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Iran Building Nuclear Weapons

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Background

Rather than a traditional nuclear weapons program, Iran threatens the world with a program ready to produce nuclear weapons "on-demand." Its readiness program poses a difficult challenge to the international community and the International Atomic Energy Agency (IAEA).

Due to its past, large-scale nuclear weapons program, called the Amad Plan, Iran has a readiness program with less need for secret nuclear weapon development activities. Iran has advanced its nuclear weapons readiness under civilian nuclear and military non-nuclear cover projects. Using a civilian cover, Iran has in recent years successfully produced highly enriched uranium (HEU) and near HEU metal.

Understanding the pace of Iran building nuclear weapons matters, in particular, for designing strategies against Iran moving to construct them.

Findings

Iran is increasingly viewed as a nuclear power, yet it has so far not been subjected to harsh international and regional penalties.

Iran has multiple pathways to build nuclear weapons: (1) Reviving and completing the Amad Plan with a capability of serially producing many warheads suitable for ballistic missiles (and possibly cruise missiles); (2) launching an accelerated effort to achieve a few crude nuclear weapons; or (3) a combination of both. Iran's likelier pathway to nuclear weapons is the pursuit of both an accelerated approach and a revival of the Amad Plan.

The time needed to revive and complete the Amad Plan is estimated as two years, at which point Iran would have produced its first missile-delivered nuclear warhead and created the infrastructure for serial warhead production.

An accelerated program, benefiting from earlier Amad work, could produce its first crude nuclear weapon in six months. Too often, the missile warhead pathway is overemphasized.

A priority is ensuring that Iran is inhibited, or deterred, from deciding to build nuclear weapons.

Introduction

A frequently propagated red herring is that if Iran's leadership has not decided to build nuclear weapons, it does not have a nuclear weapons program, as if only a directive to build them or the act of building them qualifies. However, for a country like Iran, a simplistic binary model does not suffice. Similarly, this type of categorization did not apply to Taiwan in the 1980s, when it had a program of being ready to build nuclear weapons on short order, if requested by the regime's leadership.[1] Taiwan had not made a decision to actually build nuclear weapons, nor had it shown any intention to build them, but it wanted to be ready to do so quickly in case a Chinese invasion was imminent. However, the United States feared that if the Chinese discovered the program, whether ready or not, it would invade. As a result, the United States took dramatic and secret steps to not only shut it down but insisted that Taiwan dismantle much of its associated infrastructure, including a research reactor, a secret plutonium separation plant, and an extensive secret nuclear weapons simulation and high explosive testing program. Taiwan had given the unfinished secret plutonium separation project a civilian cover story, and the research reactor was under International Atomic Energy (IAEA) inspections. Nonetheless, the U.S. government was determined to block Taiwan's pathway to a nuclear weapon once and for all.

Likewise, today, Iran does not appear to have a program focused on the actual building of nuclear weapons. But it does appear to have a program to be prepared to make nuclear weapons and to do so on short order based on covert and overt activities and facilities. Rather than a traditional nuclear weapons program, Iran threatens the region and the world with a program ready to produce nuclear weapons "on-demand."

This type of program serves the Iranian regime's interests. While Iran increasingly is viewed as a nuclear power, it has so far been able to avoid harsh international and regional penalties. All the while, it can act to bolster its nuclear weapons capabilities. Given its existing capabilities, this approach also permits Iran to minimize the need for secret nuclear weapon development activities, which if discovered could catalyze more dangerous threats against the regime.

Today, Iran is closer to being able to build nuclear weapons than it was in 2003 at the end of the Amad Plan, its large-scale nuclear weapons program in the early 2000s, aimed at building five nuclear weapons with cores of weapon-grade uranium.[2] While international efforts have complicated Iran's maintenance of a nuclear weaponization program, and even over time stymied some activities, no evidence has emerged that Iran stopped its nuclear weaponization efforts after 2003. Nonetheless, building an arsenal of nuclear weapons is a complex challenge, requiring a range of nuclear capabilities, and many that need to be kept ready under utmost secrecy.

Since the Amad Plan, Iran has focused on creating an uranium enrichment program able to make weapon-grade uranium, a capability that was years away in 2003 when the Amad Plan was

[1] David Albright and Andrea Stricker, *Taiwan's Former Nuclear Weapons Program: Nuclear Weapons On-Demand* (Washington D.C., Institute for Science and International Security Press, 2018).
[2] David Albright with Sarah Burkhard and the Good ISIS Team, *Iran's Perilous Pursuit of Nuclear Weapons* (Washington, DC: Institute for Science and International Security, 2021).

halted. It now has established a vast uranium enrichment program, housed in multiple facilities, based on advanced centrifuges, and is well-practiced in producing up to 60 percent enriched uranium – a small step from weapon-grade uranium.

Meanwhile, Iran has resisted all efforts by the IAEA to cooperate and fully reveal its nuclear programs, providing what is known as both a correct and *complete* nuclear declaration, a necessary step in the IAEA process of determining that Iran's nuclear program is peaceful. Nonetheless, the IAEA has accumulated a large body of evidence that Iran is hiding nuclear materials and activities associated with its nuclear weapons program. In the last few years, the IAEA has discovered undeclared nuclear materials and activities at four sites in Iran: three called Marivan, Varamin, and Lavisan-Shian, are linked to facilities and activities of the Amad Plan and the fourth, Turquz-Abad, with current-day storage of Amad equipment and material. These discoveries are the tip of the iceberg of Iran's nuclear weaponization capabilities, many kept intact after Amad's halt. These capabilities collectively represent decades of accumulated equipment, knowledge, and experience, including the preservation of the extensive activities and accomplishments of the Amad Plan.

Under the current conditions, despite the buildup in tensions with Iran, it is not possible to predict when or if the Iranian regime might decide to build nuclear weapons. But the regime is rapidly advancing its uranium enrichment program and nuclear-weapons-capable ballistic missile programs, while threatening to reduce further inspections.

Iran may still, however, fear the negative consequences of building nuclear weapons in the near future, which could include far harsher sanctions, military strikes, and nuclear proliferation among its Middle East neighbors. It may want to return to the Joint Comprehensive Plan of Action (JCPOA), at least for a few years, to gain immediate sanctions relief, the end of the UN missile embargo in 2023, and the expiration of the UN Security Council snapback mechanism in 2025.

Yet, there are probable triggers that could cause the Iranian regime to implement its readiness effort and build nuclear weapons. One such could be the regime assessing its survival is at stake; another would be military strikes against Iran's nuclear sites that do not deter the regime from rebuilding those sites. Although not all of the triggers can be prevented, Iran acting on them to build nuclear weapons can be deterred.

In the absence of a major triggering event, the regime may be waiting for a time when the intersection of capabilities, i.e. speed to the bomb, and negative consequences is viewed as manageable. Although this balance point is difficult to predict, the former—Iran's potential course of building a nuclear arsenal—can be analyzed, and the latter—negative consequences—can be bolstered, inhibiting Iran from crossing that line in the first place.

As Iran continues to get closer to being able to rapidly build nuclear weapons, additional risks may develop. The quicker Iran can make a nuclear weapon, the more tempted the leadership may be to give the go-ahead and accept the price it will have to pay internationally. Simultaneously, the risk increases of the West mistakenly concluding that Iran is dashing to the bomb, leading to harsh and destabilizing countermeasures.

For all of these reasons, understanding the pace of Iran building nuclear weapons matters, in particular for designing strategies against Iran moving to construct them.

What could an Iranian move to nuclear weapon status look like?

The Iranian situation poses unusual challenges. Its nuclear program is rather unique in the annals of nuclear proliferation. It learned how to build nuclear weapons but stopped a full-fledged nuclear weapons program before building any. Yet, it did not fully stop its nuclear weapons effort and is resisting the type of denuclearization undertaken by Taiwan and South Africa, stonewalling IAEA efforts at further transparency.

The Iranian regime today has the choice between two basic strategies to achieve nuclear weapons status—a relatively quick path to revive and complete the Amad Plan with a capability of serially producing many warheads suitable for ballistic missiles (and possibly cruise missiles) as well as testing underground, and/or an accelerated, interrelated effort to achieve a few crude nuclear weapons. Either strategy could be invoked separately or in parallel.

The particular course would depend on the trigger causing Iran to decide to build nuclear weapons and Iran's perception of the world's reaction, including the feasibility of progressing without risking draconian responses that would disable the nuclear weapons effort. Detectability of the effort would likely be one main consideration, and relatedly, speed, as the transition time between a decision to build nuclear weapons and the possession of the first one poses enormous risks to the regime if the effort is discovered. Further consideration would be given to the desired military strike capabilities of the nuclear weapons and their deterrence effect. An accelerated program to its first and perhaps second nuclear weapon would have less chance of premature detection, but Iran would likely also want to create a formidable arsenal of nuclear-tipped ballistic missiles able to reach Israel and eventually Europe, if not the United States.

Amad Plan Revival

Iran could revive and complete the Amad Plan, creating an industrial-scale nuclear weapons production complex able to serially produce nuclear warheads for ballistic missiles and perhaps cruise missiles. The Amad Plan was well structured, with hundreds of well-defined tasks, each with a schedule, along with careful tracking of progress and shortcomings of each task. By late 2003, and the halt of the Amad Plan, most tasks associated with nuclear weaponization were completed or well on their way to completion, the organizational hierarchy was set, needed physical infrastructure mapped out, and large-scale facilities designed or under construction.

This revival is credible because unlike a country ending its nuclear weapons program, Iran did not disperse Amad personnel or order a halt to all nuclear weapons work. Amad's leaders were extremely upset at the regime leadership's decision to halt the program and were allowed to form successor organizations that conducted nuclear weapons-related projects, serving to solve some of Amad's bottlenecks and to keep many Amad personnel employed up to today. The IAEA has also alleged that Iran has maintained and hidden nuclear and nuclear-related equipment and materials left from the Amad Plan.

However, starting up and finishing the Amad Plan's initial goals of five nuclear weapons would take time. After the halt of the program, several facilities were abandoned or never finished, and some key development activities are still required.

Under a revival, Iran could produce weapon-grade uranium late in the process, using stocks of enriched uranium. It could also build a clandestine enrichment plant, where it could receive diverted stocks of safeguarded enriched uranium for further, secret enrichment to weapon-grade.

Accelerated Program

If speed and minimizing detection are emphasized, Iran could initiate an accelerated secret program, focused on finishing the most essential work on nuclear weaponization. Experience from Iran's Amad Plan efforts would be invaluable in planning and executing the accelerated nuclear weapons program to build simpler nuclear explosive devices on an expedited schedule. Late in this process, Iran could "breakout" and divert enriched uranium to the production of weapon-grade uranium, allowing for a relatively rapid completion of its first nuclear weapons. Iran would probably calculate that the time between diversion and actualization of its first nuclear weapons would not allow an effective international response.

Under an accelerated program, Iran's weapons would likely be non-missile deliverable but could be used for underground testing to demonstrate a capability, delivered by crude delivery systems, or hinted at while their existence would simultaneously be denied. The last option was used successfully by Pakistan in the 1980s, leaving the world to ponder how many nuclear weapons it had and what type. If Iran conducted an underground nuclear test, the political and strategic effect would likely be profound, even without any clear indication of Iran having deployed nuclear weapons. Given the extent of terrorism conducted by the Iranian regime and its proxies, an unconventional delivery system should not be discounted, especially in the face of desperation. These weapons, despite their relative crudeness, would likely provide Iran with a nuclear weapon status, likely deterring enemies, while finishing its missile-deliverable warheads.

Iran's Nuclear Weapons Readiness Program[3]

Iran's current nuclear status is both credible and threatening to other countries, because under the Amad Plan, Iran did have a nuclear weapons program like the one in Pakistan or in South Africa in the 1970s and 1980s. Adding to concerns, Iran has strategic and political reasons to build nuclear weapons and an authoritarian political system able to suppress domestic opposition to building them.

Iran is way beyond what is sometimes called a latent nuclear weapons program, a term often pinned on Japan because it has a large stock of separated plutonium. But despite Japan's latency status, the country has not performed any concrete work on weaponizing that plutonium or given any sign of being ready to build nuclear weapons. Iran's leadership is thinking about nuclear weapons, preserving nuclear weapons capabilities, including related information and equipment,

[3] This section and the next one draw extensively on the discussion in *Iran's Perilous Pursuit of Nuclear Weapons.*

advancing those capabilities, and fighting off exposure and demands for greater transparency. Iran has an active capability with key nuclear weaponization abilities in place, and—it is highly likely—a plan to exercise the option to make nuclear weapons, including a process or at least a strategy if the regime's leadership decides to do so.

Traditional definitions of a nuclear weapons program thus do not fit Iran's situation today, particularly when they are applied to assessments of whether specific aspects of nuclear weaponization are active from one year or another. In the context of Iran, as was the case for Taiwan, a more realistic and useful definition of a nuclear weapons program should include a program that is preparing itself to build nuclear weapons, if an order is given.[4]

A new, broader definition of a nuclear weapons program includes a set of related activities aimed at seeking and building nuclear weapons, but it allows for programs encompassing a collection of activities aimed at being ready, on command and in short order, to build nuclear weapons. In evaluating whether Iran's program qualifies under this broader definition, assessments should look at all measures taken to create the technological and organizational conditions for producing nuclear weapons, including the planning and construction of nuclear weapon research, development, and production facilities. Iran should also be assessed on whether it is developing or maintaining the various nuclear capabilities that better position it to produce nuclear weapons, should the leadership choose to build them. In such an assessment, sensitive safeguarded nuclear facilities matter; breakout timelines become an important measure of the threat; inspection deadlocks over access to personnel and sites become an indicator of possible or covert nuclear weapons-related activities; and discovery of the construction of secret nuclear sites or their razing is met with a presumption of guilt. Illicit procurements and procurement attempts related to nuclear weaponization are another indicator of undeclared nuclear weapons-related activities. An active management structure, as indicated in Iran's case by the maintenance of a secret nuclear weapons archive, would qualify as evidence indicative of an ongoing nuclear weapons effort. Overall, the entire nuclear program must be considered, both overt and covert components, as well as potential non-nuclear cover programs.

Under that definition, Iran has at a minimum an active nuclear weapons readiness program, a capability amplified since the Amad Plan. Its readiness program is centered at both secret and safeguarded facilities.

Mohsen Fakhrizadeh and his Successors

Iran's long-time leader of its nuclear weapons efforts was Mohsen Fakhrizadeh, with the support and guidance of Iran's most senior leadership. He led the Amad Plan and its predecessor organization, the Physics Research Center, known by its acronym PHRC. He continued leading Amad's successor organizations, the most recent known by its acronym, SPND, which included many former members of the Amad Plan, until his violent death in November 2020.

[4] While some may call this a "threshold" state, that term is avoided here because it is poorly defined and ambiguous, having been applied to countries like Japan with a large, separated plutonium stockpile and Israel with an undeclared nuclear arsenal.

His death was a setback for Iran and has complicated maintaining a nuclear weapon readiness capability, given his enormous amount of institutional knowledge, his recognized managerial skills, and his political influence. However, Fakhrizadeh and his colleagues from the Amad Plan also mentored a new generation that appears to be sufficiently capable to carry on, despite Fakhrizadeh's death. In addition, the IRGC and Iran's military industries have a variety of experienced managers, two of which emerged as heads of SPND following Fakhrizadeh's death in late 2020, both well versed in Iran's missile and other military industries.

The first replacement was IRGC Brigadier General Mahdi Farahi, aka Seyyed Mahdi Farahi. He was formerly Deputy of Iran's Ministry of Defense for Armed Forces Logistics (MODAFL) and Managing Director of the Defence Industries Organisation (DIO), and head of the Aerospace Industries Organisation (AIO). He has been designated by both the United States and the European Union because of his nuclear proliferation and/or ballistic missile activities. He was also reportedly involved in the development of an 80-ton rocket booster being jointly developed by Iran and North Korea and travelled to Pyongyang, North Korea during contract negotiations.[5]

Farahi remained as head of SPND for less than a year, being replaced in September 2021 by Reza Mozaffarinia, aka Reza Mozaffarinia Hosein. Mozaffarinia is a former deputy defense minister of MODAFL and Dean of Malek Ashtar University (MUT), a university controlled by MODAFL. Mozaffarinia has made significant contributions to Iran's missile program, according to his U.S. Treasury Department designation in 2013.

Based on interviews with knowledgeable sources, neither man was part of the Amad Plan or has significant nuclear background or expertise. A priority was stabilizing SPND after Fakhrizadeh's death, and they both accepted orders to continue with Fakhrizadeh's methods. As a result, the structure of SPND did not change after his death. The core Amad groups remain intact, in particular the explosive and radiation groups.[6] Former Amad personnel remain senior experts in these programs. The core of Iran's nuclear weaponization capabilities thus remain in SPND under new leadership. If the Iranian regime decided to build nuclear weapons, despite the loss of such a unique leader of its nuclear weapons program, it maintains the expertise and managers to do so.

After decades of almost exclusively non-military figures leading the Atomic Energy Organization of Iran (AEOI), it was recently placed under the leadership of a figure with an extensive background in Iran's military industries. In August 2021, the newly elected President Ebrahim Raisi appointed Mohammad Eslami as the new head of the AEOI. Eslami is a civil engineer who was formerly Deputy Defense Minister for Research and Industry and served as head of the Defence Industries Training and Research Institute, which earlier had contained the Amad Plan. He was also managing director of Iran Aircraft Manufacturing Industries (HESA), deputy director of Aerospace Industries Organization (AIO), deputy for engineering and development plans at Defense Industries Organization (DIO), and deputy for engineering and passive defense at the Ministry of Defense and Armed Forces Logistics (MODAFL). For his activities, Eslami was designated by the U.N. Security Council and the European Union.

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[5] *Iran Watch,* accessed November 19, 2022, https://www.iranwatch.org/iranian-entities/brigadier-general-seyyed-mahdi-farahi.

[6] For more information of SPND and its projects, see *Iran's Perilous Pursuit of Nuclear Weapons,* Chapter 14.

Eslami may have had earlier connections to the nuclear program. In 2015, Eslami reportedly participated in negotiations with the IAEA about the IAEA's investigation into possible military dimensions of Iran's nuclear program. During this period, leading up to the JCPOA's implementation in early 2016, the Iranian regime's negotiating strategy was very successful, undermining the IAEA from obtaining a complete Iranian nuclear declaration and convincing the United States and its European allies that such a declaration was extraneous to implementing the JCPOA.[7]

With Eslami now in firm control of the AEOI, does his appointment, a person with extensive senior-level military industrial experience, signify an increasing militarization of the AEOI? It bears watching whether Eslami will create closer ties and cooperation between the AEOI and military industries.

The Pillars of a Nuclear Weapons Program

Any successful nuclear weapons program must be built on three pillars: nuclear explosive material production, nuclear weaponization, and delivery systems. The most important aspect of a nuclear weapons readiness program is a commitment to be ready to make both nuclear test devices and deliverable nuclear weapons on an expedited schedule. Meeting such a schedule would require the preparation of many capabilities and require the involvement of several military institutions beyond the SPND, in particular those involved in nuclear-capable delivery systems, and the AEOI.

A challenge identified in the Taiwanese case was the need to ensure that nuclear weapons personnel would be ready to build nuclear weapons when ordered, all the while denying that there was a nuclear weapons program. This was a subterfuge harder for Taiwan to maintain given its more cordial working relationship with the IAEA and the regular presence of U.S. personnel at its nuclear sites. If a decision were made to build a nuclear weapon, Taiwan's government needed assurance that personnel were well-practiced and ready to act. There would not be time to start from scratch to develop needed skills or train new personnel. The role of civilian or non-nuclear military cover stories was critical in practicing preparation for or honing skills needed in a breakout to nuclear weapons.

In Iran, the AEOI has taken the lead on developing civilian nuclear cover programs, while SPND and other military research organizations can provide non-nuclear military cover for maintaining nuclear weaponization skills, particularly given that it contains so many former Amad Plan persons. One important nuclear weapons-related practice under a civilian cover can be seen in AEOI's deployment of a capability under IAEA safeguards to make near 20 percent enriched uranium metal. The use of near 20 percent enriched uranium can stand in for the production of weapon-grade uranium metal. Within SPND and associated organizations, where cover stories are plentiful, many necessary, secret capabilities are enshrined, allowing the development and maintenance of a range of nuclear weaponization-related capabilities. Some capabilities may even involve personnel unaware of the underlying purpose of their work. These "dual-use"

[7] *Iran Watch,* accessed on November 20, 2022, https://www.iranwatch.org/iranian-entities/mohammad-eslami

activities and projects can keep personnel ready to act to build nuclear weapons on short order, if a decision to proceed were made. A former senior member of Taiwan's nuclear weapons program called this state of readiness, "hot standby."[8]

Seen from this perspective, Iran's constant defiance and blocking of the IAEA is crucial to maintain its nuclear weapons readiness programs. It has to deny inspectors access to military sites and personnel and stonewall their requests for information about suspect undeclared materials and activities. This strategy helps prevent the IAEA from learning about secret nuclear weaponization-related activities and assets and prevents interpersonal relationships from developing, contradictions in officials' statements, and relationships that could increase the chance of leaks and unintentional disclosures. It would also help explain the regime's periodic, despicable efforts to portray IAEA inspectors as little more than spies for the West.

Maintaining the ability to produce weapon-grade uranium is far easier for Iran. The safeguarded uranium enrichment program serves as one of the most significant cover stories, developing the capability of producing weapon-grade uranium on short order and being able to build clandestine centrifuge plants involving advanced centrifuges. As of November 2022, utilizing its existing stocks of enriched uranium and centrifuge enrichment capability, Iran could produce enough weapon-grade uranium for four nuclear weapons in one month. By the end of the second month after starting breakout, it could have enough material for five weapons, the number of weapons set as the original Amad Plan target.

Iran's ballistic missile force and its accomplishments in increasing the precision of their missiles are impressive. Many of these missiles are capable of delivering nuclear warheads. Iran has the distinction of having the largest conventionally armed ballistic missile force in the world; others with comparable missile forces have put nuclear weapons on them. It possesses thousands of ballistic missiles of various ranges up to 2000 kilometers, with many precision-guided. During the last two decades, Iran prioritized achieving a high degree of precision and accuracy in its missiles, a goal it has demonstrated visibly in recent years – about 90 percent of current missile production is precision-guided missiles. Iran's ballistic missile program is being watched carefully by Western intelligence agencies for signs it is working on modifying its missiles' nose cones to carry nuclear warheads, surveillance which may be inhibiting Iran from modifying its missiles to carry nuclear weapons. In addition, Iran appears constrained in developing a reentry vehicle for an ICBM, despite developing rocket engines with sufficient thrust for an ICBM under the cover of a space launch program.

Nuclear Goals and Challenges

As outlined in the Nuclear Archive, the goals of the post-Amad nuclear program were to build a secret enrichment plant at Fordow and produce an industrial prototype of the Saqib series of nuclear weapons. The Saqib-type nuclear weapons constituted a pivotal post-Amad project.

[8] *Taiwan's Former Nuclear Weapons Program: Nuclear Weapons On-Demand*.

1. **Saqib-1**[9] was a system for static testing, where its technical specifications were finished in 2003. This type of device could be tested underground.

2. **Saqib-2** was a system for installation in the reentry vehicle, where the technical specifications of this system were, in late 2003, to be developed in such a way that it meets the flight parameters needed for integration into a ballistic missile.

3. **Saqib-3** was a Shahab 3 reentry vehicle equipped with Saqib-2, a missile deliverable nuclear weapon.

There is no reason to believe that Iran's basic goals have changed fundamentally. But there is evidence that the last 20 years further shaped the nuclear weapons program.

On one hand, Iran's nuclear weapons program has suffered numerous setbacks and delays, including the premature closure of the Amad Plan, the discovery of the Fordow enrichment plant, ongoing leaks about nuclear weapons efforts, at times tough IAEA inspections, killings of its key scientists, Stuxnet and other cyberattacks, sabotage of centrifuge manufacturing and enrichment plants, increased sanctions against its programs, threats of wide-scale military strikes, and international opprobrium. Arms control in the shape of nuclear freezes and the JCPOA temporarily limited Iran's activities and increased their monitoring. Iran's Amad personnel know they have been, and remain, under intensive surveillance by multiple intelligence agencies and have been targets of espionage, and worse. Moreover, the Amad workforce is aging, and some believe that Iran's nuclear weaponization skills are declining as this workforce ages, although Iran is also believed to be training and mentoring younger generations of scientists and engineers to replace this first generation of weaponeers. The nuclear weapons program's current state is bound to be complex and highly camouflaged.

On the other hand, Iran has persisted in its efforts. Moreover, if a decision were taken, Iran can reverse any decline in weaponization skills. Its nuclear weapons capabilities appear far more formidable today, particularly when looking at the two more visible nuclear weapons pillars: production of weapon-grade uranium and nuclear-capable ballistic missiles.

One gain for Iran, but a failure for the rest of the world, is that by simply putting a secret nuclear site under IAEA safeguards, it preserved the site—even opened the door for improving it—if a civilian purpose could be concocted. This was made easier by the legitimization of Iran's uranium enrichment program under shifting European and U.S. policies and arms control deals. The world grew anesthetized to Iran's cheating. Almost the entire Amad Plan nuclear fuel cycle is now either shut down or under IAEA inspections, but it is impossible for the IAEA to guarantee a strictly peaceful use. The U.S. government certainly rejected this type of outcome in the case of Taiwan, where it demanded the dismantlement of an operating safeguarded research reactor and the destruction of a reprocessing plant under construction.[10]

[9] Saqib is also transliterated as Sareb in other English translations of this document. The main Institute translator believes Saqib is more accurate. Saqib is a male name meaning shining, radiant, or glittering.
[10] *Taiwan's Former Nuclear Weapons Program: Nuclear Weapons On-Demand.*

It remains difficult to estimate the timeframe Iran has envisioned for implementing its readiness to build nuclear weapons, but any setbacks in weaponization have been made up by drastic improvements in missile delivery and weapon-grade uranium production and processing capabilities.

Characterizing the Nuclear Weaponization Status

One starting point is to consider the progress made by the Amad Plan's nuclear weaponization project, a subproject of Project 110, codenamed the Operating System Project. This project included almost the entirety of Iran's efforts to build the nuclear weapon itself, absent efforts to integrate the warhead into a ballistic missile. A snapshot of this project's work is seen in a Nuclear Archive electronic file, a Gantt diagram of all the Operating System Project's subprojects, including names, tasks, and schedules.[11] The diagram dates to about late 2001 or early 2002, about two years into the Amad Plan, which started in March 2000, and about 18 months before it was halted.

This Gantt diagram is useful in estimating timelines because it is a specialized form of spreadsheet template used by project managers worldwide to schedule and coordinate tasks, where each task is on one line, and its start and completion date can be represented graphically, along with its progress. Moreover, the spreadsheet allows sections to be expanded or contracted, allowing an examination of different parts or the whole. The Gantt diagram for the Operating System Project contains 650 lines, indicating a highly detailed plan.

At the time the diagram was updated in early 2002, the project's overall progress was 40 percent complete. The major subprojects, in the Gantt diagram, with percentage completed, are:

- Product System Engineering — 83 percent completed
- Neutron Source Design and Production — 33 percent completed
- Weapon-Grade Core Design and Production — 51 percent completed
- Multi-point hemi-spherical initiation systems — Shock Generator Design and Production — 45 percent completed
- Construction and Equipping of Nuclear Weapons Assembly Workshop — 0 percent completed
- Product Engineering Prototype — 28 percent completed

The Amad Plan continued for another 18 months before halting, allowing the Operating System Project to make significantly more progress. For example, Nuclear Archive documents show that the Shock Generator project may likely have been completed by the end of 2003.[12] Unfortunately, however, a late 2003 Gantt diagram update is not available to reveal overall progress by that date.

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[11] Figure 3.5 in *Iran's Perilous Pursuit of Nuclear Weapons* shows part of the Gantt diagram from the archive, showing a mostly closed view of this diagram, but the major subprojects are visible. The last number line visible is 630.

[12] David Albright and Olli Heinonen, "Shock Wave Generator for Iran's Nuclear Weapons Program," *Institute for Science and International Security,* May 7, 2019, https://isis-online.org/isis-reports/detail/shock-wave-generator-for-irans-nuclear-weapons-program-more-than-a-feasibil.

The Amad Plan also included a Warhead Project, also known as Project 111, focused on integrating a nuclear warhead into a ballistic missile. This project was further from completion in 2003 than the Operating System Project.

The weaponization and integration projects, finished or incomplete by the end of 2003, can be derived from other Nuclear Archive information. Based on Figure 10.4 in *Iran's Perilous Pursuit of Nuclear Weapons,* several key weaponization activities that would still be needed today and were largely finished under the Amad Plan by 2004, include:

1) Maintaining the capability to use computer codes to simulate a nuclear weapons explosion. Greater use of simulations would make component testing less necessary.
2) Retaining a mastery of the shock wave generator, including possibly having conducted a successful cold test of a nuclear explosive with a surrogate nuclear core. (A cold test is the last step before building a nuclear weapon.)
3) Having the capability to make the neutron initiator.
4) Finishing a pilot plant to make weapon-grade uranium cores (sites subsequently abandoned or likely repurposed).

SPND inherited considerable expertise in these areas and appears fully able to maintain or even advance these capabilities, either by conducting activities under cover stories or carefully undertaking clandestine efforts. With advances in computer technologies, and the wider availability of supercomputers, one would expect that SPND's capabilities to simulate a fission nuclear explosive would be quite advanced today.

Another key aspect of making nuclear weapons concerns weapon-grade uranium metal, including:

- Preserving or establishing the ability to convert fully enriched uranium hexafluoride into uranium tetrafluoride; and
- Having the capability of converting weapon-grade uranium tetrafluoride into metal and producing nuclear weapons components.

The Nuclear Archive did not contain any information on the first bullet item, but it had extensive information on the activities associated with the second bullet, including the construction of a pilot and production-scale plants to make weapon-grade uranium metal and transform them into nuclear weapon components. The two facilities were abandoned or repurposed after 2003, but many of their capabilities have in recent years been installed and partially tested by the AEOI at Esfahan. These activities have included the production of small amounts of near 20 percent enriched uranium metal, and the subsequent installation of a processing line at the Esfahan Uranium Conversion Facility to convert near 20 percent enriched uranium hexafluoride into tetrafluoride form and work on production lines to convert that material into enriched uranium metal. The 20 percent material can stand in for weapon-grade uranium. Iran finished installing equipment for producing depleted and natural uranium metal, although as of October 2022 no nuclear material had been introduced into the production area. The AEOI's actions since about 2020, despite being under safeguards, reflect a determination to reactivate Amad's previous

ambitious plans to make uranium metal. The more recent actions inevitably aid the process of making nuclear weapons.

In addition to safeguarded activities, SPND may have maintained related conversion and metallurgical skills in programs involving surrogate materials. At this juncture, the question looms regarding what material and equipment was in the Turquz Abad shipping containers. These containers could have held equipment and materials needed for the production of weapon-grade uranium metal and its conversion into weapon components.

Additional, key Amad Plan activities and facilities from the table in Figure 10.4 of *Iran's Perilous Pursuit of Nuclear Weapons* would be needed, some of which were not completed as of 2003, including:

- Finishing and bringing into operation a pilot-scale and/or a production-scale facility to make weapon-grade uranium cores for nuclear weapons;
- Integrating a warhead into a reentry vehicle of a ballistic missile;
- Having a facility to assemble all the components of nuclear explosive devices and missile-deliverable nuclear weapons;
- Preparing an underground nuclear test site.

During the last near 20 years, Iran could have made progress on these four areas. SPND, in collaboration with Iran's missile development and manufacturing industrial organizations, could have done considerably more work on integration of a warhead into a ballistic missile. Certainly, Western surveillance is ongoing for secret activities related to Iran building a nuclear test site. With increased concerns about such monitoring, Iran may have shifted from planning on drilling a vertical shaft in an isolated section of a desert to planning the construction of a horizontal tunnel that goes deep inside a mountain.

Based on the original Amad Plan schedules and accomplishments through the end of 2003, and assuming the Amad Plan had not been halted in 2003, it appears that the weaponization and integration projects would have needed one or two more years to complete their work. This is separate from the Project 110 project to produce weapon-grade uranium, the Al Ghadir Project, which was several years from fruition.

How quickly could Iran make nuclear weapons today?

The unfortunate reality is that Iran already knows how to build nuclear weapons. Although there are some unfinished tasks, overall, the SPND and its allied organizations give every appearance of standing ready to build them today, if the regime's leadership decided to do so. But how would it proceed? How long would it take? It cannot be argued today that Iran is several years from building nuclear weapons. At the end of the Amad Plan in 2003, that was the case. The biggest bottleneck then—the production of weapon-grade uranium—is no longer a bottleneck.

Iran's exact level of readiness, including timescales, is difficult to quantify, a determination complicated further by the death of Fakhrizadeh. For comparison, Taiwan had a policy that the nuclear weapons establishment had to deliver an atomic bomb in three to six months after

receiving the order to build nuclear weapons.[13] That level of knowledge of Iran's circumstances must be estimated.

Given Fakhrizadeh's detailed planning and managerial skills, as exemplified in the Amad Plan's Gantt diagrams for the Operating System Project, planning has most likely occurred on making nuclear weapons, including many contingencies. For a state like Iran under intense international pressure not to acquire nuclear weapons but wanting to hedge against threats, it would be expected to develop a range of options, while steadfastly denying any nefarious intention.

One aspect of any such plan is to hide certain activities, equipment, and documents, particularly those which have no civilian or non-nuclear military cover. The Nuclear Archive, with detailed nuclear weapons documentation, and Turquz Abad shipping containers of sensitive equipment and undeclared nuclear materials, demonstrate that need.

Another aspect of such a plan is avoiding or delaying as long as possible certain high-signature activities that are hard to hide from Western intelligence agencies and would be expected to precipitate harsh attention and escalation. A cold test conducted today would be one such activity. Work on certain single-use components related to integrating a nuclear warhead into a ballistic missile could be another one. Work on reentry vehicles for ICBMs would also fall into this category.

An important uncertainty is the current number of unfinished Amad tasks. Iran has demonstrated great advances related to Amad's Al Ghadir uranium enrichment project and ballistic missiles. More difficult to ascertain are its accomplishments on certain nuclear weaponization and missile integration efforts. Did Iran conduct a cold test? Did it build a prototype? Did Iran finish integrating a nuclear warhead into a ballistic missile reentry vehicle? Given the inherently small-scale nature of several of these unfinished weaponization tasks, their detection is challenging even for the most accomplished intelligence agencies. So much about the Amad Plan, including production-scale facilities, was missed until the discovery of the Nuclear Archive in 2018. About half of the key Amad sites were unknown by Western intelligence and the IAEA until after the seizure of the Nuclear Archive.[14] Furthermore, none of the unfinished tasks would likely take long to complete; after all, the weaponization pillar is the easiest of the three pillars for Iran to master.

Given the pressures on Iran, however, one cannot exclude the possibility that few weaponization activities are being conducted today, including development steps, except actions to hide its capabilities, and not always successfully, as shown by the discovery of the Nuclear Archive and the shipping containers at Turquz Abad filled with equipment and nuclear material from the Amad and possibly post-Amad efforts.

At a minimum, Iran has a coordinated set of activities related to building a nuclear weapon. At worst, the weaponization team has already conducted a cold test, built an industrial prototype and

[13] *Taiwan's Former Nuclear Weapons Program: Nuclear Weapons On-Demand*.
[14] David Albright and Sarah Burkhard, "Unknown Amad Sites, Prior to the Nuclear Archive Seizure," *Institute for Science and International Security,* May 18, 2021, https://isis-online.org/isis-reports/detail/unknown-amad-sites-prior-to-the-nuclear-archive-seizure/8.

is regularly practicing and improving their nuclear weaponization craft under various covers or in clandestine locations. As mentioned above, a cold test is significant since it would be the last step before manufacturing a nuclear explosive.

An additional part of this evaluation is Iran's desired level of reliability in its weapons. The nuclear explosive device itself would probably work, but if Iran wanted something better and more reliable, more work would be required, leading to delays in the actualization of a weapon or an underground test. Iran's standards over what constitutes a reliable weapon likely differ significantly from those in the West, with Iran more likely to trade less certainty for expediency.

Returning to the original dual-strategy course of action, where Iran would pursue both an accelerated nuclear weapons program and revive the Amad Plan, what are their respective timelines? It should be reemphasized that there is no evidence Iran has activated either option at this time.

Accelerated Nuclear Program

As of November 2022, Iran is assessed by the Institute as being able to build a crude nuclear explosive in six months. At that point, it could conduct an underground nuclear test or let the world know about the device by other means.

The risk of failure could be high in Iran's case. However, the Iranian leadership may perceive the risk as necessary and worthwhile, ordering the nuclear weapons' team to undertake this approach. In the case of Iraq's pursuit of an accelerated, or "crash," nuclear weapons program in 1990 after its invasion of Kuwait, it was Saddam Hussein and his top leadership that ordered the accelerated nuclear weapons program. This program, far less advanced than Iran's, was ended before its fruition by the start of the allied bombing campaign in January 1991.

This estimate assumes that while much of the weaponization work has been accomplished, a few significant tasks remain, even for completing a crude nuclear explosive, such as a cold test. However, these tasks could be completed in a matter of several months under an expedited schedule. Much of the work on weaponization would be conducted in utmost secrecy and would use existing or repurposed military facilities or hidden equipment and materials, possibly located in tunnels. Moreover, the device would only need to be able to be tested underground or delivered by a crude delivery system such as a ship or truck.

The production of weapon-grade uranium could be delayed until near the end of this six-month period. Iran is assessed as not having a secret uranium enrichment plant, so Iran would need to divert its stock of safeguarded enriched uranium and further enrich it to weapon-grade. With enriched uranium stocks at November 2022 levels, however, within a week or two enough weapon-grade uranium could be accumulated for two nuclear weapons, and in a month enough for four weapons could be produced at declared enrichment plants. This capability means that the diversion of safeguarded enriched uranium could be delayed until a month or two before assembling the first nuclear weapon. The production of weapon-grade uranium metal and its fabrication into weapons components could be practiced in secret sites with natural uranium as a surrogate, something already part of the Amad Plan.

The IAEA may be delayed in detecting the diversion of safeguarded enriched uranium and further enrichment up to weapon-grade, or the use of natural uranium in metal production and fabrication. For the safeguarded enriched uranium and the use of any declared sites, Iran could deny the inspectors access under a pretense such as a fire, an accident, or a security incident. Nonetheless, there would probably be some observable indication that a diversion had occurred, even if indirect.

Revive the Amad Plan

The other part of the strategy involves Iran secretly reviving the Amad Plan. If launched in conjunction with an accelerated program today, the weapon-grade uranium for several nuclear weapons could be manufactured as part of the initial breakout in the accelerated program. If launched alone, the diversion of the safeguarded enriched uranium would occur late in the project. There is a possibility that Iran would also build a clandestine enrichment plant, utilizing its growing advanced centrifuge production capabilities, possibly directly replacing the critical role the Fordow facility was to play under Amad. A few thousand advanced centrifuges in a hidden plant would make breakout much harder to detect, let alone prevent.

Based on gauging the progress made in the Amad Plan by 2003, combined with setbacks faced since and the fact that Iran would have to tread carefully to avoid premature discovery, Iran is estimated today to need up to two years to reach the point of producing its first missile-deliverable nuclear weapon and recreate an industrial-scale nuclear weapons production complex. The years that have passed since the Amad Plan was downsized, the abandonment of its large construction projects, destruction of discovered facilities, loss and re-assignment of personnel, and perhaps most of all the theft of major portions of the Nuclear Archive, laying bare large parts of Amad's existing and planned physical and human infrastructure, resulted in a significant loss of momentum Iran once had for a quiet revival of the Amad Plan.

Not factored into the two-year timeline is progress made in nuclear weapons development after 2003, as its full extent is at issue. However, this assumption risks shortening the Amad revival timeline by only a matter of months.

In this type of large program, after reaching its first missile-deliverable nuclear weapon, successive ones would be expected to follow every few months, where the supply of weapon-grade uranium would become the main driver of how quickly the arsenal would grow.

This two-year estimate is consistent with Israeli public estimates. An Israeli military intelligence estimate from early 2020 assessed that Iran would need two years to build and deploy a nuclear warhead on a ballistic missile,[15] and offered the same estimate in February 2021. The latter estimate recognized shorter breakout timelines to produce enough weapon-grade uranium, but

[15] See for example, Anna Ahronheim, "Iran Will Have Enough Material for a Nuclear Bomb Within the Year," *The Jerusalem Post*, January 14, 2020, https://www.jpost.com/Middle-East/Soleimani-killing-Window-of-opportunity-open-for-Israel-against-Iran-614151.

emphasized the delays that would ensue because of the death of Fakhrizadeh.[16] The Israeli military intelligence estimate is similar to previous U.S. intelligence estimates, which assumed that Iran had made little, if any, advancements since 2003.

A similar recent Israeli estimate was reported by *The Jerusalem Post* in November 2022.[17] Senior Israeli sources stated that once Iran makes a decision to build nuclear weapons, it would need about two years to master nuclear detonation and integration into a ballistic missile.

According to knowledgeable Israeli sources interviewed by this author, the two-year estimate is based on the scenario of Iran secretly reviving the Amad Plan, meaning that two years are needed to revive the Amad Plan, finish the nuclear weaponization tasks, construct the necessary facilities, and build the first missile-deliverable nuclear weapon. Under this approach, diversion of enriched uranium and production of weapon-grade would not happen until near the end of this two-year schedule. Successive weapons would then follow, leading to a small nuclear arsenal relatively quickly, assuming enough weapon-grade uranium has been produced.

Specific Triggering Scenarios

Currently, Iran is adding to its nuclear weapons capabilities while preventing the IAEA from investigating its undeclared nuclear materials and activities. Most believe Iran has not started building nuclear weapons. Yet, Western diplomatic efforts to constrain Iran's nuclear efforts or increase their transparency have so far failed, oftentimes leading the Iranian regime to retaliate, adding to its gas centrifuge program or decreasing cooperation with the IAEA. While Iran's actions are strengthening the international perception of it being a nuclear power, international concern about its status is increasing, and Western countermeasures are being perceived in Iran as more threatening.

What could lead Iran to change from maintaining a nuclear weapons readiness program to building nuclear weapons? The trigger will affect the specific strategy Iran chooses. These triggers should be considered, and a response planned. Although not all of these triggers are preventable, Iran can be deterred from moving to build nuclear weapons.

National Survival Threatened

A natural trigger to consider is if the Iranian leadership comes to perceive its national survival is threatened, at the same time as it has a ready path to a significant supply of weapon-grade uranium. The latter is currently true today. The former could develop in the coming months as tensions rise further between the West and Iran over Iran's refusal to agree to a revived nuclear deal, Iran's ongoing intransigence with the IAEA, its continued supply of drones or their technology to Russia for use in its war against Ukraine, its expected supply of precision missiles to Russia for use in that war, continued or worsening protests in Iran threatening the regime's

[16] Yaniv Kubovich, "Israeli Military Intel: Iran Is Two Years Away from Nukes, but Hasn't Decided on Breakout," *Haaretz*, February 9, 2021, https://www.haaretz.com/israel-news/.premium-israeli-intel-iran-is-two-years-away-from-nukes-but-hasn-t-decided-on-breakout-1.9525099.

[17] Yonah Jeremy Bob, "Israel thinks Iran 2 years from being able to detonate nuke – exclusive," *The Jerusalem Post*, November 16, 2022, https://www.jpost.com/middle-east/iran-news/article-722597.

existence, and a stepped-up shadow war between Iran and Israel. Iran may come to believe that a military strike or war is imminent. In a recent assessment of the threat posed by Iran, called the Iran Threat Geiger Counter, the Institute ranked the current threat as "High Danger."[18]

If Iran decides to build nuclear weapons as a result of a crisis concerning its national survival, when it has access to a ready supply of weapon-grade uranium, it will likely follow the two-step process outlined above, seeking to possess nuclear weapons as soon as possible to deter an attack on its critical facilities while recreating a robust nuclear weapons production infrastructure. It would likely remain in the Nuclear Non-Proliferation Treaty, while hiding key safeguarded assets such as enriched uranium, and also denying inspectors access to a variety of nuclear sites, helping keep its undeclared nuclear activities secret.

Because Iran has developed new centrifuge manufacturing and operational capabilities, it might build and operate a secret centrifuge plant able to produce weapon-grade uranium for nuclear weapons, using natural uranium and safeguarded enriched uranium as feed stock. Based on IAEA reporting, uncertainties about Iran's stocks of natural uranium and advanced centrifuges are growing. The development of advanced centrifuges translates into a smaller plant or one making weapon-grade uranium more quickly.

Withdrawal from the Nuclear Non-Proliferation Treaty

In reaction to Western escalations, Iran could decide to withdraw from the Nuclear Non-Proliferation Treaty. It would invoke article X, deciding that "extraordinary events, related to the subject matter of this [t]reaty, have jeopardized the supreme interests of its country." It would provide the required three months' notice, ending IAEA inspections except those required by other agreements, such as those affecting the Russian-supplied Bushehr power reactor, but it would publicly deny any intention to build nuclear weapons, while hiding its key stocks of enriched uranium and a stock of advanced centrifuges. If the West did not respond forcibly and decisively, Iran could opt for a secret revival of the Amad Plan, avoiding an accelerated program, counting on a reduced chance of detection as its methodically builds a nuclear weapons production complex with a two-year window to its first nuclear weapon. If a crisis develops, it could opt for an accelerated program. In this option, Iran may also build a clandestine enrichment plant to better protect its capabilities against military strikes.

Revival of the JCPOA

The revival of the JCPOA would temporarily but drastically reduce Iran's stock of enriched uranium and require the mothballing of thousands of advanced centrifuges, driving up Iran's breakout timeline and the time to accumulate enough weapon-grade uranium for several nuclear weapons. In this case, during the first five years of a revived deal, assuming it survives that long, an accelerated nuclear weapons program would likely lead to its early exposure as Iran would need over three months to produce its first quantity of weapon-grade uranium for a nuclear weapon. It could revive the Amad Plan, but the rather lengthy time needed to produce enough

[18] "Iran Threat Assessment: Introducing the Iran Threat Geiger Counter," *Institute for Science and International Security*, October 20, 2022, https://isis-online.org/isis-reports/detail/iran-threat-assessment-introducing-the-iran-threat-geiger-counter/8.

weapon-grade uranium could dissuade Iran from trying out of fear of detection and the mustering of a harsh international response. Although Iran may nonetheless restart the Amad Plan, it could maintain its current posture of being ready to build nuclear weapons, while continuing to stonewall the inspectors about its undeclared materials and activities, looking forward to building up its nuclear enrichment capabilities as allowed under the JCPOA after 2025, and reaching a point where countries would not know if Iran was planning a breakout or just implementing its legal plans under the deal. At this point, (post-2028), breakout timelines would again drop to several weeks and soon thereafter to a few weeks or even days. Thus, a revived deal would at first complicate Iran's pursuit of nuclear weapons, creating a bottleneck in weapon-grade uranium for several years, but by allowing a buildup to a large enrichment capacity and ultimately no caps on enrichment level, Iran would again be able to quickly breakout and build nuclear weapons either under an accelerated program or by reviving the Amad Plan.

Better Now Than Never

With advancing capabilities and perceiving diminished international concern or pushback, the Iranian leadership could simply decide the timing is opportune, the balance of capabilities, i.e. speed to the bomb, and negative consequences is manageable, and this balance would only worsen in time. As a result, it could secretly launch both an accelerated program and a revival of the Amad Plan.

Responses and Inhibitors

Iran's pathways to possessing nuclear weapons are multiplying. It should therefore be a priority for the United States and its allies to step up and improve intelligence gathering to detect any movement down one of these pathways, recognizing that a revived Amad Plan and an accelerated program could have very different signatures.

Beyond increasing chances of detection, the United States and the international community should take steps to increase Iran's inhibitions in deciding to build nuclear weapons or leave the NPT, and hopefully act to discourage Iran from further developing its nuclear weapons capabilities. These inhibitions can take many forms, and the ultimate goal should be not only to hinder Iran from activating its current nuclear weapons readiness program but also to undermine that program.

Many expected the JCPOA and its revival to hinder Iran from deciding to build nuclear weapons, but not end its nuclear weapons capabilities, including a readiness program. Today, a JCPOA revival seems less likely, given the Islamic Republic's ongoing demands for more concessions as well as its supply of drones to Russia for use in Ukraine, persistent support for terrorist activities, and human rights violations by the regime. Furthermore, a revived JCPOA does not satisfy the need for a stronger set of methods to inhibit Iran from building nuclear weapons and prevent Iran from increasing its nuclear weapons readiness through increased enrichment capabilities. Overreliance on the JCPOA being in force was a mistake. The JCPOA is not stable, long-lasting, or a deterrent against Iran building nuclear weapons in the medium- or long-term.

An urgent priority is bolstering the IAEA to ensure that Iran addresses the inspectors' finding that Iran has undeclared nuclear material in violation of its comprehensive safeguards agreement. The IAEA Board of Governors has warned Iran thrice to cooperate with the IAEA in its efforts to settle this issue, but it has refused, preferring to drag out the process while denying any wrongdoing. While the IAEA should continue pressing Iran to address its doubts that its nuclear program is peaceful, given Iran's intransigence, the Board should demand that Iran cooperate with the inspectors or else face consequences. Such an action will send a strong signal that Iran's violations are unacceptable and further isolate it internationally, while leaving the IAEA further empowered to press Iran for answers, a process complicating any Iranian move to build nuclear weapons.

Iran needs to be made fully aware that building nuclear weapons will require drastic and serious actions by the international community, including military action. The threat of military force weakened after the negotiation of the JCPOA in 2015. Iran grew to perceive the United States as reluctant to use force and Israel as fearful and unable to launch an effective attack. This tendency is being reversed, but not quickly enough. The Western powers should get serious about offensive military options to destroy Iran's nuclear facilities if Iran moves to build nuclear weapons, diverts nuclear material, or withdraws from the Nuclear Non-Proliferation Treaty. A useful first step is President Biden's declaration that military force could be used as a last resort to stop Iran building nuclear weapons; the United States and Israel's recent drill simulating a strike on Iran is also important. In parallel, Israel has been increasing its capabilities to deliver a devastating blow to Iran's nuclear program. U.S. military cooperation with Israel should continue to be bolstered, ensuring Israel can decisively strike Iran's nuclear sites on short notice if there are signs of Iran is moving to build nuclear weapons, including the ability of delivering a second strike if Iran reconstitutes those activities. The priority should be assisting and building military capabilities with allies and regional partners in the Middle East, with a U.S. commitment to come to their aid in preventing Iran from acquiring nuclear weapons.

Other inhibitions include aggressively expanding efforts to disrupt Iran's supply chain for nuclear, drone, and missile programs and marching down the path of snapping back all sanctions and embargoes under the JCPOA dispute mechanism. The United States and the international community should also expand the enforcement of existing sanctions and applying additional ones while offering Iran negotiations on a longer, stronger, more effectively IAEA-inspected nuclear deal. In addition, the United States and its allies should build stronger defenses against missiles and other means of nuclear delivery, making it as difficult as possible for Iran to try to deliver a nuclear weapon against the U.S. or one of its allies. Governments and experts can undoubtedly develop a range of ways to deter Iran from building nuclear weapons and create an optimal package of measures. That effort should accelerate as the hope of a revived nuclear deal fades and the threat of Iran building nuclear weapons increases.