure of the Amad Plan, other organizations continued to work on nuclear weapons. The evidence suggests that Iran not only maintained the capability to produce nuclear weapons, but actively worked on efforts to advance that capability in case Iran's leaders made a decision to build them. There is no evidence that such work has halted.

The nuclear weaponization skills continue to be largely harbored in a military organization known by its acronym SPND, involved in many military development projects. Core Amad Plan groups remain in SPND, employing many former Amad Plan personnel, preserving and likely improving key nuclear weaponization skills and capabilities. SPND has also launched its own project to develop and build a nuclear propulsion reactor.

The post-Amad reorientation strategy shines a light on controversial Atomic Energy of Iran (AEOI) nuclear activities that followed after 2004, particularly the Fordow enrichment plant, which was originally the Amad Plan's intended facility to produce weapon-grade uranium. After the halt of the Amad Plan, the secret Fordow project was transferred to the AEOI, which was judged as providing a more credible civil cover for military activities. This turned out to be true, as Western powers revealed the secret project in 2009 and its repurposing to low enriched uranium production. Similarly, recent AEOI uranium metal production activities may include follow-on activities of the Amad Plan, posing as civil activities.

Iran Would Only Need a Short Time to Build a Nuclear Weapon Today

Today, Iran is closer to being able to build nuclear weapons than it was in 2003 at the end of the Amad Plan, because of the vast uranium enrichment capabilities acquired since then.

Although it may not be building a nuclear weapon today, it does appear to have a program to be prepared to make nuclear weapons and to do so in short order. Rather than a crash nuclear weapons program, Iran continues to threaten the world with a program ready to produce nuclear weapons “on-demand.”

It would not take Iran long to build nuclear weapons if it decided to do so. Iran had accumulated enough information and experience by the end of the Amad Plan to be able to design and produce a workable implosion nuclear device. That nuclear weapon design had a diameter of 55 centimeters, roughly the same as a car tire, meaning that it is small enough to fit on a ballistic missile. Work since 2003 may have led to designs with smaller diameters.

Based on all the available information, the Institute has assessed Iran as being able to prepare a nuclear explosive device for underground testing in six months. This device could also be delivered in a crude delivery system, such as a ship or bomber. A missile-delivered warhead would take longer to produce, with estimates ranging from one to two years. Iran could also decide to produce a large arsenal. If it secretly restarted the Amad Plan where it left off, it would likely be able to start manufacturing missile-deliverable nuclear weapons after about two years.²

In a rare public statement on Iranian nuclear weapons capabilities, General Mark Milley, chairman of the U.S. Joint Chiefs of Staff, told Congress on March 29, 2023, “From the time of a national decision, Iran could produce enough fissile material for a nuclear weapon in approximately 10-15 days and it would only take several months to produce an actual nuclear weapon.”^{3,4} He was unclear on the sophistication of the nuclear weapon that Iran could produce in several months.

Milley’s statement and the Institute’s analysis indicates that there is more agreement that Iran could produce a nuclear weapon in “several months” or “six months,” respectively, if the regime decided to do so. However, Milley’s statement appears to indicate that Iran may be closer to being able to build nuclear weapons than assessed in the Institute December 2022 study.

² David Albright, “Iran Building Nuclear Weapons,” *Institute for Science and International Security*, December 5, 2022, <https://isis-online.org/isis-reports/detail/iran-building-nuclear-weapons/8>.

³ “Statement of General Mark A. Milley, 20th Chairman of the Joint Chiefs of Staff, Department of Defense Budget Hearing,” before the House Armed Services Committee, March 29, 2023, <https://armedservices.house.gov/sites/republicans.armedservices.house.gov/files/03.29.23%20Milley%20Statement.pdf>. (See also [The Wall Street Journal coverage](#).)

⁴ For information about breakout timelines, see David Albright, Sarah Burkhard, Spencer Faragasso, and Andrea Stricker, “Analysis of IAEA Iran Verification and Monitoring Report - February 2023,” *Institute for Science and International Security*, March 3, 2023, <https://isis-online.org/isis-reports/detail/analysis-of-iaea-iran-verification-and-monitoring-report-february-2023>.

The Future is Uncertain

It remains unclear how Iran's nuclear weaponization program will evolve in the future, whether or not there is a revived nuclear deal. Iran remains on the brink of becoming a nuclear weapons power; its nuclear material production capabilities stronger than ever, its weaponization capabilities lurking under the surface. Iran could part from its nuclear weaponization capabilities, surgically removing any remnants and establishing international confidence that its nuclear program is truly peaceful. But only Iran can make that decision. As such, the score in this section can move in either direction. For this edition of the Threat Geiger Counter, the score has been increased by two points.