

# Countdown to SHOWDOWN

by David Albright & Corey Hinderstein

The United States wanted the Security Council to sanction Iran, but the European Union preferred to make a deal. Now Iran appears to have backed out of their agreement . . .

THE DIRECTOR GENERAL OF THE INTERNATIONAL Atomic Energy Agency (IAEA), Mohamed ElBaradei, reported to the board of governors on September 1, 2004, that Iran intended to convert 37 metric tons of yellowcake into uranium hexafluoride, the “feed” material that is enriched in gas centrifuges. It was a surprising revelation—37 metric tons is a small quantity for a civilian nuclear power program. But it would be a large amount for a fledgling nuclear weapons pro-

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gram—enough material to make roughly five crude nuclear weapons.

Iran’s processing of yellowcake represents another step in its abandonment of a short-lived agreement with the European Union (EU), signed in October 2003, that offered Iran a range of benefits in exchange for suspending its uranium enrichment program. Iran formally broke the deal when it announced that it was once again start-

ing to assemble centrifuges. Iranian officials reportedly added they would likely start enriching uranium in fall 2004.

The breakdown of the agreement alarmed members of the European Union and the United States. Joschka Fischer, the German foreign minister and a leader of the EU’s effort in Iran, said on September 13: “There is a risk Iran is making a huge error. I hope they understand that. If not, we will end up in a very serious situation.”

The suspension issue dominated the IAEA’s board of governors meeting, held September 13–18. During the contentious debate over a resolution on the matter, the United States argued that Iran



Buildings at the Lavizan-Shian site thought to house undeclared nuclear activities, shown in an August 2003 satellite image (top). When the March 2004 image (below) was taken, the buildings had been dismantled and removed.

should be referred to the U.N. Security Council and tried to add language to a draft resolution requiring Iran to remedy “all failures identified to date” no later than October 31. The EU refused to accept such a rigid trigger, preferring to give Iran one last chance for a negotiated solution, with language included in the resolution requiring the board to make a “definitive determination on whether or not further steps are required.”

Members of the non-aligned movement, led by South Africa and Brazil, were alarmed that the resolution would deny Iran the right to peaceful

nuclear activities, namely the right to process uranium for nuclear fuel.

In the end, the board adopted a consensus resolution that was somewhat weaker than the original EU proposal, but considerably stronger than that called for by the non-aligned. It called on Iran to suspend all enrichment-related activities immediately and as a matter of necessity reconsider its decision to construct a heavy-water research reactor. The resolution created a trigger for action, stating that the board “will decide whether or not further steps are appropriate” in November. The European Union and the United States left little doubt that failure on Iran’s part could lead to a referral to the Security Council.

The board meeting and resolution also focused on the IAEA’s two-year effort to verify that Iran’s nuclear program is solely for peaceful purposes. The IAEA began an intensive investigation in 2002 after learning that Iran was building nuclear sites in secret. Complicating the process, Iran provided a series of incomplete and changing declarations and delayed inspectors’ access to key sites.

The new resolution requires the IAEA to produce a comprehensive report before the November meeting that recapitulates its findings since September 2002 and analyzes in detail the implications of those findings with regard to Iran’s implementation of its IAEA safeguards agreement. The resolution states that the board will also consider this report in deciding about future steps.

After the meeting, Fischer issued a statement expressing the EU’s keen interest in resuming negotiations that might persuade Iran to permanently

suspend uranium enrichment activities in return for more immediate benefits. Other countries, such as Japan, Russia, and perhaps the United States, could also engage Iran directly.

Iran sent a mixed signal in response to the board’s resolution. Many Iranian officials called the resolution illegal or unjust and vowed to persist in developing the entire fuel cycle. Iranian Vice President Reza Aghazadeh said to reporters soon after the meeting that Iran continues to produce uranium hexafluoride gas. Hassan Rowhani, secretary of the powerful Supreme National Security Council and the EU’s counterpart in negotiations, criticized the resolution but stopped short of rejecting it outright or foreclosing negotiations.

### Getting Iran to suspend

The suspension of uranium enrichment and plutonium reprocessing activities lies at the heart of any potential solution to the conflict with Iran. Iran’s original agreement to suspend dates to October 2003, when the British, French, and German foreign ministers and Rowhani reached an agreement requiring Iran to cooperate fully with the IAEA to address and resolve outstanding issues, voluntarily suspend its uranium enrichment and reprocessing activities, and sign and start the ratification process of the IAEA’s advanced safeguards protocol.<sup>1</sup>

In return, the EU foreign ministers promised that their governments would recognize Iran’s right to the peaceful uses of nuclear energy in accordance with the Nuclear Non-Proliferation Treaty and expressed their willingness to help resolve the situation with the IAEA board of governors and promote security and stability in the region. They also committed their governments to providing Iran easier access to modern technology and supplies once international concerns were fully resolved. The latter was conditioned,

according to a participant in the meeting, on an indefinite continuance of the suspension of enrichment activities.

At first, Iranian cooperation with the IAEA appeared to improve. Iran signed the advanced protocol and announced it would act as if it were in force pending ratification by its parliament. It also started to implement the suspension itself.

Earlier this year, some EU countries wanted to start to deliver some incentives to Iran, concerned that Iran needed some immediate benefits to build domestic support for the October agreement, which powerful factions within Iran were known to oppose.

But problems in implementing the agreement had developed, leading to pressure on the European Union not to provide benefits. Additional undeclared Iranian nuclear activities were revealed, including its secret acquisition of advanced “P2” centrifuge designs and components from Pakistan. Iran was also slow in suspending its centrifuge operations, deciding that some components would continue to be made under contracts with private companies that, it said, could not be broken.

Iran also asserted in a May 18 letter to the IAEA that it was not committed to ending its production of uranium hexafluoride. The EU believed that to be a reinterpretation of the October 2003 agreement. Also contrary to the EU’s understanding was Iran’s intention to build a heavy-water research reactor.

Then, on June 23, Iran told the IAEA that it would resume manufacturing centrifuge components and assembling and testing centrifuges. But, Iranian officials said, it would not restart enriching uranium, and it would conduct all its activities under IAEA supervision.

On June 27, Iran cut the IAEA seals on its existing centrifuge components and started assembling centrifuges from its existing stock of components. Manufacturing of cer-

tain key components was delayed because Iran had dismantled its centrifuge manufacturing capabilities at military sites, partly as a way to avoid IAEA inspections at these facilities.

### Remaining safeguards issues

During the summer, the IAEA managed to clear up some outstanding safeguards issues, including Iran’s experimental laser enrichment activities. Also, no additional undeclared Iranian nuclear activities emerged. But other safeguards issues remained. According to ElBaradei, the two principal outstanding issues involved the origin of uranium contamination found at various locations in Iran, and the completeness of Iran’s declaration about the P2 gas centrifuges.

The IAEA was able to at least plausibly assess that Iran had not produced highly enriched uranium (HEU) at its two major declared research and development sites, Kalaye and Natanz. However, the IAEA needs to do more work to establish that undeclared enrichment has not taken place at other locations and that no undeclared enriched uranium has been imported from abroad.

The IAEA is still investigating Iran’s P2 gas centrifuge program. An important outstanding issue is whether Iran conducted any P2 work between 1995—when Iran first received the P2 designs from overseas—and 2002, which is when, Iranian officials say, work on the P2 started.

The inspectors need more cooper-

It is possible that some of the buildings at the top of this August 2004 satellite image of the Parchin military complex could be used for nuclear weapons R&D. The area of excavation and construction (bottom right) is also drawing suspicion.





Experts believe the partially buried bunker at the end of this winding road at the Parchin complex could be used to test high explosives for nuclear weapons.

ation from Pakistan. Although it is providing information and sampling data, it still refuses to allow the IAEA to question A. Q. Khan or take its own samples in Pakistan. Without this type of access, the IAEA might not be able to finish its assessments of Iran's nuclear program and declaration.

### Weaponization

Questions remain about whether Iran has conducted activities to research, test, and produce a nuclear weapon itself, a process called nuclear weaponization. Although the U.S. government and Israel have stated for years that Iran has a nuclear weapons program, they have not provided the IAEA or the public with the location of any nuclear weaponization sites or any direct evidence of such activities. They have largely arrived at their conclusion that Iran has a nuclear weapons program through indirect assessments.

One theory is that the Khan network, which supplied both Libya's

and Iran's gas centrifuge program, supplied Iran with a weapon design. Libya received detailed nuclear weapon design and fabrication documents from the Khan network, leading to suspicions that Iran also received them, something Iran and Pakistan deny.

The design supplied to Libya appears to be for a Chinese warhead that was tested on a missile in the mid-1960s and provided to Pakistan in the early 1980s. The warhead has a mass of about 500 kilograms, and measures less than a meter in diameter, small enough for the Iranian Shahab 3 missile. If Iran received this information, it would

have been able to short-circuit the difficult process of developing a deliverable nuclear warhead. If it received the designs several years ago, Iran could have already finished all the necessary research and development for a nuclear warhead, and perhaps even stockpiled key components.

The IAEA is evaluating Iranian sites that could have been or potentially could be used for nuclear weaponization activities, although no unambiguous sites have been identified. Nonetheless, the IAEA has sought to visit several sites to check out suspicions of nuclear weaponization work:

**Lavizan-Shian.** In early June 2004, ABC News received information about Lavizan, in the northeastern section of Tehran. ABC asked the Institute for Science and International Security (ISIS) for help in assessing the information. The initial information suggested the site was involved in some type of nuclear weaponization.

An August 2003 overhead image of the site obtained by ISIS shows large buildings inside a secure perimeter. In a second image, from

March 2004, the buildings have been removed and the earth scraped. Even the roads and walkways have been removed or covered.

The site's destruction raised concerns because it is the type of measure Iran would take if it were trying to defeat the powerful environmental sampling capabilities of IAEA inspectors. When Iran deployed less extensive deception measures at other sites, inspectors discovered evidence that forced Iran to amend its previous statements.

The Lavizan site was also known to house radiation-detection devices called whole-body counters, which Iran procured overseas in the early 1990s under false pretenses. The equipment itself is not direct evidence of a nuclear weapons program, but it could be out of place at a site that has no nuclear activity.

The IAEA became aware of the Lavizan-Shian site in 2003. Its suspicions apparently increased in early 2004 when commercial satellite imagery showed that dismantling had begun.

The ABC News report about the site and the parallel publication of an ISIS report caused considerable public and government discussion. The IAEA asked for and received permission to visit. Iran told the IAEA that the site had no nuclear material requiring a declaration, and that no fuel cycle activities were conducted there.

The Iranians described Lavizan as owned by the Military Industrialization Organization (MIO). Until 1998, it was a physics institute; afterward, a biotechnology institute. The body counters arrived after 1998. Later, the counters were moved again. One went to an MIO university in Esfahan, the other to a private clinic in Tehran. Iran provided a basic description of activities at the site, but was unwilling to provide detailed explanations about its activities or equipment, citing security concerns. The September 2004 IAEA director general's report to the board

of governors says that Iran had declared the site as a place to study “preparedness to combat and neutralization of casualties due to nuclear attacks and accidents (nuclear defense) and also support and provide scientific advice and services to the Ministry of Defense.”

Iran said the site was razed because the land was being returned to the city of Tehran after a dispute between the municipality and the ministry. Iran provided the IAEA with supporting documents, including yellowed local newspapers discussing the transfer of property. The IAEA is analyzing these documents to determine their authenticity.

The IAEA took environmental samples at Lavizan. As of late September, the results of preliminary environmental sampling showed no evidence of undeclared plutonium or HEU. In addition, Iran allowed IAEA access to the two whole-body counters that had been located there.

Iranian statements about Lavizan’s purpose and fate have raised addi-

thorities? No direct evidence points to the site being involved in nuclear weaponization, centrifuge activities, or other banned activities such as biological weapons work, but the IAEA investigation remains incomplete and further Iranian cooperation and information are required.

**Parchin.** Information obtained by ABC News led ISIS to acquire satellite images of the Parchin military complex, located about 30 kilometers southeast of Tehran. This huge complex is dedicated to research, development, and production of ammunition, rockets, and high explosives. The site, owned by Iran’s military industry, has hundreds of buildings and test sites.

Within the larger complex, there is an isolated, separately secured site that is a logical candidate for nuclear weapons-related activities. But evidence of nuclear weapons work is ambiguous.

The IAEA has known about this site for some time and has independently assessed its potential for nu-

clear weapons work. Several weeks before the September board of governors meeting, the IAEA asked Iran about visiting the location, but Iran expressed willingness to allow a visit only after ABC News and ISIS revealed their findings during the September board meeting. Although the timing of the ABC News report was not intentional, the reports

caused considerable controversy at the board meeting, intensifying pressure on Iran to permit an IAEA visit, which could take place in October. High-explosive testing facilities at Parchin could be useful to a nuclear weapons effort, particularly by providing the capability to research and develop high-explosive components for an implosion-type nuclear weapon. Buildings in one area appear to have flash X-rays and fast cameras for recording explosions. Arguing against the area being solely dedicated to high-explosive work is another building that appears to have a pad oriented for testing small rocket motors, not high explosives.

Nearby, but more isolated, is what appears to be a high-explosive testing bunker, perhaps still under construction. Such a bunker, which is partly buried, would allow the study of large explosions for a variety of purposes, including the development of nuclear weapons. The presence of this structure has increased suspicion that the site might be involved in researching nuclear weapons.

This bunker could be where Iran would test a full-scale mock-up of a nuclear explosive using natural or depleted uranium as a surrogate for a highly enriched uranium core. Such tests can provide key confirmation that a nuclear weapon will work adequately. Iraq had constructed a high-explosive testing bunker at Al Atheer before the 1991 Persian Gulf War partly for such a purpose. The bunker at Parchin has some similar characteristics, such as being partly buried. However, the imagery of the bunker at Parchin is not sufficient to draw detailed comparisons.

### **The timetable**

One Israeli intelligence report, a portion of which was leaked to the media, claims that Iran could get enough HEU for a first nuclear weapon by early 2007.<sup>2</sup> The U.S. intelligence community assessment is reportedly that Iran could have a nu-

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clear weapon in three to five years. But more recent estimates of the timeline for Iran to build its first nuclear weapon have moved the date back. Reasons for the change probably include Iran's suspension of its enrichment program and greater appreciation outside Iran of problems in Iran's centrifuge program as a result of the inspection effort.

The key to predicting the timetable is understanding the pace and scope of Iran's gas centrifuge program, such as the schedule for establishing a centrifuge plant that would hold about 1,500–2,000 centrifuges. Such a facility could produce enough HEU for about one nuclear weapon a year.

By spring 2004, Iran had assembled 1,140 centrifuge rotors, a reasonable indicator of the number of centrifuges it possessed.<sup>3</sup> However, only about 500 rotors were good enough to operate.

According to the September IAEA safeguards report, after resuming centrifuge manufacturing in June, Iran had assembled and tested about 70 centrifuge rotors by mid-August.

With this information, the intelligence estimates can be understood. Assuming that Iran does not suspend its activities again, and that it makes and tests about 70–100 centrifuges per month, it could have roughly 800–1,000 good centrifuges by the end of 2004. It could then build another 800–1,200 good centrifuges in 2005, resulting in about 1,600–2,200 centrifuges. Given another year to make enough HEU for a nuclear weapon and a few more months to convert the uranium into weapon components, Iran could have its first nuclear weapon by early 2007.

However, this scenario must be viewed as Iran's best case under prevailing conditions. Iran might not be able to meet such a schedule for bringing a centrifuge plant into operation. The suspension of manufacturing and operating centrifuges could be reestablished, or Iran might have trouble making so many centrifuges. In addition, Iran does not appear to

have accumulated enough experience to operate a cascade of centrifuges reliably. Iran had assembled 164 centrifuges into a cascade just before the suspension, but it did not acquire sufficient experience in operating the cascade to be certain it would perform adequately. Centrifuges can crash during operation, causing other centrifuges in the cascade to fail—in essence, destroying the entire cascade. Thus, Iran might need a year or more of additional experience in operating test cascades before building and operating a plant able to make HEU for nuclear weapons.

### What needs to be done

Iran does not appear to have nuclear weapons and seems unlikely to be able to make them for at least several years. Nonetheless, the IAEA board of governors is correct to view the Iranian situation as urgent and to issue a firm demand that Iran suspend its uranium enrichment and heavy-water reactor programs. Two years have passed since secret Iranian nuclear sites were first brought to public attention, and Iran appears unwilling to abandon its fissile material production programs. Iran has too often dictated the pace of diplomatic progress, giving the impression that it is playing for time. In the next one or two years, Iran could build up unstoppable institutional and public momentum to finish and operate its enrichment plant or a heavy-water reactor and outlast the current international diplomatic effort.

An ultimatum is the best way to require Iran to come clean and suspend its fissile material production programs or be perceived widely as pursuing a nuclear weapons program. If Iran chooses to stonewall the IAEA on safeguards issues or refuses to suspend its programs, it risks paying an enormous price for its choices.

But an ultimatum requires the international community to act in concert and develop a unified approach.

So far, the United States and the European Union have been unable to agree on an approach. For months, the Bush administration has pushed for a rapid referral to the Security Council with little follow-up in mind. The EU has sought a negotiated solution to the crisis with referral to the Security Council a much more distant option.

If Iran chooses not to abide by the requests in the most recent board resolution, the United States, the EU, and other allies need to develop a common strategy to impose punitive actions against Iran while at the same time holding open a path for the Iranian regime to change its mind. If Iran complies, then their goal should be to create an agreement with an optimal combination of carrots and sticks that could lead to a more durable solution.

For any diplomatic solution to last, the United States needs to open a dialogue with Iran. If the United States remains outside an agreement between Iran and the EU, Iran is unlikely to view the agreement as sufficient, particularly as long as the U.S. economic embargo on Iran remains intact and forces within the U.S. government work to make Iranian regime change the official U.S. policy. In addition, without U.S. involvement, there is little opportunity to convince U.S. decision makers and the public that the agreement is acceptable.

Whatever happens, the United States should persuade Iran that if it renounces its fissile material production capability and accepts intrusive IAEA investigations, the United States will move to significantly improve relations. ✽

1. "Agreed Statement at the End of a Visit to the Islamic Republic of Iran by the Foreign Ministers of Britain, France, and Germany," October 31, 2003.

2. Dan Williams, "Israel: No Bomb Capability Until 2007," Reuters, July 22, 2004.

3. Director General, "Implementation of the NPT Safeguard Agreement in the Islamic Republic of Iran," International Atomic Energy Agency, June 1, 2004, GOV/2004/34, Annex 1, p. 11.