

# ATOMS FOR PEACE

The Long and Troubled History of Iran's Nuclear Program

*By Muhammad Sabimi*

Iran's program to construct a complete nuclear fuel cycle, and in particular its uranium enrichment program, has been the subject of intense discussions and diplomatic activity for over a decade. The program has greatly increased tensions in the already strained relations between Iran and Western powers, and in particular the United States, which have united to impose harsh economic sanctions on the Islamic Republic. The U.S. threats against Iran intensified during the George W. Bush administration, which was explicit in its threats but in practice did little beyond rhetoric. In contrast, the Barack Obama administration has waged an all-encompassing war on Iran, including not only economic war in the form of tough economic sanctions, but also sabotage of Iran's nuclear facilities through computer viruses, such as the Stuxnet<sup>1</sup> and Flame<sup>2</sup> worms, and other covert activities.<sup>3</sup> Though not proven, and denied by the United States,<sup>4</sup> Iran also believes that Washington has been involved in the assassination of its nuclear scientists.<sup>5</sup>

Ironically, while the United States opposes Iran's nuclear program today, it played a critical role in its inception. The first discussions on developing a nuclear infrastructure for Iran took place in 1955, two years after the coup—supported by the Central Intelligence Agency—that overthrew the democratically elected government of Prime Minister Mohammad Mossadegh. The first concrete step, however, was taken in 1957 when the United States signed an agreement with Iran on civilian nuclear cooperation. This was promoted as part of the U.S. Atoms for

Peace Program that was supposed to provide technical assistance to the signatories, as well as leasing them enriched uranium, and carrying out joint research on the peaceful use of nuclear energy. In 1959, Shah Mohammad Reza Pahlavi ordered the establishment of the Tehran Nuclear Research Center (TNRC) at the University of

▷ Demonstration for nuclear rights, Tehran, Feb. 11, 2006. *Raheb Homavandi/Reuters/Corbis*

**USING  
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IS OUR  
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RIGHT**

انرژی صلح از هسته ای  
حق مسلمانست



Tehran, and began negotiating with the United States to purchase a 5 megawatt (MW) reactor for the center. To this date, the center remains one of Iran's main nuclear research organizations.

In September 1967, Iran received from the United States 5.54 kilograms of enriched uranium, of which 5.16 kg contained fissile uranium isotopes (which could be used in a nuclear bomb), to use in its research reactor at the TNRC. In addition, Iran received 112 kg of plutonium, of which 104 kg were fissile isotopes.<sup>6</sup> The safeguarded 5 MW nuclear research reactor, the Tehran Research Reactor (TRR), a pool-type, water-moderated reactor, which was supplied to Iran by the U.S. firm GA Technologies, began full operations at TNRC in November 1967, using 5.58 kg of 93 percent enriched uranium. The fuel was provided by the American firm United Nuclear Corporation. In addition, the United States supplied Iran hot cells, which are heavily shielded rooms with remotely operated arms used to chemically separate material irradiated in the research reactor, possibly including plutonium laden "targets."

On July 1, 1968, the first day that the Nuclear Non-Proliferation Treaty (NPT) was opened for signatures, Iran signed the treaty. It was ratified by the Majles, the Iranian parliament, on February 2, 1970. The U.S.-Iran agreement, the Cooperation Concerning Civil Uses of Atoms, which had been signed in 1957, was extended on March 13, 1969 for another ten years. The first announcement on Iran's intention to construct nuclear power plants was made on December 18, 1972, when Iran's ministry of water and power began a feasibility study for the construction of a reactor in southern Iran.

This brief history describes Iran's first steps to entering the "nuclear club"—the nations that have nuclear technology and know-how. In the 1970s, the United States and its European allies, and in particular France and Germany, played fundamental roles in helping Iran develop an infrastructure for an extensive nuclear program.<sup>7</sup>

In my student days, I had a personal experience related to the program. I moved to the United States in March 1978 with a scholarship from the Atomic Energy Organization of Iran (AEOI) to study for a PhD. But, the scholarship never arrived, because by the fall of 1978 the Iranian revolution was gathering steam, and the shah's government was on the verge of collapse. After the February 1979 revolution toppled the regime, the provisional revolutionary government of Prime Minister Mehdi Bazargan decided to drastically scale back the scope of Iran's nuclear program. When I visited Iran in June 1979, about seven months after the victory of the revolution (which I supported) and visited the headquarters of the AEOI, I was told that my scholarship had been cancelled—before it had ever started.

## Going Underground

The Iran-Iraq War began when, with U.S. encouragement, Iraq invaded Iran on September 22, 1980. The superior firepower of Iraqi forces, and the constant threats by Saddam Hussein that if Iran did not accept his terms for a ceasefire, Iraq would unleash new weapons with “unimaginable power,” as well as reduced oil production after the revolution amid projections of a dramatic increase in domestic consumption, forced Iranian leaders to reconsider their decision to scale back the nuclear program. The thinking was that nuclear power will address some of Iran’s energy needs, reduce the pressure for increasing oil production, and lessen environmental pollution, while nuclear technology in Iran will be a deterrent against hostile foreign powers. Then Prime Minister Mir-Hossein Moussavi<sup>8</sup>—the current leader of the democratic Green Movement who has been under house arrest since February 25, 2011—was one of the most ardent supporters of the program and pushed the leadership to restart the nuclear program.

Thus, beginning in 1982, Iran began pressing West Germany to complete the two promised nuclear reactors in Bushehr, in southern Iran by the shores of the Persian Gulf, which the shah had contracted and had largely paid for, but had been left incomplete after the revolution. Iran tried any and all reasonable approaches in order to get West Germany to live up to its obligations; it never succeeded. In fact, between 1982 and 1995, Iran openly attempted to restart its nuclear power program, but was thwarted by the United States at every step.<sup>9</sup> If anything, Iran’s efforts were clearly indicating to the world that it was pursuing a nuclear power program, and was doing so with utmost transparency. Iran’s initial transparency was, in fact, even deeper than trying to convince West Germany to finish construction of the two reactors in Bushehr.

In 1983—exactly twenty years before Iran acknowledged the existence of the Natanz facilities for uranium enrichment—it asked the International Atomic Energy Agency (IAEA) to provide it with technical assistance in setting up a pilot plant for the production of UF<sub>6</sub>, uranium hexafluoride, which is used for enrichment. During the shah’s reign, work had already begun to convert one type of uranium oxide (U<sub>3</sub>O<sub>8</sub>) into another type, UO<sub>2</sub>, which is used in the production of UF<sub>6</sub>. In 1974, and with France’s help, the Esfahan Nuclear Technology Center (ENTEC), an Iranian nuclear establishment, had been set up to work on the complete nuclear fuel cycle. ENTEC had been established by the shah in 1974 to act as a center for the transfer and development of nuclear technology, and to contribute to the establishment of home-grown expertise needed to sustain a program for nuclear reactor technology and fuel cycle.

We should recall that helping a member state with such a project is one of the main functions of the IAEA. According to Article XI.A of the statute of the IAEA:

Any member or group of members of the Agency desiring to set up any project for research, or development of practical application of, atomic energy for peaceful purposes may request the assistance of the Agency in securing special fissionable and other materials, service, equipment, and facilities necessary for this purpose. Any such request shall be accompanied by an explanation of the purpose and extent of the project and shall be considered by the Board of Governors.<sup>10</sup>

In order to approve the request, the Board of Governors of the IAEA must give due considerations to “The inability of the member or group of members making the request to secure the necessary finances, materials, facilities, equipment, and services...” (Article XI.4 of the statute) and “The special needs of the under-developed areas of the world...” (Article XI.6)

In October 1983, the IAEA dispatched a team of experts to Iran, led by Herman Vera Ruiz, an IAEA official tasked by Deputy Director-General Maurizio Zifferero. The team visited ENTEC. In November 1983, Ruiz recommended to Zifferero and to Hans Blix, then director general of the IAEA, that the IAEA provide assistance to Iran’s nuclear research program, and provide expert services in a number of areas. In particular, the report stated clearly the IAEA’s intention to:

Contribute to the formation of local expertise and manpower needed to sustain an ambitious programme in the field of nuclear power reactor technology and fuel cycle technology.<sup>11</sup>

However, the technical assistance never materialized, because as Mark Hibbs wrote in a little noticed article:

Sources said that when in 1983 the recommendation of an IAEA mission to Iran were passed on to the IAEA’s technical cooperation program, the U.S. government then “directly intervened” to discourage the IAEA from assisting Iran in production of UO<sub>2</sub> and UF<sub>6</sub>. “We stopped that in its track,” said a former U.S. official.<sup>12</sup>

Therefore, as early as 1983, not only did the IAEA know Iran’s intentions for setting up a uranium enrichment program with complete transparency, the IAEA also violated both the spirit and the letter of the NPT, its own statute, and its obligations toward Iran by buckling under U.S. pressure and refusing to go forward with the recommendations of its own experts, hence being involved in an illegal endeavor. The United States also convinced Russia in the early 1990s not to sell Iran a centrifuge

plant. And, in February 2003, after Iran announced officially the existence of the Natanz facility, Melissa Fleming, a spokeswoman for the IAEA, said:

This comes as no surprise to us, as we have been aware of this uranium exploration project [in Saghand, in the province of Yazd in central Iran] for several years now. In fact, a senior IAEA official visited this mine in 1992.<sup>13</sup>

The United States also knew in the early 1990s that Iran was trying to import the parts for a centrifuge plant. For example, Italian intelligence agencies had reported that in 1991, the Sharif University of Technology in Tehran had submitted an order for a centrifuge component. However, the United States believed that the technical problems were too complex for Iran to overcome and, therefore, it believed that Iran would not be able to set up a uranium enrichment facility any time soon. Experts have often made mistakes in underestimating the strength of science in Iran and the ingenuity Iranians show in working with whatever crude design they get their hands on.<sup>14</sup>

Thus, Iran learned a lesson: it could not set up the enrichment facilities with full transparency, because the United States would stop the effort at their inception. Beginning in 1987, while it was pursuing its nuclear power program openly, Iran also began quietly developing a uranium enrichment program based on whatever design it could obtain.

On January 8, 1995, Iran and Russia signed an agreement for Russia to complete the construction of the Bushehr light water nuclear reactor. Subsequently, the administration of the then Iranian President Ali Akbar Hashemi Rafsanjani, which was trying to improve Iranian relations with the United States, signed an agreement with the American oil firm Conoco on May 6, 1995 to develop a huge Iranian offshore oil field in the Persian Gulf, even though a European oil company was the actual winner of bidding for the contract. But, in response, the Bill Clinton administration prevented Conoco from moving forward with the work, and in July 1996 it imposed complete economic sanctions on Iran, in violation of the Algiers Accords of January 1981 with Iran that had ended the U.S. embassy hostage crisis.

### **The Natanz Revelations**

On February 9, 2003, Iran's program and efforts for building sophisticated facilities at Natanz and several other cities that were already producing enriched uranium were disclosed. Then President Mohammad Khatami announced the existence of the Natanz (and other) facilities on Iran's national television and invited the IAEA to visit them. On February 21, 2003, Mohamed ElBaradei, the then IAEA director general, and a team of IAEA inspectors visited Iran. In the same year, the IAEA experts and inspectors visited Iran several more times. A preliminary report was submitted to the

Board of Governors in July 2003, with a follow-up report on August 26, 2003. On September 12, 2003, the IAEA issued Iran an ultimatum to reveal all the details of its nuclear activities by October 31, 2003.

The existence of the Natanz facility was first revealed by an Iranian dissident group, the Mujahedeen Khalq. Critics of Iran's regime often point to the construction of the Natanz enrichment site as proof that it has something to hide. In addition to the fact that Iran had tried to set up a nuclear fuel cycle with the IAEA help and in full transparency but had been thwarted by the U.S., we also need to consider Iran's legal obligations. The Subsidiary Arrangements General Part of the Safeguards Agreement<sup>15</sup> between Iran and the IAEA,<sup>16</sup> that was in force between 1976 and February 26, 2003, called for provision to the IAEA of design information on any new facility no later than 180 days before the introduction of nuclear materials into the facility, and the provision of information on a new location outside facility (LOF), together with the report relating to the receipt of nuclear material at the LOFs. Beginning in 1992, the standard Subsidiary Arrangements part of the Safeguards Agreement changed, but Iran was not a party to such changes until February 2003.

Thus, in not declaring to the IAEA the existence of the Natanz site up to 180 days before introducing nuclear materials into the site, Iran had not violated its legal obligations. The difference between a clandestine but legal nuclear program and illegal activities has not been understood by the Western press. Indeed, in his report to the IAEA of June 26, 2003 to the IAEA,<sup>17</sup> ElBaradei did not declare Iran in breach of its Safeguards Agreement.

In 1992, the Board of Governors of the IAEA began asking member states to accept the updated Subsidiary Arrangements, called Modified Code 3.1, which required member states to notify the IAEA as soon as they made the decision to set up a new nuclear facility. Iran accepted the updated Arrangements on February 26, 2003, and began implementing it on a volunteer basis until the Majles ratified the modification of the international agreement between Iran and the IAEA. However, after the United States and its allies pushed for sanctions on Iran in the United Nations Security Council in 2006, and the Majles refused to ratify the modification, Iran declared to the IAEA that it would no longer abide by Modified Code 3.1,<sup>18</sup> and returned to the original, Code 3.1.

### **In Search of Agreement**

Under pressure by the European Union, and under constant threats of military attack by the George W. Bush administration, Iran began negotiating with Britain, France, and Germany—the group known as the EU3. The talks resulted in the Sa'dabad Declaration<sup>19</sup> between Tehran and the Europeans. (Sa'dabad is the presidential palace in Tehran.) According to the declaration:

Having received the necessary clarifications, the Iranian Government has decided to sign the IAEA Additional Protocol and commence ratification procedures. As a confirmation of its good intentions the Iranian Government will continue to co-operate with the Agency in accordance with the Protocol in advance of its ratification.

While Iran has a right within the nuclear non-proliferation regime to develop nuclear energy for peaceful purposes it has decided voluntarily to suspend all uranium enrichment and reprocessing activities as defined by the IAEA.

Thus, Iran agreed to suspend all activities related to uranium enrichment, which it did. The declaration was followed by the Paris Agreement<sup>20</sup> between Iran and the EU3 on November 14, 2004. The agreement stipulated that, “the E3/EU and Iran have agreed to begin negotiations, with a view to reaching a mutually acceptable agreement on long-term arrangements. The agreement will provide objective guarantees that Iran’s nuclear program is exclusively for peaceful purposes. It will equally provide firm guarantees on nuclear, technological, and economic cooperation and firm commitments on security issues.”

But, both the Sa’dabad and Paris agreements ultimately failed because, despite promising to address Iran’s security concerns and offering extensive economic incentives, the EU3 failed to deliver its part of the bargain. Its proposal, submitted to Tehran in early August 2005, contained only vague promises for the distant future and no security guarantee that Iran would not be attacked, in return for the elimination of a solid fact on the ground—Iran’s nuclear facilities.<sup>21</sup> A European diplomat was quoted as saying “We gave them a beautiful box of chocolate that was, however, empty.”<sup>22</sup> Khatami, the reformist Iranian president at that time, had warned European diplomats in advance of the formal submission of their proposal that it would be rejected by Iran, unless the EU3 addressed Iran’s concerns. They did not pay any attention to Khatami’s warning. And as expected, the EU3 proposal was swiftly rejected, and Khatami ordered the end of suspension of the program in the last days of his administration. The Natanz facility for uranium enrichment resumed its work in January 2006.

Meanwhile, Mahmoud Ahmadinejad was elected president in June 2005. Jack Straw, the British foreign secretary from 2001 to 2006, who was deeply involved with the negotiations with Iran, has said that it was the Bush administration that seriously weakened Iran’s moderates with his belligerent policy toward Iran, hence helping the rise of Ahmadinejad to power.<sup>23</sup> Thus, the West scuttled the opportunity to reach a diplomatic resolution with a reformist administration in Iran because it wants Iran to completely end the program, which was, and still is, unacceptable to Iran.



### Six Cases of Non-Compliance

With Iran implementing, on a voluntary basis, the provisions of the Additional Protocol, the IAEA began to inspect Iran's nuclear program very closely. After what ElBaradei called the most intrusive and extensive inspection in the history of the IAEA, the Agency discovered and Iran admitted the following:

—In 1991 it had imported from China 1800 kg of uranium compounds (UF<sub>4</sub>, UF<sub>6</sub>, and UO<sub>2</sub>), and that it used them in experiments to test its conversion processes.

—It had used a small amount of its imported UF<sub>6</sub> in the P1 centrifuges (the original Pakistani centrifuge) at the Kaalaa-ye Electric Company centrifuge workshop. Up to nineteen centrifuges were used. Note, however, that the existence of the workshop at Kaalaa-ye Electric is not, by itself, a breach of the Safeguards Agreement. In fact, according to Iran's original Safeguards Agreement, so long as nuclear materials have not been introduced into the centrifuges, even the manufacturing of centrifuges does not have anything to do with the IAEA.

—From 1989–93 Iran had carried out experiments that produced Polonium-210, a highly radioactive but unstable material with a short half-life. While Polonium-210 does have civilian applications, it can theoretically be used for initiating the fission chain reactions that result in a nuclear explosion. Due to its instability, however, Polonium-210 is not used for this purpose.

—It had developed a laser facility for uranium enrichment at the TNRC, and another in Lashkar Abad, a suburb of Tehran.

—In 1993, it imported in 50 kg of natural uranium metal. Eight kilograms of it were used at the TNRC while experimenting with atomic vapor laser isotope separation, with another 22 kg of the metal utilized in similar experiments in Lashkar Abad. It should be noted that Iran abandoned the experiments soon thereafter, and that the idea of using laser separation had been suggested to Iran by the U.S. in the late 1970s. In addition, the United States allowed Iran to purchase laser equipment in 1978.

—Iran carried out, between 1988 and 1993, plutonium separation experiments (in very small amounts) using UO<sub>2</sub>.

There were other, minor issues that have been described elsewhere.<sup>24</sup> After extensive discussions with Iran and having checked all of its explanations, on February 22, 2008,

ElBaradei submitted a report to the Board of Governors of the IAEA that declared satisfactory resolution of all the issues.<sup>25</sup>

But, before ElBaradei's report was submitted, Iran informed the IAEA in October 2005 that it would no longer abide by the provisions of the Additional Protocol, which it had previously been implementing on a voluntary basis. The reason given by Iran was that the three European Union members that had been negotiating with Iran reneged on their promise to make a comprehensive proposal that would address Iran's legitimate security concerns, and expand commercial relations and nuclear cooperation between Iran and the European Union. The August 2005 proposal from the EU3 to Iran was considered insulting by Iranian leaders, and was rejected immediately. After Iran's nuclear dossier was sent to the United Nations Security Council in February 2006, and the council approved the first round of the economic sanctions against Iran in late 2006, Iran informed the IAEA that it would no longer abide by the provision of Modified Code 3.1 of the Subsidiary Arrangements of its Safeguards Agreement. The Iranian parliament never ratified the two agreements anyway.

### The "Stolen" Laptop

Given ElBaradei's February 2008 report, it would have been reasonable to expect that Iran's case before the IAEA Board of Governors and even the United Nations Security Council would be closed, and events would return to an everyday setting. But, that did not happen. Two days after ElBaradei presented his report to the Board of Governors, Olli Heinonen, then the IAEA's deputy director general for safeguards, presented a briefing to the Board in Vienna in which he presented a dark view of Iran's nuclear program under the guise of "Agency Evaluation," as if his employer had not just declared its satisfaction with the resolution of many issues that, up until then, had been considered "crucial" and "critical." Heinonen spoke about three supposedly secret projects: Project 5, which converts UO<sub>2</sub> to "green salt" (so named due to its color and smell) or uranium tetrafluoride (UF<sub>4</sub>), an intermediate compound in the conversion of uranium ore to gaseous UF<sub>6</sub>; Projects 110 and 111, which design the firing device and re-entry vehicle for a missile; and Project 3.12, which tests high-power explosives. The same accusations were repeated in the IAEA's reports of May 26, 2008 and September 15, 2008.

What was the source of the new "information" and "data" that Heinonen was basing these accusations on? A laptop had been purportedly stolen in Iran, taken out of the country, and made available to Western intelligence agencies in Turkey. The laptop supposedly contained some of the most sensitive and classified information on Iran's nuclear program.

The existence of the laptop had been known since 2004. The first reference to it appeared on November 17, 2004, when then secretary of state Colin Powell briefly

referred to “new, missile-related” intelligence on Iran. But, most experts cast doubt on the authenticity of the laptop’s documents, if the laptop actually existed at all. A senior European diplomat was quoted by the *New York Times* saying “I can fabricate that data. It looks beautiful, but is open to doubt.”<sup>26</sup> Another European official was quoted as saying, “Yeah, so what? How do you know what you’re shown on a slide is true, given past experience?” A senior U.S. intelligence official was quoted saying, “It’s easy to fall into the trap of thinking that beautiful pictures represent reality, but that may not be the case.” Another U.S. official was quoted as saying, “Even with the best intelligence, you always ask yourself, ‘was this prepared for my eyes?’” Julian Borger of the *Guardian* quoted an IAEA official saying “There is doubt some doubt over the provenance of the computer.”<sup>27</sup> Many writers including Gareth Porter<sup>28</sup> have analyzed claims about the laptop, and cast serious doubts on the authenticity of any document that have might been on the purported laptop. So, for a while the laptop and its documents as evidence of a “smoking gun” have disappeared. But, it will re-emerge.

### **Enrichment Under the Mountain**

On September 21, 2009, the Iranian government sent a letter to the IAEA to declare that it was constructing a second uranium enrichment facility in Fordo, near the holy city of Qom, 100 miles south of Tehran. Four days later, in a hastily arranged news conference in the midst of the G20 summit in Pittsburgh, President Obama, flanked by Prime Minister Gordon Brown of Britain and French President Nicholas Sarkozy, declared that the United States, Britain, and France had provided the agency the day before with detailed information about the Qom facility. Whether the construction of the Fordo site constituted a violation of Iran’s Safeguards obligations remains a matter of contention. According to Obama, other U.S. officials, and some experts Fordo represented a gross violation of Iran’s Safeguards Agreement. Others disagreed. But rhetoric and finger pointing aside, Iran’s possible violation of its Safeguards Agreement should be studied in the context of the Subsidiary Arrangements of the Agreement.

As pointed out earlier, Code 3.1 of the Subsidiary Arrangement of the original Safeguards Agreement (as specified in 1976) stipulated that Iran must declare to the IAEA the existence of any nuclear facility no later than 180 days before introducing any nuclear material into the facility. In 1992 the Board of Governors of the IAEA amended the Subsidiary Arrangements rules and developed the Modified Code 3.1, which requires a member state to notify the IAEA “as soon as the decision to construct or to authorize construction has been taken, whichever is earlier.” It also developed the Additional Protocol to the Safeguards Agreement, which empowers the IAEA to carry out intrusive inspections of any site in its member states.

After the Natanz enrichment site was officially disclosed to the IAEA in February 2003, Iran agreed, on February 26, 2003, to implement the provision of the Modified Code 3.1. More precisely, Iran agreed to voluntarily implement the Modified Code 3.1, and in December 2003, the Additional Protocol—until ratification of both by the Majles. Iran followed the provision of Modified Code 3.1 until March 2006. But, in February 2006, the Board of Governors of the IAEA sent Iran's nuclear dossier to the United Nations Security Council. In retaliation, Iran notified the IAEA in March 2007 that it would no longer voluntarily observe Modified Code 3.1, and would revert to the original Code 3.1, which only required a 180-day notification. The IAEA responded:

In accordance with Article 39 of Iran's Safeguards Agreement, agreed Subsidiary Arrangements cannot be modified unilaterally; nor is there a mechanism in the Safeguards Agreement for the suspension of provisions agreed to in Subsidiary Arrangements.

While the statement is correct, Iran's position is that it has no obligation toward the Modified Code 3.1, since the Majles never approved the change in the Safeguards Agreement. An international treaty signed by any state goes into effect only if it has been ratified by that nation's parliament. This is beyond dispute. And, after the 1979 revolution toppled the shah's regime, it was written into law that all the international agreements signed by the government must be approved by the Majles. Even the Sa'dabad Declaration and the Paris Agreement stated specifically that Iran's implementation of the Additional Protocol remained voluntary until Iran's parliament approved it. Thus, the same must be true of Modified Code 3.1.

Regardless of its legal status, the Fordo site, which was brought online in 2011, has deeply concerned Western powers, as it is buried deep underground, beneath a mountain, and would be very difficult, if not impossible to demolish by bombing, for example. It has been designed to house 2,976 centrifuges in sixteen cascades. As of May 15, 2013, 2,710 centrifuges have been installed—and all of the inefficient IR-1 type, although more advanced centrifuges have been manufactured, and will be installed soon.

### **Fuel for the Tehran Research Reactor**

The original Tehran Research Reactor that Iran obtained from the United States in 1967 used high-enriched uranium as fuel. In 1987 the core of the reactor was redesigned by Argentina to convert it into a reactor that uses low-enriched uranium (LEU) at 19.75 percent. Argentina also supplied Iran with 115.8 kg of the fuel. The TRR supplies medical isotopes for about 850,000 Iranian patients annually. It also

produces isotopes for research activities. In 2009 Iran informed the IAEA that it would soon run out of fuel, and asked the agency to resupply it. A preliminary agreement was signed between Iran and the Agency in October 2009, according to which Iran would ship most of its then stockpile of (insufficiently enriched) LEU to Russia and France, and in return would receive fuel suitable for the TRR. The agreement broke down after Iran set conditions for its implementation, which were rejected by the United States and its allies.

Then, on May 17, 2010, Iran, Turkey, and Brazil announced that they had reached an agreement under which Iran would send 1,200 kg of its LEU stock—enriched at 3.3 to 3.7 percent—to Turkey to be stored and safeguarded there by the IAEA.<sup>29</sup> In return for the transfer of its LEU, Iran was supposed to receive 120 kg of uranium fuel rods, enriched at 19.75 percent, for the TRR. The agreement was also rejected by Washington and its allies because by May 2010 Iran's stockpile of LEU had increased substantially and, thus, they wanted Iran to transfer more of the stockpile to Turkey. This Iran was not willing to do.

Iran then announced that it would produce its own fuel for the TRR. Though there was considerable skepticism that Iran had the technological know-how to do this, it has, in fact, succeeded. Iran has used the Fordo site mostly for producing uranium enriched at 19.75 percent. The latest IAEA report on Iran's nuclear program—issued on May 22, 2013—indicates that Iran has produced 324 kg of 19.75 percent enriched uranium, of which 142 kg has been converted to fuel plates, which are very difficult to use for further enrichment.<sup>30</sup> The remaining 182 kg is less than what is generally believed to be necessary to make one nuclear warhead. In effect, the United States and its allies provoked Iran to begin enriching uranium at a level higher than 3.5 percent.

### **The IAEA Guard**

On December 1, 2009, Japanese diplomat Yukiya Amano succeeded ElBaradei as the director general of the IAEA. He issued his first report on Iran on February 18, 2010.<sup>31</sup> The tone of Amano's report was in sharp contrast with ElBaradei's.<sup>32</sup> Speculating without presenting any evidence, Amano talked about the "undeclared nuclear materials" in Iran's possession that, if true, would represent a gross violation of Iran's Safeguards obligations. It also demanded a visit to Iran's heavy water production plant near the city of Arak, although the plant is not covered by Iran's Safeguards Agreement.

Amano's stance, however, should not come as a surprise. Documents released by Wikileaks indicate that Amano, rather than being a neutral and objective director general, is firmly in the American corner. In a cable dated July 9, 2009, the U.S. *chargé d'affaires* at the U.S. mission to the IAEA, Geoffrey Pyatt, stated that "Amano

attributed his election to support from the U.S., Australia, and France, and cited U.S. intervention with Argentina as particularly decisive,” and said that Amano’s primary goal was “implementing safeguards and UNSC [United Nations Security Council]/[IAEA] Board resolutions” to impose economic sanctions against Iran.<sup>33</sup> The United States had also complained to Amano about some IAEA experts under ElBaradei who “have not always been helpful to U.S. positions.” Once in office, Amano removed those “unhelpful” experts from key positions. He eliminated the agency’s office of external relations and policy coordination that, under ElBaradei, had questioned some of the judgments made by the Safeguards department inspectors.<sup>34</sup>

Pyatt also reported that Amano had consulted with Israel’s ambassador to the IAEA, Israel Michaeli, “immediately after his appointment,” that Michaeli “was fully confident of the priority Amano accords verification issues,” that he discounted some of Amano’s public remarks about there being “no evidence of Iran pursuing a nuclear weapons capability” as mere words that Amano had to say “to persuade those who did not support him about his ‘impartiality,’” and that Amano wanted to have “consultations” with the head of the Atomic Energy Commission of Israel.

In another cable, dated October 16, 2009, the U.S. mission to the IAEA reported that Amano “took pains to emphasize his support for U.S. strategic objectives for the Agency. Amano reminded ambassador [Glyn Davies] on several occasions that... he was solidly in the U.S. court on every key strategic decision, from high-level personnel appointments to the handling of Iran’s alleged nuclear weapons program. More candidly, Amano noted the importance of maintaining a certain ‘constructive ambiguity’ about his plans, at least until he took over for DG ElBaradei in December [2009].”<sup>35</sup>

### A “Game Changing” Report

On November 8, 2011, the IAEA released its most comprehensive report on Iran’s nuclear program.<sup>36</sup> Some observers called it the most anticipated report in the history of the agency, because for at least two weeks prior to its release, Western media was already reporting various—leaked—aspects of the report, and it was generally described in such dire terms as “game changing” and “landmark.” But, the report simply rehashed the old allegations that Heinonen had made in his presentation to the Board of Governors of the IAEA in February 2008, based on the “stolen” laptop. The 2011 report made no mention of the laptop at all, however, simply because by then it had been totally discredited. The new IAEA report claimed it had corroborating evidence supplied by up to ten member states about the same allegations. No country was specifically mentioned, nothing was said about how the member states had obtained the intelligence, and no dates were given as to when the evidence had reached the agency.

Two of the most interesting aspects of the report were on a then unnamed foreign scientist who had supposedly helped Iran's nuclear program, and new allegations—or more precisely, the rehashing of old allegations—about Parchin, a conventional military site twenty miles southeast of Tehran that Iran had been using for several decades to produce ammunition and explosives for its armed forces. Parchin is not a nuclear site and, therefore, is not covered by Iran's Safeguards Agreement.

### **The Foreign Scientist**

In its report, the IAEA stated:

The Agency has strong indications that the development by Iran of the high explosives initiation system, and its development of the high speed diagnostic configuration used to monitor related experiments, were assisted by the work of a foreign expert who was not only knowledgeable in these technologies, but who, a Member State has informed the Agency, worked for much of his career with this technology in the nuclear weapon program of the country of his origin. The Agency has reviewed publications by this foreign expert and has met with him. The Agency has been able to verify through three separate routes, including the expert himself, that this person was in Iran from about 1996 to about 2002, ostensibly to assist Iran in the development of a facility and techniques for making ultra-dispersed diamonds, where he also lectured on explosion physics and its applications.

The IAEA report acknowledged that “there exist non-nuclear applications, albeit few” for the exploding bridge-wire detonators (EBWs) that the scientists were allegedly working on. But, Scott Peterson of the Christian Science Monitor quoted Robert Kelly, an American nuclear engineer and former IAEA inspector who was among the first to review the original data (supposedly coming from the laptop) in 2005, saying, “The agency is wrong. There are lots of applications for EBWs. To be wrong on this point, and then to try to misdirect opinion shows a bias towards their desired outcome... That is unprofessional.”<sup>37</sup>

This scientist turned out to be Vyacheslav Danilenko,<sup>38</sup> a Ukrainian scientist employed for six years by Iran. David Albright, president of the Washington-based Institute for Science and International Security, and his colleagues had alleged that Danilenko was hired specifically to work on refining Iran's nuclear designs.<sup>39</sup> Albright had even given a “private briefing” for “intelligence professionals” right before the IAEA report was released in which he named Danilenko as the foreign expert who had been contracted by Iran's Physics Research Center in the mid-1990s, and identified him as a “former Soviet nuclear scientist.”

But, the allegation fell flat and proved unsustainable. It turned out that Danilenko was not a nuclear scientist at all,<sup>40</sup> but one of the world's leading experts on producing industrial nanodiamonds using sophisticated explosives technology.<sup>41</sup> But, because he had been trained at a Russian institute that did undertake research on nuclear warheads, the assumption by Albright and company was that he must have learned about nuclear explosives. Danilenko himself, now seventy-eight years old, denied that he was involved in Iran's nuclear program.<sup>42</sup>

### Visiting Parchin

In its report, the IAEA also alleged that Iran had built a containment chamber in Parchin for experiments that it has—again allegedly—carried out with high explosives that are relevant to triggering a nuclear reaction.<sup>43</sup> The IAEA has demanded to visit the site, but Parchin is not a nuclear site, and has never been declared as such. Therefore, because Iran no longer abides by the provisions of the Additional Protocol, it has no legal obligation to allow a visit, even though a visit might be very good for demonstrating a spirit of cooperation between Iran and the IAEA.

In addition, the allegations are not about recent activities, but regard what might have happened in Iran over a decade ago. In 2004, the IAEA demanded to visit Parchin and on September 17, 2004 ElBaradei announced that the agency had found no sign of nuclear-related activity at the Parchin.<sup>44</sup> “We are aware of this new site that has been referred to,” he said, then added, “We do not have any indication that this site has any nuclear-related activities. However, we will continue to investigate this and other sites, we'll continue to have a dialogue with Iran.” Because at that time Iran was observing the provisions of the Additional Protocols, two visits were allowed by Iran in 2005, one in January and a second one in November.<sup>45</sup> Both times Heinonen led the IAEA inspectors.

The first time they visited five different locations within the complex. After turning down the IAEA's request for a second visit in March 2005, Iran did allow it later in the year, in November. The inspectors again visited five buildings, but then demanded a “surprise” visit to a sixth location, which was granted. Nothing was found that indicated any activity consistent with the allegations.

Why the allegations were revived in the 2011 IAEA report is not clear. Iran and the IAEA were in the midst of negotiating an agreement that would allow the agency to visit Parchin again—the agreement still hasn't been finalized as of mid-2013, although Iran's ambassador to Russia has said that Tehran will allow IAEA experts to visit Parchin, if the agency signs a relevant protocol that contains all its concerns and questions about the site.<sup>46</sup> The Iranian press quoted Heinonen at that time saying, “The Parchin case has joined history,” implying that its case was closed.



Despite this, there have been all sorts of unfounded allegations about what is going on in Parchin.<sup>47</sup> Even laying asphalt at Parchin has been called suspect.<sup>48</sup> Such allegations have been thoroughly refuted.<sup>49</sup>

The fact is there is no evidence that Iran has an active nuclear weapon program, or that it has any secret parallel program. In every single report that the IAEA has issued over the past ten years, it has always certified that there is no evidence that Iran has diverted its nuclear materials and technology from peaceful purposes to a non-peaceful program. The U.S. Intelligence Estimate of November 2007 declared that Iran has not had any nuclear weapon program, at least since 2003.<sup>50</sup> Since then, this main conclusion has remained unaltered.<sup>51</sup>

### **Is There a Political Will?**

As things stand currently, the IAEA continues to inspect and monitor all of Iran's nuclear sites, and continues to certify that Iran has not diverted any nuclear material to non-peaceful purposes. A visit to Parchin has remained a matter of contention. The IAEA continues to press Iran to respond to the allegations made in its November 2011 report, but Iran has refused to do so—on the grounds that the allegations are baseless—and will continue to do so unless the IAEA presents evidence in support of the allegations to Iran.

Meanwhile, Iran continues to expand its nuclear infrastructure, its stockpile of LEU, and its number of centrifuges. As of the latest IAEA report issued on May 22, 2013, Iran has 8,960 kg of LEU, of which 2,603 kg has been converted to fuel plates. Iran also has 13,551 IR-1 centrifuges in Natanz, in addition to those in its facility at Fordo. Iran has also announced plans for ten other enrichment sites, the locations for five of which have apparently been decided. The construction of the IR-40 Reactor, a heavy water nuclear reactor near Arak is also proceeding.

Over the past two years a series of negotiations between the P5+1 group—the five permanent members of the United Nations Security Council plus Germany—and Iran has taken place, first in Istanbul, then in Baghdad and Moscow, and most recently in Almaty, Kazakhstan. Both sides have moved somewhat from their previous, seemingly inflexible positions. Whereas the P5+1 originally demanded that Iran shut down the Fordo site permanently and stop enriching uranium at 19.75 percent, it now only asks for a temporary suspension. Whereas Iran had declared that it would never agree to any halt in its enrichment activities, it suggested in Almaty to stop enrichment at 19.75 percent for six months. Though these concessions have not been enough for a breakthrough, they do indicate that a diplomatic solution is possible, if both sides have the necessary political will.

Most objective experts agree that a clear framework for a diplomatic solution to the standoff is already in place.<sup>52</sup> It consists, for example, of the following principles:

—Iran must suspend enrichment at 19.75 percent for a fixed, mutually agreed period of time. In return, the European Union must allow oil tankers that carry Iran's oil to non-European nations to be insured by European companies, and suspend sanctions on Iran's central bank.

—Iran must ship out its stock of 19.75 percent enriched uranium to Russia and France for conversion to fuel rods. This arrangement was agreed to in October 2009, but the agreement ultimately failed. In return, the P5+1 must supply fuel for the TRR—the same 19.75 percent enriched uranium converted to fuel rods.

—Iran must then reactivate the provisions of the Additional Protocol of its Safeguards Agreement with the IAEA. That will give the IAEA intrusive authority to inspect any suspected site in Iran, including Parchin. In return, the West must lift some important sanctions simultaneously with Iran's actions under the above two points.

—Iran must agree to adhere to Modified Code 3.1 of its Safeguards Agreement. In return, the P5+1 and, in particular, the EU must cancel oil sanctions.

—Iran must agree to zero stock of 19.75 percent enriched uranium on its soil, implying that it must ship abroad the enriched uranium, both the current stock and in the future, and limit the number of enrichment sites and centrifuges to a mutually agreed upon number. In return, the P5+1 must lift its remaining economic sanctions.<sup>53</sup>

The only thing required for such an agreement is political will on both sides.

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