

# Board of Governors

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## **For official use only**

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(GOV/2007/38)

# Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran

*Report by the Director General*

1. On 23 May 2007, the Director General reported to the Board of Governors on the implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran (Iran) (GOV/2007/22). The report was submitted in parallel to the Security Council pursuant to Security Council resolutions 1696 (2006), 1737 (2006) and 1747 (2007). This report covers developments regarding the implementation in Iran of its NPT Safeguards Agreement since May 2007.

2. On 24 June 2007, the Director General met with the Secretary of the Supreme National Security Council of Iran (SNSC). During that meeting, it was agreed that, within the following 60 days, a plan should be developed on modalities for resolving the remaining safeguards implementation issues, including the long outstanding issues (GOV/2007/22, para. 9). The modalities were discussed in meetings, led by the Deputy Director General for Safeguards and the Deputy Secretary of the SNSC, which took place on 11–12 July 2007 and 20–21 August 2007 in Tehran, and on 24 July 2007 in Vienna. On 21 August 2007, a plan (hereinafter referred to as the “work plan”), which includes understandings between the Secretariat and Iran on the modalities, procedures and timelines for resolving these matters, was finalized. A copy of that work plan (issued also as INFCIRC/711, 27 August 2007) is attached hereto.

## **A. Enrichment Related Activities**

3. Since May 2007, Iran has continued to test single centrifuge machines, the 10- and 20-machine cascades and one 164-machine cascade at the Pilot Fuel Enrichment Plant (PFEP). Between 17 March and 22 July 2007, Iran fed 14 kg of UF<sub>6</sub> into the single machines; there was no feeding of nuclear material into the cascades.

4. Since February 2007, Iran has fed approximately 690 kg of UF<sub>6</sub> into the cascades at the Fuel Enrichment Plant (FEP), which is well below the expected quantity for a facility of this design. While Iran has stated that it has reached enrichment levels up to 4.8% U-235 at FEP, the highest enrichment level measured from environmental samples taken so far by the Agency from cascade components and related equipment is 3.7%. Detailed nuclear material accountancy, which is necessary to confirm the

actual enrichment level, will be carried out when the product and tails are withdrawn from the cascades. As of 19 August 2007, twelve 164-machine cascades were operating simultaneously and were being fed with UF<sub>6</sub>; one other cascade was operating without UF<sub>6</sub>; another cascade was being vacuum tested; and two more were under construction.

5. Since 22 March 2007, the Agency has implemented safeguards at FEP through interim inspections, design information verification, unannounced inspections and the use of containment and surveillance measures (GOV/INF/2007/10). To date, four unannounced inspections have been carried out at FEP.

6. The Agency provided Iran with a draft document detailing the safeguards approach for FEP and a draft Facility Attachment on 24 and 26 July 2007, respectively. The documents were discussed during a technical meeting in Tehran held on 6–8 August 2007. Further discussions will be held with the aim of finalizing the Facility Attachment by the end of September 2007.

## **B. Reprocessing Activities**

7. The Agency has been monitoring the use and construction of hot cells at the Tehran Research Reactor (TRR), the Molybdenum, Iodine and Xenon Radioisotope Production Facility (the MIX Facility) and the Iran Nuclear Research Reactor (IR-40 reactor) through inspections and design information verification. There are no indications of ongoing reprocessing related activities at those facilities.

## **C. Heavy Water Related Projects**

8. As agreed by Iran on 12 July 2007, the Agency conducted design information verification at the IR-40 reactor on 30 July 2007, and noted that construction of the facility was ongoing. Satellite imagery indicates that the operation of the Heavy Water Production Plant was also continuing.

## **D. Outstanding Issues**

### **D.1. Plutonium Experiments**

9. As agreed in the meeting of 11–12 July 2007, the Agency provided Iran in writing on 1 August 2007 with the remaining open questions regarding plutonium separation experiments carried out by Iran at TRR (GOV/2007/8, paras 20–21). On 7 August 2007, during a technical meeting in Tehran, Iran provided additional information on the neutron flux distribution for the reactor core and reflector/moderator regions, details about earlier neutron flux measurements and information on the irradiation conditions. Using this additional information, the Agency made revised estimates of the Pu-240 abundance that could be expected from irradiation of the targets. The revised estimates derived from this new information were not inconsistent with the Agency's previous findings from samples taken during its investigations. Taking all available information into account, the Agency has concluded that Iran's statements concerning these experiments are consistent with the Agency's findings with respect to the dates, and quantities and types of material involved in the experiments (GOV/2006/53, paras 15–16). This issue is therefore considered resolved.

10. In the meeting on 7 August 2007, the presence and origin of high enriched uranium (HEU) particle contamination found in samples taken from the spent fuel containers at the Karaj Waste Storage Facility (GOV/2006/53, para. 17) was addressed. Iran has maintained that the reason for the contamination was leaking TRR fuel assemblies, which had in the past been stored temporarily in these containers. During the meeting, Iran presented a copy of a report describing its investigations into the fuel leakage problem at TRR, in connection with which Agency technical support had been

provided in the early 1990s. Based on this information, the Agency has concluded that the main sources of irradiated HEU in the coolant system likely included both leaks from the fuel itself and irradiated HEU contamination from the surface of the fuel cladding. It can be further estimated that the natural uranium content in the cooling water of TRR was sufficient to dilute the level of enrichment of the HEU particles to that found in the Agency's samples taken from the containers at Karaj. Iran also provided information on the burnup and the uranium mass for all fuel assemblies at the time of the intermediate and final fuel discharges. The data indicate that several control fuel assemblies had in fact leaked, and that the stated burnup matched that calculated for a majority of the HEU particles. The Agency has concluded, therefore, that the statements of Iran are not inconsistent with the Agency's findings, and now considers this issue as resolved.

## **D.2. Acquisition of P-1 and P-2 Centrifuge Technology**

11. In order to complete its investigation of the scope and nature of Iran's centrifuge enrichment programme, the Agency needs access to additional information (GOV/2006/27, paras 10–13). This includes information related to the acquisition of P-1 technology in 1987, and P-1 and P-2 technology in the mid-1990s, as well as appropriate supporting documentation and clarifications by relevant individuals. The Agency is still waiting for, inter alia: a copy of a handwritten offer made to Iran by the network in 1987; clarification of the dates and contents of shipments in the mid-1990s; and information concerning the purchase of magnets suitable for P-2 centrifuges. Iran has, however, undertaken, as part of the work plan, to provide, over the course of the next two months, answers to written questions from the Agency, as well as clarifications and access to information, such as supporting documentation, with a target date of November 2007 for resolving this issue.

## **D.3. Contamination**

12. As indicated previously to the Board of Governors (GOV/2007/8, paras 16–17; GOV/2006/53, para. 24), analysis of environmental samples taken in January 2006 from equipment purchased by a former Head of the Physics Research Centre (PHRC) and located at a technical university in Tehran showed a small number of particles of natural and high enriched uranium. The Agency has requested clarifications, permission to take samples from other equipment and materials procured by the PHRC and access to another former Head of the PHRC (GOV/2006/53, para. 25). These requests have not yet been acceded to by Iran. However, as reflected in the work plan, Iran has undertaken to hold further discussions on this matter, on the basis of written questions from the Agency, following resolution of the P-1 and P-2 issue.

## **D.4. Uranium Metal Document**

13. To understand the full scope of the offers made by the intermediaries that provided centrifuge enrichment technology to Iran, the Agency has requested a copy of the 15-page document describing the procedures for the reduction of UF<sub>6</sub> to uranium metal and the casting and machining of enriched and depleted uranium metal into hemispheres (GOV/2005/87, para. 6). As reflected in the work plan, Iran has now agreed to cooperate in this regard.

## **D.5. Polonium-210**

14. As indicated in the work plan, Iran has agreed to provide the Agency, two weeks after the issue of the provision of a copy of the uranium metal document is resolved, with explanations in connection with the remaining questions concerning Iran's activities involving polonium extraction (GOV/2004/83, paras 79–84).

## **D.6. Gchine Mine**

15. As indicated in the work plan, Iran has agreed to provide the Agency, two weeks after the issue on polonium-210 is resolved, with the requested explanations concerning uranium mining and concentration activities at the Gchine mine and mill (GOV/2005/67, paras 26–31).

## **E. Alleged Studies**

16. In order to clarify certain aspects of the scope and nature of Iran's nuclear programme, the Agency has requested discussions with Iran about alleged studies related to the conversion of uranium dioxide to UF<sub>4</sub>, to high explosive testing and to the design of a missile re-entry vehicle (GOV/2006/15, paras 38–40). To that end, the Agency has offered to provide Iran with access to the documentation it has in its possession regarding such studies. As indicated in the work plan, while Iran considers the allegations "as politically motivated and baseless", it has undertaken to review the documentation and to inform the Agency of its assessment thereof.

## **F. Other Implementation Issues**

### **F.1. Uranium Conversion**

17. The Agency has finalized its assessment of the results of the physical inventory verification (PIV) of nuclear material at the Uranium Conversion Facility (UCF) carried out in March 2007, and has concluded that the physical inventory as declared by Iran was consistent with the results of the PIV, within the measurement uncertainties normally associated with conversion plants of a similar throughput.

18. During the current conversion campaign at UCF, which began on 31 March 2007 following the PIV, approximately 63 t of uranium in the form of UF<sub>6</sub> had been produced as of 14 August 2007, all of which remains under Agency containment and surveillance.

### **F.2. Design Information**

19. As indicated in the Director General's previous report (GOV/2007/22, paras 12–14), on 29 March 2007, Iran informed the Agency that it had "suspended" the implementation of the modified text of its Subsidiary Arrangements General Part, Code 3.1, concerning the early provision of design information. In a letter dated 30 March 2007, the Agency requested Iran to reconsider its decision (GOV/INF/2007/8). There has been no progress on this issue.

### **F.3. Inspector Designation and Visas**

20. On 12 July 2007, Iran agreed to the designation of five new Agency inspectors (GOV/2007/8, para. 23), bringing the total number of inspectors designated for Iran to 219. Iran also agreed to provide thirteen Agency inspectors with one year multiple entry visas.

### **F.4. Other Matters**

21. On 25 July 2007, the Agency conducted a PIV at the Fuel Manufacturing Plant, at which time it verified a small quantity of natural uranium oxide powder intended as feed material for preliminary process testing. The installation of process equipment is at an advanced stage, but the facility is not yet operational.

## **G. Summary**

22. The Agency is able to verify the non-diversion of declared nuclear material in Iran. Iran has been providing the Agency with access to declared nuclear material, and has provided the required nuclear material accountancy reports in connection with declared nuclear material and facilities. However, the Agency remains unable to verify certain aspects relevant to the scope and nature of Iran's nuclear programme. It should be noted that since early 2006, the Agency has not received the type of information that Iran had previously been providing, including pursuant to the Additional Protocol, for example information relevant to ongoing advanced centrifuge research.

23. The work plan is a significant step forward. If Iran finally addresses the long outstanding verification issues, the Agency should be in a position to reconstruct the history of Iran's nuclear programme. Naturally, the key to successful implementation of the agreed work plan is Iran's full and active cooperation with the Agency, and its provision to the Agency of all relevant information and access to all relevant documentation and individuals to enable the Agency to resolve all outstanding issues. To this end, the Agency considers it essential that Iran adheres to the time line defined therein and implements all the necessary safeguards and transparency measures, including the measures provided for in the Additional Protocol.

24. Once Iran's past nuclear programme has been clarified, Iran would need to continue to build confidence about the scope and nature of its present and future nuclear programme. Confidence in the exclusively peaceful nature of Iran's nuclear programme requires that the Agency be able to provide assurances not only regarding declared nuclear material, but, equally important, regarding the absence of undeclared nuclear material and activities in Iran, through the implementation of the Additional Protocol. The Director General therefore again urges Iran to ratify and bring into force the Additional Protocol at the earliest possible date, as requested by the Board of Governors and the Security Council.

25. Contrary to the decisions of the Security Council, Iran has not suspended its enrichment related activities, having continued with the operation of PFEP, and with the construction and operation of FEP. Iran is also continuing with its construction of the IR-40 reactor and operation of the Heavy Water Production Plant.

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

(Issued also as INFCIRC/711)

**Understandings**  
**of**  
**the Islamic Republic of Iran and the IAEA**  
**on**  
**the Modalities of Resolution of the Outstanding Issues**  
**Tehran – 21 August 2007**

Pursuant to the negotiations between H.E. Dr. Larijani, I. R. of Iran's Secretary of Supreme National Security Council and H.E. Dr. ElBaradei, Director General of the IAEA, in Vienna; following the initiative and good will of the Islamic Republic of Iran and the agreement made, a high ranking delegation consisting of the directors of technical, legal and political departments of the IAEA, paid a visit to Tehran from 11 to 12 July 2007 during which "Understandings of The Islamic Republic of Iran and the IAEA on the Modalities of Resolution of the Outstanding Issues, Tehran 12 July 2007" were prepared.

A second meeting took place in Vienna on 24 July 2007 followed by a further meeting in Iran from 20 to 21 August 2007. The Agency's delegation had the opportunity to have meetings with H.E. Dr. Larijani during both visits to Tehran. Following these three consecutive meetings, both Parties reached the following understandings:

**I. Latest Developments:**

Based on the modalities agreed upon on 12 July 2007, the following decisions were made:

**1. Present Issues:**

**A. Enrichment Programme**

The Agency and Iran agreed to cooperate in preparing the safeguards approach for the Natanz Fuel Enrichment Plant in accordance with Iran's Comprehensive Safeguards Agreement. The draft text of the safeguards approach paper, and the facility attachment of IRN- were provided to Iran on 23 July 2007. The safeguards approach and the facility attachment were discussed during technical meetings in Iran between the Agency and the AEOI from 6 to 8 August 2007. Further discussions will be held with the aim of finalizing the facility attachment by the end of September 2007.

## **B. Heavy Water Research Reactor in Arak**

Iran agreed with the Agency's request to visit the heavy water research reactor (IR40) site in Arak. A successful visit took place on 30 July 2007.

## **C. Designation of new inspectors**

On 12 July 2007, Iran accepted the designation of five additional inspectors.

## **D. Issue of multiple entry visas**

On 12 July 2007, Iran agreed to issue one year multiple entry visas for 14 inspectors and staff of the Agency.

## **2. Past Outstanding Issues:**

### **A. Plutonium Experiments**

In order to conclude and close the file of the issue of plutonium (Pu), the Agency provided Iran with the remaining questions on 23 July 2007. During a meeting in Iran between representatives of the Agency and Iran, Iran provided clarifications to the Agency that helped to explain the remaining questions. In addition, on 7 August 2007, Iran sent a letter to the Agency providing additional clarifications to some of the questions. On 20 August 2007 the Agency stated that earlier statements made by Iran are consistent with the Agency's findings, and thus this matter is resolved. This will be communicated officially by the Agency to Iran through a letter.

### **B. Issue of P1-P2:**

Based on agreed modalities of 12 July 2007, Iran and the Agency agreed the following procedural steps to resolve the P1-P2 issue. The proposed timeline assumes that the Agency announces the closure of the Pu-experiments outstanding issue by 31 August 2007, and its subsequent reporting in the Director General's report to the September 2007 Board of Governors.

The Agency will provide all remaining questions on this issue by 31 August 2007. Iran and the Agency will have discussions in Iran on 24-25 September 2007 to clarify the questions provided. This will be followed up by a further meeting in mid-October 2007 to further clarify the written answers provided. The Agency's target date for the closure of this issue is November 2007.

### **C. Source of Contamination**

Based on the agreed modalities on 12 July 2007 and given the Agency's findings which tend, on balance, to support Iran's statement about the foreign origin of the observed HEU contamination, the

only remaining outstanding issue on contamination is the contamination found at a Technical University in Tehran.

Iran and the Agency agreed on the following procedural steps to address this issue, starting once the P1-P2 issue is concluded and the file is closed. The Agency will again provide Iran with the remaining questions regarding the contamination found at a Technical University in Tehran by 15 September 2007. After 2 weeks of the closure of the P1-P2 issue Iran and the Agency will have discussions in Iran on this issue.

#### **D. U Metal Document**

Upon the request of the Agency, Iran agreed to cooperate with the Agency in facilitating the comparison of the relevant sections of the document. Iran is presently reviewing the proposals already made during the first meeting on 12 July 2007. After taking this step by Iran, the Agency undertakes to close this issue.

### **II. Modalities of Resolution of other Outstanding Issues**

#### **A. Po210**

Based on agreed modalities of 12 July 2007, Iran agreed to deal with this issue, once all the above mentioned issues are concluded and their files are closed. Iran and the Agency agreed upon the following procedural steps: regarding this issue, the Agency will provide Iran in writing with all its remaining questions by 15 September 2007.

After 2 weeks from conclusion and closure of the issues of the source of contamination and U-metal, reflected in the Director General's report to the Board of Governors, Iran and the Agency will have discussions in Iran where Iran will provide explanations on the Po210.

#### **B. Ghachine Mine**

Based on agreed modalities of 12 July 2007, Iran agreed to deal with this issue, once the issue of Po210 is concluded and its file is closed. Iran and the Agency agreed upon the following procedural steps: regarding this issue, the Agency will provide Iran in writing with all its remaining questions by 15 September 2007.

After 2 weeks from conclusion and closure of the issue of Po210, reflected in the Director General's report to the Board of Governors, Iran and the Agency will have discussions in Iran where Iran will provide explanations to the Agency about Ghachine Mine.

### **III. Alleged Studies**

Iran reiterated that it considers the following alleged studies as politically motivated and baseless allegations. The Agency will however provide Iran with access to the documentation it has in its

possession regarding: the Green Salt Project, the high explosive testing and the missile re-entry vehicle.

As a sign of good will and cooperation with the Agency, upon receiving all related documents, Iran will review and inform the Agency of its assessment.

#### **IV. General Understandings**

1. These modalities cover all remaining issues and the Agency confirmed that there are no other remaining issues and ambiguities regarding Iran's past nuclear program and activities.
2. The Agency agreed to provide Iran with all remaining questions according to the above work plan. This means that after receiving the questions, no other questions are left. Iran will provide the Agency with the required clarifications and information.
3. The Agency's delegation is of the view that the agreement on the above issues shall further promote the efficiency of the implementation of safeguards in Iran and its ability to conclude the exclusive peaceful nature of the Iran's nuclear activities.
4. The Agency has been able to verify the non-diversion of the declared nuclear materials at the enrichment facilities in Iran and has therefore concluded that it remains in peaceful use.
5. The Agency and Iran agreed that after the implementation of the above work plan and the agreed modalities for resolving the outstanding issues, the implementation of safeguards in Iran will be conducted in a routine manner.