

## Board of Governors

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# Implementation of the NPT Safeguards Agreement and relevant provisions of Security Council resolutions 1737 (2006) and 1747 (2007) in the Islamic Republic of Iran

*Report by the Director General*

1. On 30 August 2007, the Director General reported to the Board of Governors on the implementation of the NPT Safeguards Agreement and relevant provisions of Security Council resolutions 1737 (2006) and 1747 (2007) in the Islamic Republic of Iran (Iran) (GOV/2007/48 and Corr.1). This report covers the relevant developments since that date.

## **A. Implementation of the Work Plan on Outstanding Issues**

2. On 21 August 2007, the Secretariat and Iran reached understandings on a work plan for resolving outstanding safeguards implementation issues (GOV/2007/48, Attachment). Since the previous report, the following progress has been made in the implementation of the work plan.

### **A.1. P-1 and P-2 Centrifuges**

3. The chronology of activities since the previous report is as follows:

- On 31 August 2007, the Agency provided to Iran in writing the outstanding questions relating to the P-1 and P-2 uranium enrichment programme;
- On 24 and 25 September 2007, a meeting took place in Tehran between the Agency and Iranian officials to clarify the questions provided to Iran;
- From 9 to 11 October 2007, another meeting took place in Tehran between the Agency and the Iranian authorities, at which Iran provided oral answers to the questions and the Agency requested additional clarifications and amplifications;

- On 15 October 2007, the Agency received preliminary written answers to the questions;
- From 20 to 24 October 2007, an Agency technical team visited Tehran to review in detail the answers and supporting documentation, and to interview officials involved in the P-1 and P-2 uranium enrichment programme;
- From 29 October to 1 November 2007, the Agency continued discussions with the Iranian authorities on the centrifuge enrichment programme. Iran provided additional supporting documentation and written amplifications and the Agency held discussions and interviews with Iranian officials involved in nuclear activities in the 1980s and 1990s;
- On 5 and 12 November 2007, Iran provided in writing its response to the Agency's questions about the P-1 and P-2 uranium enrichment programme.

### **A.1.1. Acquisition of Fuel Cycle Facilities and Technology 1972–1995**

4. According to Iran, in its early years, the Atomic Energy Organization of Iran (AEOI) concluded a number of contracts with entities from France, Germany, the United Kingdom and the United States of America to enable it to acquire nuclear power and a wide range of related nuclear fuel cycle services, but after the 1979 revolution, these contracts with a total value of around \$10 billion were not fulfilled. Iran noted that one of the contracts, signed in 1976, was for the development of a pilot plant for laser enrichment<sup>1</sup>. Senior Iranian officials said that, in the mid-1980s, Iran started working with many countries to revitalize its nuclear programme to meet the State's growing energy needs. Taking advantage of investments already made, Iran said it focused its efforts initially on the completion of the Bushehr nuclear power plant, working with entities from, inter alia, Argentina, France, Germany and Spain, but without success. At that time, Iran also initiated efforts to acquire research reactors from Argentina, China, India and the former Soviet Union, but also without success.

5. Parallel to the activities related to nuclear power plants, Iran started to build supporting infrastructure by establishing nuclear technology centres in Esfahan and Karaj. However, apart from uranium conversion technology acquired from an entity in China, Iran was not able to acquire other nuclear fuel cycle facilities or technology from abroad. As a result, according to Iran, a decision was made in the mid-1980s to acquire uranium enrichment technology on the black market.

6. To assess the detailed information provided by Iran, the Agency held discussions with senior current and former Iranian officials. The Agency also examined supporting documentation, including Iranian legislation, contracts with foreign companies, agreements with other States and nuclear site surveys.

7. Bearing in mind the long history and complexity of the programme and the dual nature of enrichment technology, the Agency is not in a position, based on the information currently available to it, to draw conclusions about the original underlying nature of parts of the programme. Further light may be shed on this question when other aspects of the work plan have been addressed and when the Agency has been able to verify the completeness of Iran's declarations.

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<sup>1</sup> In addition to the 1976 contract for the laser enrichment pilot plant, concluded with a US company, Iran has reported the conclusion of the following contracts related to laser enrichment (GOV/2004/60, Annex, para. 30):

- 1975 – for the establishment of a laboratory to study the spectroscopic behaviour of uranium metal (Germany);
- 1991 – for the establishment of a Laser Spectroscopy Laboratory and a Comprehensive Separation Laboratory (China);
- 1998 – to obtain information related to laser enrichment, and the supply of relevant equipment (Russian Federation).

## **A.1.2. Acquisition of P-1 Centrifuge Technology**

### ***The 1987 Offer***

8. As previously reported to the Board (GOV/2005/67, paras 14–15), the Agency was shown by Iran in January 2005 a copy of a hand-written one-page document reflecting an offer for certain components and equipment said to have been made to Iran in 1987 by a foreign intermediary. Iran stated in 2005 that this was the only remaining documentary evidence relevant to the scope and content of the 1987 offer. On 9 October 2007, the Agency was provided with a copy of the document. Certain aspects of the document indicate that it dates from 1987. However, the originator of the document has still not been identified.

9. On 5 November 2007, Iran provided the Agency with an updated chronology of meetings between Iran and the supply network covering the period 1986 to 1987. Iran maintains that only some components of two disassembled centrifuges, plus supporting drawings and specifications, were delivered in 1987 by the network. Iran reiterated that it did not acquire uranium casting and re-conversion technology or equipment from the network, nor did it ask for the 15-page document describing the procedures for the reduction of UF<sub>6</sub> to uranium metal, and its casting into hemispheres (GOV/2005/87, para. 6). These points are addressed in A.3 below.

10. According to Iran, the decision to acquire centrifuge technology was taken by the President of the AEOI and endorsed by the Prime Minister of Iran. In response to its enquiries about possible additional documentation relevant to the 1987 offer, the Agency was provided on 8 November 2007 with a copy of a confidential communication from the President of the AEOI to the Prime Minister, dated 28 February 1987, which also carried the Prime Minister's endorsement, dated 5 March 1987. In his communication, the AEOI President indicated that the activities "should be treated fully confidentially." In response to the Agency's enquiry as to whether there was any military involvement in the programme, Iran has stated that no institution other than the AEOI was involved in the decision-making process or in the implementation of the centrifuge enrichment programme.

11. Based on interviews with available Iranian officials and members of the supply network, limited documentation provided by Iran and procurement information collected through the Agency's independent investigations, the Agency has concluded that Iran's statements are consistent with other information available to the Agency concerning Iran's acquisition of declared P-1 centrifuge enrichment technology in 1987.

### ***Early Research and Development***

12. Iran has stated that, during the first phase of P-1 research and development (R&D) in 1987–1993, it devoted only limited financial and human resources (three researchers) to the project. According to Iran, emphasis was put on understanding the behaviour of centrifuges and their assembly and on domestic production of components. Iran has also stated that during this period, the R&D work was conducted only by the AEOI, without the support of universities or the Physics Research Centre (PHRC). According to Iran, no contacts were made during this period with the supply network to seek support in solving technical problems which Iran had encountered.

13. Iran's statements about this phase of R&D are not inconsistent with the Agency's findings, which are based on interviews with available Iranian officials and members of the supply network, supporting documentation provided by Iran and procurement information collected during the Agency's investigations. However, the role of the technical university at which uranium particle contamination was found still needs to be examined (see A.2 below).

### ***The 1993 Offer and Subsequent R&D***

14. As previously reported to the Board (GOV/2006/15, para. 15), statements made by Iran and key members of the supply network about the events leading up to the mid-1990s offer have been at variance with each other. Over the course of meetings held in October 2007, Iran provided the Agency with an updated chronology of events from 1993 to 1999 which clarified certain details concerning meetings, participants and deliveries of P-1 centrifuge equipment by the network during this period.

15. Iran stated again that in 1993 the supply network, on its own initiative, had approached an Iranian company with an offer to sell enrichment technology. This offer was brought to the attention of the Head of Iran's Budget and Planning Organization, who was also a member of the country's Atomic Energy Council. The offer was then further pursued by the AEOI (GOV/2005/67, para. 16).

16. The Agency has so far not been able to confirm Iran's statement that the supply network initiated the 1993 offer. Information provided by Iran on the deliveries and technical meetings after 1993 is consistent with that given to the Agency in interviews with some of the network members. Based on interviews with Libyan officials and supply network members and information from other sources, the Agency has concluded that most of the items related to the 1993 offer had originally been ordered by the Libyan Arab Jamahiriya but were in fact delivered to Iran in the period 1994–1996.

17. Iran stated that, during the period 1993 to 1999, it was still experiencing difficulty in producing components for P-1 centrifuges and manufacturing reliable P-1 centrifuges. It said that only limited human resources were devoted to the project until 1997 and that, around 1998, additional theoretical and experimental studies were initiated at the Amir Khabir University. Its statements in this regard are supported by the technical questions raised by AEOI staff with the network and procurement information available to the Agency.

18. Iran stated that it successfully tested P-1 centrifuges at the end of the 1990s and that a decision was made to go ahead with larger-scale R&D and eventually with an enrichment plant. To that end, Iran stated that it considered locations at Hashtgerd Karaj, Natanz and Esfahan before deciding to build the enrichment plant at Natanz. During this period, procurement activities were intensified and vacuum equipment, as well as special raw materials such as maraging steel and high strength aluminium, were acquired from abroad. Iran has provided names, locations and activities of the workshops involved in the domestic production of centrifuge components, most of which are owned by military industrial organizations (GOV/2004/11, para. 37). Information provided by Iran on the timing of these purchases and the quantities involved is consistent with the Agency's findings.

### **A.1.3. Acquisition of P-2 Centrifuge Technology**

19. Iran has stated that, in order to compensate it for the poor quality of the P-1 centrifuge components provided by the supply network, the network provided Iran at a meeting in Dubai in 1996 with a full set of general P-2 centrifuge drawings. This statement was confirmed to the Agency in interviews with key members of the network.

20. Iran has reiterated that, although the drawings were acquired in 1996, no work on P-2 centrifuges was begun until 2002. According to the former and current senior management of the AEOI, Iran did not yet have the technical and scientific capabilities to master centrifuge manufacturing during this period. The Agency does not have credible procurement related information pointing to the actual acquisition by Iran of P-2 centrifuges or components during this period (an earlier indication which appeared to support this (GOV/2006/15, para. 18) could not be substantiated).

21. In 2002, the AEOI concluded a contract with a private company to manufacture a modified P-2 centrifuge (GOV/2004/11, para. 45). On 5 November 2007, the Agency received a copy of the contract, the content of which is consistent with earlier interviews with the company owner, who was not available for interview on this occasion. The contract was terminated in March 2003, but the company owner has stated that he continued to work “on his own initiative” until June 2003.

22. The owner of the company stated in earlier interviews that he was able to obtain all raw materials and minor items, with the exception of bearings, oils and magnets, from domestic sources, which is consistent with the procurement information currently available to the Agency. The owner stated that he acquired 150 magnets with P-2 specifications and attempted to buy tens of thousands more, but these orders were cancelled by the suppliers. The AEOI stated that, after termination of his contract with the AEOI, the company owner sought to secure the supply of additional magnets for the AEOI but that his attempts to do so failed, which is consistent with the information available to the Agency through its investigations. Iran acknowledged that composite rotors for P-2 centrifuges had been manufactured in a workshop situated on a Defence Industries Organisation (DIO) site (GOV/2004/34, para. 22).

23. Based on visits made by Agency inspectors to the P-2 workshop in 2004, examination of the company owner’s contract, progress reports and logbooks, and information available on procurement enquiries, the Agency has concluded that Iran’s statements on the content of the declared P-2 R&D activities are consistent with the Agency’s findings. Environmental samples taken at declared R&D locations and from equipment did not indicate that nuclear material was used in these experiments.

## **A.2. Source of Contamination**

24. On 15 September 2007, the Agency provided Iran with questions in writing in connection with the source of uranium particle contamination at the technical university and requested access to relevant documentation and to individuals, as well as to relevant equipment and locations for sample-taking. The questions were, inter alia, about the origin of the uranium particle contamination of equipment (GOV/2006/53, para. 24), the nature of the equipment, the envisioned use of the equipment and the names and roles of individuals and entities involved (including PHRC). In accordance with the work plan, Iran should provide answers to the questions and the requested access in the next few weeks.

## **A.3. Uranium Metal Document**

25. On 8 November 2007, the Agency received a copy of the 15-page document describing the procedures for the reduction of UF<sub>6</sub> to uranium metal and casting it into hemispheres. Iran has reiterated that this document was received along with the P-1 centrifuge documentation in 1987. The Agency has shared this document with Pakistan, the purported country of origin, and is seeking more information. Iran stated that the reconversion unit with casting equipment mentioned in the one-page 1987 offer was not pursued with the supply network. Apart from the conversion experiments of UF<sub>4</sub> to uranium metal at the Tehran Nuclear Research Centre (GOV/2004/60 Annex, para. 2), the Agency has seen no indication of any UF<sub>6</sub> reconversion and casting activity in Iran. It should be noted, however, that a small UF<sub>6</sub> to uranium metal conversion line in the Uranium Conversion Facility (UCF) was declared by Iran in the design information questionnaire for the UCF (GOV/2003/75, Annex 1, para. 3). This line has not been built, as verified by the Agency’s inspectors.

## **A.4. Polonium-210**

26. On 15 September 2007, the Agency provided questions in writing to Iran concerning Iran’s activities involving polonium and requested access to relevant documentation, individuals and

equipment. The questions were, inter alia, about the scope and objectives of the polonium-210 studies (GOV/2004/11, para. 28), whether any bismuth acquisitions from abroad had been made or attempted and whether any related theoretical or R&D studies had been carried out in Iran. In accordance with the work plan, Iran should provide answers to the questions and the requested access in the next few weeks.

### **A.5. Gchine Mine**

27. On 15 September 2007, the Agency provided questions in writing to Iran concerning the Gchine Mine and requested access to relevant documentation, individuals and equipment. The questions were, inter alia, about the ownership of the mining area and mill, why activities took place at this location when suitable infrastructure was available elsewhere and why AEOI activities at the mine ceased around 1993 (GOV/2005/67, para. 26). In accordance with the work plan, Iran should provide answers to the questions and the requested access in the next few weeks.

### **A.6. Alleged Studies**

28. The Agency has urged Iran to address at an early date the alleged studies concerning the conversion of uranium dioxide into UF<sub>4</sub> (the green salt project), high explosive testing and the design of a missile re-entry vehicle (GOV/2006/15, paras 38–39). In accordance with the work plan, Iran should address this topic in the next few weeks. In the meantime, the Agency is working on arrangements for sharing with Iran documents provided by third parties related to the alleged studies.

### **A.7. Facility Attachment for the Natanz Fuel Enrichment Plant**

29. On 17 and 18 September 2007, an Agency technical team discussed with the Iranian authorities details of a draft Facility Attachment for the Fuel Enrichment Plant (FEP) at Natanz. Further discussions from 20 to 24 September led to the entry into force of the Facility Attachment on 30 September 2007.

## **B. Current Enrichment Related Activities**

30. On 3 November 2007, the Agency verified that Iran had finished installing eighteen 164-machine cascades at FEP and that UF<sub>6</sub> had been fed into all 18 cascades. There has been no installation of centrifuges or centrifuge pipework outside the original 18-cascade area. Work to install feed and withdrawal infrastructure and auxiliary systems is continuing.

31. Since February 2007, Iran has fed approximately 1240 kg of UF<sub>6</sub> into the cascades at FEP. The feed rate has remained 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 U-235 enrichment measured so far from the environmental samples taken by the Agency from cascade components and related equipment is 4.0%. Detailed nuclear material accountancy will be carried out during the annual physical inventory taking which is scheduled from 16 to 19 December 2007. Since March 2007, a total of seven unannounced inspections have been carried out at FEP.

32. Since August 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 23 July and 22 October 2007, Iran fed 5 kg of UF<sub>6</sub> into the single machines; no nuclear material was

fed into the cascades. From 15 to 18 September 2007, the Agency performed a physical inventory verification at PFEP. Although some of the sample results are not yet available, the Agency's provisional evaluation tends to confirm the physical inventory as declared by Iran.

33. There have been several press reports about statements by high level Iranian officials concerning R&D and testing of P-2 centrifuges by Iran (GOV/2006/27, para. 14). In a communication to the Agency received on 8 November 2007, Iran wrote: "Iran voluntarily has informed the IAEA on the status of mechanical test (without UF<sub>6</sub> feeding) of new generation of centrifuge design." In the communication, Iran added that it "agreed that exchanging of the new centrifuge generation information" would be discussed with the Agency in December 2007.

## **C. Reprocessing Activities**

34. The Agency has continued 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) through inspections and design information verification. There have been no indications of ongoing reprocessing related activities at those facilities.

## **D. Heavy Water Reactor Related Projects**

35. On 11 November 2007, the Agency conducted design information verification at the IR-40 and noted that construction of the facility was proceeding. Satellite imagery appears to indicate that the Heavy Water Production Plant is operating. The Agency must rely on satellite imagery of this plant as it does not have routine access to it while the Additional Protocol remains unimplemented.

## **E. Other Implementation Issues**

### **E.1. Uranium Conversion**

36. During the current conversion campaign at UCF, which began on 31 March 2007, approximately 78 tonnes of uranium in the form of UF<sub>6</sub> had been produced as of 5 November 2007. This brings the total amount of UF<sub>6</sub> produced at UCF since March 2004 to approximately 266 tonnes, all of which remains under Agency containment and surveillance.

## **E.2. Design Information**

37. On 30 March 2007, the Agency requested Iran to reconsider its decision to suspend the implementation of the modified text of its Subsidiary Arrangements General Part, Code 3.1. (GOV/2007/22, paras 12–14)<sup>2</sup>, but there has been no progress on this issue.

## **E.3. Other Matters**

38. The Agency has made arrangements to verify and seal the fresh fuel foreseen for the Bushehr nuclear power plant on 26 November 2007, before shipment of the fuel from the Russian Federation to Iran.

## **F. Summary**

39. The Agency has been able to verify the non-diversion of declared nuclear material in Iran. Iran has provided the Agency with access to declared nuclear material, and has provided the required nuclear material accountancy reports in connection with declared nuclear material and activities. Iran concluded a Facility Attachment for FEP. However, it should be noted that, since early 2006, the Agency has not received the type of information that Iran had previously been providing, pursuant to the Additional Protocol and as a transparency measure. As a result, the Agency's knowledge about Iran's current nuclear programme is diminishing.

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

41. There are two remaining major issues relevant to the scope and nature of Iran's nuclear programme: Iran's past and current centrifuge enrichment programme and the alleged studies. The Agency has been able to conclude that answers provided on the declared past P-1 and P-2 centrifuge programmes are consistent with its findings. The Agency will, however, continue to seek corroboration and is continuing to verify the completeness of Iran's declarations. The Agency intends in the next few weeks to focus on the contamination issue as well as the alleged studies and other activities that could have military applications.

42. Iran has provided sufficient access to individuals and has responded in a timely manner to questions and provided clarifications and amplifications on issues raised in the context of the work plan. However, its cooperation has been reactive rather than proactive. As previously stated, Iran's active cooperation and full transparency are indispensable for full and prompt implementation of the work plan.

43. In addition, Iran needs to continue to build confidence about the scope and nature of its present 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

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<sup>2</sup> Code 3.1 of the Subsidiary Arrangements General Part as agreed to in 1976 provides for the submission of design information for new facilities "normally not later than 180 days before the facility is scheduled to receive nuclear material for the first time", in contrast to the modified text agreed to in 2003, which provides for the submission of such information as soon as the decision to construct, or to authorize construction, of such a facility has been taken, whichever is earlier.



importantly, regarding the absence of undeclared nuclear material and activities in Iran. Although the Agency has no concrete information, other than that addressed through the work plan, about possible current undeclared nuclear material and activities in Iran, the Agency is not in a position to provide credible assurances about the absence of undeclared nuclear material and activities in Iran without full implementation of the Additional Protocol. This is especially important in the light of Iran's undeclared activities for almost two decades and the need to restore confidence in the exclusively peaceful nature of its nuclear programme. Therefore, the Director General again urges Iran to implement the Additional Protocol at the earliest possible date. The Director General also urges Iran to implement all the confidence building measures required by the Security Council, including the suspension of all enrichment related activities.

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