Policy White Paper
Analysis of Weapons-Related Security Threats and Effective Policy Responses
Arms Control Association

Constraining Iran's Nuclear Potential in the Absence of the JCPOA

By Kelsey Davenport
Director for Nonproliferation Policy, Arms Control Association

July 2024

Preventing a nuclear-armed Iran remains a top U.S. security objective, but in recent months Tehran has accelerated its sensitive nuclear activities and threatened to pursue nuclear weapons, creating significant new challenges for addressing proliferation risks. Since Iran began breaching limits imposed by the 2015 nuclear deal, known as the Joint Comprehensive Plan of Action (JCPOA), it has expanded its uranium enrichment capacity, amassed more nuclear material, and invested in new, more proliferation-sensitive activities.

Whereas Iran's initial violations of the JCPOA's limits were designed to pressure the United States to return to the accord after former U.S. President Donald Trump unilaterally withdrew from the deal in 2018, Tehran's more recent nuclear activities appear focused on reaching the threshold of nuclear weapons. These advances irreversibly altered the pathways available to Iran if the decision were made to develop nuclear weapons and the speed at which Tehran could produce weapons-grade material.

In addition to Iran's technical advances, the proliferation risk posed by Iran's threshold status is compounded by its decisions to reduce International Atomic Energy Agency (IAEA) monitoring and a security environment that risks tilting Tehran's calculus toward developing a nuclear arsenal.

HIGHLIGHTS

- Since 2019, Iran has significantly expanded its sensitive nuclear activities, which has irreversibly altered the pathways available to Iran if the decision were made to develop nuclear weapons.
- The proliferation risk posed by Iran's nuclear advances is amplified by the monitoring gaps that Tehran created by reducing IAEA access and monitoring.
- Iranian officials have long denied any interest in nuclear weapons but there are new signs that Iran may rethink the prohibition on nuclear weapons if security conditions change.
- Iran's technical expertise cannot be reversed, and its nuclear infrastructure is less vulnerable to attack. As a result, military strikes against Iran would set back the program, but only temporarily, and risk driving Tehran to develop nuclear weapons.
- Tehran has signaled its willingness to de-escalate tensions, including on its nuclear program. Leaders in Washington should seize this opportunity to incentivize Tehran to take steps that increase monitoring of its nuclear program and reduce proliferation risk.
- The experience of the 2015 nuclear deal demonstrated the limitations of transactional bargaining. The regional nuclear environment also has shifted since 2015 and there is an increased risk that additional states will seek to match Iran's capabilities. The United States should be thinking now about alternative frameworks for negotiating a longer-term nuclear deal, or series of deals, that take into account Iran's nuclear advances and mitigate regional proliferation risks.

The military confrontation between Iran and Israel in April highlighted how Iran's nuclear strategy is shifting in response to the regional security environment. Iran's direct attack on Israel on April 13 in retaliation for an earlier strike on an Iranian diplomatic compound in Syria and subsequent statements from Iranian officials threatening that Iran will rethink its nuclear doctrine if Israel strikes its nuclear facilities or threatens Iran's security interests are designed to deter future attacks and leverage the country's threshold status to control escalation.[1]

Although the immediate risk of a broader conflict between Israel and Iran has decreased slightly since April and the U.S. intelligence community continues to assess that Tehran is not pursuing nuclear weapons, the events in April demonstrate how U.S. policy will need to take into account Iran's shifting nuclear doctrine and its technical advances and contend with these new challenges in future diplomatic efforts.

With the U.S. presidential election months away and the restoration of the JCPOA effectively off the table, there is no quick fix to the nuclear crisis. However, Tehran has signaled its willingness to de-escalate tensions, including on its nuclear program.

Given this approach and newly-elected President Masoud Pezeshkian's support for nuclear talks, there may be a short window for de-escalatory steps after he takes office in August. The Biden administration should seize this opportunity to incentivize Tehran to take steps that increase monitoring of its nuclear program to de-escalate nuclear tensions in the short term, buying time for more comprehensive, longer-term negotiations to reduce Iranian and regional proliferation risks.

Iran's Nuclear Advances

When Iran first began breaching the JCPOA's limits in 2019 in response to the U.S. withdrawal from the nuclear deal the previous year, its initial actions focused on resuming activities that were rolled back under the 2015 accord.[2] This included exceeding the stockpile cap of 300 kilograms of uranium enriched to 3.67 percent, resuming enrichment up to 20 percent, and restarting enrichment at Fordow. Although these activities were troubling breaches of the JCPOA, they were quickly and fully reversible.

However, as Tehran sought to expand its leverage, it began investing in new, more proliferation-sensitive activities that resulted in the acquisition of knowledge that can not be reversed. This included activities such as:

- enriching uranium to 60 percent, a level just short of the 90 percent level considered weapons-grade and a capability Iran had not mastered before the JCPOA's negotiation.
- enriching using more efficient centrifuges, such as the IR-2, IR-4, and IR-6 models, that were not used on a large scale prior to the JCPOA.
- using cascade designs that allow Tehran to switch between enrichment levels more quickly.
- further experimentation with uranium metal production, which was prohibited by the JCPOA, and a key component of weaponization.

As a result of the irreversible knowledge gains from these activities, Iran's nuclear program is fundamentally different from the pre-JCPOA period. Several critical differences include:

1. **Drop in the time necessary to achieve "breakout."** Breakout is a common metric for assessing how quickly a country can produce enough fissile material for a nuclear weapon. In the case of highly enriched uranium, a significant quantity for one nuclear device is approximately 25kg of uranium enriched to 90 percent. Although breakout calculations rely on certain technical assumptions and do not take intent into account, it is a useful metric for assessing technical progress in Iran's uranium enrichment program.[3] In the lead-up to negotiations on the JCPOA, Iran's breakout time to produce enough weapons-grade material for one bomb was about 2-3 months. The JCPOA's restrictions on enrichment capacity, stockpiles, and enrichment level pushed breakout to about 12 months. As of early 2024, Iran could produce enough nuclear material for one bomb in about a week and enough for five to six weapons in a month. Iran's stockpiles of material enriched to 20 percent and 60 percent and its installation of more efficient centrifuges contribute to the significant decline in breakout.

   As Iran's stockpiles of highly enriched uranium grow and/or Iran installs further advanced centrifuges, the breakout time to multiple nuclear weapons will continue to shrink. A future nuclear deal with Iran should seek to put time back on the breakout clock, but it is highly unlikely that any agreement can achieve a 12-month breakout, similar to the JCPOA. Even if Tehran agreed to limits similar to those in the JCPOA, the knowledge Tehran has gained about advanced centrifuge production, operation, and higher-level enrichment would allow the country to reconstitute its program more quickly. As a result, the United States will likely need to contend with an Iran that is closer to nuclear weapons than it was in the past.
2. **Expanded pathways to nuclear weapons.** Iran's nuclear advances have expanded the country's

A billboard in Tehran depicts Iranian ballistic missiles. Iran used ballistic missiles in a large-scale attack against Israel on April 13. If Tehran were to develop nuclear weapons, ballistic missiles would be the likely delivery system. Photo by Atta Kenare/AFP via Getty Images)

pathways to developing nuclear weapons. Iran's recent enrichment work, for example, would enable Tehran to move to weapons-grade enrichment using fewer steps than what was likely pre-JCPOA. Iran's advances also increase the viability of the so-called sneak-out option, which would entail producing weapons-grade material at undeclared, covert sites. With more efficient centrifuges, Tehran would need fewer machines to set up an illicit enrichment process. A covert site with a smaller footprint that can more quickly produce weapons-grade materials decreases the likelihood of detection. Similarly, Tehran could decide to divert highly enriched uranium from its declared stockpiles and enrich it to weapons-grade at an undeclared location.

Although any diversion from Iran's declared nuclear stockpiles would be detected by the IAEA, Tehran's ability to use more efficient centrifuges to quickly enrich its HEU to weapons-grade levels makes timely detection more critical for preventing proliferation. Any delay in detection also reduces the already short window for the international community to act before the weapons-grade material is moved to another site for weaponization. This risk is magnified by the IAEA's inability to access critical facilities, such as centrifuge workshops, that are not subject to inspections under a comprehensive safeguards agreement. As the IAEA's Director General Rafael Mariano Grossi stated in 2023, it is no longer possible to ensure that all of Iran's centrifuges are accounted for.[4]

3. **Increased resiliency.** Iran has responded to past acts of sabotage and threats to its nuclear infrastructure by hardening its facilities. Tehran continued that trend in recent years by building a new underground facility at its Natanz complex after attacks on its centrifuges manufacturing and assembly facilities in Natanz and Karaj. The new facility, like Fordow, the deeply buried enrichment facility near Qom, will be challenging to destroy using conventional weaponry.[5] Additionally, Iran is expanding its nuclear program. The dispersal of infrastructure increases the complexity of any large-scale attack on the program, particularly if Tehran has moved materials and components, such as centrifuges, to covert locations. As a result, Iran's nuclear program is more difficult to target militarily than it was prior to the JCPOA. Relatedly, Iran's uranium enrichment advances could enable it to build back its nuclear program more quickly in response to an attack.

Iran's centrifuge advances, for example, would allow the country to reconstitute its uranium enrichment capacity more quickly by focusing on manufacturing more efficient machines.

Monitoring Gaps

The proliferation risk posed by Iran's nuclear advances is amplified by the monitoring gaps resulting from Tehran's decision to limit IAEA access and monitoring over the past three years.

When Tehran was fully implementing the JCPOA's verification mechanisms, the country's nuclear program was subject to the most intrusive monitoring regime negotiated. Every aspect of Iran's fuel cycle was subject to verification measures. In addition to its legally required comprehensive safeguards agreement under the Nuclear Nonproliferation Treaty (NPT), the JCPOA required Iran to implement the additional protocol, which gives the IAEA access to sites that support the program but do not house nuclear material and requires Tehran to provide the agency with more information about the nuclear program. The JCPOA also required further transparency measures, such as daily access to Natanz and Fordow, continuous surveillance at certain nuclear facilities, and prohibitions on certain activities relevant to weaponization.[6] Although many of the JCPOA-specific monitoring mechanisms expired over time, Iran was required to implement the additional protocol in perpetuity.

However, in February 2021 Iran halted implementation of the additional protocol and the JCPOA-specific monitoring mechanisms. The suspension was required under a December 2020 law that Tehran passed after the assassination of Mohsen Fakhrizadeh, a nuclear scientist who played a critical role in Iran's pre-2003 organized nuclear weapons program.[7]

Although Tehran did allow IAEA cameras to operate at certain facilities as part of a February 2021 agreement with the agency to mitigate the damage caused by the reduction in IAEA access, the agency has not had access to the camera data. Furthermore, Iran removed the cameras in June 2022 after the IAEA board passed a resolution censuring Tehran for failing to cooperate with the agency on a separate safeguards issue. The IAEA and Iran agreed in March 2023 to restore the surveillance, but Iran has only allowed nine of the planned 30 cameras to begin operating again.[8] As a result of the monitoring gaps, Grossi concluded that the agency lost its continuity of knowledge regarding Iran's nuclear program.[9]

Tehran is still implementing its comprehensive safeguards agreement, which gives the IAEA regular access to all sites in Iran that house nuclear materials, as legally required by the NPT. However, past proliferators such as Iraq and North Korea demonstrated that comprehensive safeguards agreements are insufficient to guard against determined proliferators and that states can exploit those gaps.

Iran's decision to reduce monitoring exacerbates proliferation risk in both the short and long term. Specifically, there is:

1. **Increased risk of diversion of non-nuclear materials.** IAEA inspectors have not accessed facilities that support Iran's nuclear program but do not house nuclear materials in over three years. These facilities include Iran's uranium milling site and centrifuge production and assembly workshops. Without agency access and monitoring, there is an increased risk that Tehran is diverting non-nuclear materials for a covert program.
2. I**ncreased risk of delayed detection of breakout.** Although IAEA inspectors still have regular access to Iran's uranium enrichment facilities and would detect any move by Iran to produce weapons-grade material at those sites or divert enriched material, Iran's short breakout and limitations on access increase the risk that Tehran could delay detection if it made the decision to pursue nuclear weapons. The aftermath of Iran's missile attack on Israel demonstrates how Tehran could use regional security dynamics to close its nuclear facilities to inspectors, as it did on April 14.[10] Given Israel's history of sabotage against Iranian facilities, it is plausible that Iran could announce the closure of its facilities due to security concerns and bar inspector access. Delaying inspectors even for a few days would give Iran a jumpstart on diverting enriched uranium or breaking out.
3. **Longer-term challenges in verifying limits under a future deal.** As a result of the gaps in access and surveillance at key nuclear sites, the IAEA has concluded it will be difficult, if not impossible, to reestablish reliable baseline inventories for certain materials, such as centrifuge components and uranium ore concentrate, even with future Iranian cooperation.[11] Without reliable baselines, it will be difficult to verify with confidence that Iran is meeting limits set by a future deal (if the deal were to include restrictions in these areas). The longer these gaps persist, the more uncertainty there is likely to be regarding the reliability of baseline inventories in the future. Any challenge in verifying Iran's compliance limits could undermine the sustainability and support of a future agreement, particularly in the United States. For instance, the Iran Nuclear Agreement Review Act (INARA) requires the administration to submit a certification to Congress that a nuclear agreement with Iran can be verified by

the IAEA.[12] It will be more challenging for a future president to issue such a certification if the deal includes limits on areas where the IAEA has already raised concerns about credible baselines. Without a certification, it is more likely that Congress would use INARA's provisions to try and block the president from granting sanctions relief to Iran.

4. **Challenges in effectively designing safeguards for new nuclear facilities.** When Iran suspended the additional protocol and JCPOA-specific monitoring measures, Tehran also halted the implementation of Modified Code 3.1 to its comprehensive safeguards agreement. Unlike the additional protocol, which Iran was implementing voluntarily, Modified Code 3.1 is a legal obligation. It requires a state to provide design information about a new nuclear facility to the IAEA once the decision is made to begin or authorize construction. Modified Code 3.1 updates the original safeguards requirement, which mandated that states provide design information 180 days before nuclear materials are introduced to a facility. The longer lead time allows the agency to develop a more effective and thorough safeguards approach. The IAEA disputes Iran's claim that it can suspend Modified Code 3.1 and continues to reiterate that Modified Code 3.1 cannot be unliterally suspended—an interpretation supported by the IAEA's Board of Governors. In a June 2024 censure resolution on Iran, the board called upon Tehran to implement Modified Code 3.1. The resolution said Modified Code 3.1 is a legal obligation that "cannot be modified or suspended unilaterally."[13] As a result of Iran's failure to meet its Modified Code 3.1 obligations, the IAEA has not received design information for several new nuclear facilities that Tehran announced are under construction. This includes a new research reactor at Esfahan and the new Iran Hormoz nuclear power plant. These facilities pose little immediate proliferation risk, although Iran may argue an expanded uranium enrichment program is necessary to fuel these reactors. More concerning in the short term is the underground facility Iran is constructing at Natanz. Some officials and experts have suggested it may be intended for uranium enrichment and not just centrifuge assembly as Iran claims.[14] (Tehran similarly built the Fordow enrichment facility in violation of Modified Code 3.1 after having claimed

The IAEA Board of Governors censured Iran in June for failing to cooperate with the IAEA's investigation into undeclared nuclear activities and to provide the agency with design information about new nuclear facilities. Iran's decision to reduce IAEA monitoring compounds proliferation risk. (Photo by Dean Calma/IAEA)

to have suspended the provision.[15]) The longer Iran goes without providing the information required by Modified Code 3.1, the more challenges the IAEA may face in designing safeguards and the greater the risk that Tehran is building facilities to diversify its options for breakout or sneak out if the decision is made to develop nuclear weapons. Additional facilities, particularly a deeply buried enrichment facility a Natanz, also could be more difficult to roll back once operational and provide Iran with greater leverage in a future nuclear deal.

Shifting Nuclear Weapons Policy?

In addition to Iran's technical advances, recent statements demonstrate a shift in Iranian nuclear policy that has implications for proliferation risk.

Iranian officials never admitted that the country pursued an illicit nuclear weapons program prior to 2003 (despite IAEA conclusions to the contrary) and continue to assert that Tehran does not need nuclear weapons for its national security.[16] In denying interest in nuclear weapons, officials frequently cite a fatwa issued by Iran's Supreme Leader, Ayatollah Ali Khamenei, in 2003 that forbids the production and use of weapons of mass destruction, describing such weapons as contrary to Islam.[17]

Recent statements from Iranian officials, however, appear to confirm what experts have long assessed: the fatwa is not immutable, and Iran will rethink its position on nuclear weapons if security conditions shift and a nuclear deterrent is perceived as necessary.[18]

For instance, following Iran's April 13 attack on Israel, Ahmad Haghtalab, the IRGC commander in charge of security at Iran's nuclear facilities, said that Israel's threats against Iranian nuclear facilities "make it possible to review our nuclear doctrine and deviate from our previous considerations."[19] His reference to "doctrine" suggests rethinking the country's position on nuclear weapons. Haghtalab also suggested that Iran would respond to an attack on its nuclear facilities by retaliating against Israeli facilities.

Following Haghtalab's comments, Kamal Kharrazi, an advisor to the Supreme Leader, acknowledged the fatwa's prohibition of nuclear weapons, but said "if the enemy threatens you, you will inevitably have to make changes to your doctrine."[20] Kharrazi went on to repeat similar comments several days later when he said that Iran has made "no decision to build a nuclear bomb but should Iran's existence be threatened, there be no choice but to change our military doctrine."

Former JCPOA negotiator Abbas Aragchi made a similar comment in May, stating that Israel's "nuclear threat can disrupt the security equations in the region" and could force states to "reconsider their security calculations and nuclear doctrines."[21]

Current and former officials involved in Iran's nuclear program lent credence to these threats by underscoring that Iran has the necessary capabilities to develop nuclear weapons. Current Atomic Energy Organization of Iran (AEOI) head Mohammad Eslami and former head Ali Akhbar Salehi said in 2024 that Iran has the capabilities necessary to build a bomb but has chosen not to do so.[22]

Iranian comments about weaponization are likely intended for several audiences. Domestically, Iran is signaling it will protect its territorial integrity and may be socializing the idea of a nuclear deterrent. Iran also is directing these comments at a foreign audience, particularly its adversaries in the region and the United States, to leverage its threshold status and the threat of weaponization to deter further aggression and attacks.

While Tehran has used its nuclear program as leverage in the past, those efforts were focused on gaining concessions. When Tehran did attempt to deter certain actions, such as further censures by the IAEA board, its actions were aimed at expanding the nuclear program, not threats to rethink its nuclear doctrine.

Tehran's willingness to use its threshold status more overtly as a source of leverage for deterrence suggests an important shift in the country's nuclear policy. If Tehran perceives security benefits from leveraging its threshold status, it will seek to cement that status, making it more challenging to negotiate a rollback of the program.

Implications of Iran's Nuclear Trajectory on U.S. Policy

Iran's nuclear advances and its shift in language regarding its nuclear program have implications for U.S. policy options for preventing proliferation and reducing nuclear risk. Pathways that were viable at the beginning of the Biden administration, such as the restoration of the JCPOA, are no longer effective mechanisms for addressing Iran's nuclear risk. As Grossi said in a March 28 interview, the "Iran of 2015 is not the "Iran of 2024," noting that Iran's nuclear advances have superseded the technological basis that served as a basis for the JCPOA.[23] The United States will need to take these changes into account in designing a new strategy for engaging Iran and deterring Tehran from taking further steps toward nuclear weapons.

The New Challenges to Military Options

Successive U.S. presidents, including Joe Biden, have threatened to use military force if necessary to prevent Iran from developing nuclear weapons. The Biden administration continues to reiterate that the United States will strike Iran

Iran is building a new, deeply buried facility at the Natanz nuclear complex that would be challenging to destroy in the event of a military strike. (Photo by Majid Saeedi/Getty Images)

as a "last resort" to ensure the country does not acquire nuclear weapons.[24]

Although Biden tempers military signaling with support for diplomacy as the preferred option to address the Iranian nuclear crisis, current and former policymakers are calling for preventive strikes on Iran's nuclear program now, despite continued assessments from the U.S. intelligence community that Iran is not engaged in key nuclear weapons-related activities. These calls were particularly pronounced during the period of heightened tensions between Iran and Israel in April. For instance, former Trump National Security Advisor John Bolton suggested that Israel use Iran's April 13 missile attack "as an opportunity to destroy Iran's nuclear weapons program."[25] Although the risk of an Israeli counterstrike on Iran's nuclear infrastructure has waned, there will be continued pressure on U.S. and Israeli officials to strike Iran's nuclear facilities absent de-escalation, despite the risks of a strike spurring Iranian nuclear weapons development in response.

The drawbacks to military action have become more pronounced due to Iran's nuclear advances, its shifting nuclear policy, and an increased tolerance for risk. First, any military strike against Iran's nuclear infrastructure will only set back the program temporarily. This is not new—the United States intelligence community has long assessed that Iran has the necessary capabilities to develop nuclear weapons if the decision were made to do so—and that knowledge cannot be bombed away.[26] However, Iran's nuclear advances suggest that Tehran could build back more quickly than it could in 2012-2013 before diplomacy rolled back Iran's nuclear program, particularly because of its centrifuge advances.

Second, Iran's nuclear program is more challenging to target now than it was in 2013, before the diplomatic breakthrough that led to the interim deal, known as the JPOA, and then later the JCPOA. Since then, Iran has expanded its nuclear program, building more hardened and dispersed facilities. Of particular concern is the new facility under construction at the Natanz complex that appears to be more deeply buried and difficult to target than Fordow. Targeting Fordow and the Natanz facility would require repeated strikes using the largest conventional weapon in the U.S. arsenal.[27]

Given the complexity and challenges inherent in a large-scale military strike, there is an increased risk that Iran will divert materials to covert locations if it sees any indication of an imminent attack. Tehran may have already moved technologies and materials that are not subject to IAEA safeguards, such as centrifuges. The gaps in monitoring make it difficult to track any such diversions, increasing the challenges in conducting military strikes.

Third, the shift in Iran's nuclear strategy and Tehran's decision to directly attack Israel on April 13 to retaliate for a

strike on an Iranian diplomatic compound in Syria suggests that Tehran is less risk-averse and more willing to consider developing nuclear weapons in response to a strike. Recent statements from officials about Iran rethinking its nuclear doctrine appear designed to deter an attack but also signal Iran's resolve to respond to any targeting of its nuclear facilities by developing nuclear weapons. These statements could also put more domestic pressure on Iran to follow through on its threat to weaponize in response to an attack. Relatedly, Iran's willingness to directly strike Israel and its threat to retaliate in response to further attacks on its nuclear facilities suggests that Tehran will respond militarily to any strike against its nuclear program, likely opening a broader conflict with the United States and/or Israel.

There is also a risk that the United States or Israel prematurely resorts to military force by miscalculating Iran's intentions. Iran's near-zero breakout window and limited monitoring reduce decision-making time, increasing the risk of misinterpreting Iran's intentions.

Despite these challenges and the risk of miscalculation, the United States is still likely to resort to force if there is evidence that Tehran has made the decision to develop nuclear weapons. No U.S. president will want the legacy of allowing a nuclear-armed Iran, irrespective of the likelihood of a military action igniting a push to weaponization down the road and a broader regional conflict.

The Urgent Need for Nuclear Deescalation

The drawbacks of military action underscore the critical importance of diplomatic options to walk Iran back from the threshold of nuclear weapons and expand monitoring of its program. As retired U.S. General Frank Mckenzie, former commander of U.S. Central Command, said at a gathering in April, "It remains my opinion today that the best way to keep Iranians from possessing a nuclear weapon remains some form of diplomatic agreement, however unsatisfying and incomplete parts of it may be. The worst way is through military action against their nuclear program either by us or ... the Israelis." He also noted that, "the less you know about the problems and risks inherent in a strike, the more positive about its potential success one tends to be."[28]

With the unexpected election of Masoud Pezeshkian after the deaths of President Ebrahim Raisi and Foreign Minister Hossein Amir Abdollahian in a helicopter crash on May 19 and the U.S. presidential election five months away, it appears that neither side has the political will or time to begin negotiations on a broad comprehensive nuclear framework. Reciprocal de-escalatory steps, however, are a viable option to stabilize the nuclear crisis and reduce proliferation risk until after the U.S. election.

Despite the presidential transition in Iran, it is unlikely that Tehran will significantly alter its nuclear trajectory. Although the presidency can impact policy outcomes, as President Hassan Rouhani's support for negotiations and the JCPOA demonstrated, nuclear policy is set by the Supreme Leader's office. Iran's willingness to engage with the Biden administration on limited, de-escalatory nuclear measures in 2023 and comments from officials over the past several months suggest that the country may be willing to take similar steps in the coming months in exchange for sanctions relief.[29] A de-escalatory package may be even more attractive to the new president if it includes tangible economic benefits that would provide an early win for a new administration seeking to establish itself and shore up support.

A crucial component of any de-escalatory package should be enhancing IAEA monitoring and expanding access for inspectors. Although enhancing transparency does not move Iran back from its threshold status, the benefits are two-fold.

First, in the short term, additional monitoring will provide greater assurance any dash toward nuclear weapons at Iran's declared facilities or diversion of materials will be more quickly detected. Ensuring the earliest possible detection increases the window for the international community to respond to an Iranian breakout, which is crucial when the timeframe for producing weapons-grade material for multiple bombs is so short. Additionally, monitoring may deter Iran from diverting materials, such as centrifuges, for a sneak-out or to preserve capacity in the event of a military strike.

Second, enhancing transparency now can help lay the groundwork for a comprehensive deal down the road. If the IAEA can begin reconstituting a record of Iran's nuclear activities, the agency will have a clearer picture of where the challenges will be in establishing new baselines. Understanding these challenges can inform how future negotiators think about crafting an effective agreement and what additional information or actions may be necessary from Iran to address the risks posed by these gaps.

To achieve these benefits, the United States and its partners should focus on incentivizing Iran to take de-escalatory steps that improve transparency. The priority should be expanding IAEA access to facilities that support the country's nuclear program but do not house nuclear materials, such as centrifuge workshops and uranium mills. Allowing inspectors to access these facilities provides both of the aforementioned benefits: deterring the diversion of non-nuclear materials and providing the agency with information to begin reconstructing a history of Iran's nuclear activities, such as production and inventories of centrifuge components.

Since it is unlikely that Iran would agree to implement the additional protocol and provide access under that

agreement, the agency and Iran could negotiate a separate access arrangement that would allow inspectors to visit certain facilities outside of the sites inspected under the comprehensive safeguards agreement. There is a precedent for these types of technical visits.

This access arrangement could include Iran agreeing to turn over surveillance recordings from key facilities between February 2021, when Iran and the IAEA reached an agreement to allow certain monitoring, and June 2022, when Tehran disconnected those cameras. Grossi has emphasized the importance of the agency having access to that data.[30]

If additional access cannot be negotiated, an alternative could be for the agency to allow the IAEA to reinstall—or in the case of new facilities introduce—surveillance equipment and allow the IAEA regular access to the data recorded. If Tehran is willing to hand over the recordings, this arrangement could provide similar benefits in deterring diversion and monitoring Iran's capacities.

Beyond reintroducing access and/or monitoring at sites that support the nuclear program, Iran could restore daily access to inspectors at Natanz and Fordow and install additional enrichment monitors. Although inspectors have frequent access to these sites under Iran's comprehensive safeguards agreement and Iran's enrichment is monitored in parts of Natanz and Fordow, daily access would provide additional assurance that any move by Iran to breakout or divert material would be quickly detected. Daily access and enrichment monitoring also benefit Tehran by reducing the risk of U.S. and/or Israeli miscalculations. For example, if there were to be an accidental spike in enrichment above declared levels or a material accountancy error, the IAEA may be better positioned to quickly determine if the incident was accidental or intentional.

A de-escalatory package could also include a commitment from Iran to resume implementation of Modified Code 3.1. Iran's adherence to these legally required safeguards measures does less to reduce proliferation risk in the short-term. However, given Tehran's history of building covert, undeclared facilities, having Modified Code 3.1 in place would provide greater assurance that Iran is not building a new, more deeply buried uranium enrichment facility at the Natanz complex and that new facilities can be effectively safeguarded.

Prioritizing monitoring has clear benefits in reducing the risk of breakout, diversion, and miscalculation, but Tehran would also gain from expanding access. Iran continues to assert that it does not seek a broader conflict with the United States or Israel and that its nuclear program is peaceful.[31] Miscalculation over Iran's nuclear activities increases the risk of military strikes against the program, which could push Iran to a broader conflict and reduce a key source of leverage it has over the United States. Additional monitoring reduces those risks and helps keep open the option of a future deal.

Comments from Iranian officials also suggest that Tehran may be open to expanding monitoring and IAEA access. In March 2023, Iran agreed in a joint statement with the IAEA to voluntarily expand agency monitoring. After taking some steps in April and May, such as allowing the IAEA to install enrichment monitoring devices and cameras at a centrifuge

Newly-elected Iranian President Masoud Pezeshkian arrives at the shrine of Ayatollah Ruhollah Khomeini. During his campaign, Pezeshkian expressed support for negotiations with the West over Iran's nuclear program. (Photo by Atta Kenare/AFP via Getty Images)

workshop in Esfahan, Tehran ceased cooperating with the agency under the March 2023 statement. In September 2023, Eslami told Grossi not to expect any additional cooperation without sanctions relief.[32] After a May 7 trip to Iran to revive the March 2023 joint statement, Grossi told reporters Iran is looking for incentives the IAEA cannot offer, namely sanctions relief, before expanding cooperation.[33] This suggests that monitoring may be an avenue where Iran is willing to negotiate reciprocal de-escalatory measures.

Although transparency should be the primary focus of a de-escalation package, the United States could seek additional commitments from Iran that reduce proliferation risk. Tehran is highly unlikely to take steps that extend the country's breakout, which is near-zero for the first nuclear weapon and about a month for five to six weapons, or move Tehran back from threshold status. However, Iran's leaders may be willing to take steps that prevent breakout to multiple weapons from dropping further.

Given that Iran will not risk breaking out to produce one bomb's worth of weapons-grade uranium, preventing the breakout time to multiple weapons from decreasing further provides greater assurance that any move to weaponization will be detected with enough time for the United States and the international community to respond. To achieve this, Iran could convert 20 and 60 percent enriched uranium produced beyond an agreed-upon stockpile number into powder or blend it down back to 5 percent. Tehran could also commit not to install or operate additional advanced centrifuge machines.

In exchange for taking these steps, the United States could provide Iran with tangible economic benefits. Given that the United States faces a credibility deficit when it comes to sanctions relief after the Trump administration's withdrawal from the JCPOA and the Biden administration's decision to halt payments using the Iranian funds transferred to Qatar as part of the 2023 de-escalation package, Washington could look at options to work with states in the region and states that have economic ties with Iran, such as China, to create a more credible incentive package. That could include unfreezing additional funds for humanitarian trade or providing waivers for limited oil transactions. One advantage of the latter incentive is that it could be quickly reversed if Iran reneged on its escalatory commitments. Encouraging limited regional investment in Iran could also be an attractive option for Iran and provide buy-in from regional states.

A Longer-Term Framework

Expanded IAEA access and more intrusive monitoring can deescalate tensions in the short-term and provide greater assurance that the agency will detect a breakout, but it is insufficient in the long-term. Allowing Tehran to remain a threshold state increases the risk of the country developing nuclear weapons or using its proximity to weapons for leverage or coercive purposes. Furthermore, Iran's threshold status risks driving other states in the region, most notably Saudi Arabia, to match its capabilities.

Iran's experience with the JCPOA, however, suggests that if Tehran is interested in a nuclear deal, it is unlikely to accept a similarly structured transactional bargain. Even before Trump withdrew from the JCPOA and reimposed sanctions—despite Iran's compliance—Iran was dissatisfied with the performance of sanctions relief. If the United States cannot credibly lift sanctions, the credibility of relief as an incentive diminishes. Washington's ability to reimpose sanctions, despite widespread support for the JCPOA internationally and Iran's compliance with the accord, further demonstrates the credibility deficit the United States will face in future negotiations.[34]

Additionally, from a nonproliferation perspective, a similarly structured agreement will be unlikely to deliver nonproliferation benefits on par with the JCPOA, most notably the same 12-month breakout. Although breakout should not be the prevailing metric for determining the nonproliferation value of the deal it will carry important weight politically: anything less than what the JCPOA achieved will open a future agreement up to criticism in Washington and increase the risk that Congress will try to block implementation of the accord.

Furthermore, if Iran perceives security benefits from leveraging its threshold status, future negotiations may need to address more directly the regional threat environment or support dialogue at the regional level that mitigates Iran's perceived need to remain on the threshold of nuclear weapons.

Given these challenges, the United States should be considering new approaches for negotiating with Iran that go beyond transactional bargaining. A new strategy could include the following considerations:

1. **Greater focus on transparency and monitoring.** A new nuclear deal with Iran will likely include some restrictions on the program but even with limitations in place, the international community will likely need to contend with an Iran that is technically closer to a weapon than it was under the JCPOA. The irreversibility of Iran's knowledge gains and the speed at which it could reconstitute its program dilutes the effectiveness of capacity limits on the uranium enrichment program. This suggests that the monitoring and verification measures will play a more crucial role in a future deal. In addition to intrusively monitoring Iran's fuel cycle capabilities, verification measures could include a greater focus on monitoring prohibited weaponization

activities such as those laid out in Section T of the JCPOA and establishing an agreed-upon system for assessing compliance.

2. **Broaden the array of incentives offered to Iran.** Washington's demonstrated ability to reimpose sanctions reduces the credibility of a sanctions-relief off-ramp in any future deal. In addition to studying the JCPOA experience and examining how to provide more tangible and durable benefits when sanctions are lifted, a new framework for negotiations should consider additional incentives that would be attractive to Iran and more durable. This could include encouraging greater direct investment in Iran, including from states in the region, and guarantees on cooperative nuclear activities that benefit Tehran without increasing proliferation risk. Cooperative nuclear activities could include assistance on fuel fabrication technology or a U.S. commitment to purchase uranium enriched to 20 percent if Tehran produced the material under certain conditions. Such an arrangement would also benefit the U.S. nuclear industry and the 20 percent gap in fuel availability that is hindering the development and testing of new nuclear reactor designs.[35]
3. **Involve regional stakeholders in nuclear restrictions.** The nuclear landscape in the Middle East has shifted significantly since negotiations commenced on the JCPOA. There is greater interest in civil nuclear energy and other peaceful applications of nuclear technology, such as nuclear medicine and nuclear applications in agriculture. This expanding civil nuclear interest provides both risks and opportunities. As states develop nuclear programs there is a risk they will seek to match Iran's fissile production and weaponization-related capabilities, increasing proliferation risk. But the expansion also creates opportunities. Iran has long argued that it does not wish to be singled out within the NPT regime. Pursuing certain restraints at a regional level would address that concern. States, for instance, could jointly agree to implement IAEA additional protocols, agree to prohibitions on certain weaponization activities, and/or refrain from plutonium reprocessing. These agreements could reinforce negotiations between the United States and Iran and reduce regional proliferation risks. Relatedly, the rise in nuclear programs creates opportunities for collaboration in areas of shared interest, such as nuclear security and safety. Encouraging cooperative activities in these areas helps build ties between expert communities that serve as a form of transparency and communication regarding a country's nuclear intentions.
4. **Situate a nuclear deal within a broader Iran policy.** One of the most common criticisms regarding the JCPOA was that it did not address Iran's activities in the region that the United States and its partners consider destabilizing. The JCPOA was never intended to be a panacea—it was narrowly construed to remove the threat of a nuclear-armed Iran. The experience of holding a transactional nuclear agreement to a transformational standard, however, is indicative of the challenges facing a new nuclear agreement. It suggests that sustaining a nuclear accord in the future is more likely to be successful if the United States can demonstrate that it is engaging, or supporting engagement, on a broader range of security issues. The United States could look to support security dialogues between Iran and other states in the region and set up parallel forums to discuss areas where the United States and Iran may have shared concerns.

Strengthen Nonproliferation Norms

The United States should complement its Iran strategy with efforts to strengthen nonproliferation norms writ large. Although the P5+1 (China, France, Germany, Russia, the United Kingdom, and the United States) is no longer a viable structure for projecting great-power unity on preventing Iranian proliferation, these states still have an interest in preventing the erosion of nonproliferation norms and the rise of additional threshold states. Russia is unlikely to play a constructive role even on general provisions to strengthen nonproliferation given its blatant rejection of nuclear norms. China, however, has an interest in deterring further proliferation—particularly given South Korea may be the most likely state behind Iran to develop nuclear weapons—and preventing conflict in the Middle East.

To date, China appears reluctant to use its leverage with Iran specifically to encourage the country to de-escalate. However, Beijing may be willing to engage with the United States and the E3 more generally on reinforcing nonproliferation norms. If these states were to express shared concerns about certain civil nuclear activities relevant to weaponization or articulate the consequences of a state withdrawing from the NPT and/or weaponizing a civil nuclear program, it could help demonstrate to Iran that it will face costs for developing nuclear weapons.

Conclusion

With U.S. attention focused on the Gaza conflict, the Biden administration's strategy toward Iran appears to be focused on avoiding escalation and preventing a crisis. This approach risks missing an opportunity to stabilize the nuclear crisis

through mutual de-escalation and lay the groundwork for future negotiations. Providing Iran with an incentive to enhance monitoring would be a small price to pay to reduce the risk of proliferation and miscalculation. Deescalating nuclear tensions also creates time and space for future negotiations on a longer-term agreement. It is past time that U.S. diplomatic urgency equaled the urgency of the threat posed by Iran's growing nuclear program.

ENDNOTES

1. Eric Brewer, "Iran's New Nuclear Threat: How Tehran Has Weaponized its Threshold Status," *Foreign Affairs*, June 25, 2024, https://www.foreignaffairs.com/iran/irans-new-nuclear-threat.
2. Julia Masterson and Kelsey Davenport, "Restoring the Nuclear Deal with Iran Benefits U.S. Nonproliferation Priorities," Arms Control Association *Issue Brief*, Volume 13, Issue 1, March 15, 2021, https://www.armscontrol.org/issue-briefs/2021-03/restoring-nuclear-deal-iran-benefits-us-nonproliferation-priorities.
3. Kelsey Davenport and Julia Masterson, "The Limits of Breakout Estimates in Assessing Iran's Nuclear Program," Arms Control Association Issue Brief, Volume 12, Issue 6, August 4, 2020, https://www.armscontrol.org/issue-briefs/2020-08/limits-breakout-estimates-assessing-irans-nuclear-program.
4. Jon Gambrell, "UN atomic chief backs nuclear power at COP28 as world reackons with proliferation," Associated Press, November 30, 2023, https://apnews.com/article/cop28-climate-talks-grossi-iaea-iran-nuclear-power-11a37c802d7e0bca6538d5c66a9ec6fd.
5. Jon Gambrell, "An Iranian nuclear facility is so deep underground that US airstrikes likely couldn't reach it," Associated Press, May 22, 2023, https://apnews.com/article/iran-nuclear-natanz-uranium-enrichment-underground-project-04dae673fc937af04e62b65dd78db2e0.
6. "The Joint Comprehensive Plan of Action at a Glance," Arms Control Association Factsheet, 2016, https://www.armscontrol.org/factsheets/joint-comprehensive-plan-action-jcpoa-glance.
7. "New Iran Law Accelerating Enrichment," *The Iran Primer*, United Institute of Peace, December 7, 2020, https://iranprimer.usip.org/blog/2020/dec/07/new-iran-law-accelerating-enrichment.
8. Andrew England, Iran open to 'serious dialogue,' says UN nuclear chief, *Financial Times*, May 14, 2024 https://www.ft.com/content/d5e07404-2fed-4f60-ba11-59e6734665c2.
9. Verification and monitoring in the Islamic Republic of Iran in light of United Nations Security Council resolution 2231 (2015), Report by the Director General, International Atomic Energy Agency, GOV/2023/8, February 28, 2023, https://www.iaea.org/sites/default/files/documents/gov2023-8.pdf.
10. "IAEA chief worried Israel could strike Iran nuclear facilities," Reuters, April 16, 2024, https://www.straitstimes.com/world/iaea-chief-worried-israel-could-strike-iran-nuclear-facilities.
11. Verification and monitoring in the Islamic Republic of Iran in light of United Nations Security Council resolution 2231 (2015), Report by the Director General, International Atomic Energy Agency, GOV/2023/57, November 15, 2023, https://www.iaea.org/sites/default/files/documents/gov2023-57.pdf.
12. INARA
13. NPT Safeguards Agreement with the Islamic Republic of Iran, Resolution of the International Atomic Energy Agency's Board of Governors, GOV/2024/39, June 5, 2024, https://www.iaea.org/sites/default/files/24/06/gov2024-39.pdf.
14. Jon Gambrell, "An Iranian nuclear facility is so deep underground that US airstrikes likely couldn't reach it," Associated Press, May 22, 2023, https://apnews.com/article/iran-nuclear-natanz-uranium-enrichment-underground-project-04dae673fc937af04e62b65dd78db2e0.
15. James Acton, "Iran Violated International Obligations on Qom Facility," Carnegie Endowment for International Peace, September 25, 2009, https://carnegieendowment.org/research/2009/09/iran-violated-international-obligations-on-qom-facility?lang=en.
16. "Iran says nuclear weapons have no place in its nuclear doctrine," Reuters, April 22, 2024, https://www.reuters.com/world/middle-east/iran-says-nuclear-weapons-have-no-place-its-nuclear-doctrine-2024-04-22/.
17. Mohammad Hossein Sabouri, "Iran's Nuclear Fatwa: Analysis of a Debate." *Journal of Military Ethics* 15 (3): 227–45, 2016.
18. Farzan Sabet, "Iran's nuclear weapon option emerges from the shadows during the April crisis," Iran Wonk, Substack, May 7, 2024, https://iranwonk.substack.com/p/irans-nuclear-weapon-option-emerges.
19. "Iranian commander says Tehran could review 'nuclear doctrine' amid Israeli threats," Reuters, April 18, 2024, https://www.reuters.com/world/middle-east/iranian-commander-warns-tehran-could-review-its-nuclear-doctrine-amid-israeli-2024-04-18/.
20. Beatrice Farhat, "Iran warns it will change 'nuclear doctrine' if threatened by Israel," Al-Monitor, May 9, 2024, https://www.al-monitor.com/originals/2024/05/iran-warns-it-will-change-nuclear-doctrine-if-threatened-israel#ixzz8ZpquuLXA.
21. Abbas Aragchi, Remarks, Al Jazeera Forum, May 27, 2024.
22. Ali Akbar Salehi, Interview on Nasim TV, February 11, 2024.
23. Rafael Mariano Grossi, Interview, Amanpour and Co., PBS, March 29, 2024.
24. "Biden says he would use force as 'last resort' to keep Iran from nuclear weapons," Reuters, July 13, 2022, https://www.reuters.com/world/middle-east/biden-says-he-would-use-force-last-resort-keep-iran-nuclear-weapons-2022-07-13/.
25. "Former Trump advisor Bolton: Opportunity for Israel to destroy Iran nuclear program," *The Jerusalem Post*, April 14, 2014, https://www.jpost.com/middle-east/former-national-security-advisor-bolton-opportunity-for-israel-to-destroy-iran-nuclear-program-796985.
26. "Iran: Nuclear Intentions and Capabilities, National Intelligence Estimate," National Intelligence Council, November 2007, https://www.dni.gov/files/documents/Newsroom/Reports%20and%20Pubs/20071203_release.pdf.
27. "Weighing the Costs and Benefits of Miltiary Action Against Iran," The Iran Project, September 2012, https://www.wilsoncenter.org/sites/default/files/media/documents/event/IranReport_091112_ExecutiveSummary.pdf.
28. General (Ret.) Frank McKenzie, "The Iran Enigma," Global National Security Institute, University of South Florida, April 10, 2024, https://www.youtube.com/watch?v=kgJzDXhWfdw&list=PLm9bckPQyMTohGAbdty7uPx0dpzTppEyJ&index=3&t=701s.
29. Michael Crowely, Ronen Bergman, and Farnaz Fassihi, "Prisioner Deal Could Smooth Effort to Contain Iran's Nuclear Program," *The New York Times*, August, 10, 2024, https://www.nytimes.com/2023/08/10/us/politics/iran-us-prisoners-nuclear-program.html; Kelsey Davenport, "IAEA Condemns Iran for Failure to Cooperate," *Arms Control Today*, December 2023, https://www.armscontrol.org/act/2023-12/news/iaea-condemns-iran-failure-cooperate.
30. Kelsey Davenport, "IAEA Services Cameras in Iran," *P4+1 and Iran Nuclear Deal Alert*, Arms Control Association, February 16, 2024, https://www.armscontrol.org/blog/2024-01/p4-1-iran-nuclear-deal-alert.
31. "Iran Says it Does Not Seek Escalation in the Region," Asharq Al Awsat, April 16, 2024, https://english.aawsat.com/world/4968191-iran-says-does-not-seek-escalation-region.
32. "NPT Safeguards Agreement with the Islamic Republic of Iran," Report by the Director General, International Atomic Energy Agency, GOV/2023/58, https://www.iaea.org/sites/default/files/documents/gov2023-58.pdf.
33. Press Conference with IAEA Director General Rafael Mariano Grossi, IAEAvideo, Vienna, May 7, 2024, https://www.youtube.com/watch?v=4yMI2IFoy78&list=PLCsYX9QVCDTGpRPcQo7xiHOR-xZoHuJA0&index=2.
34. "Iran welcomes US sanctions relief, but says 'not enough,'" Al Jazeera, February 5, 2022. https://www.aljazeera.com/news/2022/2/5/iran-welcomes-us-sanctions-relief-but-expects-more.
35. "US seeks proposals for domestic HALEU production," World Nuclear News, January 10, 2024, https://world-nuclear-news.org/Articles/US-seeks-proposals-for-domestic-HALEU-production.