



WISCONSIN PROJECT
ON NUCLEAR ARMS CONTROL



Iran's Atomic Archive

Lessons Learned for Export Controls and Inspections



IRAN WATCH ROUNDTABLE

August 2021

Introduction

An early challenge for the Biden Administration has been to determine and implement its Iran policy, including whether and under what conditions to return to the Joint Comprehensive Plan of Action (JCPOA). New information regarding Iran's past nuclear weapon program has emerged since the accord was reached in 2015, notably an archive of Iranian documents seized by Israel in 2018. This information merits consideration in shaping not only U.S. policy toward Iran but nonproliferation policy more broadly. Information from the archive was not part of the public debate or Congressional evaluation of the JCPOA in 2015; it should be taken into account as part of current efforts to revive or expand that accord or to design a new one.

The archive provides lessons on the role and relative value of export controls, inspections, and other international measures in slowing or preventing a country's ability to develop nuclear weapons, and how a determined country might evade such measures. The Wisconsin Project on Nuclear Arms Control convened a group of experts for two private roundtable discussions to identify these lessons, which are expressed in the findings below.

The group recognized that the archive provides a significant perspective of the Iranian nuclear effort, but reflects a past moment in time and does not cover all aspects of Iran's nuclear weapon-related activities. While some of the information revealed by the archive is new to the public, it may have been known to the U.S. and other governments. The archive provides additional detail about these activities and brings more information about them into the public domain. These details reinforce what is known about Iran's clandestine pursuit of tasks and materials necessary to make nuclear weapons, which the International Atomic Energy Agency (IAEA) has reported on extensively in the past.

Background

In a television presentation on April 30, 2018, then-Israeli Prime Minister Benjamin Netanyahu unveiled information about Iran's nuclear weapons program that he said had been clandestinely acquired by Israeli agents early that year from a storage building in Tehran. The information, which the Prime Minister called "a secret atomic archive," comprises 55,000 pages and thousands of additional files on CDs. The Iranians had moved the archive to an "innocent-looking compound" in 2017, according to Netanyahu.¹

¹ "[PM Netanyahu presents conclusive proof of Iranian secret nuclear weapons program](#)," Israel Ministry of Foreign Affairs, April 30, 2018.

The captured blueprints, spreadsheets, charts, photos, and videos – apparently official government documents – describe Iran's Project Amad, a coordinated nuclear weapon program that ran between 1999 and 2003 to design, produce, and test five warheads of ten kilotons each.² After 2003, according to expert analysis of some Archive documents, Iran divided this project between covert and overt activities. Covert activities had no clear civilian explanation; activities with a plausible non-military application continued openly, often at universities and research institutions.

In addition, Iran retained an expert team, led by Mohsen Fakhrizadeh,³ to continue work on weaponization through SPND, the Organization of Defense Innovation and Research controlled by Iran's military. According to the Archive, a majority of the Project Amad team was transferred to SPND and the Project was directed by Iran's leaders and had high-level political support.

Much of the revealed information from the Archive provides greater detail on what was previously publicly known about Iran's past nuclear weapon work from IAEA reporting and unclassified national intelligence estimates. The Archive also appears to reveal new information about the intent, scope, and advancement of Iran's past nuclear activities. This information raises questions about how nuclear weapon programs develop, how the nonproliferation regime (particularly multilateral supply regimes) inhibits the spread of such programs, and how weapon programs can be hidden from international inspectors.

These questions were examined in two roundtable discussions hosted by the Wisconsin Project on Nuclear Arms Control on September 4, 2019, and again on March 18, 2021. The objective of these discussions was to identify lessons that should be drawn from the Archive related to the effectiveness of export controls, monitoring measures such as international inspections, and other efforts to prevent material and expertise from reaching programs to develop nuclear weapons. Informed by these lessons, the group sought to develop a set of findings and recommendations to support the policymaking and monitoring communities.

² This summary description of the Archive, and of conclusions drawn from it, is based on Israeli Prime Minister Benjamin Netanyahu's April 2018 press conference, as well as expert analysis published by the Institute for Science and International Security and the Belfer Center for Science and International Affairs at Harvard University. See ["The Iran Nuclear Archive: Impressions and Implications"](#) (Belfer Center) and reports by the [Institute for Science and International Security](#), notably [Breaking Up and Reorienting Iran's Nuclear Weapons Program](#).

³ Mohsen Fakhrizadeh Mahabadi was a physicist and senior officer in the Islamic Revolutionary Guard and generally recognized as the leader of the Iranian nuclear program. He was assassinated, reportedly by Israel, in November 2020.

Valerie Lincy, Executive Director of the Wisconsin Project, and **John Lauder**, a Senior Fellow at the Project and former Director of the Intelligence Community's Nonproliferation Center, hosted these roundtables. The participants were **Aaron Arnold**,⁴ a member of the U.N. Panel of Experts on North Korea who previously served as a counterproliferation subject matter expert at the U.S. Departments of Defense and Justice; **Eric Brewer**, former Director for Counterproliferation at the National Security Council and now Deputy Director and Senior Fellow with the Project on Nuclear Issues at the Center for Strategic and International Studies (CSIS); **David Kay**, former Chief Weapons Inspector at the IAEA and a Senior Fellow at the Potomac Institute for Policy Studies; **Michael Singh**, former Senior Director for Middle East affairs at the National Security Council and currently Managing Director of the Washington Institute for Near East Policy; and **William Tobey**, former Deputy Administrator for Defense Nuclear Nonproliferation at the Department of Energy's National Nuclear Security Administration and now a Senior Fellow at Harvard University's Belfer Center for Science and International Affairs.

Roundtable Findings

Following are the group's findings, which are a composite of the panelists' individual views. No finding should be attributed to any single panelist or be seen as a statement of the policy of any organization with which the panelist is affiliated.

The information revealed in the Archive is not incompatible with a U.S. decision to rejoin or renegotiate the JCPOA. Information from the Archive underscores the limitations of the accord, but also reinforces the benefits of a diplomatic agreement as a method for constraining Iran's path to a nuclear weapon.

While a full discussion of the JCPOA and its future was beyond the scope of the roundtable, the panel touched on the accord's limitations and benefits in relation to information from the Archive. The Archive underscores the importance of constraining Iran's fissile material production, blocking Iran's ability to acquire expertise and sensitive items from abroad, the connection between Iran's ballistic missile and nuclear weapons work, and the need to access undeclared sites in Iran. On balance, the panel found that a diplomatic agreement could complement export controls, interdiction measures, and existing monitoring provisions, and that the JCPOA's known limitations should not be considered more serious as a result of information from the Archive.

⁴ Mr. Arnold was not able to attend the March 2021 roundtable but provided written comments.

The main purpose of the JCPOA is to slow Iran's acquisition of large quantities of fissile material that could be converted into a stockpile of nuclear weapons and to detect covert attempts to do so. Acquisition of substantial quantities of highly enriched uranium or plutonium has been long seen as the long-pole in the tent of nuclear weapon development. Some members of the panel found it unlikely that a determined Iran could be prevented from acquiring key knowledge and technology for the fabrication of nuclear weapons and, for some panelists, even clandestinely acquiring or producing enough material for one or two weapons. But one or two nuclear weapons "in the basement" do not provide the same strategic value as a stockpile of weapons, or the material to build them. The Archive reveals Iran's plan for an arsenal of five nuclear warheads. Limiting the size and delaying the growth of Iran's fissile material stockpile, as the JCPOA had done before the United States withdrew from the accord and Iran announced it would no longer be bound by several key provisions, could delay such an outcome.

Relatedly, the JCPOA, complemented by interdiction measures and export controls, is also a means of buying time. The United States and its JCPOA partners considered the pursuit of a diplomatic solution and a delay in the Iranian program as a less perilous option than direct military action. Any such delay would allow time for Iranian leaders to better understand the danger they would face if they were to decide to pursue nuclear weapons and that such a course of action would not be in their interest.

In addition, the consultative mechanisms within the JCPOA could offer a vehicle for exploring questions raised by the Archive about the scope, locations, and status of nuclear weaponization efforts, if U.S. or other officials are willing to press for such action. The Joint Commission established in the accord provides a forum for reinforcing the importance of compliance, for addressing ambiguities, for mandating access by international inspectors, and for floating ideas to improve implementation. Such consultations could occur quietly and within a body and process intended for fact-based, technical discussions. Returning to the JCPOA or a similar agreement would once again provide the United States with a voice within such a body.

Some panel members stressed that resolution of all the issues about weaponization work raised by the Archive should not be a precondition for the United States to rejoin the JCPOA. There is historical precedent for using agreements to resolve troublesome issues. For example, the United States signed the treaty on Conventional Forces in Europe in 1990 even after the Russians had provided an incomplete data declaration on some of their military forces to be subject to the agreement. The U.S. signing statement articulated its concerns about the incomplete data but noted that the agreement itself provided the best mechanism for addressing the disparity.

Clandestine nuclear weapon development should not be expected to proceed in a linear and sequential fashion. Rather, nuclear weapon aspirants work to solve multiple hard acquisition challenges simultaneously, exploiting opportunities as they became available.

The Archive indicates that Iran pursued nuclear weaponization work while fissile material production was in its infancy. Documents in the Archive indicate that Iran had selected a nuclear weapon design and was preparing facilities for weapons manufacturing when the program was halted, or redirected, in 2003. At that time, Iran's fissile material production capability was at an early stage of development. Thus, domestic production of the most technically challenging part of a weapon – fissile material – was still uncertain.

The panel warned against expecting nuclear weapon programs to begin with fissile material production and then advance to weaponization work. Such an expectation implies that there is a single logical sequence or an ideal nuclear weapons "program," which the panel rejected. This expectation can lead to false conclusions about the behavior of proliferators, including about the procurement activities of nuclear weapon aspirants. Iraq and Libya, for example, focused on the components and technology that they could acquire when they could acquire them, without a particular acquisition timeline. Moreover, concurrent activities are possible; one panelist observed that some of the highly enriched uranium used in the Hiroshima bomb in 1945 was delivered only weeks before the detonation.

Iran's strategy may have been to minimize the time between a decision to surge toward a weapon and having an actual weapon. By first accomplishing the design, component testing, and delivery vehicle development, which Iran could more easily keep covert, Iran could move ahead more deliberately on the large-scale industrial processes that are difficult to keep secret: uranium enrichment and plutonium production. It is also possible that Iran mistakenly assumed that fissile material production would be easier to master – or, as the Archive suggests, that Iran planned to purchase fissile material from abroad.

Another factor that could explain Iran's approach to weapons development is secrecy and compartmentalization. Program compartmentalization can impede coordination and result in multiple paths that may not make sense when viewed from outside. Some panelists raised the possibility that Iran might not have been pursuing a dedicated, top-down driven nuclear weapons program, as many have concluded. These panelists noted that it is one thing for senior leadership to approve a program, as the Archive confirms, but another for leaders to guide the program or actively manage it. A less top-down driven effort might allow different centers of power in Iran to pursue either parallel or redundant paths.

Neither the Archive nor other publicly available information offers much insight into specific Iranian motivations or decision-making processes. The IAEA has reported that "Iran has maintained over prolonged periods of time both overt and clandestine programs to accomplish the tasks necessary to fabricating a nuclear weapon."⁵ In some cases, these efforts were parallel and redundant; in others, they were sequential.

This diversity and uncertainty in the approaches of nuclear weapon aspirant states adds further stress to the demands on export control regimes and interdiction efforts.

Export controls slowed the development of Iran's clandestine nuclear program but did not prevent the program from advancing. Export controls can be expected to increase the cost of nuclear weapon development and introduce technological risk but cannot prevent a determined country from developing nuclear weapons.

Export controls can reasonably be expected to perform three functions: slow and raise the cost of proliferation-related procurement; provide information about the acquisition methods and procurement interests of nuclear weapon aspirants; and force proliferators to undertake activities that constitute both warning and evidence of illicit nuclear activities. The panel found that all of these functions were accomplished in the Iran case, although determining the specific impact of export controls requires some speculation.

Still, the Archive reflects the shortcomings of relying on export controls alone. According to the Archive, Iran received multiple foreign nuclear weapon designs. In addition, up to two dozen foreign individuals assisted in the nuclear weapons effort. The machinery for the covert uranium metallurgy facility, *inter alia*, was procured from abroad. While some of this supply originated from entities in countries with porous or permissive export control systems – like China, Russia, Pakistan, and Ukraine – European and North American companies have also been sources of dual-use equipment.

Most practically, the Archive provides leads on procurement networks and methods that might still be active and that should be investigated and blocked by both national authorities and the IAEA. In this way, export controls serve as trip wires. While some controls may be evaded, there is substantial risk to proliferators that they will trip at least one of the alerting mechanisms.

⁵ ["Final Assessment on Past and Present Outstanding Issues Regarding Iran's Nuclear Programme \(GOV/2015/68\),"](#) International Atomic Energy Agency, December 2, 2015.

The panel concluded that a singular focus on limiting supply by restricting access to goods and expertise is insufficient in addressing proliferation problems, as the Iran case illustrates. Export controls are more meaningful when complemented by other supply side measures, such as interdictions, as well by addressing the demand side of proliferation through diplomacy – creating incentives and disincentives for countries that might seek nuclear weapons.

For instance, it is likely that Iranian decision-makers had confidence in the country's technical capacity to produce highly enriched uranium. Their primary uncertainty was the political, economic, and even military cost of pursuing such production. Ultimately, it appears that Iran's leaders treated the decision as an optimization problem: they sought to pursue large-scale enrichment and the nuclear weapon break-out potential it provides, while avoiding the severest international penalties. While this implies that, absent the use of force, the decision as to whether or not to pursue nuclear weapons lies entirely on the demand side, within Iran, the halt order on the Amad Plan, documented in the Archive, shows that Iran's decision making can be influenced by outside events.

The panel noted two more general benefits of export controls that were present in the Iran case. Control mechanisms, both multilateral regimes and national regulations, signal to the international business community their role in slowing the progress of a clandestine nuclear program that may be underway. Export controls establish standards of behavior for the private sector and facilitate information sharing between the public and private sectors. On the punitive side, violating or evading those standards of behavior carries the risk of penalties and therefore deters proliferation sensitive trade. Evidence that a country is violating export control standards can also be used to build international consensus against illicit programs and help to organize efforts beyond export controls themselves to stop such programs.

Iran's clandestine nuclear weapon program did not rely exclusively on export-controlled foreign technology. Iran sought items from abroad that were below the control thresholds of multilateral supply regimes and demonstrated the capability to produce some key items domestically. In order to counter nuclear proliferation more effectively, the scope of these regimes and controls should therefore be broadened.

Given the advances in technology that have taken place in the last two decades, much of the technology relevant to proliferation is no longer exclusive to the production of nuclear weapons. Relevant material and technology are now available more widely and have a greater number of non-military applications. Thus, it is increasingly difficult to associate suspicious foreign procurement by a proliferator with certain military end use. This task is even more difficult when a country – like Iran – has a nuclear energy program and well-developed industries with

indigenous engineering capacities. Such industries have a legitimate need for importing sensitive goods, technology, and material, while at the same time holding the skills needed to support the fabrication of nuclear weapons. One panelist noted that large-scale uranium enrichment is not a technical challenge; it is an engineering challenge.

According to Israeli briefings on the Archive, Iran could produce its own pressure transducers, vacuum pumps, and maraging steel. While some panelists questioned whether Iran truly has the capability to produce such items to a high standard and in large quantities indigenously, the Archive suggests that Iran's domestic capability might have been broader and deeper than previously believed. Iran may have continued to seek similar export-controlled goods and technologies clandestinely from abroad not because of an inability to produce such items but as a result of internal political factors. One panelist cited Iraq's past nuclear weapon program as an example: Iraqi engineers and scientists accepted both the risk of detection and the higher cost of procuring from abroad because it provided them with some amount of protection. Any failure caused by shortcomings from foreign technology would be less likely to prompt reprisal.

Several panelists emphasized that preventing trade in items below international control thresholds from contributing to proliferation requires increased cooperation with both emerging supplier countries and key transit countries in the global supply chain. U.N. Security Council resolution 1540 was adopted in 2004, largely in response to revelations about the black market nuclear supply network run by Pakistani metallurgist A.Q. Khan. Iran's nuclear program was a major beneficiary of Khan's network. Resolution 1540 is principally aimed at preventing non-state actors from acquiring nuclear, biological, and chemical weapons, their means of delivery, and related materials. It lacks an enforcement mechanism. But it has raised awareness about the connection between proliferation and export controls among a broader group of countries, fostered cooperation among those countries and traditional nuclear supplier states, and spurred the passage of comprehensive strategic trade control legislation around the world, including concepts such as "catch all" controls and controls on transit and transshipment. Some panelists suggested that further work on such legislation and its implementation will help close the gaps that were exploited by Iran and its suppliers.

Education and capacity-building support by the U.S. and its allies could also prove effective. The panel supported engaging not only the manufacturing sector but also industries providing financing, insurance, reinsurance, shipping, and other supply chain logistics services to further constrain the ability of proliferators to exploit those services. These sectors already have compliance and due-diligence structures, into which the risk of exploitation by proliferators could be included. A focus on resource-constrained countries with less institutional and private sector knowledge of trade controls, which may be more vulnerable to exploitation, was also

recommended, to prevent resource disparities from creating or exacerbating gaps in export control and sanctions implementation.

Export controls may serve both a police and information gathering function in countering proliferation and must be integrated and coordinated in order to operate effectively. The Archive suggests that diplomacy and nonproliferation norms were successful in preventing official foreign assistance to Iran's undeclared nuclear program but that Iran nevertheless received critical assistance from abroad through other channels.

The foreign support described in the Archive was undertaken by individuals, not governments, though there are considerable uncertainties about the extent of Iranian-North Korean cooperation. This apparent lack of official foreign assistance may be a reflection of the intense and sustained international effort to cut off support for Iranian nuclear activities during a period of concern about the military dimension of those activities. The panel found that the Iranian case highlights the importance of diplomacy for denying state support to incipient nuclear weapon programs.

Nuclear weapon aspirants can cut short their path to weapons by relying on foreign technologies and experts. Foreign expertise from individuals was helpful to Iran's nuclear weapons program, according to the Archive. This underscores the importance of monitoring people and expertise, not just materials. While a focus on such monitoring has been a trend in nonproliferation in recent decades, more could be done to track individuals and dissuade them from undertaking activities that support proliferation.

The number of nuclear weapon experts and middlemen able to access and move money, material, and knowledge is relatively finite, according to one panelist. Such individuals could be regularly monitored. They might lead to programs of concern and also can also be a vulnerability to penetrate programs both to gain intelligence and to undertake sabotage.

Another panelist suggested that the techniques and lessons learned regarding terrorist tracking could be applied to monitoring the activities and travel of those with fissile material production or nuclear weapon design expertise.

There was also support among panelists for increasing funding for cooperative threat reduction programs that provide alternative employment for nuclear experts. The foreign experts who helped Iran's nuclear weapon program were likely financially rather than ideologically motivated. Redirecting scientists and engineers away from programs of concern is a challenge, however, since no threat reduction program will be able to outbid a sovereign state for the services of a

corrupt individual. Such programs must find alternative employment for all potentially exploitable individuals, while nuclear weapon programs need to recruit only a few.

The best that threat reduction programs can hope to do, according to the panel, is ensure that basically honest people are not forced by financial exigency into actions they otherwise would not undertake, and to produce some insight into the thinking, activities, and location of those with nuclear weapons expertise. Optimally, would-be proliferators would both receive incentives for honest work and face penalties for proliferation.

Reliance on foreign experts and support is a double-edged sword for a clandestine nuclear program. It can allow the program to move ahead faster with fewer false steps; on the other hand, it opens up opportunities for detection and disruption. Limiting the supply of foreign expertise must be advanced, while also exploiting reliance on foreign experts by nuclear weapon aspirants as a means of discovering, monitoring, and disrupting the programs.

Israel has not released specific information about Iran's foreign supply network from the Archive. Such information might be useful as a source of intelligence about who the suppliers were, what Iran was seeking from them, and what such procurement says about the technical challenges Iran may have been facing. The panel emphasized that there are trade-offs between publicizing a procurement channel and shutting it off completely and monitoring the channel to learn more about the program it is supporting. Panelists debated this tension between export controls as a police function and as an information-gathering function and concluded that the dichotomy can be overstated, especially in well-integrated and coordinated counterproliferation efforts.

The Archive reinforces the need to clarify remaining uncertainties about Iran's nuclear weapon development effort, notably how far Iran may have proceeded in the development and engineering of a functional nuclear weapon. An Iranian data declaration and additional access to individuals and sites could help the IAEA investigate these uncertainties. Information from the Archive could also support such an investigation.

The multiple nuclear weapon acquisition paths pursued by Iran – as reported by the IAEA and revealed in the Archive – have worrisome implications. Iran has been interested in nuclear technology since the 1950s. Since that time, and certainly over the past two to three decades, Iran has been cooperating with nuclear scientists from a number of countries, including Russia. Iranians have also been active customers in the nuclear black market.

All the relevant facilities and scientists in Iran, and the full scope of technology and material acquired internationally, may not be known. Given the breadth and depth of Iran's nuclear

program, some panelists warned that Iran could very well have produced, acquired, or diverted at least laboratory quantities of fissile material that could be marshaled together at some point to fabricate one or two nuclear weapons. Large-scale illicit activities of this type would surely have been detected by the IAEA and national intelligence agencies. But smaller-scale efforts, while cumulatively significant, might fly below the radar.

In order to fill important knowledge gaps about Iran's nuclear program, some panelists argued Iran should be encouraged to provide an accounting of its prior nuclear weapons effort. Iran largely stonewalled the IAEA in the Agency's past investigation of the "possible military dimensions" of Iran's nuclear program. This investigation concluded in 2015, before the JCPOA took effect, with several key issues unresolved, notably a program to integrate a nuclear warhead into a missile delivery system and large-scale work relevant to nuclear weapon detonation.⁶ The Archive reemphasizes the value of greater Iranian transparency on past weaponization work, including through a formal declaration. Interviews of key individuals, long sought by the IAEA and equally long resisted by Iran, might also be valuable in an IAEA investigation and contribute to an effective verification system.

There was some debate among panelists about the relative value of pressing Iran to provide a declaration about its past nuclear weapon work and to permit interviews at this point in time. The panel agreed that such a declaration should not be a precondition for the United States to return to the nuclear accord but rather an issue that could be discussed within the JCPOA's Joint Commission. There was a sense among some panelists that the IAEA and member states could use the Archive to demand of Iran a complete declaration about its prior nuclear activities and access to people, records, and facilities to verify it. Other panelists found that, while a more limited declaration about the status of key equipment might be helpful, pressing Iran for complete declaration accompanied by broad IAEA access is unrealistic. Iran would not be forthcoming and would be unlikely to share information of which national intelligence agencies are unaware.

The public does not have complete insight into what the IAEA and intelligence agencies know about Iran's nuclear weapon effort. The United States seems to have a good appreciation of the overall status of Iran's weaponization effort, both before and after the period covered by the Archive. Indeed, the U.S. intelligence community's assessment regarding Iran's nuclear program has remained unchanged since the United States acquired access to the Archive. This was

⁶ ["Final Assessment on Past and Present Outstanding Issues Regarding Iran's Nuclear Programme \(GOV/2015/68\),"](#) International Atomic Energy Agency, December 2, 2015.

reaffirmed in the State Department's 2019 Compliance Report, which describes the weaponization effort as in the past and the Archive as an indication that Iran aims to preserve "information from its historical efforts to aid in any future decision to pursue nuclear weapons, if a decision were made to do so."⁷

The Archive, which has been provided by Israel to the IAEA, is supporting specific follow-up action by the IAEA. The Agency has requested access to multiple locations in Iran based on information from the Archive, notably the "Tehran site," a former pilot uranium conversion plant; and the "Marivan site" or "Abadeh site," a defunct high-explosive test location.⁸ Given the size of the Archive and the time-consuming task of reviewing, translating, and collating it with existing IAEA information, additional action by the Agency can be expected going forward.

The Archive raises questions about Iran's nuclear past that, if answered with cooperation from Iran, would create confidence that Iran is complying with its international obligations. As a result, the panel believed that efforts to obtain greater clarification from Iran are necessary and should be pursued. However, the panel cautioned that there is little international consensus on the need to pursue answers to these questions as a priority. Likewise, Iran has expressed no interest in doing so or in increasing transparency with the Agency in response to the Archive, as a means of building confidence in the peaceful nature of its nuclear program.

The Archive reinforces the importance of supporting the monitoring efforts of the IAEA and in strengthening its authority to investigate allegations of weaponization. The Agency successfully reported on Iran's nuclear weapons activities but was limited in its final assessment of these activities by the absence of political support from member states.

The IAEA – greatly aided by information from member states – achieved timely detection of critical aspects of Iran's undeclared nuclear program using its existing authorities, including those provided under Iran's Comprehensive Safeguards Agreement and Iran's provisional application of an Additional Protocol to that Agreement between 2003 and 2006.⁹ The IAEA developed the Additional Protocol following the discovery in the 1990s of Iraq's undeclared nuclear program.

⁷ ["Adherence to and Compliance with Arms Control and Nonproliferation, and Disarmament Agreements and Commitments,"](#) U.S. Department of State, August 2019.

⁸ David Albright, Sarah Burkhard, and Andrea Stricker, ["The IAEA's Latest Iran NPT Safeguards Report: Tehran Continues to Stonewall Inspectors,"](#) February 25, 2021.

⁹ The relationship between the IAEA's authorities in Iran and the differing levels of access that they provide are elaborated in the March 25, 2021 episode of the [Iran Watch Listen podcast](#), which features a discussion with Laura Rockwood, a former senior official at the IAEA.

The Protocol provides more information about and access to a country's nuclear fuel cycle and makes it more difficult to divert fissile material from a declared to an undeclared program.

Despite this success, according to the panel, the Archive suggests areas where IAEA authority could be strengthened, both in terms of the binding nature of the arrangement as well as the type of facility and activity being monitored.

As part of the JCPOA, Iran agreed to resume its provisional application of the Additional Protocol, but it is not legally bound by this commitment until it brings the Additional Protocol into force. Iran is required to seek such ratification under the accord as nuclear restrictions sunset but has since moved in the opposite direction, and as of June 2021 had reverted to a minimalist approach.

The IAEA was granted further access pursuant to the JCPOA to inventories of key gas centrifuge components and manufacturing equipment, including flow-forming machines, filament winding machines, and mandrels.¹⁰ This was meant to ensure that Iran was using these components and equipment only for activities allowed for by the JCPOA. The JCPOA also set forth a process by which the IAEA could request information about and access to locations not declared by Iran but suspected of involvement in undeclared nuclear material activity.¹¹ The Agency may have used this authority to obtain access to some sites in Iran described in the Archive, including the Tehran and Marivan sites noted above.

Panelists found that the Agency's pursuit of information about weaponization may be an area where existing monitoring tools could be buttressed. The panelists took note of the debate over how the Agency should verify a section of the JCPOA that prohibits Iran from pursuing activities that could contribute to the design and development of a nuclear weapon in this context.¹² This section requires an Iranian commitment not to engage in activities involving detonation, explosive simulation, explosive diagnostic systems, and explosively driven neutron sources associated with nuclear weapons development. However, such work often takes place at military facilities and are not part of the IAEA's standard monitoring responsibilities. While Iran has allowed the IAEA access to some such facilities, this access has been slow and uneven, as described above.

The panel agreed that IAEA should retain the authority to verify the absence of weaponization work in Iran and that this authority should, at a minimum, be affirmed by IAEA member states. Explicit statements of support for the Agency's inspection authority by the United States and

¹⁰ ["Joint Comprehensive Plan of Action,"](#) Section R.

¹¹ JCPOA, Section Q.

¹² JCPOA, Section T.

European parties to the JCPOA might also be useful. These statements would be intended to provide the IAEA with the political backing it needs to fulfill its mandate to investigate alleged activities related to weaponization at military sites. Iran will not be more open with the Agency without substantial political backing from member states.

Indeed, the panel found that the IAEA's limitations in pursuing its investigation about undeclared nuclear work stem more from a lack of support at key moments from IAEA member states than from a lack of authority – notably IAEA efforts to resolve the "possible military dimensions" of Iran's nuclear program. The requirement to reach consensus with the Agency's Board of Governors is a source of legitimacy for any action taken (e.g. the 2005 finding of Iran's non-compliance with its NPT obligations and referral to the U.N. Security Council) but also of delay in effective action.

For many years, debate raged within the Board of Governors as to whether Iran was actively trying to attain nuclear weapons or pursuing some lesser goal. The IAEA's efforts to inform this debate through monitoring was delayed by Iran. The Archive suggests that the Iranians had penetrated the IAEA and were aware of the Agency's questions and plans for site visits in advance. This knowledge strengthened the ability of Iran to organize a successful denial and deception scheme.

Some panelists found that too much expectation is placed on the IAEA, given its limited ability to compel a country to provide access and the nature of decision-making within the Board of Governors. To remedy these limitations would require putting into place a default inspection mechanism that is much stronger than what currently exists. Such a mechanism might involve more aggressive use of the Additional Protocol or a new type of inspection regime that borrows elements from the temporary authorities provided for in the JCPOA.

Even with this mechanism, panelists were broadly skeptical that more aggressive inspections in themselves would reveal information that Iran was trying to hide. While the United States should encourage the IAEA to pursue questions raised by the Archive, the United States will have to decide what the consequences for Iran would be if Iran does not provide the cooperation that is required.

The Archive confirms the sobering conclusion that Iran made substantial progress in the development of nuclear weapons despite sustained international efforts to constrain the flow of technology to Iran and the scrutiny of the IAEA and national intelligence agencies. Such efforts would be even less effective in blocking the progress of countries with more expansive

domestic nuclear and engineering infrastructure and must be complemented with other tools.

The goal of stopping the Iranian nuclear program was paramount among U.S. priorities with respect to Iran, which allowed the United States and its partners to focus policies and actions on achieving this goal. The Archive confirms that despite these efforts, Iran was running a structured nuclear weapon program and had made substantial progress toward building a nuclear weapon. It was, as has been documented by U.S. intelligence findings, an internal decision by Iran to halt its program. This halt was largely motivated by a desire to avoid the risks of exposure rather than due to a technical hurdle that prevented the program from proceeding.

The current export control regime and related interdiction tool kit are designed to frustrate the ability of pariah states like Iran and North Korea from acquiring technology and material for nuclear weapons from more advanced economies. The regime is not necessarily well suited to monitor tertiary proliferation networks, for instance if Iran and North Korea supply potential nuclear weapon states. Nor is it well suited to stop countries with expansive nuclear power programs and engineering infrastructure from sprinting or sneaking to building a nuclear arsenal. Such countries hold much of the necessary capability and technology domestically.

Iran has been identified for decades as a problematic actor. The international community had extensive time to tighten controls, draw attention to Iranian behavior, and mobilize other countries to join punitive sanction and interdiction campaigns. More advanced countries could take steps toward nuclear weapons before the international community has the time to detect such steps and counter them.

The ability to maintain an almost singular focus on the issue of nuclear proliferation in dealing with a country – as has been the case with Iran – has not often been possible in the past and is unlikely to be possible in the future. In the case of Pakistan, for instance, the United States had competing foreign policy and national security priorities and was unable to prevent Pakistan from developing and testing nuclear weapons. The relationship between the United States and allies with latent nuclear weapon capabilities like Japan and Taiwan would likewise have to balance nonproliferation with other priorities.

Nuclear weapon aspirants like Iran draw lessons from Iraq and Libya. They fret that giving up nuclear and other weapons of mass destruction programs would reduce a bulwark against external support for regime change. These states look for so-called negative security assurances – that countries with nuclear weapons would not use these weapons against them. They may be motivated to change behavior based on the promise of relief from the cost of U.S. economic and diplomatic countermeasures.

Countries with latent nuclear weapon capabilities pay close attention to U.S. commitment to their defense. They look for positive assurances that they remain under the U.S. nuclear deterrence umbrella. This U.S. commitment lessens incentives for proliferation among these countries. The decision-making of these countries with regard to nuclear weapons may also be influenced by outcomes in Iran (or North Korea). Egypt, Japan, Saudi Arabia, South Korea, Taiwan, and Turkey are among the countries with nuclear capabilities – or, in Saudi Arabia's case, the aspirations to develop them – warily watching developments in their regions.

The panel agreed that despite limitations confirmed by the Archive, export controls and inspection by the IAEA remain critical nonproliferation tools and require U.S. support. These multilateral tools must be supplemented by ongoing intelligence operations, which are more likely to discover and penetrate deception and covert programs than the IAEA alone. The challenge will be to share persuasively such intelligence to build international consensus for cooperative actions to deter, constrain, and ultimately prevent the acquisition of nuclear weapons by additional countries.

About the Wisconsin Project

The Wisconsin Project on Nuclear Arms Control is a non-profit, non-partisan organization based in Washington, D.C. that conducts research, advocacy, and public education designed to inhibit the spread of nuclear, chemical, and biological weapons and the missiles to deliver them. The organization was founded in 1986, in cooperation with the University of Wisconsin.

The Wisconsin Project's mission is to reduce the risk that exports will accelerate the proliferation of weapons of mass destruction. The Project helps governments comply with the export restrictions in international agreements, and helps them ensure that their national controls on strategic goods are enforced. The Project also publicizes clandestine transactions in these goods, and draws attention to weaknesses in trade agreements and national laws. Through its research, the Project has influenced the export policies of major supplier countries.

About Iran Watch

Iran Watch is a website published by the Wisconsin Project that monitors Iran's capability for building nuclear weapons and long-range missiles. The purpose of the website is to increase public awareness of the strategic situation in Iran and to make detailed knowledge of Iran's weapon potential available to policymakers, the media, scholars, and the general public.

Through Iran Watch, the Wisconsin Project provides an objective resource for monitoring and assessing U.S. sanctions that were re-imposed following the U.S. withdrawal from the Joint Comprehensive Plan of Action (JCPOA), as well as advances in Iran's nuclear program following Tehran's decision to stop complying with JCPOA requirements. The site contains thousands of primary source documents related to Iran, as well as reports on Iran's nuclear and missile programs, profiles of the entities involved in or supporting these programs, and analysis of the international effort halt them.