

# Board of Governors

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(GOV/2004/1)

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

*Report by the Director General*

1. At its meeting in November 2003, the Board of Governors considered the report submitted by the Director General on the implementation of the Agreement between the Islamic Republic of Iran (hereinafter referred to as Iran) and the IAEA for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons (the Safeguards Agreement)<sup>1</sup>. The report, published in GOV/2003/75 (10 November 2003), provided a summary of the Agency's verification activities, its findings, its current assessment and next steps, and an annex providing a detailed technical chronology of the various processes involved.<sup>2</sup>
2. On 26 November 2003, the Board of Governors adopted resolution GOV/2003/81, in which it:
  - Welcomed Iran's offer of active cooperation and openness and its positive response to the demands of the Board in the resolution adopted by the Board on 12 September 2003 (GOV/2003/69), and underlined that, in proceeding, the Board considered it essential that the declarations that had now been made by Iran amounted to the correct, complete and final picture of Iran's past and present nuclear programme, to be verified by the Agency;
  - Strongly deplored Iran's past failures and breaches of its obligation to comply with the provisions of the Safeguards Agreement, as reported by the Director General, and urged Iran to adhere strictly to its obligations under its Safeguards Agreement in both letter and spirit;
  - Noted the statement by the Director General that Iran had taken the specific actions deemed essential and urgent and requested of it in paragraph 4 of GOV/2003/69;

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<sup>1</sup> INFCIRC/214.

<sup>2</sup> The initial report to the Board of Governors on this specific matter was provided by the Director General orally at the Board's meeting on 17 March 2003. The Director General subsequently submitted three written reports to the Board: GOV/2003/40, dated 6 June 2003; GOV/2003/63, dated 26 August 2003; and GOV/2003/75, dated 10 November 2003.

- Requested the Director General to take all steps necessary to confirm that the information provided by Iran on its past and present nuclear activities was correct and complete, as well as to resolve such issues as remained outstanding;
- Endorsed the view of the Director General that, to achieve this, the Agency must have a particularly robust verification system in place: an Additional Protocol, coupled with a policy of full transparency and openness on the part of Iran, was indispensable;
- Reiterated that the urgent, full and close cooperation with the Agency of all third countries was essential in the clarification of outstanding questions concerning Iran's nuclear programme;
- Called on Iran to undertake and complete the taking of all necessary corrective measures on an urgent basis, to sustain full cooperation with the Agency in implementing Iran's commitment to full disclosure and unrestricted access, and thus to provide the transparency and openness that are indispensable for the Agency to complete the considerable work necessary to provide and maintain the assurances required by Member States;
- Decided that, should any further serious Iranian failures come to light, the Board would meet immediately to consider, in the light of the circumstances and of advice from the Director General, all options at its disposal, in accordance with the IAEA Statute and Iran's Safeguards Agreement;
- Noted with satisfaction the decision of Iran to conclude an Additional Protocol to its Safeguards Agreement, and re-emphasized the importance of Iran moving swiftly to ratification and also of Iran acting as if the Protocol were in force in the interim, including by making all declarations required within the required timeframe;
- Welcomed Iran's decision voluntarily to suspend all enrichment related and reprocessing activities and requested Iran to adhere to it, in a complete and verifiable manner, and endorsed the Director General's acceptance of Iran's invitation to verify implementation of that decision and report thereon; and
- Decided to remain seized of the matter.

3. In resolution GOV/2003/81, the Board also requested the Director General to submit a comprehensive report on the implementation of the resolution by mid-February 2004 for consideration by the March Board of Governors, or to report earlier if appropriate. This report is being submitted in response to that request.

## **A. Chronology since November 2003**

4. Between 8 and 16 December 2003, the Agency carried out ad hoc inspections at the Tehran Nuclear Research Centre (TNRC) and the Natanz site, design information verification (DIV) at TNRC, Natanz and the Esfahan Nuclear Technology Centre (ENTC), and complementary access at ENTC and Karaj.

5. On 18 December 2003, the Iranian Government signed the Protocol Additional to its Safeguards Agreement.

6. In a Note Verbale dated 29 December 2003, the Iranian Government specified the scope of suspension of its enrichment and reprocessing activities that the Agency was invited to verify. On

24 February 2004, Iran informed the Agency of its decision to expand the scope of its suspension (see Section B.5.1 below).

7. On 6 January 2004, the Director General met in Vienna with H.E. Dr. H. Rohani, Secretary of the Supreme National Security Council of Iran, to discuss matters related to outstanding safeguards issues and Iran's decision to suspend all enrichment and reprocessing activities.

8. Between 10 and 28 January 2004, the Agency carried out safeguards inspections and DIV at Natanz, Karaj, ENTC and TNRC. The Agency also carried out complementary access at the Kalaye Electric Company workshop and at a number of hot cells located in the TNRC Jabr Ibn Hayan Laboratories (JHL). The Agency was also granted access to a number of military sites to take environmental samples at workshops involved in the domestic production of gas centrifuge components.

9. On 3 and 4 February 2004, the Director General met in Vienna with a high level delegation from Iran to discuss further the outstanding safeguards issues and the implementation of Iran's decision to suspend enrichment and reprocessing activities.

10. Between 15 and 19 February 2004, the Agency conducted inspections in Iran involving follow up actions from previous inspections, including the verification of nuclear material declared to the Agency in October 2003 on the basis of provisional data and for which additional characterization by Iran had been requested.

11. On 17 February 2004, a delegation of senior Iranian officials met with the Director General to inform the Agency that additional information would be provided as a follow up on issues discussed at the earlier meeting in February. This information was conveyed to the Agency in a letter dated 20 February 2004, and is in the process of being assessed.

12. On 21 February 2004, the Director General met in Vienna with Dr. Rohani to review outstanding safeguards issues and the Agency's verification of the suspension of enrichment and reprocessing activities.

## **B. Verification Activities**

### **B.1. Uranium Conversion**

#### **B.1.1. The Uranium Conversion Facility**

13. As reflected in the Director General's November 2003 report (para. 22; Annex 1, para. 5), Iran had stated to the Agency that it had designed the Uranium Conversion Facility (UCF), presently under construction at ENTC, without having tested a number of key conversion processes.

14. During the January 2004 visit, Agency conversion experts were provided access to an extensive set of drawings and technical reports related to the UCF project that had been provided by a foreign supplier. On the basis of a preliminary examination of these documents, Iran's declaration that UCF is being built essentially on the basis of these drawings and technical reports, augmented by training provided by the supplier country, appears to be credible. However, further comparison of the documents with the as-built components of UCF is necessary to confirm this preliminary conclusion.

15. As previously reported, the Agency has raised with Iran questions related to the purpose and use of uranium metal to be produced at UCF (GOV/2003/75, para. 25; Annex 1, paras 3–4). In July 2000, Iran provided design information to the Agency that indicated, inter alia, a process line for the conversion of low enriched UF<sub>6</sub> to low enriched uranium (LEU) metal (30 kg per year of uranium metal enriched to 19.7% uranium-235 (U-235)) and a process line for the conversion of depleted UF<sub>4</sub> to depleted uranium metal (50 tonnes per year of depleted uranium metal). In the course of conducting a DIV in 2002, the Agency noticed that the depleted uranium metal process line had been changed to a process line for natural uranium metal production. Iran later acknowledged that the uranium metal had been intended not only for producing shielding material, but also for the laser enrichment programme. The Agency is continuing to assess the explanations provided by Iran regarding its intended use of uranium metal.

### **B.1.2. Experiments and Testing**

16. In its letter of 21 October 2003, Iran acknowledged that it had conducted laboratory and bench-scale conversion experiments in the Uranium Conversion Laboratory (UCL) at the ENTC, at the former Radiochemical Laboratories located at TNRC and at JHL, using nuclear material which had been imported in 1977, 1982 and 1991 (see GOV/2003/75, paras 20–24). Iran further stated that it had transferred relevant dismantled equipment used in the bench scale processes at TNRC to the Radioactive Waste Storage Facility (RWSF) at Karaj.

17. As previously agreed by the Iranian authorities, on 20 November 2003, Iran provided design information for the RWSF and revised design information for JHL, and, on 21 November 2003, the inventory change reports (ICRs) relevant to the experiments. Additional technical information has also been provided by Iran with respect to several areas of the experimental conversion work, including the area of uranium metal production.

18. During the Agency's October 2003 inspection at TNRC, Iran presented to the Agency for its verification 17 kg of uranium of different compounds collected from throughout the site, part of which had resulted from the conversion experiments and for which limited information was available. Work is continuing on the characterization of the nuclear material involved in the experiments, including with respect to its origin, use and quantity.

19. On 14 and 15 January 2004, Agency inspectors visited Karaj to monitor the recovery of nuclear material hold-up from the dismantled equipment used in the conversion experiments. Approximately 1.25 kg of uranium in different forms was recovered during this operation and samples from the uranium compounds were taken for destructive analysis. It was agreed that the equipment could be further dismantled by Iran and discarded after the results of Agency analysis became available and provided that the results are in agreement with Iran's declarations.

20. Analysis of data supplied by the Iranian authorities is continuing, and further analytical measurements are being carried out, with a view to confirming Iran's declaration concerning these activities to ensure the absence of pilot scale conversion. It should be noted that, given the size and capacity of the equipment used, the possibility cannot be excluded that larger quantities of nuclear material could have been involved than those declared by Iran as having been consumed and produced during this testing and experimentation. However, it is very difficult to account precisely for the uranium involved in these processing activities after the passage of many years, especially when some quantities have been declared as having been discarded. The Agency will investigate this further.

### **B.2. Irradiation and Reprocessing Experiments**

21. In the course of 2003, Iran acknowledged its past irradiation in the Tehran Research Reactor (TRR) of depleted UO<sub>2</sub> targets that had been prepared at ENTC, and the subsequent reprocessing of

some of the irradiated targets in shielded glove boxes at TNRC (GOV/2003/75, Annex 1, paras 27-33). According to Iran, 7 kg of UO<sub>2</sub> were irradiated, 3 kg of which were subsequently reprocessed for the separation of plutonium, and the remaining 4 kg buried in containers on the site of TNRC.

22. The glove boxes in which the reprocessing is said to have been conducted were dismantled and stored in a warehouse at ENTC, along with related equipment. During the inspections that took place in November and December 2003, the Agency collected environmental samples from the glove boxes and equipment. The results of the sample analysis are not yet available.

23. The solidified wastes from these activities were declared by Iran as having been mixed in concrete and sent to Anarak, and the liquid wastes to Qom, where they were disposed of. As requested by the Agency, Iran transferred the Anarak waste to JHL in January 2004.

24. Iran has now, as a corrective action, also submitted accounting reports covering the movements of the irradiated targets between ENTC, TRR and JHL.

25. On 8 November 2003, the separated plutonium resulting from these experiments was presented for Agency verification in the form of plutonium solution contained in two small bottles. The contents of one of the bottles had completely leaked into its over-pack container, so an exact verification of the original volume of plutonium solution will not be possible. Agency inspectors took samples of the solution for laboratory analysis, the results of which are not yet available.

26. Iran has estimated that the original amount of plutonium in the solution was approximately 200 µg. Until sample results are available, the Agency cannot verify the accuracy of that estimate. However, based on Agency calculations, the amount of plutonium produced in 3 kg of depleted uranium targets under the declared irradiation conditions should have been substantially higher. The reason for this apparent discrepancy is not yet clear. The matter remains under discussion with Iran.

27. On 8 November 2003, during an Agency inspection at JHL, inspectors were also shown four heavily shielded containers said by Iran to contain the 4 kg of unprocessed targets. The containers had been buried on the site of TNRC, but were disinterred and presented to the Agency for verification. Using available non-destructive analysis equipment, Agency inspectors were able to confirm that one of the containers (selected at random) contained highly radioactive material characteristic of irradiated targets. All four containers have been placed under Agency seal for future examination.

28. In September 2003, Agency inspectors, aware by then that undeclared uranium irradiation had taken place in the TRR, noticed from available records that bismuth metal samples had also been irradiated in the same general period (1989–1993). Although bismuth is not nuclear material requiring declaration under the Safeguards Agreement, its irradiation is of interest to the Agency as it produces polonium-210 (Po-210), an intensely radioactive alpha emitting radioisotope<sup>3</sup> that could be used not only for certain civilian applications (such as radioisotope thermoelectric generators (RTGs), in effect, nuclear batteries<sup>4</sup>), but also, in conjunction with beryllium, for military purposes (specifically, as a neutron initiator in some designs of nuclear weapons).

29. In a letter to the Agency dated 13 November 2003, Iran informed the Agency that the bismuth irradiation had been part of a feasibility study for the production and use of Po-210 in RTGs.

30. During its visits to Iran in November and December 2003, the Agency requested further clarification and, in January 2004, was able to interview two Iranian scientists involved in the bismuth

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<sup>3</sup> Po-210 has a half-life of 138 days.

<sup>4</sup> The reported applications of Po-210 based RTGs are limited in number.

irradiation. One of the scientists is currently living outside of Iran and was asked by Iran to return for the interviews. According to the scientists, two bismuth targets had been irradiated, and an attempt had been made, unsuccessfully, to extract polonium from one of them. The other irradiated bismuth target was said to have been discarded. The scientists confirmed that the purpose of the project had been only for research on the chemical separation of polonium and the development of RTGs. During follow-up discussions in Vienna in February 2004, Iranian officials said that the experiments involving Po-210 were also part of a study about neutron sources, noting that commercially available neutron sources, used, for example, for industrial applications, are not obtainable by Iran due to import restrictions. However, Iran has stated that there are few remaining records related to the bismuth irradiation project and, as a result, has not been able to provide evidence to support its claims as to the stated purpose.

31. The Agency will continue to follow up on this matter as appropriate.

### **B.3. Uranium Enrichment**

#### **B.3.1. Gas Centrifuge Enrichment**

32. As previously agreed, ICRs for the Pilot Fuel Enrichment Plant (PFEP) covering the nuclear material used for enrichment experiments at the Kalaye Electric Company workshop (and now located at PFEP) have been provided by Iran, and relevant parts of the design information for PFEP have been updated.

33. As reported in the Director General's earlier reports, Iran imported UF<sub>6</sub> in 1991. The material was contained in three cylinders, a large one and two smaller ones. Iran initially attributed the absence of 1.9 kg of the UF<sub>6</sub> from the two small cylinders to leakage during their storage in the TRR building. Environmental samples taken from that storage area, at the request of the Atomic Energy Organization of Iran (AEOI), did in fact reveal particles of UF<sub>6</sub>. However, the explanations concerning leakage were not technically credible. As indicated in the Director General's report of November 2003 (para. 32; Annex 1, para. 21), Iran subsequently confirmed that it had in fact used that material in centrifuge tests at the Kalaye Electric Company workshop. Iran has been asked to provide explanations for the UF<sub>6</sub> contamination detected in the TRR building where the two small cylinders were stored, specifically as regards the source of the contaminant material and its current location, as well as the date on which the contamination took place.

34. In its 21 October 2003 declaration, Iran declared the 1.9 kg of UF<sub>6</sub> as hold-up in the dismantled equipment currently stored at PFEP. Verification of the hold-up is planned. Destructive analysis still needs to be undertaken on the contents of the imported UF<sub>6</sub> cylinders, which are currently stored under Agency seal at TNRC.

35. As described in GOV/2003/75 (paras 34 and 35; Annex 1, paras 38–41, 45, 53), environmental samples taken by the Agency at Natanz and at the Kalaye Electric Company workshop have revealed particles of natural uranium, LEU and high enriched uranium (HEU) that called into question the completeness of Iran's declarations about its centrifuge enrichment activities.

36. As part of its efforts to resolve the issue of contamination, the Agency has continued to take environmental samples of the imported and domestically manufactured centrifuge components and equipment located at Natanz. The Agency has also recently requested another State to provide access for environmental sampling at locations from which the imported centrifuges are believed to have originated. Taking environmental samples at such locations is indispensable for the Agency to arrive at conclusions regarding the issue of contamination.

37. In its declaration of 21 October 2003, Iran provided the names of manufacturing workshops involved in the domestic production of centrifuge components. In response to a further request by the

Agency, Iran supplied the Agency with the locations of the workshops and information on their functions in connection with Iran's centrifuge enrichment programme. Most of the workshops are owned by military industrial organizations.

38. In January 2004, the Agency was granted managed access to the component manufacturing workshops to take environmental samples with a view to clarifying the reasons for contamination of the domestically produced centrifuge components. While the results from those samples are pending, the results from earlier sampling campaigns have become available, and confirm the Agency's earlier findings (GOV/2003/75, paras 34–35; Annex 1, paras 38–40, 53).

39. On the basis of environmental sample analysis thus far, there remain a number of discrepancies and unanswered questions:

- Analysis of samples taken from domestically manufactured centrifuge components show predominantly LEU contamination, while analysis of samples from imported components show both LEU and HEU contamination. It is not clear why the components would have different types of contamination if, as Iran states, the presence of uranium on domestically manufactured components is due solely to contamination originating from imported components.
- The types of uranium contamination found at the Kalaye Electric Company workshop differ from those at Natanz, even though Iran states that the source of contamination in both cases is the imported centrifuge components.
- Environmental samples showing uranium enriched to 36% U-235 have come almost entirely from one room in the Kalaye Electric Company workshop, which seems to be predominantly contaminated with that material. Only negligible traces of 36% enriched uranium have been found on imported centrifuge components. The level of contamination suggests the presence of more than just trace quantities of such material.<sup>5</sup>

40. Iran has been asked to provide comments on the above issues, particularly in light of its declaration that it has not enriched uranium to more than 1.2% U-235 using centrifuge technology. The Agency continues to work with the country from which the imported components are believed to have originated with a view to resolving the issues associated with the contamination.

41. Agency visits in January 2004 to the component manufacturing workshops revealed the existence of two subsidiary companies of the Kalaye Electric Company<sup>6</sup>: Farayand Technique located near Esfahan, and Pars Trash in Tehran.

42. Farayand Technique has had a number of different roles in Iran's centrifuge enrichment programme. According to Iran, it had been intended to be the centrifuge assembly site, but the Iranian authorities decided that it was too far away from Natanz. It is currently said to be the Quality Control Centre for all centrifuge components manufactured for the facilities at Natanz, but it also has capabilities suitable for the testing and assembly of centrifuges.

43. As reported earlier, the Agency has continued to investigate the chronology of Iran's gas centrifuge enrichment programme and to assess the declarations concerning that programme made by Iran in its letter of 21 October 2003. The Agency's investigations, which have included discussions with former Iranian officials familiar with the programme, together with Agency verification activities

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<sup>5</sup> 36% enriched uranium is characteristic of nuclear material used in certain research reactors outside of Iran.

<sup>6</sup> Kalaye Electric Company is a subsidiary of the AEOL.

elsewhere, led the Agency to consider that Iran might have had drawings of a more advanced centrifuge design, a so-called P-2 centrifuge.<sup>7</sup>

44. In response to the Agency's inquiry in early January 2004 about this possibility, Iran acknowledged on 20 January 2004, during a meeting with the Agency's uranium enrichment experts, that it had received P-2 centrifuge drawings from foreign sources in 1994 and that it had conducted some mechanical tests, without nuclear material, using domestically manufactured rotors. The Iranian authorities showed the Agency a set of P-2 drawings, which they said Iran had acquired from a foreign intermediary. The Agency's centrifuge enrichment experts confirmed that the drawings were similar to a more advanced early European origin centrifuge design using maraging steel rotors with bellows. The Iranian authorities stated, however, that Iran had not obtained any P-2 centrifuges, or components thereof, from abroad, and that what components Iran did have, it had produced domestically.

45. Iran also provided information on the P-2 research and development activities, stating that the AEOI, in 1999 or 2000, concluded a contract with a private company located in Tehran, to develop a P-2 centrifuge. The Agency was able to interview the owner of that company during a meeting on 28 January 2004. The owner explained that, since in his view Iran was not capable of manufacturing appropriate maraging steel cylinders with bellows called for in the P-2 design, it was decided that work should proceed on a shorter, sub-critical carbon composite rotor. As a consequence, according to him, the company had manufactured seven rotors with various dimensions, and had performed some mechanical tests on those rotors without, however, using nuclear material. The owner of the company also stated that the work had been terminated after June 2003 and all of the centrifuge equipment was moved to the Pars Trash Company in Tehran.

46. In response to an Agency question as to why the P-2 design, and related work on it, had not been included in Iran's 21 October 2003 declaration, the Iranian authorities stated that they had, due to time pressure in preparing the declaration on the centrifuge research and development programme, neglected to include it. This explanation is difficult to comprehend since, as stated by Iran, the equipment had been moved only after June 2003 on the instruction of the AEOI to Pars Trash, where, as indicated in the Director General's November 2003 report (Annex 1, para. 41), the P-1 centrifuge equipment from the Kalaye Electric Company workshop had been stored and concealed from the Agency after its dismantlement in the spring of 2003 until October 2003, when it was presented to the Agency at Natanz.

47. In further discussions on this issue in February 2004, the Iranian authorities provided additional explanations for the non-inclusion in the October 2003 declaration of information related to the P-2 design and related work: (a) it had not mentioned specifically the P-1 centrifuges either in that declaration<sup>8</sup>, (b) the declaration only included information intended to correct the failures of Iran in reporting under its Safeguards Agreement and (c) the information was not required to be reported under its Safeguards Agreement, but only under the Additional Protocol. The question remains, however, as to why, at the time it informed the Agency of the existence of the P-1 centrifuges and associated activities, Iran did not inform the Agency of the existence of the P-2 components, the work thereon under an AEOI contract, and the transfer of all related equipment to Pars Trash after June 2003.

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<sup>7</sup> Heretofore, all information provided by Iran concerning its centrifuge enrichment programme (including the centrifuge design and information on research and development, production and processing, and the locations where such activities were carried out) involved an earlier, less-advanced centrifuge design (P-1) of European origin.

<sup>8</sup> It should be noted, however, that the 21 October 2003 declaration contained details about the P-1 centrifuges and Iran's work associated with such centrifuges.



48. The Agency is currently investigating all of the information available to it concerning the P-2 centrifuge issue.

### **B.3.2. Laser Enrichment**

49. In its letter of 21 October 2003, Iran declared that, starting in the 1970s, it had had contracts related to laser enrichment using Atomic Vapour Laser Isotope Separation (AVLIS) and Molecular Laser Isotope Separation (MLIS) techniques, and had imported equipment under those contracts. Iran also informed the Agency that it had imported 50 kg of uranium metal in 1993, some of which was used in experiments involving the imported equipment at TNRC and at Lashkar Ab'ad. Iran informed the Agency that the laser equipment was dismantled in May 2003 and transferred to Karaj, along with the uranium metal (the latter was subsequently transferred to JHL). The equipment and material were presented to Agency inspectors prior to the issuance of the November report. Environmental samples were collected from the equipment, and the nuclear material was verified by weighing and through destructive analysis.

50. As a corrective action, Iran has submitted all of the ICRs relevant to the use of the uranium metal that was presented for Agency verification in November 2003. Iran has also submitted design information for the RWSF at Karaj and amended design information for JHL to cover the additional laser laboratories as well as waste tanks containing nuclear material.

51. The Agency has continued its examination of nuclear material accountancy records related to the AVLIS programme and has taken additional environmental samples since November 2003 from key equipment and associated laboratories and destructive analysis samples from the waste tanks used in connection with the programme. The results of the sample analyses are still pending.

52. Having received from Iran additional information and amplifications of its 21 October 2003 declaration, the Agency is continuing with its assessment of the chronology of Iran's laser enrichment programme. With the support of relevant Member States, the Agency has attempted to reconcile the deliveries of key equipment with information provided by Iran in connection with its AVLIS and MLIS programmes. While the information related to the MLIS programme in the 1970s appears to be coherent, more information is still expected from Member States with regard to deliveries of equipment related to Iran's AVLIS programme.

53. During the Agency's complementary access to the mass spectrometry laboratories at Karaj in December 2003, the Agency examined two mass spectrometers that had not been included in Iran's declaration of 21 October 2003. Iran acknowledged that the mass spectrometers had been used in the past to provide analytical services (isotope enrichment measurements) to the AVLIS programme. Iran also provided a list of samples that had been analysed. The Agency collected environmental samples from the mass spectrometers, the results of which are still pending.

54. Following the complementary access at Karaj, the Agency requested Iran to clarify the role of the mass spectrometers in relation to Iran's uranium enrichment programme. Iran submitted additional information in that regard to the Agency on 5 January 2004.

55. Further assessment is pending evaluation of the new information and the verification results from recent inspections, including the results of environmental and other sample taking during the December 2003 and January 2004 inspections and the ongoing detailed study of information related to AVLIS equipment design.

### **B.4. Heavy Water Reactor Programme**

56. In 2003, Iran declared to the Agency its construction at Arak of a Heavy Water Production Plant and its planned construction of a heavy water reactor, the Iran Nuclear Research Reactor (IR-40). Iran

provided preliminary design information on the reactor, along with preliminary information on a facility intended to manufacture fuel for the IR-40, the Fuel Manufacturing Plant (FMP), to be built on the Esfahan site.

57. In mid-2003, the Agency was provided with drawings of the reactor that contained no references to hot cells. In its declaration of 21 October 2003, Iran stated that two hot cells had been foreseen for the project, but that neither the design nor detailed information about the dimensions or the actual layout of the hot cells was available at present. Iran later stated that it had tentative plans to construct at Arak an additional building with hot cells for the production of radioisotopes to produce “long lived” radioisotopes. Iran has provided some very preliminary design information on the building.

## **B.5. Suspension of Enrichment Related and Reprocessing Activities**

### **B.5.1. Scope of Suspension**

58. As reported by the Director General to the November 2003 meeting of the Board, Iran informed him on 10 November 2003 of its decision to suspend enrichment related and reprocessing activities, and that the suspension would cover all activities at the Natanz enrichment facility, the production of all feed material for enrichment and the importation of any enrichment related items.

59. In its Note Verbale of 29 December 2003, Iran further informed the Agency, that, with immediate effect:

- it would suspend the operation and/or testing of any centrifuges, either with or without nuclear material, at PFEP at Natanz;
- it would suspend further introduction of nuclear material into any centrifuges;
- it would suspend installation of new centrifuges at PFEP and installation of centrifuges at the Fuel Enrichment Plant (FEP) at Natanz; and
- it would withdraw nuclear material from any centrifuge enrichment facility if and to the extent practicable.

60. Iran also stated that: it did not currently have any type of gas centrifuge enrichment facility at any location in Iran other than the facility at Natanz that it was now constructing, nor did it have plans to construct, during the suspension period, new facilities capable of isotopic separation; it had dismantled its laser enrichment projects and removed all related equipment; and it was not constructing nor operating any plutonium separation facility.

61. In addition, Iran stated that: during the period of suspension, Iran did not intend to make new contracts for the manufacture of centrifuge machines and their components; the Agency could fully supervise storage of all centrifuge machines assembled during the suspension period; Iran did not intend to import centrifuge machines or their components, or feed material for enrichment processes, during the suspension period; and there was no production of feed material for enrichment processes in Iran.

62. On 24 February 2004, Iran informed the Agency that instructions will be issued by the first week of March to implement the further decisions voluntarily taken by Iran to: (i) suspend the assembly and testing of centrifuges, and (ii) suspend the domestic manufacture of centrifuge components, including those related to the existing contracts, to the furthest extent possible. Iran also informed the Agency that any components that are manufactured under existing contracts that cannot be suspended will be stored and placed under Agency seal. Iran invited the Agency to verify these measures. Iran also confirmed that the suspension of enrichment activities applied to all facilities in Iran.

### **B.5.2. Monitoring Activities**

63. On 12 November 2003, Iran shut down all centrifuges at the cascade hall of PFEP. The feed cylinder was removed from the autoclave, and Agency inspectors sealed all feed and withdrawal stations and chemical and cold traps. The cascade hall continues to be under Agency surveillance, adjusted to accommodate the need to verify that no enrichment is taking place. During inspections carried out in November and December 2003, the Agency completed the sealing of all declared UF<sub>6</sub> feed material. Since then, all containment and surveillance devices have been checked during monthly inspections, confirming the non-operational status of the facility. Design information verification was also carried out at FEP on 10 December 2003.

64. The dismantled pilot enrichment facility at the Kalaye Electric Company workshop in Tehran has also been monitored, using complementary access under the Additional Protocol.

65. The decommissioned AVLIS pilot plant at Lashkar Ab'ad and the decommissioned AVLIS and MLIS installations at TNRC have been monitored through complementary access. Dismantled AVLIS and MLIS related equipment currently stored at Karaj has been subject to inspection, DIV and complementary access.

66. In addition, all declared uranium metal was sealed on 12 November 2003. The non-production of UF<sub>6</sub> at UCF, and of uranium metal at UCF and TNRC, has been monitored through inspections, DIV and complementary access.

67. As a result of its monitoring activities, the Agency is able to confirm that there has been no operation or testing of any centrifuges, either with or without nuclear material, at PFEP; that no new centrifuges have been installed at PFEP; that no centrifuges have been installed at FEP; and that no nuclear material has been introduced into any centrifuges which have been declared to the Agency. Although some civil construction activities are still being carried out at Natanz, these activities are not directly related to the operation of the facilities located there.

68. Between November 2003 and mid-January, Iran continued to assemble centrifuges. During that time, Iran assembled some 120 centrifuges (in addition to the 800 centrifuges which had been produced prior to November 2003), which have been counted by the Agency. These, and any centrifuges assembled since mid-January 2004, will now be placed under Agency seal.

69. Iran has continued to manufacture centrifuge components domestically under existing contracts. In response to an Agency request, Iran agreed in its letter dated 20 February 2004 to present to the Agency in Iran the contracts between AEOI and the domestic manufacturers of centrifuge components. The Agency intends to discuss with Iran in the near future the additional activities necessary for verifying the expanded suspension, including the storage and sealing of domestically manufactured centrifuge components.

70. In relation to reprocessing, the Agency has been monitoring the use and construction of declared hot cells, including equipment used earlier for plutonium separation experiments at TNRC, ENTC, Karaj and Arak, through inspections, DIV, complementary access and the use of satellite imagery. The remaining irradiated unprocessed uranium targets were placed under Agency seal on 15 November 2003, and are being verified regularly.

## C. Assessment and Next Steps

71. Iran has presented all declared nuclear material to the Agency for its verification. Iran has also provided all of the inventory change reports, material balance reports and physical inventory listings requested by the Agency. While some corrections are required and are still pending, this is partially due to the need to establish the nuclear material hold-up in dismantled equipment and other problems associated with nuclear material accountancy for past activities. In addition, Iran has submitted design information with respect to facilities, as requested by the Agency, although some of the information needs to be revised and/or supplemented, which Iran has agreed to do.

72. Iran has been actively cooperating with the Agency in providing access to locations requested by the Agency. This included access to workshops situated at military sites. This is welcome. Also welcome is the decision by Iran to expand the scope of suspension to cover remaining enrichment activities, which, in the Agency's view, will contribute to confidence building.

73. Although investigations are ongoing, the Agency has made good progress in verifying Iran's statements regarding the UCF project and the associated experiments and testing activities. The Agency has also been verifying the suspension of those enrichment and reprocessing activities specified in Iran's Note Verbale of 29 December 2003.

74. The omission from Iran's letter of 21 October 2003 of any reference to its possession of the P-2 centrifuge design drawings and associated research, manufacturing and mechanical testing activities is a matter of serious concern, particularly in view of the importance and sensitivity of those activities. It runs counter to Iran's declaration, a document characterized by Iran as providing "the full scope of Iranian nuclear activities" and a "complete centrifuge R&D chronology". The Director General has continued to emphasize to Iran the importance of declaring all the details of Iran's nuclear programme.

75. The Agency has still to resolve the major outstanding issue, of the LEU and HEU contamination found at the Kalaye Electric Company workshop and Natanz, and associated concerns. Until this matter is satisfactorily resolved, it will be very difficult for the Agency to confirm that there has not been any undeclared nuclear material or activities. The Agency is still waiting for Iran to provide requested information detailing the origin of the centrifuge equipment and components, the locations in Iran to which such equipment and components were moved and the associated details of timescales, and the names of individuals involved. The resolution of this issue will depend to a great extent on the cooperation of the country from which the imported items are believed to have originated.

76. Other issues requiring clarification include the nature and scope of Iran's activities in relation to P-2 centrifuges, and the nature and scope of Iran's laser isotope enrichment research and details of the associated equipment. The issue of the purpose of Iran's activities related to the production and intended use of Po-210 remains a concern, in the absence of information to support Iran's statements in this regard.

77. Although the timelines of the conversion and centrifuge programmes of Iran and the Socialist People's Libyan Arab Jamahiriya (Libya) are different, they share several common elements. The basic technology is very similar and was largely obtained from the same foreign sources. As part of verifying the correctness and completeness of the declarations of Iran and Libya<sup>9</sup>, the Agency is investigating, with the support of Member States, whose full cooperation is essential, the supply routes and sources of such technology and related equipment and nuclear and non-nuclear materials.

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<sup>9</sup> See the Director General's report on the implementation of Libya's NPT Safeguards Agreement (GOV/2004/12, para. 38).

78. The Agency will continue its efforts to resolve and clarify the outstanding issues. In this context the Director General has requested Iran to continue and intensify its cooperation with the Agency, in particular through the prompt provision of detailed information. The Director General will report to the June 2004 meeting of the Board, or earlier, as appropriate.