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Implementation of the NPT Safeguards Agreement and relevant provisions of Security Council resolutions 1737 (2006), 1747 (2007), 1803 (2008) and 1835 (2008) in the Islamic Republic of Iran

Report by the Director General

1. On 18 February 2010, 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), 1747 (2007), 1803 (2008) and 1835 (2008) in the Islamic Republic of Iran (Iran) (GOV/2010/10). This report covers developments since that date.

A. Current Enrichment Related Activities

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

2. **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 (Units A21 to A28) are planned for Production Hall A, with 18 cascades in each unit. No detailed design information has been provided for Production Hall B.

3. On 24 May 2010, Iran was feeding natural UF₆ into all 18 cascades of Unit A24, and 6 cascades of Unit A26, at FEP. Sixteen cascades of Unit A28 and the remaining 12 cascades of Unit A26 (seven cascades of which were under vacuum) were also installed, but were not being fed with UF₆.¹ To date, all the centrifuges installed are IR-1 machines, of which there are 164 in each cascade. Installation

¹ On 24 May 2010, of the 8528 centrifuges which had been installed at FEP, 3936 centrifuges were being fed with UF₆.

work in Units A21, A22, A23, A25 and A27 was ongoing but no centrifuges had been installed. As of 4 May 2010, there had been no installation work in Production Hall B.

4. As reported previously, the Agency conducted a physical inventory verification (PIV) at FEP and verified that, as of 22 November 2009, 21 140 kg of natural UF₆ had been fed into the cascades since production first began in February 2007, and a total of 1808 kg of low enriched UF₆ had been produced.² While the Agency was able to confirm the total amount of uranium, there is a difference between the Agency's measurement and the operator's measurement of the U-235 enrichment level for the enriched material in the product cylinder. The Agency informed Iran of this in a letter dated 13 April 2010, and is discussing with Iran how Iran can improve the operator's measurement system in this regard.

5. Iran has estimated that, between 23 November 2009 and 1 May 2010, it produced an additional 619 kg of low enriched UF₆,³ which would result in a total production of 2427 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.⁴

6. As of 1 March 2010, the results of the environmental samples taken at FEP indicate that the maximum enrichment level in the Design Information Questionnaire (DIQ) (i.e. less than 5.0% U-235 enrichment) has not been exceeded at that plant.⁵ Since the last report, the Agency has conducted three unannounced inspections at FEP, making a total of 38 such inspections since March 2007.

7. **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 brought into operation for the first time in October 2003. It has a cascade hall that can accommodate six cascades. Cascades 1 and 6, each of which can comprise up to 164 machines, are designated for the production of LEU enriched up to 20% U-235. The other part of the cascade hall is designated as an R&D area.

8. In the R&D area of PFEP, between 3 February 2010 and 21 May 2010, a total of approximately 74 kg of natural UF₆ was fed into a 20-machine IR-4 cascade, a 20-machine IR-2m cascade and single IR-1, IR-2m and IR-4 centrifuges. In this area no LEU is withdrawn because the product and the tails of this R&D activity are re-combined at the end of the process.

9. As reported previously, on 8 February 2010 the Agency received a letter from Iran referring to "the announcement made by H.E. the President of the Islamic Republic of Iran concerning the production of the required fuel for the Tehran Research Reactor" and, in that regard, submitting a revised version of the DIQ for PFEP. This revised DIQ provided for the "production of enriched UF₆ up to 20%". On 9 February 2010, Iran began feeding low enriched UF₆ into cascade 1. In a letter dated 10 March 2010, Iran informed the Agency that it intended to install a second 164-machine IR-1 cascade (cascade 6) at PFEP and connect it to cascade 1. In the same letter, Iran stated that "by

² The Agency also verified that, at the time of the PIV, 2026 kg of UF₆ enriched to 0.97% U-235 was present in the dump cylinder and another 516 kg of UF₆ enriched to 0.72% U-235 was present in the feed purification cylinder.

³ The Agency has verified, through independently calibrated operator load cell readings, that, between 23 November 2009 and 1 May 2010, 6436 kg of natural UF₆ was fed into the cascades, and a total of 581 kg of low enriched UF₆ product and 5785 kg of UF₆ tails and dump material was off-loaded into UF₆ cylinders. The difference of 70 kg between the input figure (6436 kg) and the sum of the output figures (581 kg + 5785 kg) comprises natural, depleted and low enriched UF₆ arising mainly from hold-up in the various cold traps and is not inconsistent with the design information provided by Iran.

⁴ In line with normal safeguards practice, small amounts of nuclear material at the facility (e.g. some waste and samples) are not under containment and surveillance.

⁵ These results have shown particles of low enriched uranium (with up to 4.8% U-235), natural uranium and depleted uranium (down to 0.19% U-235).

applying this modification the enrichment of Tails [is] expected to be reduced from ~2% to ~0.7% U-235”.

10. In reply to Iran’s letter of 10 March 2010, the Agency informed Iran, in a letter dated 12 March 2010, that the introduction of the second 164-machine cascade and its interconnection with the first 164-machine cascade would constitute a new and significant development in the design and operation of PFEP that required a full revision of the previous safeguards approach proposed by the Agency and communicated to Iran in February 2010.⁶ In the same letter, the Agency requested Iran not to start feeding UF₆ into the second cascade until a new safeguards approach was agreed upon. On 7 April 2010, when the Agency carried out an inspection, Iran had installed all the centrifuges of the second 164-machine cascade, and the cascade had been vacuum tested in preparation for its passivation with natural UF₆. As of 25 May 2010, Iran had neither started to feed this cascade, nor connected it to the first cascade.

11. Following meetings held in Iran in April 2010, the Agency provided, in a letter dated 6 May 2010, a revised safeguards approach to Iran, to which, in a letter dated 12 May 2010, Iran agreed. The approach takes into account, inter alia, the enrichment of uranium up to 20% U-235 and the installation of the second cascade, and includes the following measures: a monthly interim inventory verification (IIV), a monthly design information verification (DIV), and two unannounced inspections per month; the application of seals on all possible exit routes for UF₆ and on all pipework connections between the areas used for testing new centrifuges and the areas used for the production of uranium enriched up to 20%; an enhanced surveillance system in the cascade area and the feed and withdrawal area; the use of load cell data; and the taking of destructive analysis samples, including from the cascades. On 24–25 April 2010, the Agency applied all the seals and installed all the surveillance cameras as required under the revised safeguards approach. As of 15 May 2010, the Agency has been implementing the revised approach, and has, since then, conducted two unannounced inspections.

12. Between 9 February 2010 and 21 May 2010, a total of approximately 172 kg of low enriched UF₆ was fed into the first cascade. On 7 April 2010, Iran withdrew 5.7 kg of UF₆ from the first cascade and stored it in a small (5B) cylinder. According to Iran, this UF₆ was enriched to 19.7% U-235.⁷ This material is now under containment and surveillance. Iran has informed the Agency that, following the next withdrawal of UF₆ into the same cylinder, which is planned soon, the material in this cylinder will be homogenized. After the homogenization, the Agency will sample this material for destructive analysis to accurately verify the enrichment level declared by Iran.

13. Since the Director General’s last report, Iran has informed the Agency that it intends to continue to transfer UF₆ enriched at FEP into a number of smaller cylinders for later use as LEU feed material at PFEP. The latest transfer took place on 24 May 2010. All transfers have been carried out in the presence of Agency inspectors, who then sealed all of the cylinders involved.

⁶ GOV/2010/10, para. 13.

⁷ Non-destructive assay measurements by the Agency of the material in this cylinder indicated an enrichment of 19.3% U-235.

A.2. Qom: Fordow Fuel Enrichment Plant

14. In September 2009, Iran informed the Agency that it was constructing the Fordow Fuel Enrichment Plant (FFEP), located near the city of Qom. The Agency verified that FFEP is currently being built to contain sixteen cascades, with a total of approximately 3000 centrifuges.⁸

15. The Agency has asked Iran on a number of occasions to provide additional information regarding the chronology of the design and construction of FFEP, as well as its status and original purpose.⁹ In response to these requests, Iran has 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”. The Agency has also reiterated the need for access to companies involved in the design and construction of FFEP. The Agency informed Iran that it had received extensive information from a number of sources alleging that design work on the facility had started in 2006.¹⁰ In its letters dated 14 February 2010 and 17 February 2010, Iran referred to its earlier answers on this subject and indicated that “the Agency is not mandated to raise any question beyond the Safeguards Agreement”. The Agency considers that the questions it has raised do not go beyond the Safeguards Agreement, and that the information requested is essential for the Agency to verify the chronology and original purpose of FFEP.¹¹

16. In a letter dated 22 January 2010, the Agency reiterated its request that Iran submit a complete DIQ for FFEP. In its reply, dated 17 February 2010, Iran said that updates to the DIQ would be provided subsequently. In the Agency’s view, some of the required information is already available to Iran and should already have been included in the DIQ.

17. Since October 2009, the Agency has been conducting, on average, one DIV at FFEP per month. The Agency has verified that the construction of the facility is ongoing. As of 26 May 2010, no centrifuges had been introduced into the facility. The results of the environmental samples taken at FFEP up to 16 February 2010 did not indicate the presence of enriched uranium.¹²

A.3. Other Enrichment Related Activities

18. In light of the announcement made by Iran on 9 April 2010 regarding the development of ‘third generation’ centrifuges, the Agency, in a letter to Iran dated 23 April 2010, reiterated its previous requests that Iran provide access to additional locations related, inter alia, to the manufacturing of centrifuges, R&D on uranium enrichment, and uranium mining and milling.¹³ In a letter dated 8 May 2010, Iran reiterated that it was “continuing to cooperate with the Agency in accordance with its Safeguards Agreement”, but it did not provide the Agency with the requested information.

⁸ GOV/2010/10, para. 14.

⁹ GOV/2010/10, paras 14–16.

¹⁰ GOV/2010/10, para. 15.

¹¹ GOV/2010/10, para. 14.

¹² The results did show a small number of particles of depleted uranium (see GOV/2010/10, para. 17).

¹³ GOV/2008/15, para. 13.

B. Reprocessing Activities

19. The Agency has continued to monitor the use and construction of hot cells at the Tehran Research Reactor (TRR) and the Molybdenum, Iodine and Xenon Radioisotope Production (MIX) Facility. The Agency carried out an inspection and a DIV at TRR on 11 May 2010 and carried out a DIV at the MIX Facility on 12 May 2010. There were no indications of ongoing reprocessing related activities at those facilities. While Iran has stated that there have been no reprocessing related activities in Iran, the Agency can confirm this only with respect to these two facilities, as the measures of the Additional Protocol are not currently available to it for Iran.

C. Heavy Water Related Projects

20. As indicated in the Director General's previous report, in a letter dated 15 February 2010, the Agency 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) for the taking of samples;¹⁴ and any other location in Iran where projects related to heavy water are being carried out. In its reply dated 17 February 2010, Iran indicated that the Agency's request for access was "beyond our safeguards agreement", and stated that the relevant UN Security Council resolutions had been "issued illegally and have no legal basis". To date, Iran has not provided the requested access.

21. On 15 May 2010, the Agency carried out a DIV at the IR-40 reactor at Arak. The Agency verified that the construction of the facility was ongoing. Based on satellite imagery, the HWPP appears to be in operation again.¹⁵ However, in order for the Agency to verify the suspension of heavy water related activities at this plant, and given that satellite images can only provide information on what is happening at the time they are taken, the Agency requires access to the HWPP.

22. On 16 May 2010, the Agency carried out a DIV at the Fuel Manufacturing Plant (FMP), and confirmed that no new process equipment had been installed at the facility and that no new assemblies, rods or pellets had been produced at FMP since May 2009.

D. Uranium Conversion

23. In an updated DIQ for UCF submitted in August 2009, Iran indicated that it would install an analytical laboratory in an underground location in one of the UCF storage areas.¹⁶ In a letter dated 17 February 2010, Iran informed the Agency that the underground analytical laboratory at UCF would have the same functions as the existing UCF laboratory, but that it was going to be set up underground

¹⁴ GOV/2010/10, paras 20 and 21.

¹⁵ As previously indicated to the Board, in light of Iran's refusal to permit the Agency access to the HWPP, the Agency has had to rely solely on satellite imagery.

¹⁶ GOV/2009/74, para. 23.

in order “to meet security measures”. During a DIV on 18 May 2010, the Agency noted that there had been no further installation of laboratory equipment.

24. In a letter dated 17 March 2010, Iran informed the Agency that, “in connection with nuclear fuel fabrication for the Tehran Research Reactor (TRR), part of... [UCF] is allocated for this purpose, and some structural modifications will be started in near future”. In a letter dated 28 April 2010, Iran provided additional information regarding R&D activities to be conducted at UCF related to the conversion of depleted UF₆ to depleted U₃O₈. According to Iran, the results of these conversion R&D activities will be used, inter alia, to prepare for the fabrication of fuel for the TRR.

25. Between 7 March and 11 March 2010, the Agency carried out a PIV at UCF, during which Iran presented 352 tonnes of uranium in the form of UF₆ for the Agency to verify. The results of this PIV are being evaluated by the Agency.

26. On 18 May 2010, the Agency carried out a DIV at UCF. At that time the plant was still undergoing maintenance. As no UF₆ has been produced at UCF since 10 August 2009, the total amount of uranium in the form of UF₆ produced at UCF since March 2004 remains 371 tonnes (some of which has been transferred to FEP and PFEP), which remains subject to Agency containment and surveillance. During the DIV, inspectors were informed by Iran that the process line for the production of natural UO₂ for the IR-40 reactor fuel is now expected to be completed by September or October 2010.¹⁷

E. Other Activities

27. Iran has informed the Agency that it will perform a technical examination of fuel assemblies prior to loading them into the core of the Bushehr Nuclear Power Plant (BNPP), currently scheduled for June 2010. Immediately following this examination, and before loading commences, the Agency plans to re-verify the fuel assemblies, after which they will again be placed under containment and surveillance, the details of which are being discussed with Iran.

28. On 9 January 2010, during a DIV at the Jabr Ibn Hayan Multipurpose Research Laboratory (JHL) in Tehran, the Agency was informed by the operator that pyroprocessing R&D activities had been initiated at JHL to study the electrochemical production of uranium metal. On 14 April 2010, the Agency conducted another DIV at the JHL, during which Iran reiterated what it had stated in its letter dated 21 February 2010, specifically that the activities were related to “a research project aiming purely [at] studying the electrochemical behaviour of uranyl ion in ionic liquid”, using a uranyl nitrate solution. During the latter DIV, the Agency observed that the electrochemical cell had been removed.

29. Based on satellite imagery, the Agency assesses that activities involving the recovery of uranium are continuing in the area of the Bandar Abbas Uranium Production Plant, and that construction activities are continuing at the Ardakan Yellowcake Production Plant. Currently, the Saghand Uranium Mine does not appear to be in operation.

¹⁷ GOV/2010/10, para. 25.

F. Design Information

30. As explained in previous reports of the Director General, the modified Code 3.1 of the Subsidiary Arrangements General Part to Iran's Safeguards Agreement, as agreed to by Iran in 2003, remains in force, notwithstanding Iran's decision in 2007 to suspend its implementation.¹⁸ Although the Agency has, on numerous occasions, reminded Iran that it is obliged to provide design information in accordance with the modified Code 3.1, Iran has not resumed implementation of the modified Code 3.1, which is inconsistent with its obligation under the Subsidiary Arrangements. Iran remains the only State with significant nuclear activities which has a comprehensive safeguards agreement in force that is not implementing the provisions of the modified Code 3.1.

31. In the case of both the Darkhovin facility and FFEP, Iran did not notify the Agency in a timely manner of the decision to construct, or to authorize construction of, the facilities, as required in the modified Code 3.1, and has provided only limited design information with respect to those facilities.¹⁹ Iran has also not provided updated design information for the IR-40 reactor.

32. In December 2009, the Agency asked Iran whether reports that it intended to build ten new uranium enrichment facilities were correct. Iran subsequently stated that it would "provide the Agency with the required information if necessary".²⁰ In a letter to Iran dated 5 May 2010, the Agency requested clarification of the public statement made in Iran on 19 April 2010 announcing that "the venue of new sites has been located according to atomic energy organization plan and the process of building these centres continues".²¹ The Agency informed Iran that, if a decision to construct new nuclear facilities had been taken by Iran, Iran was required to submit information to the Agency regarding the design, and scheduling of the construction, of the facilities. In its reply, dated 11 May 2010, Iran did not provide the requested information and stated only that it would provide the Agency "with the required information in due time ... according to the Safeguards Agreement".

33. The modification of PFEP to produce uranium enriched up to 20% in U-235, which is clearly relevant for safeguards purposes, was not notified to the Agency by Iran with sufficient time for the Agency to adjust its safeguards procedures, as required under Article 45 of Iran's Safeguards Agreement.²²

¹⁸ GOV/2010/10, paras 28–30.

¹⁹ GOV/2010/10, para. 31.

²⁰ GOV/2010/10, para. 33.

²¹ Mujtaba Samareh Hashemi, aide to President Ahmadinejad, quoted by Iranian Labour News Agency, 19 April 2010.

²² The period of notice provided by Iran regarding the related changes made to PFEP was insufficient for the Agency to adjust the existing safeguards procedures before Iran started to feed the material into PFEP (GOV/2010/10, para. 48).

G. Possible Military Dimensions

34. Previous reports by the Director General have detailed the outstanding issues related to possible military dimensions to Iran's nuclear programme and the actions required of Iran necessary to resolve those issues.²³ In the Director General's last report, the Agency described a number of technical matters it needed to address with Iran.²⁴ Since August 2008, however, Iran has declined to discuss the outstanding issues with the Agency or to provide any further information or access to locations and people necessary to address the Agency's concerns, asserting that the allegations relating to possible military dimensions to its nuclear programme are baseless and that the information to which the Agency is referring is based on forged documents.

35. Based on an overall analysis undertaken by the Agency of all the information available to it,²⁵ 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. There are indications that certain of these activities may have continued beyond 2004.

36. With the passage of time and the possible deterioration in the availability of information, it is essential that Iran engage with the Agency on these issues, and that the Agency be permitted to visit all relevant sites, have access to all relevant equipment and documentation, and be allowed to interview all relevant persons, without further delay. Iran's substantive and proactive engagement is essential to enable the Agency to make progress in its verification of the correctness and completeness of Iran's declarations.

H. Summary

37. While the Agency continues to verify the non-diversion of declared nuclear material in Iran, Iran has not provided the necessary cooperation to permit the Agency to confirm that all nuclear material in Iran is in peaceful activities.²⁶

38. More specifically, Iran is not implementing the requirements contained in the relevant resolutions of the Board of Governors and the Security Council, including implementation of the Additional Protocol, which are essential to building confidence in the exclusively peaceful purpose of Iran's nuclear programme and to resolving outstanding questions. In particular, Iran needs to cooperate in clarifying outstanding issues which give rise to concerns about possible military dimensions to its nuclear programme. Iran also needs to implement the modified Code 3.1 on the early provision of design information.

²³ A summary of the issues was provided to the Board in Section E of GOV/2008/15, and most recently in GOV/2010/10, para. 40.

²⁴ GOV/2010/10, paras 42–43.

²⁵ GOV/2010/10, para. 41.

²⁶ 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 37 above reflects the past and current implementation by Iran of its Safeguards Agreement and other obligations.

39. In addition, contrary to the relevant resolutions of the Board of Governors and the Security Council, Iran has not suspended enrichment related activities. Iran has continued with the operation of FEP and PFEP at Natanz, and the construction of a new enrichment plant at Fordow. Iran's enrichment of uranium up to 20% U-235 at PFEP, and its subsequent plan to use two cascades that will be interconnected, necessitated a new safeguards approach, which is now being implemented. In order to verify the chronology and original purpose of FFEP, Iran still needs to provide the Agency with access to relevant design documents and to companies involved in the design of the plant. Iran also needs to submit a complete DIQ for the facility. Iran has also announced that it has selected the venues for new nuclear sites and that construction of these sites is underway, but has not provided the Agency with the necessary relevant information and access in accordance with Iran's Safeguards Agreement.

40. Similarly, contrary to the relevant resolutions of the Board of Governors and the Security Council, Iran has also continued with the construction of the IR-40 reactor and with heavy water related activities. The Agency has not been permitted to take samples of the heavy water which is stored at UCF, and has not been provided with access to the Heavy Water Production Plant.

41. The Director General requests Iran to take steps towards the full implementation of its Safeguards Agreement and its other obligations, including implementation of its Additional Protocol.

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