Implementation of the NPT Safeguards Agreement and relevant provisions of Security Council resolutions in the Islamic Republic of Iran

Report by the Director General

A. Introduction

1. This report of the Director General to the Board of Governors and, in parallel, to the Security Council, is on the implementation of the NPT Safeguards Agreement and relevant provisions of Security Council resolutions in the Islamic Republic of Iran (Iran).

2. The Security Council has affirmed that the steps required by the Board of Governors in its resolutions are binding on Iran. The relevant provisions of the aforementioned Security Council resolutions were

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1 The Agreement between Iran and the Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons (INFCIRC/214), which entered into force on 15 May 1974.


3 In resolution 1929 (2010), the Security Council: affirmed, inter alia, that Iran shall, without further delay, take the steps required by the Board in GOV/2006/14 and GOV/2009/82; reaffirmed Iran’s obligation to cooperate fully with the IAEA on all outstanding issues, particularly those which give rise to concerns about the possible military dimensions of the Iranian nuclear programme; decided that Iran shall, without delay, comply fully and without qualification with its Safeguards Agreement, including through the application of modified Code 3.1 of the Subsidiary Arrangements; and called upon Iran to act strictly in accordance with the provisions of its Additional Protocol and to ratify it promptly (operative paras 1–6).
adopted under Chapter VII of the United Nations Charter, and are mandatory, in accordance with the terms of those resolutions.  

3. By virtue of its Relationship Agreement with the United Nations, the Agency is required to cooperate with the Security Council in the exercise of the Council’s responsibility for the maintenance or restoration of international peace and security. All Members of the United Nations are required to take actions which are consistent with their obligations under the United Nations Charter.  

4. This report focuses on those areas where Iran has not fully implemented its binding obligations, as the full implementation of these obligations is needed to establish international confidence in the exclusively peaceful nature of Iran’s nuclear programme. It addresses developments since the last report (GOV/2011/7, 25 February 2011), as well as issues of longer standing.

B. Facilities Declared under Iran’s Safeguards Agreement

5. Under its Safeguards Agreement, Iran has declared to the Agency 16 nuclear facilities and nine locations outside facilities where nuclear material is customarily used (LOFs). Notwithstanding that certain of the activities being undertaken by Iran at some of the facilities are contrary to relevant resolutions of the Board of Governors and the Security Council, as indicated below, the Agency continues to verify the non-diversion of declared nuclear material at these facilities and LOFs.

C. Enrichment Related Activities

6. Contrary to the relevant resolutions of the Board of Governors and the Security Council, Iran has not suspended its enrichment related activities in the following declared facilities, all of which are nevertheless under Agency safeguards.

C.1. Natanz: Fuel Enrichment Plant and Pilot Fuel Enrichment Plant

7. Fuel Enrichment Plant (FEP): There are two cascade halls at FEP: Production Hall A and Production Hall B. According to the design information submitted by Iran, eight units are planned for Production Hall A, with 18 cascades in each unit. No detailed design information has yet been provided for Production Hall B.

8. On 14 May 2011, 53 cascades were installed in three of the eight units in Production Hall A, 35 of which were being fed with UF₆. Initially, each installed cascade comprised 164 centrifuges. Iran has modified 12 of the cascades to contain 174 centrifuges each. To date, all the centrifuges installed are IR-1

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4 The United Nations Security Council has adopted the following resolutions on Iran: 1696 (2006); 1737 (2006); 1747 (2007); 1803 (2008); 1835 (2008); and 1929 (2010).

5 The Agreement Governing the Relationship between the United Nations and the IAEA entered into force on 14 November 1957, following approval by the General Conference, upon recommendation of the Board of Governors, and approval by the General Assembly of the United Nations. It is reproduced in INFCIRC/11 (30 October 1959), Part I.A.

6 GOV/2011/7, para. 2.

7 All of the LOFs are situated within hospitals.

8 On 14 May 2011, the 53 installed cascades contained approximately 8000 centrifuges. The 35 cascades being fed with UF₆ on that date contained a total of 5860 centrifuges, some of which were possibly not being fed with UF₆.
machines. As of 14 May 2011, installation work in the remaining five units was ongoing, but no centrifuges had been installed. There had been no installation work in Production Hall B.

9. Following a physical inventory verification (PIV) at FEP, the Agency confirmed that, as of 17 October 2010, 34,737 kg of natural UF₆ had been fed into the cascades since the start of operations in February 2007, and a total of 3,135 kg of low enriched UF₆ had been produced.

10. Iran has estimated that, between 18 October 2010 and 13 May 2011, it produced an additional 970 kg of low enriched UF₆, which would result in a total production of 4,105 kg of low enriched UF₆ since February 2007. The nuclear material at FEP (including the feed, product and tails), as well as all installed cascades and the feed and withdrawal stations, are subject to Agency containment and surveillance. In a letter dated 4 April 2011, Iran informed the Agency that a metal seal in the feed and withdrawal area of FEP had been accidentally broken by the operator. The consequences for safeguards of this seal breakage will be evaluated by the Agency upon completion of the next PIV.

11. Based on the results of the analysis of environmental samples taken at FEP since February 2007 and other verification activities, the Agency has concluded that the facility has operated as declared by Iran in the Design Information Questionnaire (DIQ).

12. **Pilot Fuel Enrichment Plant (PFEP):** PFEP is a research and development (R&D) facility and a pilot, low enriched uranium (LEU) production facility, which was first brought into operation in October 2003. It has a cascade hall that can accommodate six cascades, and is divided between an area designated for the production of LEU enriched up to 20% U-235 and an area designated for R&D.

13. In the production area, Iran first began feeding low enriched UF₆ into Cascade 1 on 9 February 2010, for the stated purpose of producing UF₆ enriched up to 20% U-235 for use in the manufacture of fuel for the Tehran Research Reactor (TRR). Since 13 July 2010, Iran has been feeding low enriched UF₆ into two interconnected cascades (Cascades 1 and 6), each of which consists of 164 centrifuges.

14. As a result of discussions between the Agency and Iran, certain improvements to the operator’s measurement system, especially in the determination of the level of U-235 enrichment, were agreed during a meeting which took place on 17–18 April 2011, and are expected to be implemented by the time of the next PIV.

15. Iran has estimated that, between 19 September 2010 and 21 May 2011, a total of 222.1 kg of UF₆ enriched at FEP was fed into the two interconnected cascades and that approximately 31.6 kg of UF₆ enriched up to 20% U-235 was produced. This would result in a total of approximately 56.7 kg of UF₆ enriched up to 20% U-235 having been produced since the process began in February 2010.

16. In the R&D area, between 12 February 2011 and 21 May 2011, a total of approximately 331 kg of natural UF₆ was fed into centrifuges, but no LEU was withdrawn as the product and the tails of this R&D activity are recombined at the end of the process.

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In line with normal safeguards practice, small amounts of nuclear material at the facility (e.g. some waste and samples) are not subject to containment and surveillance.

Results are available to the Agency for samples taken up to 14 September 2010.

GOV/2010/28, para. 9.

TRR is a 5 MW reactor which operates with 20% U-235 enriched fuel and is used for the irradiation of different types of targets and for research and training purposes.

GOV/2010/28, para. 9.


On 22 May 2011, the centrifuges being tested in the R&D area were IR-1, IR-2m and IR-4 machines.
17. As stated in the Director General’s previous report, on 19 January 2011 Iran indicated that it would install two new 164-centrifuge cascades (Cascades 4 and 5) in the R&D area. These two cascades, one of which will consist of IR-4 centrifuges and the other IR-2m centrifuges, will be fed with natural UF₆. Although installation work for Cascades 4 and 5 is ongoing, as of 22 May 2011, no centrifuges had been installed.

18. Based on the results of the analysis of the environmental samples taken at PFEP and other verification activities, the Agency has concluded that the facility has operated as declared by Iran in the DIQ.

C.2. Fordow Fuel Enrichment Plant

19. In September 2009, Iran informed the Agency that it was constructing the Fordow Fuel Enrichment Plant (FFEP), located near the city of Qom. In its DIQ of 10 October 2009, Iran stated that the purpose of the facility was the production of UF₆ enriched up to 5.0% U-235, and that the facility was being built to contain 16 cascades, with a total of approximately 3000 centrifuges. In September 2010, Iran provided the Agency with a revised DIQ in which it stated that the purpose of FFEP was now to include R&D as well as the production of UF₆ enriched up to 5.0% U-235.

20. While the Agency continues to verify that FFEP is being constructed according to the latest DIQ provided by Iran, it is still not in a position to confirm the chronology of the design and construction of FFEP or its original purpose. Iran has stated that there is no legal basis upon which the Agency may request information on the chronology and purpose of FFEP, and that the Agency is not mandated to raise questions that are beyond its Safeguards Agreement. The Agency considers that the questions it has raised are within the terms of the Safeguards Agreement, in that the information requested is essential for the Agency to confirm that the declarations of Iran are correct and complete.

21. As stated in the Director General’s previous report, on 21 February 2011, Iran informed the Agency that it planned to begin feeding nuclear material into cascades “by this summer”. As of 21 May 2011, no centrifuges had been introduced into the facility. The results of the analysis of the environmental samples taken at FFEP up to February 2010 did not indicate the presence of enriched uranium.

C.3. Other Enrichment Related Activities

22. The Agency is still awaiting a substantive response from Iran to Agency requests for further information in relation to announcements made by Iran concerning the construction of ten new uranium enrichment facilities, the sites for five of which, according to Iran, have been decided, and the construction of one of which was to have begun by the end of the last Iranian year (20 March 2011) or the start of this Iranian year. To date, the Agency has no information as to whether that construction has started.

\[16\] Results are available to the Agency for samples taken up to 1 January 2011.
\[17\] GOV/2009/74, para. 9.
\[18\] GOV/2010/62, para. 16.
\[19\] GOV/2010/46, para. 15.
\[20\] As previously reported, in Iran’s initial declaration regarding the purpose of FFEP, contained in a letter dated 2 December 2009, Iran stated that, “The location [near Qom] originally was considered as a general area for passive defence contingency shelters for various utilizations. Then this location was selected for the construction of [the] Fuel Enrichment Plant in the second half of 2007” (GOV/2010/10, paras 14–16).
\[21\] The results did show a small number of particles of depleted uranium (GOV/2010/10, para. 17).
\[23\] GOV/2010/46, para. 33.
23. Iran has not provided further information, as requested by the Agency, in connection with its announcement on 7 February 2010 that it possessed laser enrichment technology, and its announcement on 9 April 2010 regarding the development of third generation centrifuges. Since early 2008, Iran has not responded to Agency requests for access to additional locations related, inter alia, to the manufacturing of centrifuges, and to R&D on uranium enrichment. As a result, the Agency’s knowledge about Iran’s enrichment activities continues to diminish.

D. Reprocessing Activities

24. Pursuant to the relevant resolutions of the Board of Governors and the Security Council, Iran is obliged to suspend its reprocessing activities, including R&D. In a letter to the Agency dated 15 February 2008, Iran stated that it “does not have reprocessing activities”. In that context, the Agency has continued to monitor the use of hot cells at TRR and the Molybdenum, Iodine and Xenon Radioisotope Production (MIX) Facility. The Agency carried out an inspection and design information verification (DIV) at TRR on 8 May 2011 and a DIV at the MIX Facility on 9 May 2011. It is only with respect to TRR, the MIX Facility, and the other facilities to which the Agency has access, that the Agency can confirm that there are no ongoing reprocessing related activities in Iran.

E. Heavy Water Related Projects

25. Contrary to the relevant resolutions of the Board of Governors and the Security Council, Iran has not suspended work on all heavy water related projects, including the construction of the heavy water moderated research reactor, the IR-40 Reactor, which is under Agency safeguards.

26. As indicated in the Director General’s previous reports, in light of the request by the Security Council to report to it on whether Iran has established full and sustained suspension of, inter alia, all heavy water related projects, the Agency has requested that Iran make the necessary arrangements to provide the Agency, at the earliest possible date, with access to: the Heavy Water Production Plant (HWPP); the heavy water stored at the Uranium Conversion Facility (UCF) in order to take samples; and any other location in Iran where projects related to heavy water are being carried out. Iran has objected to the Agency’s requests on the basis that they go beyond the Safeguards Agreement and because Iran has already stated that it has not

28 The MIX Facility is a hot cell complex for the separation of radiopharmaceutical isotopes from targets, including uranium, irradiated at TRR. The MIX Facility is not currently processing any uranium targets.
31 Based on satellite imagery, the HWPP appears to be in operation.
suspended its heavy water related projects.\textsuperscript{33} The Security Council has decided that Iran shall provide such access and cooperation as the Agency requests to be able to verify the suspension of its heavy water related projects.\textsuperscript{34} To date, Iran has not provided the requested access.

27. While Iran has made statements to the effect that it has not suspended work on all its heavy water related projects, without full access to the heavy water at UCF, to HWPP, and any other heavy water related projects there may be in Iran, the Agency is unable to verify such statements and therefore to report fully on this matter.

28. On 10 May 2011, the Agency carried out a DIV at the IR-40 Reactor at Arak and observed that construction of the facility was ongoing and that the moderator heat exchangers had been delivered to the site. According to Iran, the operation of the IR-40 Reactor is planned to commence by the end of 2013.

F. Uranium Conversion and Fuel Fabrication

29. As indicated above, Iran is obliged to suspend all enrichment related activities and heavy water related projects. Some of the activities carried out by Iran at UCF and the Fuel Manufacturing Plant (FMP) at Esfahan are in contravention of that obligation, although both facilities are under Agency safeguards.

30. Between 5 March and 9 March 2011, the Agency carried out a PIV at UCF, and verified the total amount of uranium in the form of UF\textsubscript{6} present at the facility.

31. In a letter dated 16 March 2011, Iran informed the Agency that during the period 4–6 April 2011 it intended to start the production of natural UO\textsubscript{2} for IR-40 Reactor fuel. On 18 May 2011, the Agency carried out a DIV at UCF and observed that, although the process to produce such UO\textsubscript{2} had started, none had yet been produced. The Agency also confirmed that no UF\textsubscript{6} had been produced at UCF since 10 August 2009. The total amount of uranium produced at UCF since March 2004, therefore, remains 371 tonnes in the form of UF\textsubscript{6} (some of which has been transferred to FEP and PFEP), and remains subject to Agency containment and surveillance. During the DIV, the Agency observed that Iran had not yet begun the installation of equipment for the conversion of the UF\textsubscript{6} enriched up to 20% U-235 into U\textsubscript{3}O\textsubscript{8} for the fabrication of fuel for TRR.\textsuperscript{35}

32. On 11 May 2011, the Agency carried out an inspection and a DIV at FMP and confirmed that Iran had not yet started to install equipment for TRR fuel fabrication.\textsuperscript{36}

G. Possible Military Dimensions

33. The Board of Governors has called on Iran on a number of occasions to engage with the Agency on the resolution of all outstanding issues concerning Iran’s nuclear programme in order to exclude the existence of possible military dimensions to Iran’s nuclear programme.\textsuperscript{37} In resolution 1929 (2010), the Security Council

\textsuperscript{33} GOV/2010/62, para. 21.
\textsuperscript{34} S/RES/1737 (2006), para. 8.
\textsuperscript{35} GOV/2010/46, para. 25.
\textsuperscript{36} GOV/2010/46, para. 26.
\textsuperscript{37} Most recently in GOV/2009/82 (27 November 2009).
reaffirmed Iran’s obligations to take the steps required by the Board of Governors in its resolutions GOV/2006/14 and GOV/2009/82, including by providing access without delay to all sites, equipment, persons and documents requested by the Agency.\(^{38}\)

34. Previous reports by the Director General have listed the outstanding issues related to possible military dimensions to Iran’s nuclear programme and the actions required of Iran necessary to resolve these.\(^{39}\) On 6 May 2011, in light of Iran not having engaged with the Agency on the substance of these issues since August 2008, the Director General sent a letter to H.E. Mr Fereydoun Abbasi, Vice President of Iran and Head of the Atomic Energy Organization of Iran (AEOI), reiterating the Agency’s concerns about the existence of possible military dimensions to Iran’s nuclear programme and expressing the importance of Iran clarifying these issues. In the same letter, the Director General also requested that Iran provide prompt access to relevant locations, equipment, documentation and persons, and noted that, with Iran’s substantive and proactive engagement, the Agency would be able to make progress in its verification of the correctness and completeness of Iran’s declarations.

35. Based on the Agency’s continued study of information which the Agency has acquired from many Member States and through its own efforts, the Agency remains concerned about the possible existence in Iran of past or current undisclosed nuclear related activities involving military related organizations, including activities related to the development of a nuclear payload for a missile. Since the last report of the Director General on 25 February 2011, the Agency has received further information related to such possible undisclosed nuclear related activities, which is currently being assessed by the Agency. As previously reported by the Director General, there are indications that certain of these activities may have continued beyond 2004.\(^{40}\) The following points refer to examples of activities for which clarifications remain necessary in seven particular areas of concern:\(^{41}\)

- Neutron generator and associated diagnostics: experiments involving the explosive compression of uranium deuteride to produce a short burst of neutrons.
- Uranium conversion and metallurgy: producing uranium metal from fluoride compounds and its manufacture into components relevant to a nuclear device.
- High explosives manufacture and testing: developing, manufacturing and testing of explosive components suitable for the initiation of high explosives in a converging spherical geometry.
- Exploding bridgewire (EBW) detonator studies, particularly involving applications necessitating high simultaneity: possible nuclear significance of the use of EBW detonators.
- Multipoint explosive initiation and hemispherical detonation studies involving highly instrumented experiments: integrating EBW detonators in the development of a system to initiate hemispherical high explosive charges and conducting full scale experiments, work which may have benefitted from the assistance of foreign expertise.
- High voltage firing equipment and instrumentation for explosives testing over long distances and possibly underground: conducting tests to confirm that high voltage firing equipment is suitable for the reliable firing of EBW detonators over long distances.

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38 S/RES/1929, paras 2 and 3.
41 GOV/2011/7, Attachment.
• Missile re-entry vehicle redesign activities for a new payload assessed as being nuclear in nature: conducting design work and modelling studies involving the removal of the conventional high explosive payload from the warhead of the Shahab-3 missile and replacing it with a spherical nuclear payload.

H. Design Information

36. The modified Code 3.1 of the Subsidiary Arrangements General Part to Iran’s Safeguards Agreement provides for the submission to the Agency of design information for new facilities as soon as the decision to construct, or to authorize construction of, a new facility has been taken, whichever is the earlier. The modified Code 3.1 also provides for the submission of fuller design information as the design is developed early in the project definition, preliminary design, construction, and commissioning phases. Iran remains the only State with significant nuclear activities in which the Agency is implementing a comprehensive safeguards agreement but which is not implementing the provisions of the modified Code 3.1. The Agency is still awaiting receipt from Iran of, inter alia, updated design information for the IR-40 Reactor, and further information pursuant to statements it has made concerning the planned construction of new uranium enrichment facilities and the design of a reactor similar to TRR.

37. In a letter dated 26 April 2011, the Agency requested Iran to confirm the statement reportedly made by H.E. Mr Fereydoun Abbasi, to the effect that Iran plans to build four to five new reactors in Iran in the next few years in order to produce radioisotopes and carry out research. In the same letter, the Agency also requested that, if Iran had taken a decision to construct new nuclear facilities, Iran provide further information regarding the design and scheduling of the construction of the facilities. In its reply of 3 May 2011, Iran stated that it would provide the Agency with the required information in “due time” and in accordance with its Safeguards Agreement.

I. Additional Protocol

38. Iran is not implementing its Additional Protocol, contrary to the relevant resolutions of the Board of Governors and the Security Council. The Agency will not be in a position to provide credible assurance about the absence of undeclared nuclear material and activities in Iran unless and until Iran provides the necessary cooperation with the Agency, including by implementing its Additional Protocol.

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42 In accordance with Article 39 of Iran’s Safeguards Agreement, agreed Subsidiary Arrangements cannot be changed unilaterally; nor is there a mechanism in the Safeguards Agreement for the suspension of provisions agreed to in the Subsidiary Arrangements. Therefore, as previously explained in the Director General’s reports (see e.g. GOV/2007/22, 23 May 2007), the modified Code 3.1, as agreed to by Iran in 2003, remains in force. Iran is further bound by operative paragraph 5 of Security Council resolution 1929 (2010) to “comply fully and without qualification with its IAEA Safeguards Agreement, including through the application of modified Code 3.1”.

43 GOV/2010/46, para. 32.

44 ‘Iran will not stop producing 20% enriched uranium’, Tehran Times, 12 April 2011.

45 Iran’s Additional Protocol was approved by the Board on 21 November 2003 and signed by Iran on 18 December 2003, although it has not been brought into force. Iran provisionally implemented its Additional Protocol between December 2003 and February 2006.
J. Other Matters

39. On 15–16 April 2011, the Agency conducted a PIV at the Bushehr Nuclear Power Plant (BNPP), during which it verified all nuclear material present and confirmed that the loading of the fuel assemblies into the core had been completed. On 10 May 2011, Iran informed the Agency that the reactor had reached criticality.

K. Summary

40. While the Agency continues to conduct verification activities under Iran’s Safeguards Agreement, Iran is not implementing a number of its obligations, including: implementation of the provisions of its Additional Protocol; implementation of the modified Code 3.1 of the Subsidiary Arrangements General Part to its Safeguards Agreement; suspension of enrichment related activities; suspension of heavy water related activities; and clarification of the remaining outstanding issues which give rise to concerns about possible military dimensions to its nuclear programme.

41. While the Agency continues to verify the non-diversion of declared nuclear material at the nuclear facilities and LOFs declared by Iran under its Safeguards Agreement, as Iran is not providing the necessary cooperation, including by not implementing its Additional Protocol, the Agency is unable to provide credible assurance about the absence of undeclared nuclear material and activities in Iran, and therefore to conclude that all nuclear material in Iran is in peaceful activities.46

42. The Director General urges Iran to respond positively to his letter of 6 May 2011, and to take steps towards the full implementation of its Safeguards Agreement and its other relevant obligations, in order to establish international confidence in the exclusively peaceful nature of Iran’s nuclear programme.

43. The Director General will continue to report as appropriate.

46 The Board has confirmed on numerous occasions, since as early as 1992, that paragraph 2 of INFCIRC/153 (Corr.), which corresponds to Article 2 of Iran’s Safeguards Agreement, authorizes and requires the Agency to seek to verify both the non-diversion of nuclear material from declared activities (i.e. correctness) and the absence of undeclared nuclear activities in the State (i.e. completeness) (see, for example, GOV/OR.864, para. 49). Paragraph 41 reflects the past and current implementation by Iran of its Safeguards Agreement and other obligations.