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IRAN
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No nuclear proliferation controversy has consumed more international attention, diplomatic energy, and negotiating patience than Iran’s. This ongoing saga reflects the vexing nature of Iran’s multi-faceted challenge to the nonproliferation regime. At issue is whether the Islamic Republic can be coaxed by the international community back into compliance with its obligations under the Nuclear Nonproliferation Treaty (NPT) in a manner that balances each side’s key security interests, namely, the Iranian regime’s ability to construct a nuclear weapon should it be imperiled, and the West’s ability to detect that construction early enough to thwart it, by use of force if necessary. In any event, serious consideration will need to be given to shoring up the nuclear nonproliferation regime in the wake of what may be called the Iranian proliferation model, for it appears that the current negotiating path will still leave Iran very close to the nuclear-weapon threshold. Other nuclear aspirants are likely to take note and potentially emulate Iran’s behavior. By itself, an Iranian breakout from the NPT could lead to the unraveling of the nuclear nonproliferation regime. If other countries in volatile regions similarly build right up to the nuclear weapon threshold, collapse of the regime could come rapidly in the form of proliferation cascades.

As this chapter details, Iran’s nuclear behavior has challenged the spirit and letter of the NPT, the treaty review process, the authority of the International Atomic Energy Agency (IAEA), and the nuclear export control regime. In discussing these challenges, the chapter addresses six themes: deception (including Iran’s secret construction of sensitive nuclear facilities), denial (Tehran’s refusal to admit to illicit nuclear activity, save when confronted with incontrovertible evidence to the contrary), defiance (such that in response to international calls for restraint and warnings, Iran accelerated its nuclear program), disruption (of the NPT review conference process to divert attention from its noncompliance), domestic politics (whereby the nuclear issue had become a political football among competing factions in Tehran), and diplomacy (the efforts since 2002 to negotiate a peaceful resolution of the Iranian nuclear controversy).

Background
The United States and a number of its allies and partners harbored suspicions of Iran’s nuclear intentions well before Tehran’s secret build-up of fissile material production facilities was
publicly exposed in 2002. Indeed, US concerns about nuclear proliferation in Iran predate the founding of the Islamic Republic in 1979. The Carter administration feared that the Shah of Iran sought to produce nuclear weapons, causing it to draw out negotiations with Tehran on civil nuclear cooperation. US fears were stoked by the Shah’s own comments indicating an interest in acquiring the bomb, as well as his formation of a nuclear–weapon design team. The Shah was toppled before the issue of US civil nuclear cooperation was resolved.

As the mullahs assumed power in Tehran, the nuclear inheritance was but one of many issues they had to address. In such an unsettled and emotionally charged atmosphere, the revolutionaries condemned the Shah’s investment in nuclear energy as a wasteful vestige of Western imperialism and cancelled Iran’s contracts with Germany and France for construction of nuclear power plants at Bushehr and Darkhovin, respectively. The new regime opted to uphold Iran’s adherence to the NPT. Behind the scenes, the situation was more complicated. The memoirs of Iran’s current president, Hassan Rouhani, revealed that even before they assumed power, the mullahs were weighing their nuclear options. They called to Paris Iran’s nuclear scientists and afterwards concluded that they would retain Iran’s core nuclear research effort. Within three months of Khomeini’s triumphant return to Tehran as leader of the new Islamic Republic, Ayatollah Beheshti, a key Khomeini ally, summoned Iranian nuclear scientists and reportedly declared that the new regime was intent on acquiring nuclear weapons.

Saddam Hussein’s invasion of Iran in 1980 and his use of chemical weapons beginning in 1982 added impetus to the mullahs’ atomic pursuits. Iran’s current Supreme Leader, Ayatollah Khamenei, previously served as Iran’s president beginning in 1981, after terrorist bombings killed a number of the fledgling republic’s leaders, including Beheshti. Documents obtained by the IAEA by 2009 indicate that in 1984, then-president Khamenei advocated Iran’s acquisition of nuclear weapons at a high-level government meeting, declaring that such weapons would be a deterrent in the hands of God’s soldiers. Iran at this time embarked on a major effort to expand its cadre of nuclear experts and to revive nuclear reactor deals with the West. The United States prevailed on its allies not to assist Iran in these efforts.

Frustrated in its attempts to restore nuclear cooperation with the West, Iran looked elsewhere. It found success with China. *Inter alia*, Beijing helped Iran develop the Esfahan uranium conversion facility, which played a critical role in preparing uranium for enrichment in gas centrifuges. In 1991, China also provided Iran with nearly 2,000 kg of uranium compounds that were used to secretly test conversion processes for the plant. Iran failed to declare these uranium imports at the time, as well as the conversion experiments, in violation of IAEA safeguards. By the late-1990s, US pressure caused China to attenuate its nuclear cooperation with Iran.

Iran also turned to Russia, which in 1995 agreed to complete the Bushehr nuclear power reactor. A secret annex to the Russian–Iranian nuclear cooperation agreement called for Moscow to supply Tehran with a uranium enrichment facility. Under pressure from Washington, Russian President Boris Yeltsin announced that the enrichment proviso would be struck but otherwise, Russian nuclear cooperation with Iran would continue.

Much of the US effort to deny Iran technology that would support nuclear–weapon development focused on discouraging Chinese and Russian cooperation. Washington was caught off guard, however, by Iran’s dealings since the late-1980s with the nuclear black market being run out of the Pakistani nuclear complex by A.Q. Khan. The Khan network provided Tehran with critical uranium centrifuge technology and components, as well as nuclear–weapon-related design and production plans.

In August 2002, an Iranian opposition group claimed that the regime was constructing secret nuclear facilities in central Iran. Commercial satellite imagery lent credence to the claims in December, revealing a massive underground uranium enrichment facility being built at Natanz and a large-scale plant to produce heavy water, a moderator for reactors fuelled by natural uranium, at Arak. It was only after the cover was blown on these facilities that the Iranians officially notified the IAEA of their existence. A request by the IAEA to visit the sites was rebuffed by Iran, which cited “the need to prepare.” It was not until February 2003 that IAEA Director General Mohammed ElBaradei and a team of agency inspectors was granted access to the sites. ElBaradei discovered an Iranian nuclear fuel cycle program far more advanced than expected.

The ElBaradei visit launched an IAEA investigation that uncovered numerous breaches of Iran’s safeguards obligations. Under intense international scrutiny, Tehran shifted into crisis management mode. Some leadership figures sensed that the regime had to grant the IAEA greater access in order to allay fears that it was seeking to build nuclear weapons, a perception that could invite an attack on the Islamic Republic. Already, US military forces were massing on Iraq’s border, determined to prevent Saddam Hussein from completing what was believed to be an effort to reconstitute his nuclear–weapon program. Other Iranian leaders, particularly from the military, resisted disclosure of the regime’s nuclear–weapon work in order to save face and, presumably, retain the weapons option. By fall 2003, with American troops having already toppled Saddam Hussein, Supreme Leader Khamenei personally called upon Hassan Rouhani, then–Secretary of Iran’s Supreme National Security Council, to step in as the regime’s nuclear trouble-shooter.

Rouhani focused on two efforts, externally allaying concerns that Iran was seeking nuclear weapons, and internally consolidating authority over the regime’s nuclear activities. Regarding the former, Rouhani found willing partners in Europe and in IAEA Director General ElBaradei, who opposed the American invasion of Iraq and feared that the United States could launch an unsanctioned war against Iran next. Rouhani negotiated a deal in October 2003 with the so-called EU–3 (i.e., Germany, France, and the United Kingdom), whereby Iran would suspend its enrichment program and adopt a range of transparency measures, albeit on a strictly “voluntary, temporary” basis. Tehran understood that in return, the EU–3 would use their influence in the IAEA to ensure that Iran’s nuclear portfolio was normalized and Tehran would not be referred to the UN Security Council and sanctioned.

Internally, Rouhani had to coordinate the various institutional players in Iran’s nuclear program, such as the Atomic Energy Organization of Iran (AEOI) and the Islamic Revolutionary Guards Corps (IRGC), Iran’s radicalized military. He fully understood how challenging that would be:

I could see the difficulties ahead … it was necessary that different organizations cooperate with the official in charge of the nuclear case and I wasn’t sure at the time if all of them were willing to cooperate 100 percent. When the work started, 90 percent of the problems that I predicted came true. The problems included both disharmony and sabotage.

Rouhani also presided over ongoing efforts to sanitize Iran’s highly incriminating nuclear activities. Those efforts began in February 2003 when another secret facility was uncovered by the Iranian opposition, the Kalaye Electric Company in Tehran. Once publicly exposed, the regime immediately began to remove equipment and sanitize the site. The IAEA sought to take
environmental samples at Kalaye in February but was rebuffed. Iran only acknowledged a nuclear connection for Kalaye under pressure, claiming that the site was a watch factory that also built centrifuge components. Tehran maintained that no nuclear material had been present at the site. It took months for the IAEA to obtain full access to Kalaye; even then, it was not permitted to take environmental samples until August 2003. The Agency discovered that Iran had not only removed equipment but also reconstructed the interior of the main building. Despite these deception efforts, the IAEA confirmed that nuclear material had been present at the site, a safeguards violation that forced Iran to divulge more details about its secret enrichment activities.11

By June 2004, Iran had completely demolished another suspect site, the Lavisan-Shian complex in Tehran, as documented by commercial satellite imagery, before allowing the IAEA access to it.12 Lavisan-Shian housed the Physics Research Center (PHRC) which Iran subsequently acknowledged had been engaged in unspecified “nuclear defence” research.13 Tehran maintained that no nuclear material or nuclear activities related to the fuel cycle had been present at the site. The IAEA was unable to detect the presence of nuclear material at Lavisan, but noted that “the detection of nuclear material in soil samples would be very difficult in light of the razing of the site.”14

Sensing Iran’s vulnerability, Rouhani was able, with the help of other key elite figures such as Ayatollah Hashemi Rafsanjani, to persuade the Supreme Leader to accept the enrichment suspension deal with the EU-3. He also appears to have halted the regime’s weaponization work, the research, development, and testing of a nuclear explosive.15 As the US Intelligence Community concluded in an unclassified summary to a National Intelligence Estimate in 2007, “We assess with high confidence that until fall 2003 [i.e., before Rouhani asserted control], Iranian military entities were working under government direction to develop nuclear weapons.”16

Iran’s enrichment suspension did not prove to be durable, however. The Iranian regime used ambiguities in the 2003 agreement to continue advancing its enrichment program, necessitating the deal to be renegotiated in 2004. Sensing that the Europeans were intentionally dragging out the negotiations to hold back Iran’s nuclear development, the Supreme Leader directed in April 2005 that work resume on the Esfahan uranium conversion facility, effectively ending Iran’s enrichment suspension. Notably, Iran’s rejection of nuclear suspension preceded the election of firebrand president Mahmoud Ahmadinejad in June 2005.

Tehran’s reactivation of its enrichment program triggered intense international diplomacy. In September 2005, the IAEA Board of Governors found that, based on the evidence gathered by IAEA inspectors, Iran was in noncompliance of its safeguards agreement. In February 2006, the IAEA Board voted to report Iran to the UN Security Council. In defiance of IAEA resolutions, President Ahmadinejad announced on April 11, 2006 that Iran had now enriched uranium. The UN Security Council followed with an ultimatum, Resolution 1696, demanding, inter alia, that Iran suspend all enrichment related activities by the end of August 2006 or face sanctions. Iran ignored the warning, and the Security Council passed Resolution 1737 in December, the first of many sanctions against Iran.

Under Ahmadinejad, and with the Supreme Leader’s blessing, Iran embarked on a policy of nuclear defiance. Hassan Rouhani was replaced as the regime’s lead nuclear negotiator. Tehran then made good on warnings that additional pressure on the regime would only trigger new advances in the nuclear program. The centrifuge program in particular witnessed rapid and sustained expansion. It went from about 200 IR–1 model centrifuges in late-2006 to 18,000 by early-2014. Tehran also continued to build out the IR–40 heavy water reactor at Arak. Another aspect of this defiance was to curtail cooperation with the IAEA to what Tehran determined was the bare minimum.
To forestall a preemptive military attack against its nuclear complex by Israel or the United States, Iran was careful all along to balance its nuclear defiance by professing a willingness to continue discussions with the international community. There were many attempts over 2005–2012 to test Iran’s stated desire for a diplomatic solution. After shunning the E3 process for years, the Bush Administration decided to join it, along with Russia and China, expanding it into the so-called P5+1 (or EU3+3) process in 2006. The P5+1 gained no traction with Tehran before President Bush left office in early 2009.

The incoming Obama administration was committed to engaging Iran in pursuit of a diplomatic settlement and dropped the Bush administration’s insistence that Iran resume suspension of uranium enrichment as a prerequisite to negotiations. In September 2009, the Obama administration creatively proposed that Iran swap the low–enriched uranium it had produced by then for an equivalent amount of near–20 percent enriched uranium fuel that was now needed for the Tehran Research Reactor but which Iran was unable to manufacture by itself.

After Iranian negotiators accepted the “fuel swap” proposal in principle, the deal foundered on the shoals of Iranian domestic politics. The Supreme Leader was still in no mood to compromise and factions opposed to President Ahmadinejad refused to hand him a diplomatic victory.

Doubts about Tehran’s intentions where amplified at this time with the discovery that Iran was building another secret uranium enrichment site, this time beneath a mountain at Fordow to withstand air attack. Iran was forced to acknowledge the facility and to apply IAEA safeguards to it. Turkey and Brazil sought to resurrect the fuel swap deal with the Tehran Declaration of 2010 but Iran’s last–minute enthusiasm was seen by the Obama administration as a cynical attempt to forestall another round of sanctions which was gaining momentum at the UN Security Council. Despite earlier encouragement of the mediation effort, President Obama set aside the trilateral deal and secured the passage of United Nations Security Council (UNSC) Resolution 1929, further tightening sanctions against Tehran. Iran responded by escalating its enrichment of uranium to near–20 percent to produce the research reactor fuel on its own. It also denied admission to certain IAEA inspectors and announced that it was preparing to build ten additional enrichment facilities.

### Turning points, 2013

Following a dubious re-election in 2009, a popular uprising in protest, and its violent suppression by the regime, President Ahmadinejad proved to be a highly polarizing figure, even managing to alienate Supreme Leader Khamenei by the end of his tenure. Against this backdrop, the Iranian presidential election of 2013 proved to be a referendum on the regime’s nuclear policy. The campaign pitted two nuclear negotiators against each other, President Ahmadinejad’s appointee, Said Jalili, and Hassan Rouhani. The third televised debate among all eight candidates underscored elite dissatisfaction with Iran’s nuclear defiance, particularly as US and European Union sanctions against the oil and banking sectors were exacting a harsh toll on Iran’s economy. Rouhani openly questioned the regime’s single–minded pursuit of enrichment, noting,

All of our problems stem from this – that we didn’t make the utmost effort to prevent the [nuclear] dossier from going to the UN Security Council. It’s good to have [uranium enrichment] centrifuges running, providing people’s lives and sustenance are also spinning.
Rouhani promised to quickly resolve the nuclear dispute and get the sanctions lifted. He won the election decisively and took office in August 2013.

Having been marginalized politically during Ahmadinejad’s eight-year presidency, Rouhani had ample time to strategize how to extract Iran from its nuclear predicament. He was receptive to secret back-channel negotiations with US officials to begin framing a deal. Negotiations with the P5+1 resumed in October 2013, with Foreign Minister Javad Zarif being designated as Iran’s new lead nuclear negotiator. A Joint Plan of Action (JPOA) was agreed on November 24, 2013. Under its terms, Iran agreed for the first time in eight years to accept limits on its enrichment program. Indeed, key elements were to be rolled back. Specifically, Iran committed to:

- Convert half of its stockpile of uranium enriched to 20 percent to oxide form and downblend the remainder to an enrichment level of no more than 5 percent;
- Suspend production of uranium enriched to above 5 percent;
- No further advances in nuclear activities at the Natanz Fuel Enrichment Plant, the enrichment plant at Fordow and the Arak heavy water reactor;
- Convert uranium enriched up to 5 percent produced during the six months to oxide form when the construction of the conversion facility is completed;
- No new enrichment facilities;
- Research and development practices, including on enrichment, will continue under IAEA safeguards;
- No reprocessing of spent plutonium fuel or construction of any facility capable of reprocessing; and
- Enhanced monitoring including: providing information to the IAEA on plans for nuclear sites and the Arak reactor; negotiating a safeguards approach for the Arak reactor; allowing daily IAEA access to Natanz and Fordow; and allowing managed access to centrifuge workshops and uranium mines and mills.

In return, the P5+1 committed to:

- No new nuclear-related sanctions from the UN Security Council, the EU, and the United States;
-Pause efforts to further reduce Iran’s oil sales and partial repatriation of frozen Iranian assets from oil sales;
-Suspension of US and EU sanctions on petrochemical exports and gold and precious metals;
-Suspension of US sanctions on Iran’s auto industry;
-Supply and installation of spare parts for Iranian civil airplanes, including repairs and safety inspections;
-Establish a financial channel for humanitarian goods using Iran’s oil revenues that are frozen abroad, which can also be used for tuition payments for Iranian students abroad and payment of Iran’s UN dues; and
-Increase of the EU thresholds for non-sanctioned trade with Iran.

The JPOA also included elements of a longer-term settlement, namely:

- An agreed upon duration;
- Reflection of the rights and obligations of all NPT parties and IAEA Safeguards Agreements;
-Lifting all multilateral and unilateral sanctions on nuclear-related measures;
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• Defining Iran’s enrichment program with agreed upon limits;
• Resolving concerns about the Arak reactor;
• Implementing agreed upon transparency measures, including Iran’s ratification and implementa-
tion of the Additional Protocol of its safeguards agreement with the IAEA;
• Cooperation on civil nuclear projects, including a light water reactor for power, research
reactors, and nuclear fuel.

The JPOA was a major breakthrough in the Iranian nuclear saga, coming within President
Rouhani’s first 100 days in office. Reaction to the deal was mixed in Iran and pointed to the
gap between the people and the ruling elite. Supreme Leader Khamenei offered tepid support,
expressing both his skepticism that these latest nuclear negotiations would lead anywhere, as
well as his backing for the Rouhani negotiating team. IRGC Commander General
Mohammad Ali Jafari warned that continued vigilance was necessary both against potential
violation of the agreement by the United States and against Iran’s negotiators conceding too
much in a longer-term deal.25 In contrast, the news was greeted with elation by the Iranian
people and businesses that had been bearing the brunt of the sanctions; shortly after the JPOA
was announced, Iran’s stock market gained 14 percent, inflation decreased, and the national
currency stabilized.23

In the West, the JPOA had a similarly mixed reception. Most nonproliferation and Iran
experts found the deal to be surprisingly good, both for changing the trajectory of Iran’s
nuclear program and, potentially, Iran’s relations with the outside world.24 Hardliners, particu-
larly in the US Congress, threatened to upset the agreement by calling for new sanctions,
arguing that if economic sanctions had compelled Iran to negotiate, more were needed to
ensure Iran complied.25 Israeli Prime Minister Benjamin Netanyahu was categorically opposed
to the deal, insisting that Iran could not be trusted and should have no enrichment capability.
President Obama announced that he would veto such sanctions and, assisted by Senate
Majority Leader Harry Reid, fended off a sanctions push in the Congress in early 2014.

Under the terms of the JPOA, the IAEA was invested with monitoring Iranian compliance.
The Agency issued its first two such findings of compliance, in January and February 2014. The
P5+1 and Iran resumed high-level talks in February 2014 to begin the push for the longer-
term pact by the end of the year. Major divisive issues remained, including the future of the
IR-40 reactor, the scope and nature of constraints on the centrifuge program, and lingering
questions over the nuclear program’s possible military dimensions.

Iran’s challenge to the NPT

As the two sides drive towards a longer-term agreement, it is useful to reflect upon the nature
of Iran’s challenge to the NPT, to better understand potential tests of, and benchmarks for,
compliance with such an agreement, as well as to inform thinking about how to strengthen the
nuclear nonproliferation regime generally.

In retrospect, it seems doubtful that the Islamic Republic of Iran accepted its basic obliga-
tion under the NPT to not acquire nuclear weapons, at least prior to 2003. The entire thrust
of its activity was to secretly develop the nuclear technology and infrastructure that would
enable the regime to produce fissile material for nuclear weapons. Iran’s nuclear program simply
could not be justified on economic grounds,26 and the evidence of weaponization, which the
IAEA deems credible, is highly incriminating (see below). Indeed, a former Obama adminis-
tration official recently noted that despite their differences, the United States and Russia have
always agreed that the mullahs’ nuclear program was intended to produce weapons.27 The
operative language of the NPT for the purposes of inhibiting the secret development of nuclear weapons resides in Article II, the obligation not to manufacture nuclear weapons, and Article III, the obligation to accept and comply with IAEA safeguards to ensure nuclear activities and materials are strictly for peaceful purposes.

With respect to the latter, the investigation mounted by the IAEA in 2002 revealed that Iran had been systematically violating its safeguards obligations for over two decades, as it secretly built up its ability to produce enriched uranium and plutonium, the two essential ingredients for nuclear weapons. These failures can be summarized as follows:

(a) Failure to report:
   (ii) The import of natural uranium metal in 1994 and its subsequent transfer for use in laser enrichment experiments, including the production of enriched uranium, the loss of nuclear material during these operations, and the production and transfer of resulting waste.
   (iii) The production of UO₂, UO₃, UF₄, UF₆ and ammonium uranyl carbonite (AUC) from imported depleted UO₂, depleted U₃O₈ and natural U₃O₈, and the production and transfer of resulting wastes (these unreported uranium conversion activities date back to 1981, two decades before Natanz was uncovered).
   (iv) The production of UO₂ targets at the Esfahan Nuclear Technology Center (ENTC) and their irradiation in the Tehran Research Reactor (TRR), the subsequent processing of those targets, including the separation of plutonium, the production and transfer of resulting waste, and the storage of unprocessed irradiated targets at the Tehran Nuclear Research Center (TNRC).

(b) Failure to provide design information for:
   (i) The centrifuge testing facility at the Kalaye Electric Company.
   (ii) The laser laboratories at TNRC and Lashkar Ab’ad, and locations where resulting wastes were processed and stored, including the waste storage facility at Karaj.
   (iii) The facilities at ENTC and TNRC involved in the production of UO₂, UO₃, UF₄, UF₆ and AUC.
   (iv) TRR, with respect to the irradiation of uranium targets, and the hot cell facility where the plutonium separation took place, as well as the waste handling facility at TNRC.

(c) Failure on many occasions to cooperate to facilitate the implementation of safeguards, through concealment.38

It was this systematic breach of its safeguards obligations relevant to NPT Article III that led the IAEA Board of Governors to refer Iran to the UNSC in 2006.

With respect to issues impacting Article II, the IAEA released in November 2011 a highly-detailed twelve-page annex on the possible military dimensions (PMD) of Iran’s nuclear program. The report summarized material made available to the IAEA by its member states and developed by the IAEA itself pertaining to nuclear explosive development indicators in Iran, such as:

- A detailed program management structure for an undeclared nuclear program involving the PHRC and Iran’s Ministry of Defense and Armed Forces Logistics. Operating under the
so-called “AMAD Plan,” the apparent aim of this work was to provide a source of uranium for an undisclosed enrichment program, develop high-explosives for a nuclear implosion device, and adapt a ballistic missile to carry the device.

- Procurement activities under the AMAD Plan targeting equipment, materials, and services that would be useful in developing a nuclear explosive device, such as high-speed electronic switches and spark gaps, high speed cameras, neutron sources, and radiation detection and measuring equipment.
- Acquisition of nuclear materials by the AMAD Plan, including kilogram quantities of natural uranium metal, and experiments aimed at the recovery of uranium from fluoride compounds.
- Preparation of components for an explosive device. Under pressure, Iran acknowledged that it had received from the A.Q. Khan network a fifteen-page document on how to convert uranium compounds into metal and then shape the metal into hemispheres, the tell-tale signature of a nuclear weapon. The Agency further believed that Iran had acquired sophisticated nuclear-weapon designs from the Khan network and may have undertaken early work to prepare natural and highly-enriched uranium metal components for a nuclear weapon.
- Detonator development. Iran asserted that it had been developing fast-acting detonators, so-called exploding bridge wires (EBW), for civil and conventional military applications. Material in the IAEA’s possession indicated that the real purpose of this work was to develop a safer alternative to detonating a nuclear weapon.
- A 2003 experiment to initiate a high explosive charge in the shape of a hemispherical shell;
- Manufacture of simulated nuclear explosive components using high density materials like tungsten, and hydrodynamic high explosive testing possibly involving nuclear materials at the Parchin military complex—another site that Iran has extensively sanitized and kept off limits to IAEA inspectors. 39
- Modeling and calculations conducted in 2008–2009 involving spherical geometries, consisting of the core of a highly-enriched uranium (HEU) device, which could only be related to a nuclear weapon.
- Development of a neutron initiator to spark a fission chain reaction in an implosion device, including work to manufacture and possibly experiment with small capsules in this regard. Notably, technical work in this area may have continued after 2004.
- Preparations to conduct a test of a nuclear explosive, including tests to see whether Iran’s EBW equipment would function reliably over long distances between a firing point and a test device located down a deep shaft.
- Modification of Iran’s Shahab 3 ballistic missile to integrate a new spherical payload.
- Development of a fusing, arming, and firing system for the missile payload modification. In the IAEA’s assessment, the altitude of warhead burst for this system only made sense for a nuclear payload.

For all the documented safeguards violations and evidence of nuclear weapons intent, the Islamic Republic has been unapologetic and dismissive. Tehran maintains that it was only its inability to acquire peaceful nuclear technology on the open market, in violation of its “inalienable right” under NPT Article IV, that drove it to clandestine procurement. Iran even rejects the notion that it was constructing the Natanz enrichment facility in secret, claiming that the IAEA was well aware of the project. Behind the scenes, however, Hassan Rouhani lamented that the secrecy over Natanz had been breached. 40 Tehran maintains that it is prudently trying to develop nuclear energy to reduce its reliance on oil and natural gas, which it would prefer
to export and which will not last indefinitely. According to the regime, it is the constant threat of attack from Israel and the United States that compelled it to build its enrichment plant underground at Natanz; the Fordow enrichment site was later added merely as part of Iran’s overall strategy of passive defense, which calls for back-up facilities to be constructed to hedge against foreign attack.

Iran rejects out of hand the material in IAEA possession on PMD, calling it fraudulent, an argument that carries some sway with the international community following the Iraq WMD intelligence debacle. Iran also points out that it has been unable to review much of this material itself because the member states who contributed it have not authorized the IAEA to make it available to Tehran. Further, Iranian officials point to a religious decree, or fatwa, issued by Supreme Leader Khamenei which prohibits Iran’s production, possession, or use of nuclear weapons. Officials such as President Rouhani contend that this fatwa is a more important impediment to nuclear weapons in Iran than even the NPT:

My first negotiation with the European ministers [following the fatwa] was on December 13, 2004, a month after the fatwa ... I told the three European ministers that they should know about two explicit guarantees from our side, one of which is the fatwa of the [Supreme Leader]. He issued the fatwa and declared the production nuclear weapons haram [forbidden]. This fatwa is more important to us than the NPT and its Additional Protocol, more important than any other law.31

Yet, there is much ambiguity surrounding the fatwa, which appears to have been issued in response to international pressure. Skeptics, including a Shi’a scholar, point to the relative ease with which Khamenei’s fatwa could be revoked.32 Of course, the unintended implication of the regime’s assertion is that if the Supreme Leader determined that possession of nuclear weapons was imperative to the longevity of the Shi’a theocracy in Tehran, not even the NPT could impede it.

Worrying as this is, the Iranian challenge to the nuclear nonproliferation regime extends beyond first principles and treaty articles. Tehran also demonstrated that it was prepared to reject IAEA authorities at will. After agreeing in 2003 to adopt the Agency’s Modified Code 3.1 of the Safeguards Subsidiary Arrangement – which moved up the requirement to notify the IAEA of a new nuclear facility from 180 days before nuclear material was introduced at the site to as soon as the decision was made to construct it – Iran unilaterally abrogated this commitment in 2007, even though it arguably had no legal basis to do so, since mutual consent is required.33 Iran also demonstrated in 2005 that it was prepared to jeopardize the crucial five-yearly review of the NPT by blocking consensus in order to avert attention from its suspect nuclear behavior.34

Iran poses an ongoing test to the nuclear export control regime. It managed to acquire illicitly the technology, plans, and components that gave rise to its now formidable enrichment program. Tehran procured from Russian institutes technology and design assistance for the IR–40 reactor at Arak before the United States interceded in the late-1990s.35 It also succeeded on an individual basis, hosting from 1996–2002 a former-Soviet nuclear weapons expert, Vycheslav V. Danilenko, who appears to have provided critical information for Iran’s development of a nuclear implosion device.36 Indeed, the Islamic Republic has become quite skilled at evading nuclear export controls. As recently as mid-March 2014, a senior US official reported that Iran was still actively seeking to acquire illicitly components for its nuclear and missile programs, creating front companies and engaging in other activities to conceal its procurements.37
Meeting the Iranian Nuclear Challenge

Crafting an enduring arrangement to ensure the Islamic Republic honors its NPT obligations will thus be an arduous, if not heroic task. Success will hinge, in part, to the extent that:

- **The ruling regime, including the IRGC, believes its security needs can be satisfied with a latent form of nuclear deterrence, that is, a perceived ability to produce nuclear weapons in time to meet a dire threat.** There are indicators that President Rouhani subscribes to the notion of latent deterrence, but given his integral role in Iran’s nuclear development since the ’79 Revolution, he may be a fairly recent convert. At the same time, the P5+1 must have what it judges to be an adequate margin of security, that is, confidence that it could detect an Iranian move to manufacture nuclear weapons far enough in advance to thwart it, including by military means. The JPOA does not provide that margin, as it would only move Iran back a matter of weeks from being able to produce enough highly-enriched uranium for a weapon, from about one month to two. It will take a combination of restraints on the number and quality of centrifuges Tehran will be permitted to operate and the amount and purity of the enriched uranium it will be allowed to possess to achieve the West’s desired security objectives. For example, a benchmark of six months of warning translates into an Iranian enrichment program of 4,000 IR-1 centrifuges and possession of less than 100 kg of near-percent enriched uranium. To meet the West’s margin of security as it applies to the plutonium rout to the bomb, Iran will need to significantly alter is plans for the Arak research reactor.

- **Iran demonstrates in a consistent, sustained fashion that it accepts the authorities of the IAEA, ambiguous as they might sometimes be, in ensuring that nuclear activities are strictly for peaceful purposes.** This will be a real challenge for a generally recalcitrant, yet highly legalistic regime. This acceptance will be measurable against major benchmarks, such as the regime’s ratification and sustained implementation of the IAEA Additional Protocol, which it signed in 2003. For too long, Iran’s cooperation with the IAEA has been “temporary and voluntary,” a favor that could be withdrawn petulanty. Another measure of Iran’s change of heart will be when it plays a constructive role in the NPT Review Conference process. Indeed, the 2015 Review Conference will be President Rouhani’s first major test in this regard.

- **Iran shuts down its clandestine nuclear procurement network.** There can be no confidence in Iran’s disavowals of nuclear weaponry so long as its purchasing agents aggressively scour the globe looking for key nuclear materials, components, and technologies. Of course, Tehran would counter that if the West lives up to its end of the bargain, Iran would not have any need to shop the black market. Western concerns about Iranian cooperation with North Korea in sensitive technologies also will need to be addressed.

- **Lingering questions about weaponization are resolved.** For the credibility of the IAEA and Iranian assurances, the lingering questions over PMD must be resolved. Presumably, this would involve some “bargain,” whereby the Iranian regime makes restitution for nuclear-weapon-related research, development, and testing – e.g., in the form of confidential disclosures to the IAEA about the work and acceptance of highly intrusive monitoring to ensure it does not resume – while not being forced to publicly admit guilt or be further penalized. One can imagine a narrative wherein “unsanctioned activities” were discovered by Iranian authorities and then reined in under the Supreme Leader’s fatwa. Granting IAEA access to the suspected nuclear-explosive-related test facility at Parchin will need to be part of such a bargain.
• **The P5+1 and Iran develop habits of cooperation to resolve disputes under the agreement.** Because of the deep and mutual deficit of trust, and historic patterns of mega-phone diplomacy, Iran and the West will need to develop new approaches to resolving disputes, particularly in an agreement as complex as the long-term resolution is expected to be. The JPOA recognized this need by creating a Joint Commission of the EU3/EU+3 and Iran to monitor implementation measures and “address issues that may arise.” The Joint Commission assigns responsibility for verification of nuclear-related measures to the IAEA and effectively links the P5+1 process to the IAEA’s separate investigation of Iran’s nuclear program. Presumably, the longer-term agreement will carry forward this mechanism and enable the parties to address their concerns with less risk of politicization.

• **More broadly, new efforts are needed to clarify and uphold the NPT Article II obligation by Nonnuclear-Weapon State parties not to manufacture nuclear weapons.** The framers of the NPT grappled with where to draw the line between permissible nuclear activity and prohibited nuclear weapons development. An early draft of the Treaty actually extended the Article II prohibition to “prepare for the manufacture of nuclear weapons.” In the end, “prepare for” was dropped from Article II but the United States clarified in 1968 that, “facts indicating that the purpose of a particular activity was the acquisition of a nuclear explosive device would tend to show non-compliance [with Article III].”41 Often overlooked is that this US interpretation was accepted by the Soviet Union and our European allies at the time.42 In order to discourage Iran and those that would follow its proliferation pathway, it is necessary to reinforce Article II and uphold it. This could be done through retrospective analysis of NPT negotiating history, assessing the lessons learned from Iran, and fresh thinking about scientific, institutional, and normative approaches to build a higher barrier between nuclear energy and nuclear weapons.

The prospects for a successful and lasting diplomatic resolution of the Iranian nuclear challenge are uncertain. As of March 2014, the Rouhani Administration has indicated its willingness to be more forthcoming on issues like modification of the Arak research reactor and PMD, while at the same time drawing a firm red line around dismantling nuclear facilities, such as Fordow. The economic benefits of Iran’s new-found spirit of cooperation are starting to flow into the regime’s depleted coffers, enabling Rouhani to hold his nuclear critics at bay. Time will tell if the two sides’ diplomats are able to produce a longer-term arrangement that brings Iran back into the NPT fold. What is clear is that Iran’s nuclear activities will bear close watching for some time to come.

### Notes

1. Shortly after India tested its nuclear device in 1974, the Shah was asked whether Iran would also possess nuclear weapons. He replied, “Without any doubt, and sooner than one would think.” Quoted in Leonard S. Spector, *Going Nuclear* (Cambridge, MA: Ballinger, 1987), p. 259, n. 87. See also pp. 45–57.
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22. See, for example, Annie Tracy Samuel, “Revolutionary Guard is Cautiously Open to Nuclear Deal,” *Iran Matters*, Belfer Center for Science and International Affairs, Harvard University, December 20, 2013, http://belfercenter.ksg.harvard.edu/publication/23779/revol utionary_guard_is_cautiously_open_to_nuclear_deal.html.


29. David Albright and Serena Kellerhe-Vergantini, “Changes Visible at Parchin Nuclear Site: Why Parchin Matters to a Final Deal,” ISIS Report, February 25, 2014, http://isis-online.org/isis-reports/detail/changes-visible-at-parchin-nuclear-site/8. Iran maintains that no nuclear-related activity was conducted at the site and therefore the IAEA has no right of access. While Iran and the IAEA recently concluded a seven-point plan on inspections of nuclear facilities in February 2014, access to Parchin was not on the list.

30. Rouhani noted in a speech to Iran’s Supreme Cultural Revolution Council that, “One of the [Council] members indicated here that all this [nuclear development] should have been done in secret. This was the intention; this never was supposed to be in the open. But in any case, the spies exposed it. We did not want to declare all this.” Text of speech by Supreme National Security Council Secretary Hassan Rohani to the Supreme Cultural Revolution Council; place and date not given: “Beyond the Challenges Facing Iran and the IAEA Concerning the Nuclear Dossier,” *Rahbord* (in Persian), September 30, 2005. Translation available at, http://lewis.armscontrolwonk.com/files/2012/08/Rahbord.pdf.


38. “…during a dinner in Tehran with visiting American [nonproliferation] experts in 2005, Iranian leaders Hashemi Rafsanjani and Hassan Rowhani flatly declared that the country’s nuclear-weapon research had been halted because Iran felt it did not need the actual bombs, only the ability to show the world it could. ‘Look, as long as we can enrich uranium and master the [nuclear] fuel cycle, we don’t need anything else,’ Rafsanjani said at the dinner, according to George Perkovich of the Carnegie Endowment for International Peace. ‘Our neighbors will be able to draw the proper conclusions.’” Peter Baker and Dafna Linzer, “Diving Deep, Unearthing a Surprise,” The Washington Post, December 8, 2007, www.washingtonpost.com/wp-dyn/content/article/2007/12/07/ AR2007120702418.html.


