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Iran's Nuclear Deception Strategy: Tactics, International Response, and Outlook



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Introduction

Throughout the last decade, Iran has successfully used negotiations as a stalling tactic as it expands the program under a variety of dubious pretexts. Despite the “breakthrough” diplomatic negotiations with the world powers that resulted in a temporary suspension of high-level uranium enrichment, Iran has no intention of dismantling or scaling back a project that has become central to the regime’s legitimacy and survival. From its inception, Iran’s nuclear program has served as a dual-use prestige project that furthers its long term of strategic policy and military objectives. The nuclear program has proved to be an invaluable lifeline for the Iranian government, allowing it to create a wedge issue to divide domestic opposition and foreign diplomats, increase nationalist feelings of military prowess, create a threshold deterrence capacity, strengthen hardline elements by fostering a siege mentality, and maintain a valuable bargaining chip for multilateral negotiations. This paper will review the Iranian nuclear project and erase any reasonable doubt that it is a peaceful civilian program.

Evidence Strongly Supports A Nuclear Weapons Program

In 2002, the National Council of Resistance of Iran, a dissident group opposed to the clerical regime, revealed to the Western media that Iran had a secret nuclear enrichment program in Natanz. The information revealed that the Natanz nuclear site consisted of an underground bunker for uranium enrichment connected to a series of tunnels, located under decoy buildings that were designed to camouflage the nuclear facility from Western spy satellites. After the publication of this disclosure, Iran admitted that it had a secret nuclear enrichment program that it did not declare to the IAEA. Iran asserted that it did not violate any of its obligations under the Non-Proliferation Treaty, which generally requires the disclosure of nuclear facilities after they have been completed and are operational, not while they are under construction. Iranian diplomats argued that exploiting this loophole did not violate any treaty obligation, and that its activities were purely peaceful in nature. At this early stage, it did not offer any explanation for the secrecy of its allegedly civilian activities, which were met with widespread skepticism since Iran has been under international sanctions since the 1990s for attempting to develop nuclear weapons.

In the intense scrutiny that followed the 2002 Natanz disclosures, it was revealed that Iran also had illicitly obtained nuclear centrifuges, enrichment equipment, and technical designs from A.Q. Khan, the director of the Pakistani nuclear weapons program. Khan, one of the world’s foremost authorities in nuclear physics, had stolen designs for uranium enrichment equipment from a Dutch company, which could be used for the production of fuel for a nuclear power plant or a nuclear weapon. Although the exact date is unclear, Pakistan constructed a nuclear weapon at some point in the 1970s or 1980s, and began to stockpile a secret arsenal, which led to sanctions

and pariah status. It was not until 1998 that Pakistan conducted its first known nuclear detonation in a remote tribal region, despite denying military nuclear research for years. After this success, Khan began a second career by developing a black market nuclear proliferation network that sold technology to Iran, Libya, and North Korea for hundreds of millions of dollars, almost certainly with the knowledge of other members of the intelligence services in Pakistan, who also were responsible for his personal security. Subsequent investigations showed that Iran secretly received enrichment information from the Khan proliferation network. Besides patronizing the Khan network, Iran had engaged in a covert procurement program using a variety of front companies and smuggling techniques to acquire American, French, German, and Dutch technology.

No civilian nuclear program has required an enormous black market procurement network, located facilities inside mountains on military bases, and spent billions of dollars circumventing sanctions to procure sophisticated Western technology. The idea that Iran would wreck its economy and subject itself to crippling sanctions, sabotage, assassinations, and cyber-attacks as part of a multi-decade electricity diversification project is simply not plausible. Similarly, the notion that Iran's nuclear posturing and activities are part of disinformation campaign to trick the world into believing it is trying to produce nuclear weapons to create an imaginary deterrence capacity through nuclear energy is also extremely unlikely.

There exists a large amount of evidence that Iran has conducted nuclear research that is only of a military nature and is intended for weapons research. Iran has performed expensive computer modeling for nuclear missiles, nuclear warhead designs, and on neutron initiators as part of its supposed electricity program. Neutron initiators are detonators almost exclusively used to trigger a nuclear explosion and have no known civilian purpose for Iran. Iran also explained that a document in its possession from A.Q. that details how to make the fissile core of a nuclear weapon was delivered against its wishes, but does not explain how it would have received it. The government has also openly admitted to buying nuclear weapons production equipment from A.Q. Khan's organization in the 1990s after it became undeniable, but euphemistically describes sourcing it "from an international network." It claims that it purchased the equipment on the black market and in total secrecy in part to create the special mirrors used in hospital operating theaters. This innocuous explanation is easily discredited by the fact that mirrors for such a niche application could simply be bought on the open market, instead of secretly purchasing nuclear equipment on the black market for millions of dollars and creating a huge nuclear infrastructure.

Iran has also demolished facilities, banned inspectors from visiting Fordo, and conducted sophisticated sanitization and cover-up operations. In Parchin, a closed military facility where nuclear weapons design work is believed to have taken place, Iran appears to have conducted advanced computer modeling on nuclear physics and blasts, including using a special chamber to mimic the effects of a warhead exploding. When inspectors requested permission to visit Parchin, Iran stalled, claiming that inspectors needed to disclose what they believed was there before they were allowed to visit. During this time, satellite images showed Iran sanitizing the site, spraying large quantities of water, demolishing structures, and conducting a variety of suspicious concealment activities. Ultimately, Iran banned inspectors from entering on the basis that no such activities ever took place there, and that it was not a nuclear facility subject to inspection.

On the official website of Iran's nuclear program, the government claims that the nuclear program is intended to provide limitless electricity for a nation that dependent on fossil fuels which are rapidly being depleted and needs emergency energy diversification. Although it is true that Iran suffers from notoriously frequent power shortages, this is a flimsy and easily discredited cover story. Iran suffers from chronic blackouts not because it lacks sources of fossil fuels, but because of substandard infrastructure that cannot handle increasing delivery demands to consumers, price controls, obsolete equipment, and bureaucratic dysfunction. For electricity generation, the nuclear program is wholly unnecessary since Iran has some of the world's largest proven reserves of oil and natural gas, which are far cheaper and technologically less complex to use as a source of electricity. Iran's proven reserves could easily last until the next century for low cost electricity generation, and the nation is widely believed to have other enormous deposits of untapped natural gas ready for drilling.

When Iran was enriching uranium to the 3% level, instead of the 90% level needed for a nuclear weapon, it claimed that the low-enriched uranium was fuel for a nuclear power plant. Despite having several nuclear power plants, none are connected to the power grid in a substantial way to deliver electricity, casting doubt on their purpose. When Iran started to stockpile a quantity of low enriched uranium in excess of any projected civilian use, it claimed that the stockpile was for ten planned power plants, which were in still on the drawing boards and have no known funds or construction assets allocated to them. Since Iran does not have the capability or resources to construct a single power plant without foreign assistance, this claim is simply a pretext to stockpile large amounts of nuclear materials, which could be later enriched to weapons grade level. Iran currently has thousands of centrifuges that allow it to enrich huge quantities of nuclear material, in excess of any credible requirement for nuclear power plant fuel production. Iran declined a public offer from Russia to defuse the crisis during Six Party Talks to store spent nuclear fuel in Russia, or allow its fresh nuclear fuel to be enriched ins Russia under international supervision only to a level necessary for peaceful purposes. This material is presumably being stockpiled by Iran preparation for an order to be enriched to a level needed for nuclear weapons production.

When Iran was caught enriching isotopes to 20%, a technologically daunting challenge, it claimed that its activities were nuclear medicine and cancer research. Offers from France, Russia, and the United States to provide nuclear medicines, eliminating the need for the higher levels of enrichment, were denied. While 20% enriched isotopes are genuinely used for nuclear medicine, they can be bought on the heavily regulated, but open market by hospitals without spending billions of dollars on nuclear infrastructure. The enrichment of radioactive material to 20% was a learning experience, and demonstration that Iran had obtained the technical sophistication and capacity to enrich at higher levels at will. Iran claims that it may start enriching material to 60% to provide nuclear fuel for submarines, even though Iran does not possess any nuclear submarines or the capacity to build them. Coincidentally, nuclear powered submarines are used almost exclusively as a launch platform for nuclear weapons. Given that Iran is decades away from being able to construct miniature nuclear reactors able to be used underwater, the assertion that Iran is going to enrich nuclear materials for military submarines seems intended as a threat to scuttle any agreement.

A Civilian Nuclear Program Does Not Make Economic Sense

Besides obtaining nuclear weapons technology, Iran's nuclear program has since become central to the regime's legitimacy and supports its adversarial posturing towards the world. The Iranian government has blamed many of the nation's economic problems on Western sanctions, and it portrays itself as victimized for seeking electricity and infrastructure modernization, instead of being penalized for violating its international agreements. Iran preposterously claims it is about to be rapidly running out of oil, which is not credible given the size of its astounding proven reserves and a steep decline in production and exports, which has extended the years of supply further. Iran's assertion that it is imminently running about to run out of fossil fuels is a complete lie, as it has over a hundred years worth of hydrocarbon production remaining at current levels and huge fields that remain untouched.

While Iran has never revealed how much money it has spent on its nuclear program over the years, it is believed to be at least \$200 billion dollars when black market procurement, sabotage, the construction of underground sites and tunnels, enrichment, nuclear power plant construction, and sanctions are taken into account, an amount equal to nearly 39% of 2013 GDP. If Iran had spent this amount of money increasing its production of oil and natural gas, constructing natural gas power plants, modernizing refineries, pumps, and the power grid, it would have made a huge return on its infrastructure investment and allowed for rapid economic development. It would also have genuinely allowed for economic diversification, which would dramatically lower unemployment and increase government revenue. Ironically, it would also have enriched the ruling elite further, since the Revolutionary Guards and many clerics own and operate import-export monopolies, construction companies, energy firms, and state-owned enterprises.

Subsequent Nuclear Revelations and Iran's Posturing

Since 2002, Iran has installed thousands of uranium centrifuges, opened multiple nuclear reactors, and has massively expanded its nuclear project. Patterning its concealment techniques after those successfully used by North Korea, Iran constructed underground facilities and an expansive tunnel network, which was facilitated by President Ahmadinejad, a former mayor of Tehran and prominent tunnel engineer. Taking advantage of the distraction caused by the Iraq and Afghan War, Iran was able to stall negotiations for over half a decade. The Bush Administration considered Iran part of an "Axis of Evil", and its refusal to engage in direct negotiations and Presidential level talks was a welcome relief. Many of Ahmadinejad's inflammatory statements about the "Zionist Regime" were not only for domestic consumption, but seemed intended to preclude negotiations due to the offensiveness of his comments. Congressional Republicans and John McCain's campaign in 2008 particularly vilified Ahmadinejad, and explicitly ruled out any negotiations with him, playing into the hands of Iran's diplomats. The Bush Administration's no-negotiation policy was also applied to Kim Jong Il, which was able to successfully develop and detonate nuclear weapons under the cover of a civilian nuclear program.

In 2009, it was jointly revealed by American, British, and French intelligence that Iran had constructed a secret nuclear enrichment facility in Fordo, near the holy city of Qom. The Fordo site, located under a mountain, seemed to have been chosen because the site has unique geological characteristics that made it virtually impervious to conventional attack. Iranian officials said that it had to keep the site secret and conceal it under a mountain to protect its civilian infrastructure from Israeli and Western warplanes. In reality, Fordo symbolized a new stage of construction for

Iran's hardened, dispersed, and redundant nuclear infrastructure. The Fordo site allowed for new negotiating leverage that would allow it to extract concessions, and became a symbol of defiance not subject to easy destruction. As it was located in a restricted military zone, Fordo was exempt from IAEA inspections. While it is unknown exactly how or when Western governments discovered Fordo, Iran's ability to keep it secret for a long period of time confirmed suspicions that it may hide even more undeclared sites that are already completed or under various stages of construction.

In 2010, as foreign powers became increasingly concerned by the disguised nature of an ostensibly civilian nuclear program, Iran began to negotiate a nuclear fuel swap deal with the West. After months of protracted negotiations and diplomatic concessions, Iran canceled their own agreement, which they had painstakingly negotiated. Instead of negotiating with the Security Council members, Iran claimed to have reached a breakthrough deal with Turkey and Brazil, two nations that have sought to build their global diplomatic clout. Iran led both countries into believing that they had achieved a diplomatic triumph as emerging powers, and had broken the diplomatic stalemate with new ideas. The agreement with Turkey and Brazil was then presented by Iran in altered form to the Security Council members. Iran then rejected the deal it had made with Turkey and Brazil, froze negotiations with the original major powers, and then canceled the major power talks. This behavior was part of a pattern of diversionary and dilatory negotiating tactics intended to divide major powers and waste their diplomatic resources, while it expanded nuclear activities not covered by any agreement under negotiation.

Khamenei's Thinking and Nuclear Development Strategy

Khamenei has denied that Iran is developing nuclear weapons, but at the very least is clearly acquiring the capability to construct them, having perfected the enrichment process over the last ten years. Khamenei has reportedly issued a religious fatwa declaring nuclear weapons to be contrary to the Islam, which has been cited many times by the Iranian government as proof of its supposedly peaceful intentions. Curiously, its text has never been released, unlike hundreds of previous fatwas, which are duly posted on official government websites. The government has sometimes indicated that it was an oral fatwa, but no transcript has been released.

In Iran's governing structure, Khamenei's oral religious rulings literally become law, even if they have not been written down, but they can be orally amended, repealed, or ignored at any time. Although Khamenei has strongly implied his fatwa would somehow prove that Iran could not develop nuclear weapons, he has variously indicated that it would be against Islamic law to use a nuclear weapon, versus constructing one. Additionally, Khamenei has said that he does not *want* nuclear weapons, he strongly implied Iran could be forced to construct or need one. Iran also previously denied having chemical weapons, but later admitted to developing them after signing the Chemical Weapons Convention. This behavior suggests that Khamenei is simply seeking to trick Western diplomats into thinking that he is theologically constrained by his supposed fatwa. The government's position is that any violation of the mysterious edict would cause a religious credibility crisis and be against Islamic law, which was developed centuries before modern atomic theory and does not cover nuclear weapons. Neither Khamenei nor any of his senior clerics has published a religious ruling or detailed jurisprudence that supposedly proves that Iran cannot construct and will not construct a nuclear weapon, let alone develop a production capacity.

Khamenei has skillfully exploited America's war fatigue, reluctance to be involved another Middle East, fears of oil price spikes, and electoral cycles to divide major powers. Iran is aware of and exploits the strong parallels between a prospective war on Iran the 2003 War in Iraq, where dissident groups provided disinformation to the American government to serve their own political objectives. All prior nuclear agreements were abrogated before they were implemented, as Iran has pursued a deliberate strategy of dilatory negotiating tactics. Every failed deal requires a recalibrated new offer and counteroffer, followed by months of high-level diplomacy between the five Security Council members and Germany. When Western powers offered to provide Iran medical isotopes so that Iranian production would be unnecessary, this was rejected on the basis that Iran's cancer patients would suffer in the interim, despite nuclear cancer medicines being widely available for the few Iranian hospitals able to use them prior to the new nuclear enrichment. The rejection of the offer and failure of talks was presented to the Iranian public as a victory for public health and a humanitarian necessity, with the nation's nuclear negotiator arguing that a million Iranian cancer patients could not wait, falsely implying that all of them needed rapidly decaying medical isotopes and could not afford to be victimized by cruel Western powers. During the 2012 American presidential elections, Iran suspended negotiations on the basis that any agreement would have to wait until the next president was known, even though prior diplomatic agreements aren't automatically voided due to the results of an election cycle in a mature democracy.

Iran's Military Goals and Strategic Nuclear Objectives

If the program were truly civilian in nature, it would not be run by the Iranian military, and the Iranian government would feel that a self-inflicted economic crisis outweighs the benefits of its nuclear activities. The Iranian government believes that its nuclear program is so essential that it is apparently worth any amount of sanctions, sabotage, international isolation, and trade embargos. Iran may be following the Pakistani example, whereby it denies the development of nuclear weapons and endures sanctions only to successfully test one later. As in Pakistan, Iran hopes that nations will accept or be resigned to it having possession of nuclear weapons, after which sanctions will be moot and lifted. By possessing a nuclear weapon, Iran believes that it will make the regime immune to foreign invasion and retaliation for its support for foreign proxy forces it supports. Finally, the development of nuclear weapons would make any opponents of the government averse to regime change, as the consequences of a government in chaos that possesses nuclear weapons would be considered too dire. This approach has already been taken by Pakistan, which does not feel constrained when it funds Taliban militants and religious extremists, since it is essentially immune to a massive Indian counter-attack.

Technologically speaking, Iran clearly has sought to gain the scientific knowledge, industrial capacity, supply chains, logistics networks, and manufacturing skills necessary to create the capacity to build a nuclear weapon once the order is given. Even though Western intelligence agencies believe that Iran has periodically suspended nuclear weapons research, it has been caught numerous times experimenting with military nuclear activities. Iran has experimented with devices needed to detonate a nuclear weapon, conducted advanced computer modeling to determine the effects of a nuclear blast and the optimal attitude to detonate a nuclear weapon, and has researched special underground shafts used conduct underground nuclear tests.

Iran is militarily inferior to many of its neighbors, and believes that if it has nuclear deterrence capabilities the regime will be insulated from outside pressure. After witnessing the fall of Saddam Hussein and the invasion of Iraq, the Iranian government has decided that a nuclear weapon is the ultimate guarantor of security, correctly noting that America has never invaded or attacked a nuclear weapons state. Ahmadinejad has done very little to dispel the impression that he seeks at least the capability to construct a nuclear weapon, and refers to Iran as a “nuclear power.” After two terms in office and handing power to Rouhani, the former engineer was appointed political director of its nuclear activities. Since Rouhani is a former nuclear negotiator, and both Presidents have a scientific background and were chosen directly by Khamenei, it is clear that the Khamenei has consciously made a choice to fill the executive branch with technocrats deeply involved in the nuclear program, and made it his government's top priority. While Rouhani markets himself as a candidate for change and an independent political figure, he has previously bragged to Iranian audiences that he stalled for years in past negotiations to expand the nuclear program. Rouhani admitted in an interview with Russia Today that Iran previously had a nuclear weapons program, but stopped it because it was “sinful.” He now categorically denies any nuclear weapons research, activities, or proliferation ever took place.

Iran's Nuclear Negotiation Strategies and Domestic Policy Constraints

During fuel swap negotiations with Western powers, Iran was offered low enriched uranium in exchange for unrefined fuel. Iran rejected the offer, instead insisting that it needed the amount of nuclear fuel coincidentally needed to construct at least one nuclear weapon. For several years, Iran also set preconditions to wrest concessions from Western powers, including lifting all sanctions first before any negotiations would even begin or examining Israel's nuclear program, which is not subject to NPT restrictions as Israel is not a signatory. Talks were delayed as well when Iran successfully forced major powers to hold diplomatic talks in Baghdad, knowing that it would require a hugely expensive logistical effort and pose major security concerns that would shorten the length of negotiations and scope of any agreement. Similarly, Iran demanded that talks be held in Kazakhstan, a nation that closely cooperates with Russia. This seemed intended to make Russia feel that it would have a leading role in dividing allied powers, as the talks were held in a nation under its sphere of influence.

The demand that the Security Council would lift all sanctions implemented over ten years upfront in exchange for meaningless talks was clearly not a serious offer, as Iran would have required the Security Council to remove all of their negotiating leverage and coercive penalties simply for the promise to engage in bad-faith diplomacy. Khamenei almost certainly authorized and tailored these negotiating tactics to for domestic consumption, as it divided Iranian opposition lawmakers and sought to confuse and frustrate foreign diplomats of its intentions. The Iranian government has used the talks to reframe responsibility for economic conditions on Western sanctions and foreign meddling rather than political isolation and violation of Security Council resolutions. Talks in 2014 and 2015 have also broken down due to Iran's fallback position that all international sanctions imposed by the Security Council, European Union, Japan, and the United States must be immediately lifted before it will even consider further negotiations, once again setting a ludicrous precondition for negotiations that have already been underway for years.

These nuclear negotiation stalling tactics were also used by North Korea, which signed several nuclear deals, but later violated them after it received aid and concessions first, citing the “hostile policies” of foreign powers. In a previous instance, North Korea agreed to disable its uranium enrichment program but was accelerating a secret, parallel plutonium enrichment program not subject to the agreement under negotiation. It later turned off its nuclear power plant, only to periodically reactivate it when it needed to ramp up pressure or produce more nuclear weapons. Similarly, Iran has not declared all of its nuclear sites, and banned inspectors from visiting many of the known ones. These may be revealed at a time convenient for Iran’s negotiators, if ever.

Unlike Ahmadinejad, who did not personally engage in nuclear negotiations in previous talks with major powers, Rouhani has publicly indicated his desire to take credit for a successful nuclear deal. Rouhani derives all of his power and authority from Khamenei, who privately seems to want at least an interim deal to resolve certain political issues resulting in succession. Khamenei is elderly, regularly misses important religious events, is widely rumored to be critically ill, no longer travels or meets with foreign diplomats, and has no known successor. If the Iranian public is led to believe that Rouhani cannot accomplish any of his stated foreign policy objectives, it will only increase the public’s feeling of isolation and disillusionment.

While the newly elected President Rouhani is often described as a moderate, he holds very little power in the Iranian political system. Like Ahmadinejad, he was ideologically vetted, and his nomination and ascent to office occurred with Khamenei’s authorization. While Khamenei has not personally engaged in negotiations over Iran’s nuclear program, it is clear that he has authorized limited concessions in exchange for economic relief, and ultimately must give his blessing to any diplomatic agreement. Unusually, Rouhani tried to give himself diplomatic credibility by stating on the record that he has full powers for negotiating, which under the Vienna Convention heads of state and Presidents are not required to produce, as they automatically have authority to represent and negotiate on behalf of their government during negotiations under international law.

Rouhani may be trying to convince angered foreign diplomats that he is not simply a puppet of Khamenei who cannot negotiate in good faith, seeking to ink an interim agreement or making very limited, temporary concessions to establish some international credibility. During negotiations, senior Iranian military officials and parliamentarians publicly criticized Rouhani and the status of negotiations, with Khamenei also expressing doubt an agreement could take place, reflecting the dysfunction of a semi-competitive authoritarian system and difficulty in reaching elite policy consensus. If Rouhani cannot convince major diplomatic powers that he can implement a negotiated solution and the ruling elite is unable to consent to the framework, the Iranian economic crisis will continue to require subsidy cuts and unpopular austerity budgets that could threaten the current governing structure with a larger power struggle.

Iran’s economy is heavily distorted by price controls, subsidies, state-owned enterprises, and government monopolies, which are harmful to the nation’s overall wellbeing but have widespread populist appeal during a time of economic decline and policy stagnation. The public perceives that the subsidies help the poor, offset low wages, and lower the cost of living in a nation wracked by inflation and import bottlenecks, despite the funding being derived from the declining general government budget and oil revenue. Almost certainly with Khamenei’s

approval, Ahmadinejad cut subsidies near the end of his final term in office, which politically protected Rouhani and insulated him from public anger created before the transition period. While independent economists agreed the subsidy cuts were necessary, it infuriated many Iranians already suffering from salaries shrinking from inflation and chronic economic problems.

It is possible that the ailing Khamenei is seeking a deal that will lessen widespread public frustration with economic hardship and international isolation to increase regime legitimacy. At the same time, Iran has domestically used sanctions to excuse far deeper economic dysfunction caused by wasteful subsidies, inefficient state-owned enterprises, dependence on declining oil exports, commodity prices, military owned monopolies, and a poor regulatory environment. In addition to the problems caused by sanctions, Iran's economy needs major structural reform that would require economic diversification, as the oil industry is declining and creates very few jobs in a nation with one of the world's highest levels on unemployment.

Any serious structural reform would require reigning in on corruption and businesses owned by the Revolutionary Guards and clerics, many of whom own or control large conglomerates and have acquired billion dollar fortunes, without paying any tax. It is extremely unlikely that such radical economic or political reforms will be possible under the current regime, as the Revolutionary Guards, clerics, and their families are the most powerful groups in Iran, and anchor the regime's legitimacy. Similarly, these interest groups will never allow Iran's nuclear program to be dismantled, and clearly will seek to preserve the status quo, using declining energy revenues as the nation's lifeline. This will become even more precarious in the coming decade as more nations increase shale production and energy dependence on the Middle East lessens.

Assassinations, Industrial Sabotage, and Mysterious Explosions

In addition to sanctions, foreign powers have responded in others ways to curb Iran's nuclear ambitions, and have undertaken a variety of covert actions to sabotage, destroy, and delay Iran's nuclear program. Several nuclear labs have mysteriously burst into flames, two Iranian airplanes carrying cargo for the nuclear program crashed, and a number of scientists have been kidnapped or disappeared due to foul play. In recent years, numerous scientists were killed or wounded by magnetic bombs attached to their vehicles and booby-traps. Ardeshir Hosseinpour, a world authority on electromagnetism involved in Iran's nuclear program, mysteriously died due to "gas poisoning" which was deemed an accident, but his death once initially kept secret. Masoud Alimohammadi, an expert in quantum field theory, was killed by a remotely detonated bomb that exploded near his motorcycle. Another leading scientist severely wounded by a magnetic bomb attached to his car, apparently by trained assassins from an Iranian dissident group. As a result of these threats, the elusive Mohsen Fakrizadeh, a nuclear scientist and Revolutionary Guards General who leads Iran's nuclear weapons program, has disappeared. Often described as Iran's Oppenheimer, Fakrizadeh has never been allowed to meet with foreign diplomats or inspectors, and it is believed that he is being heavily protected by Iranian intelligence due to widespread rumors he is literally on top of Israel's high value target list. While it is unknown exactly who is attacking Iran's scientists, the assassinations are widely blamed on Israel's Mossad, which has publicly made the delay of Iran's nuclear program its top priority.

Israel and the United States have conducted a variety of cyber-attacks on Iranian infrastructure to delay and sabotage the Iranian nuclear program's computer system and even destroy mechanical

systems. The Stuxnet computer virus became the first known malicious computer program intended to cause physical destruction in real life. Stuxnet attacked several pieces of industrial control equipment, only if it was using a very specific configuration and equipment exclusively used in Iran. The virus manipulated the equipment into spinning too fast and exploding, while the safety systems falsely reported that all functioning was normal. At least 1,000 centrifuges were destroyed by Stuxnet, which delayed the program by months and disrupted enrichment. The sabotage also caused widespread damage to equipment, which spun out of control or wore down much faster than expected due to malicious code. Several other advanced viruses, known as Flame, Duqu, and Wiper, have targeted Iran's ministries, nuclear infrastructure, computer control systems, and government offices. The sophistication of the code, use of undiscovered exploits, reprogramming capabilities, and precise targeting strongly suggests that they are part of a multi-year, continuous effort by a nation state.

Industrial sabotage by Western powers is believed to have greatly slowed Iran's nuclear program, increased material costs, and forced Iran to negotiate. Equipment obtained by Iran through intermediaries has been intercepted by Western intelligence agencies and has been covertly modified. Microscopic but dangerous flaws in sensitive equipment, tampered parts, defective microchips, remote reprogramming capabilities, rigged wiring, and even tiny explosives that are remotely detonated have been introduced into Iran's nuclear supply chains. Iran has acknowledged the severity and effectiveness of the industrial sabotage operations, even arranging a televised event displaying the tampered equipment, some of which it claims is modified by a special factory in the United States before being exported and introduced into Iran's supply chain.

The introduction of sabotaged British, French, American, Ukrainian, and German equipment to Iran's covert supply chains is believed to have delayed progress by years, inflicted large financial losses, and made Iranian nuclear workers suspicious and paranoid. The machinery may initially work before exploding or malfunctioning, requiring exhaustive supply chain security procedures and investigations. While it is not believed to be colluding with Western saboteurs, Russia has repeatedly delayed its prior nuclear power construction projects in Iran for nearly twenty years, using it as a diplomatic lever that conveniently has generated billions of dollars in addition fees from preexisting contracts not subject to sanctions. Even though Russia has successfully constructed and deployed dozens of nuclear power plants in a timely fashion, its Iranian operations have been plagued by huge cost overruns, delays, technical problems, shoddy construction, and serious accidents.

An unexplained aspect of Iranian nuclear sabotage is the amount of mysterious explosions that have been plaguing the country, which are believed to be part of a covert war. An Iranian factory producing the special steel needed for nuclear enrichment equipment was seriously damaged by an explosion that killed several workers, allegedly including unspecified foreign helpers said to be North Korean. Several Revolutionary Guards were killed in an unexplained explosion at a munitions depot. Natanz and several other nuclear facilities were also affected by blasts, which have also occurred at military bases, tunnel entrances, power facilities, munitions depots, and launch pads, which have destroyed electrical infrastructure, leveled buildings, ruptured oil pipelines, collapsed tunnel entrances, and caused many casualties. Power lines to underground facilities were destroyed by explosions that sent huge plumes of smoke to the sky, causing sensitive equipment in bunkers to be damaged from the sudden loss of electricity. In several

instances, Iran denied reports of blasts while residents of surrounding areas produced videos and audio recordings to the Western media corroborating claims of huge explosions strong enough to shake buildings miles away.

Ironically, the saboteurs' work is aided by the reality that Iran seeks to deny and cover up disastrous sabotage or explosions when possible, in order to prevent domestic pressure that would undermine domestic support of its nuclear ambitions. Similarly, Iran wants scientists who are not accustomed to occupational death threats to feel safe. When sabotaged equipment is successfully intercepted and foreign spies are executed, Iran tries to maximize publicity to demonstrate a propaganda victory but remains silent much of the time when foreign media report sabotage. While the sabotage from Western powers is clearly pervasive, its efficacy is not publicly known because Iran has an interest in not disclosing disastrous security breaches or failures. Given that Iran regularly announces that it has caught sabotage teams, executed spies, intercepted sabotaged equipment, and repaired damage done by electronic attacks, it leaves the impression that foreign intelligence services have had temporary gains and at least some devastating successes. Overall, it appears that foreign sabotage and covert action have succeeded in dramatically slowing the program creating technical problems and frustration which has pressured the Iranian government and forced it reconsider its activities.

The largest known blast took place east of Tehran in 2011, which killed General Hassan Moqaddam, director of the range missile program, and destroyed the entire military base. During a test of an advanced long-range missile presumed to be a delivery vehicle for future nuclear weapons, a Moqaddam and several Revolutionary Guard soldiers were killed in an alleged catastrophic accident. Satellite imagery showed that the entire base, several kilometers in size, was destroyed in a series of powerful blasts that even tore up paved roads hundreds of meters away. Iran immediately ruled out foreign sabotage to the foreign media in a matter of hours, before any credible investigation or forensic conclusions could have been conducted. It did not explain how a failed engine test conducted outdoors on a concrete launch pad destroyed an entire military base several kilometers in size, severely damaged or destroyed almost every structure, killed a Revolutionary Guards general, and supposedly caused a chain reaction that leaped from various unconnected buildings hundreds of meters apart. If the explosions were the result of sabotage or an attack, Iran did not want to acknowledge an astounding security breach. While the exact cause may never be known, the appeared to be caused by an airstrike or dozens of large explosive devices secretly implanted throughout the entire base. No nation or group has taken responsibility for the explosions.

Outlook and Prospect of War

America is the only country that possesses the conventional capability to destroy all of Iran's nuclear facilities by itself, but this would require months of military operations, hundreds of aircraft, and carrier strike operations on a scale last seen during Desert Storm. Iran has threatened to block the Straits of Hormuz, which would at least temporarily causing oil prices to soar due to supply bottlenecks and political risk. However, such a blockade would likely result in Saudi Arabia and Gulf Arab states militarily retaliating or joining a coalition, as their governments would last only a few months without hydrocarbon exports. Any assault would carry the political risks that parallel those of the Iraq War, where America found itself spending trillions of dollars in

a war based on false intelligence reports that subsequently ruined its credibility and international reputation. Given that Obama did not attack Syria after repeatedly crossing his "red line" by using chemical weapons, it's unclear if he is actually serious about his prevention policy or is simply trying to dampen intense Republican criticism of his foreign policy by using tough talk and exploiting public wariness to get involved in yet another Middle Eastern war.

Obama has claimed that he is not pursuing a policy of nuclear containment towards Iran, but of prevention. The United States, France, Britain, and Israel have all openly threatened to use military force against Iran to prevent it from constructing nuclear weapons. While Israel has repeatedly threatened to attack Iran, it lacks the conventional capabilities to massively damage its nuclear program. Any Israeli airstrike on Iran's nuclear infrastructure would require in-flight refueling and a flight path through hostile Arab airspace and dozens of surgical strikes at dispersed facilities. This has led to fears that Israel may resort to using low-yield nuclear weapons on hardened nuclear facilities, and such an attack is likely the subject of contingency planning. Although nobody in the Israeli government has publicly advocated a nuclear first-strike, Israel considers a nuclear Iran to be an existential threat, and almost certainly launch a second strike if hit by Iranian nuclear weapons.

Absent a truly revolutionary diplomatic breakthrough or regime change in Iran, the nuclear program and nuclear weapons research activities will continue, but may be affected by Iran's economic crisis and succession issues. Any future Supreme Leader will lack Khamenei's revolutionary credentials and religious legitimacy, and Iran's economic crisis has required it to sell its declining production of oil at a discount, and curb public benefits and subsidies that the poor rely on as a lifeline. Collapsing oil revenue and a lack of spare parts for existing fields has resulted in major holes in the government budget, which prioritizes nuclear weapons capacity over export revenue and economic modernization.

As the crisis worsens, Iran's inflation will continue to soar and result in rampant inflation that makes declining imports more expensive, and further increases in gasoline prices due to subsidy cuts. Although market rate gas prices undistorted by subsidies are seen as essential to fix the nation's budget, reduce oil smuggling, and incentivize economic efficiency, low fuel prices are seen as a sacred national entitlement. Every price increase has caused public anger, even though the government ultimately pays for the subsidies out of a declining government budget by forgoing revenue. Iran has sought to quell public anger with energy shortages by claiming that its nuclear program will create so much electricity for domestic use that the surplus production will allow it to become a net energy exporter, but this is simply a weak excuse for investing in military nuclear technology at the expense of the civilian power grid. None of Iran's supposedly civilian nuclear plants has resulted in a net increase in energy production to meet rising demand, or halted chronic blackouts and power cuts, since they are not actually connected to its antiquated grids in a meaningful way.

While Iran has begun to implement the first stages of its recent agreement under Rouhani, it has already started to undermine current and future negotiations. Iranian lawmakers are threatening to expand enrichment to higher levels, and sabotage the deal, repeating the pattern seen in past negotiations. Similarly, lawmakers in Washington are becoming increasingly impatient with negotiations that have lasted over a decade yet have no produced any deals or agreements that

have curtailed the program. Congressional Republicans are attempting to pass legislation that would add more sanctions to Iran during or immediately after an interim agreement, possibly jeopardizing negotiations. In terms of its overall negotiation strategy, Iran seems to be following North Korea, which received aid concessions upfront only violate its international agreements and demand international recognition as a nuclear power. Iran, like North Korea, will likely use nuclear weapons development as negotiating leverage, then try to use nuclear weapons as bargaining chips after they are successfully developed.

Khamenei's mortality will loom large over Iran's government and overall nuclear strategy, and a disorderly transition could result in unpredictable developments. In the last five years, Iran has been gripped by a complex power struggle between Khamenei, the office of the president, Revolutionary Guards, and senior clerics. The competition between these openly hostile interest groups working at cross-purposes is increasingly resulting in policy paralysis and hampering elite consensus on Iran's future, and each individual interest group has its own fiefdoms, commercial interests, bureaucratic turf and privileged it seeks to protect. It also may partly explain why Iranian diplomats struggle to implement their own agreements in which they won concessions or constantly change track. Iran's elite is also divided over how to manage political repression and Green Movement supporters of Mousevi, who was placed under house arrest after rigged elections in 2009. Khamenei has said that he wants to directly appoint the next President, abolishing the rigged elections designed to provide false popular legitimacy. Revolutionary Guards officers also keen to fill any power vacuum after Khamenei's death, and want to maintain military control of the nuclear program, security services and state-owned enterprises. The clerical establishment lacks any transcendent figure, and is positioning itself as necessary to religiously legitimize the future ruling structure. While Iran's overall policy intentions and future governing structure are unclear, the standoff appears destined to continue for years to come absent regime change or a massive foreign attack.

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