Iran after the Nuclear Agreement: A Status Report

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In July 2015, Iran and the six countries that negotiated with it – the five permanent members of the UN Security Council and Germany (P5+1) – reached agreement on the future restrictions on Iran's nuclear program and the removal of sanctions as compensation to Iran for its consent to the restrictions. Implementation of the agreement began in January 2016, six months after it was reached.

There are several major disadvantages of the agreement: the agreement is limited in time, and after its main clauses expire, Iran will have almost unlimited options for developing a broad nuclear program; the agreement covers only some of the issues related to nuclear weapons development (it does not mention the ballistic missile program, for example); and quite surprisingly, the agreement is not signed by the respective parties, and all of its clauses are "voluntary." Nevertheless, the overall situation appears better than before the agreement, and in the absence of an agreement, the parties would probably have reached a crisis. A report by the director general of the International Atomic Energy Agency (IAEA) published in December 2015 found clearly that Iran had been developing a nuclear weapon; it left no room for doubt that this was Iran's intention, and stressed that Iran should be supervised and prevented from achieving this capability at almost any price.[1]

A military nuclear program has three main parts: production of fissile material, construction of an explosive device, and achievement of a method of delivery. Producing fissile material is the most difficult part and takes the

most time. The three parts, however, can be developed simultaneously, which saves a great deal of time. This essay describes the current and presumed state of the Iranian nuclear project until the expiration of the main clauses of the agreement, and the situation liable to prevail afterwards.

The Iranian Nuclear Project under the Duration of the Agreement

Production of Fissile Material and the Restrictions in the Agreement

The first attempt to reach an agreement was led by the three major European powers – France, the UK, and Germany. Unsuccessful, the efforts in fact enabled Iran to continue its nuclear development activity and did not materially slow it down. The intensive involvement of President Obama, first secretly and then openly, eventually led to the agreement, which involved far reaching concessions to Iran. The agreement is between Iran and six countries that appointed themselves as negotiators and reached a written but unsigned agreement with an unclear legal status, although it later received international approval when it was endorsed by the UN Security Council (Resolution 2231).

According to President Obama, the period of time in Iran between a decision to complete the process of developing a nuclear weapon and production of enough fissile material to produce a nuclear bomb, which is called the breakout time, was minimal in the period before the agreement was achieved, and was lengthened to a year as a result of the agreement. This is a fairly short period in international terms, and it is also valid only for a limited period of 10 years from now, assuming that the Iranians comply with both the letter and the spirit of the agreement.

The agreement is inadequate in many important ways:

a. It addresses only the inspection of production of fissile material; concerns only forbidden activity, not inspection of the explosive mechanism; and does not mention means of delivery.
b. Its main clauses are limited in time: beginning eight years after the start of the implementation in January 2016, important bans on research and development are removed, followed by the removal of the ban on uranium enrichment.
c. The agreement is limited to routine visits to declared nuclear facilities only, and a special complicated procedure is required for inspection of other facilities (those that are known, and those suspected of forbidden

activity). All activity in development of the nuclear explosive mechanism takes place at facilities defined by the Iranians as military, and they do not allow access to these facilities. On the other hand, it is not clear whether the IAEA has submitted a formal request to visit these facilities.[2]

d. The agreement does not allow a search for undeclared facilities, materials, and activities.
e. Inspection is allowed according to the Additional Protocol, but this too is limited.

Iran is taking advantage of the agreement's weak points in order to continue its development of a nuclear explosive device in a short breakout time, as evidenced by developments in all matters pertaining to uranium enrichment. While the stock of enriched uranium in Iran was substantially reduced following the agreement, this does not necessarily prevent or significantly impede a quick breakout to a bomb, should Iran decide to achieve one. In fact, this will become easier as time passes, as under the agreement Iran is allowed to develop advanced centrifuges for uranium enrichment.[3] Iran is also developing and possibly engaging in forbidden production of IR-8 centrifuges, which have an enrichment capacity 20 times that of the older centrifuges based on the IR-1 Pakistani design.[4] If operated in cascades, the advanced model can produce far more military grade enriched uranium in far less time. The small number of centrifuges necessary to enrich uranium to military grade will enable Iran to operate them in the well protected underground facility at Fordow. Iran has also acquired additional stocks of natural uranium, and has considerable stocks of depleted and natural uranium ready for use in the enrichment facilities.

Another point in Iran's favor is the weakness of the IAEA inspection mechanism. However dedicated the inspectors, their work is subject to limitations, some of which apply to all inspections and some specific to Iran. Particularly prominent is the lack of IAEA transparency in the reports that it publishes about Iran's nuclear activities since the agreement went into effect. This differs from the procedure that existed for many years, even during the period when Mohamed ElBaradei of Egypt was IAEA director general. This lack of transparency probably dates back to the period of the negotiations for the agreement. Lack of transparency about Iran's activities affects the discussions and decisions of the Joint Commission set up to oversee implementation of the agreement. The situation has even reached an absurd state of affairs, when Iran published the decisions and discussions

about authorizations granted to it, such as permission to buy additional natural uranium from Russia.[5]

The Obama administration classified the Joint Commission's reports, and the agreement also has classified appendices. Done for Iran's benefit, there is no justification for the classification, given Iran's past as a country that violated its commitments under the nuclear Non-Proliferation Treaty (NPT). Iran managed, however, to extract this concession in the negotiations that led to the agreement. The transparency so necessary in this matter was thereby prevented, with a clear bias in favor of Iran. Despite some improvement on the subject of transparency following more frequent inspections of the declared facilities, the situation is far from desirable. To all this should be added the lack of money for the inspection teams, an issue raised previously by IAEA director general Yukiya Amano.[6]

How does Iran profit from the lack of transparency? Iran needs authorization from the working group set up by the Joint Commission for every procurement request involving equipment with a link to the nuclear program, including if these requests are submitted by the parties selling the requested equipment and/or materials. The list of requests is confidential, thereby skirting public criticism. One example that was leaked, for example, involves carbon fibers that can be used to make the rotors for advanced enrichment centrifuges. The working group apparently did not approve the request to procure large quantities of this material, but was willing to approve a number of requests for procurement of smaller quantities each time. A more important indirect benefit, however, is that the Joint Commission will probably avoid major controversies liable to upset the entire agreement. Since the agreement is beneficial mainly to Iran, despite the postponement in principle of the date on which uranium enrichment activity is allowed in general, Iran benefits from the lack of transparency.

According to reports, Iran has been caught violating a number of clauses in the agreement, including, for example, clauses governing its stocks of low grade enriched uranium and heavy water. These are considered minor violations, however, and will not cause termination of the entire agreement.

Development of the Explosive Mechanism

Development of the explosive mechanism of a nuclear device is critical to the same extent as production of fissile material, but far less difficult and

can take place concurrent with the other parts of the project, especially if a warhead based on uranium enriched to a high degree is involved.

The IAEA found that Iran had been developing the explosive mechanism at least until 2003 and probably until 2009, and might be continuing until the present time. Iran (like Libya) may well have had a detailed design of an explosive mechanism that it received from Pakistan, which was previously used by China.[7] This old design likely required updates and further development, and presumably Iran dealt with this matter and may be doing so to this day. In all probability, Iran possesses a proven design.

While the IAEA inspection mechanism has the option of filing a request to inspect military and other facilities suspected of developing a nuclear explosive mechanism, only one inspection has actually been carried out since the agreement, at the Parchin facility. This inspection was carried out unprofessionally by any criterion set by the IAEA itself, and yielded dubious and unclear results (discovery of traces of uranium in the area where nuclear weapons development trials are suspected) that increased suspicions about activities conducted in the past at this facility. All the attempts to clarify the findings were unsuccessful, however, due to Iran's refusal to allow a visit and collection of new samples at the site.

Means of Delivering Nuclear Weapons

Iran is developing and producing ballistic missiles with ranges varying from hundreds of kilometers to 2,000 kilometers. Table 1 describes the Iranian missile program for medium ranges, which cover up to large parts of the Middle East, extending past Israel to areas in southeastern Europe. The missile issue is not included in the agreement with Iran, and a decisive 2010 Security Council resolution (Resolution 1929) banning any activity related to the development and testing of ballistic missiles capable of bearing nuclear weapons was replaced by a watered-down resolution in 2015 that merely *calls on* Iran not to engage in activities related to missiles *planned* to bear nuclear weapons (and Iran continues to assert – despite the IAEA's findings – that it has no intention of developing nuclear weapons, and never had any such intention). According to an unconfirmed report published in 2017, Iran acceded to a demand by President Obama not to develop and test ballistic missiles with ranges over 2,000 kilometers.[8]

Table 1. Iranian Medium Range Missiles[9]

Missile	Type	Range	Status
Sejjil	Ballistic	2,000 km	Operational
Shahab-3	Ballistic	2,000 km	Operational
Ghadr 1 (Shahab-3 Variant)	Ballistic	1,950 km	In development
Emad (Shahab-3 Variant)	Ballistic	1,700 km	In development
Soumar	Cruise missile	2,000-3,000 km	Operational
Khorramshahr	Ballistic	2000< km	In development

Two objections are required here: Iran is proud that it is also developing cruise missiles. The subject of cruise missiles is not mentioned in the context of Iran – not verbally, in writing, in the current agreement, or in the relevant Security Council resolutions. The second issue is the general subject ignoring the possibility that Iran will be able to operate missiles from other territories, rather than its own, such as Syria (where it is intervening in order to help save the regime). The subject of the weight of the missiles' payload is also a problem, because a nuclear warhead, especially one with a uranium core, is heavier compared to what the Iranian missiles are able to carry, but Iran is overcoming this problem. Iran is also improving accuracy, and at some point, its missiles will be accurate enough to destroy a defined target with a nuclear warhead that does not require too much accuracy. The use of methods not employed by states also cannot be ruled out – non-military transportation methods – in order to deliver a nuclear weapon to a target in another country.

The Iranian Nuclear Program after the End of the Agreement

What can be expected in the future? This depends primarily on the Iranian regime, but on the United States and the global political situation as well. If the attitude of the regime in Iran changes, whether toward the region or toward Israel and the United States – which at this stage appears very unlikely – it will be able to attain what it calls "a status similar to that of Japan."[10] At present, however, it must be assumed that Iran will not change its political views or its ambitions, especially on the subject of development of non-conventional weaponry.

Perhaps Iran will comply with the nuclear agreement. In this case, presumably about ten years from now, Iran will be able to build a uranium enrichment facility on a scale that will enable it to enrich a significant quantity of uranium to a military level within a short time, even if it does not carry out such enrichment immediately, and waits for an opportune time, whether political, military, or as a result of internal pressure, to attain nuclear military capability. This will not be unexpected. Iran is liable then to declare its withdrawal from the NPT, or to declare its capability with no additional activity, claiming that this is not explicitly forbidden and does not contravene its commitments. The response to this development by the world and by Israel cannot be predicted.

Given its history of concealment, cheating, and ignoring agreements and conventions, however, the possibility also exists that Iran will work secretly, and while ostensibly complying with the agreement, will clandestinely engage in activities enabling it to break out and produce the fissile material it needs on short notice. In the worst case, Iran will succeed in building a concealed conversion plant (which produces the raw material for enrichment) and a concealed enrichment plant, and will secretly produce all that it needs in order to produce a nuclear explosive device, and perhaps even a bomb. This possibility should not be ignored. Iran is very experienced and knowledgeable in concealing activities, especially if it uses advanced centrifuges, and an enrichment plant on its territory can therefore have limited physical dimensions. It has all the knowledge required, and probably also the equipment, to build such secret plants.

What will happen if and when the intelligence services detect such activities? Detection is of course by no means certain, despite the Obama administration's assurances. There is no clear historical support for such an unequivocal conclusion, and there are innumerable cases of major intelligence failures. Iran can utilize many methods of deception, and a single detection failure, in which false information leads to a false alarm, will deter those engaged in detection efforts from any future attempts. Even if the intelligence services provide proven and verified information, the UN has no way of enforcing inspection and verification, despite what is written in the agreements, especially if the information comes from clandestine sources that the governments involved are deterred from exposing to Iran, as the agreement requires in cases of such accusations.

The worst case for the world in general, and for Israel in particular, is the day on which the world discovers that Iran has broken all the rules, using its existing materials and those it produced secretly, and has produced a nuclear explosive device and performed an underground or even atmospheric nuclear test. It is doubtful whether there will be a military response to this. It is unclear whether in the situation that prevails 10 years from now, Iran will fear economic and other sanctions, and for Iran, the cases of India, Pakistan, and North Korea constitute a positive precedent.

Some regard the agreement with Iran as a breakthrough that removes the nuclear threat, at least for the near future. They may be right. Nevertheless, given the long history of Iranian nuclear development, including methods of deception, denial, and concealment, it is dangerous to ignore the existing potential, which will increase with time and will give Iran a tool for making nuclear threats, if not worse. A more basic and substantial change must occur in the Iranian regime, so that Iran will not realize any part of its nuclear ambitions in the future.

Notes

1 See Section 81 in the IAEA report: December 2, 2015: GOV/2015/68, https://www.iaea.org/sites/default/files/gov-2015-68.pdf.

2 Peter Kenyon, "Access to Military Sites Debated as White House Reconsiders Iran Nuclear Deal," September 13, 2017, http://www.npr.org/sections/parallels/2017/09/13/549217764/should-nuclear-inspectors-be-demanding-access-to-irans-military-sites.

3 Enriching uranium through gas centrifuges is the method used by Iran to increase the concentration of Uranium 235 above the proportion of approximately 0.7% in natural uranium to around 90% (the concentration needed for military uses). The centrifuges are connected with each other in structures of about 160 units, called cascades, in order to achieve the necessary concentrations and quantities.

4 See, "Iran Starts Testing IR-8 Centrifuges with UF6," *Tehran Times*, January 28, 2017, http://www.tehrantimes.com/news/410533/Iran-starts-testing-IR-8-centrifuges-with-UF6. For background on IR-8, see David Albright, "Technical Note: Making Sense out of the IR-8 Centrifuge," ISIS Report, September 23, 2014**,** http://isis-online.org/uploads/isis-reports/documents/IR8_Sept__2014.pdf**.**

5 An IAEA statute allows classification restrictions in cases concerning the security of the inspected country or commercial secrets, but does not stipulate classification in other cases. In the case of Iran, there were many deviations from this rule.

6 "Long-term Funding Crucial to Monitoring Nuclear Agreement with Iran, UN Atomic Chief Warns," UN News Centre, January 19, 2016, http://www.un.org/apps/news/story.asp?NewsID=53038#.WeBlHBXyvIU.

7 David Albright and Corey Hinderstein, "Documents Indicate A.Q. Khan Offered Nuclear Weapon Designs to Iraq in 1990: Did He Approach Other Countries?" ISIS, February 4, 2004, http://www.isis-online.org/publications/southasia/khan_memo.html.

8 A. Savyon et al., "According To Iranian Officials, Obama Administration Gave Unwritten Consent in the Nuclear Talks and in the JCPOA Negotiations for Iran to Develop Ballistic Missiles With a Range Of Only 2,000 km – That is, Capable of Striking Israel but not Europe," MEMRI *Inquiry & Analysis Series*, No. 1298, February 2, 2017, https://www.memri.org/reports/according-iranian-officials-obama-administration-gave-unwritten-consent-nuclear-talks-and.

9 Taken from "Missiles of Iran," a report by the Center for Strategic and International Studies (CSIS), https://goo.gl/n7Zj38; the last item is taken from the media.

10 Japan can currently be classified as a nuclear threshold state, i.e., a state that possesses the technical ability to attain military nuclear capability within a short time, although no desire to achieve this capability is evident. There are other countries in the same situation, such as Germany, but the world does not regard these countries as posing a risk of obtaining nuclear military capability.