

# Board of Governors

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

*Report by the Director General*

### **Main Developments**

- Iran and the Agency held technical meetings on two separate occasions in Tehran to discuss the two outstanding practical measures agreed in May 2014 in the third step of the Framework for Cooperation.
- Iran has not provided any explanations that enable the Agency to clarify the outstanding practical measures, nor has it proposed any new practical measures in the next step of the Framework for Cooperation.
- The Agency has continued to undertake monitoring and verification in relation to the nuclear-related measures set out in the Joint Plan of Action (JPA), as extended.
- Since the JPA took effect, Iran has not enriched UF<sub>6</sub> above 5% U-235 at any of its declared facilities and all of its stock of UF<sub>6</sub> enriched up to 20% U-235 has been further processed through downblending or conversion into uranium oxide.
- Enrichment of UF<sub>6</sub> up to 5% U-235 has continued at a rate of production similar to that indicated in the Director General's previous reports. The amount of such nuclear material that remains in the form of UF<sub>6</sub> enriched up to 5% U-235 has increased to 8390.3 kg.
- No additional major components have been installed at the IR-40 Reactor and there has been no manufacture and testing of fuel for the reactor.
- Iran has continued to provide the Agency with managed access to centrifuge assembly workshops, centrifuge rotor production workshops and storage facilities.

## A. Introduction

1. This report of the Director General to the Board of Governors and, in parallel, to the Security Council, is on the implementation of the NPT Safeguards Agreement<sup>1</sup> and relevant provisions of Security Council resolutions in the Islamic Republic of Iran (Iran). It contains information, inter alia, regarding the implementation of measures under the “Joint Statement on a Framework for Cooperation” (the Framework for Cooperation) and the Joint Plan of Action (JPA), as extended.<sup>2</sup>

2. The Security Council has affirmed that the steps required by the Board of Governors in its resolutions<sup>3</sup> are binding on Iran.<sup>4</sup> The relevant provisions of the aforementioned Security Council resolutions<sup>5</sup> were adopted under Chapter VII of the United Nations Charter and are mandatory, in accordance with the terms of those resolutions.<sup>6</sup> The full implementation of Iran’s obligations is needed in order to ensure international confidence in the exclusively peaceful nature of its nuclear programme.

3. As previously reported, on 11 November 2013 the Agency and Iran signed a “Joint Statement on a Framework for Cooperation” (GOV/INF/2013/14). In the Framework for Cooperation, the Agency and Iran agreed to cooperate further with respect to verification activities to be undertaken by the Agency to resolve all present and past issues, and to proceed with such activities in a step by step manner. The practical measures agreed to date in relation to the Framework for Cooperation are listed in Annex I.

4. As previously reported, in a separate development, on 24 November 2013 China, France, Germany, the Russian Federation, the United Kingdom and the United States of America (E3+3) agreed on the JPA with Iran. The JPA, inter alia, stated that the “goal for these negotiations is to reach a mutually-agreed long-term comprehensive solution that would ensure Iran’s nuclear programme will be exclusively peaceful”.<sup>7,8</sup> According to the JPA, which took effect on 20 January 2014, the first step would be time-bound (six months) and renewable by mutual consent. As requested by the E3+3 and Iran, and endorsed by the Board of Governors (subject to the availability of funds), the Agency undertook the necessary nuclear-related monitoring and verification activities in relation to the JPA, involving activities additional to those already being carried out pursuant to Iran’s Safeguards Agreement and relevant provisions of Security Council resolutions. In July 2014, the E3/EU+3 and Iran agreed to extend the JPA until 24 November 2014 and requested the Agency to continue to undertake the necessary nuclear-related monitoring and verification activities.<sup>9</sup> Based on the endorsement by the Board of Governors in January 2014, the Agency has continued to do so. The

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

<sup>2</sup> GOV/INF/2014/18.

<sup>3</sup> Between September 2003 and September 2012, the Board of Governors adopted 12 resolutions in connection with the implementation of safeguards in Iran (see GOV/2013/56, footnote 2).

<sup>4</sup> Security Council resolution 1929 (2010).

<sup>5</sup> GOV/2013/56, footnote 4.

<sup>6</sup> Part I.A of the Agency’s Relationship Agreement with the United Nations (INFCIRC/11).

<sup>7</sup> GOV/2014/2, para. 2.

<sup>8</sup> The JPA also stated that a Joint Commission would work with the Agency to “facilitate resolution of past and present issues of concern”.

<sup>9</sup> GOV/INF/2014/18, para. 1.

additional sum of one million euros that was required for the Agency to continue such implementation has been pledged by a number of Member States.<sup>10</sup>

5. This report addresses developments since the Director General's previous report (GOV/2014/43),<sup>11</sup> as well as issues of longer standing.

## **B. Clarification of Unresolved Issues**

6. The Board of Governors, in its resolution of November 2011 (GOV/2011/69), stressed that it was essential for Iran and the Agency to intensify their dialogue aimed at the urgent resolution of all outstanding substantive issues for the purpose of providing clarifications regarding those issues, including access to all relevant information, documentation, sites, material and personnel in Iran. In its resolution of September 2012 (GOV/2012/50), the Board of Governors decided that Iranian cooperation with Agency requests aimed at the resolution of all outstanding issues was essential and urgent in order to restore international confidence in the exclusively peaceful nature of Iran's nuclear programme.

7. As previously reported, during meetings in Tehran in August 2014, the Director General noted Iran's statement of its firm commitment, expressed at a high level, to the implementation of the Framework for Cooperation and Iran's stated willingness to accelerate the resolution of all outstanding issues.<sup>12</sup>

8. During technical meetings in Tehran on 7 October 2014 and 2 November 2014, Iranian and Agency officials held discussions in relation to the implementation of the two practical measures agreed in May 2014 in the third step of the Framework for Cooperation that remained to be implemented, namely, those relating to the initiation of high explosives and to neutron transport calculations (see Annex I). During the meeting on 7 October 2014, the Agency described in detail its concerns in relation to the two practical measures. This involved asking Iran questions and sharing information. At the meeting on 2 November 2014, Iran provided some explanation of related open source scientific publications. Iran has not however provided any explanations that enable the Agency to clarify the two outstanding practical measures.

9. It was agreed that another technical meeting to further discuss the two outstanding practical measures would take place as soon as possible, but not before 24 November 2014. In preparation for this meeting, the Agency agreed to provide Iran with additional questions.

10. With respect to new practical measures, in a letter dated 25 August 2014, the Agency first invited Iran to propose such new measures that it would implement in the next step in the Framework for Cooperation.<sup>13</sup> This invitation has been repeated several times since,<sup>14</sup> including at a meeting in Tehran on 8 October 2014, but Iran has not proposed any new practical measures.

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<sup>10</sup> GOV/INF/2014/18, para. 4.

<sup>11</sup> The Director General continues to provide the Board of Governors with monthly updates on Iran's implementation of "voluntary measures" undertaken in relation to the JPA, the most recent of which was provided in GOV/INF/2014/23.

<sup>12</sup> GOV/2014/43, para. 10.

<sup>13</sup> GOV/2014/43, para. 13.

<sup>14</sup> GOV/2014/43, para. 16.

## C. Facilities Declared under Iran's Safeguards Agreement

11. Under its Safeguards Agreement, Iran has declared to the Agency 18 nuclear facilities and nine locations outside facilities where nuclear material is customarily used (LOFs)<sup>15</sup> (Annex II). Notwithstanding that certain of the activities being undertaken by Iran at some of the facilities are contrary to the relevant resolutions of the Board of Governors and the Security Council, as indicated below, the Agency continues to verify the non-diversion of declared nuclear material at these facilities and LOFs.

## D. Enrichment Related Activities

12. Contrary to the relevant resolutions of the Board of Governors and the Security Council, Iran has not suspended all of its enrichment related activities in the declared facilities referred to below. However, since 20 January 2014, Iran has not produced UF<sub>6</sub> enriched above 5% U-235 and all of its stock of UF<sub>6</sub> enriched up to 20% U-235 has been further processed through downblending or conversion. All of the enrichment related activities at Iran's declared facilities are under Agency safeguards, and all of the nuclear material, installed cascades, and feed and withdrawal stations at those facilities are subject to Agency containment and surveillance.<sup>16</sup>

13. Iran has stated that the purpose of enriching UF<sub>6</sub> up to 5% U-235 is the production of fuel for its nuclear facilities.<sup>17</sup> Iran has also stated that the purpose of enriching UF<sub>6</sub> up to 20% U-235 is the manufacture of fuel for research reactors.<sup>18</sup>

14. Since Iran began enriching uranium at its declared facilities, it has produced at those facilities:

- 13 397.3 kg (+625.3 kg since the Director General's previous report) of UF<sub>6</sub> enriched up to 5% U-235, of which 8390.3 kg (+625.3 kg since the Director General's previous report)<sup>19</sup> remain in the form of UF<sub>6</sub> enriched up to 5% U-235<sup>20</sup> and the rest has been further processed (see Annex III); and
- Up to the point at which it stopped producing UF<sub>6</sub> enriched up to 20% U-235, 447.8 kg of such nuclear material, all of which has been further processed through downblending or conversion into uranium oxide<sup>21</sup> (see Annex III).

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<sup>15</sup> All of the LOFs are situated within hospitals.

<sup>16</sup> In line with normal safeguards practice, small amounts of nuclear material (e.g. some waste and samples) may not be subject to containment and surveillance.

<sup>17</sup> As declared by Iran in its design information questionnaires (DIQs) for the Fuel Enrichment Plant (FEP) at Natanz.

<sup>18</sup> GOV/2010/10, para. 8; and as declared by Iran in its DIQ for the Fuel Plate Fabrication Plant (FPFP).

<sup>19</sup> These figures include 115.6 kg of UF<sub>6</sub> enriched up to 5% U-235 that has been produced from the downblending of UF<sub>6</sub> enriched up to 20% U-235.

<sup>20</sup> This comprises nuclear material in storage as well as nuclear material in the cold traps and inside cylinders still attached to the enrichment process.

<sup>21</sup> Apart from 0.6 kg of UF<sub>6</sub> enriched up to 20% U-235, which is under Agency seal at Iran's declared enrichment facilities where the nuclear material had been used as reference material for mass spectrometry.

## D.1. Natanz

15. **Fuel Enrichment Plant:** FEP is a centrifuge enrichment plant for the production of low enriched uranium (LEU) enriched up to 5% U-235, which was first brought into operation in 2007. The plant is divided into Production Hall A and Production Hall B. According to the design information submitted by Iran, eight units, each containing 18 cascades, are planned for Production Hall A, which totals approximately 25 000 centrifuges in 144 cascades. Currently, one unit contains IR-2m centrifuges; five contain IR-1 centrifuges; and the other two units do not contain centrifuges. Iran has yet to provide the corresponding design information for Production Hall B.

16. In the unit containing IR-2m centrifuges, as of 15 October 2014, the situation remained unchanged from the Director General's previous report: six cascades had been fully installed with IR-2m centrifuges;<sup>22</sup> none of these cascades had been fed with natural UF<sub>6</sub>; and preparatory installation work had been completed for the other 12 IR-2m cascades in the unit.

17. In the five units containing IR-1 centrifuges, as of 15 October 2014, the situation remained unchanged from the Director General's previous report: 90 cascades had been fully installed,<sup>23</sup> of which 54 were being fed with natural UF<sub>6</sub>.<sup>24</sup> As previously reported, preparatory installation work had been completed for 36 IR-1 cascades in the two units not containing centrifuges.

18. As of 14 October 2014, Iran had fed 146 855 kg of natural UF<sub>6</sub> into the cascades at FEP since production began in February 2007 and produced a total of 12 945 kg of UF<sub>6</sub> enriched up to 5% U-235.

19. As of 19 October 2014, Iran had downblended about 4118 kg of UF<sub>6</sub> enriched up to 2% U-235 to natural uranium.<sup>25,26</sup>

20. Based on the results of the analysis of environmental samples taken at FEP,<sup>27</sup> and other verification activities, the Agency has concluded that the facility has operated as declared by Iran in the relevant design information questionnaire (DIQ).

21. **Pilot Fuel Enrichment Plant:** PFEP is a pilot LEU production, and research and development (R&D) facility that was first brought into operation in October 2003. It can accommodate six cascades, and is divided between an area designated by Iran for the production of UF<sub>6</sub> enriched up to 20% U-235 (Cascades 1 and 6) and an area designated by Iran for R&D (Cascades 2, 3, 4 and 5).

22. Between 13 and 30 September 2014, the Agency conducted a physical inventory verification (PIV) at PFEP to verify the inventory as declared by Iran on 13 September 2014. The results of the PIV are now being evaluated by the Agency.

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<sup>22</sup> The number of IR-2m centrifuges installed at FEP (1008) was also unchanged.

<sup>23</sup> The number of IR-1 centrifuges installed at FEP (15 420) was also unchanged.

<sup>24</sup> GOV/2014/10, para. 22. The Agency has applied additional containment and surveillance measures to confirm that no more than the 54 IR-1 cascades (containing 9156 centrifuges) are being fed with nuclear material at FEP.

<sup>25</sup> This relates to one of Iran's undertakings in the JPA, as extended. The nuclear material originates from the tails produced by the enrichment of UF<sub>6</sub> up to 20% U-235 and from nuclear material evacuated from the cascades producing UF<sub>6</sub> enriched up to 5% U-235, and is not included in the amount of UF<sub>6</sub> enriched up to 5% U-235 indicated in para. 18.

<sup>26</sup> Of the 4118 kg, an estimated 22 kg of nuclear material remains in the equipment used in the downblending process. This nuclear material will be verified by the Agency prior to 24 November 2014.

<sup>27</sup> Results are available to the Agency for samples taken up to 22 July 2014.

23. **Production area:** As indicated in the Director General's previous report, Iran has ceased feeding Cascades 1 and 6 with UF<sub>6</sub> enriched up to 5% U-235 and is feeding them with natural UF<sub>6</sub> instead.<sup>28</sup> On 8 February 2014, Iran provided an update to parts of the DIQ in which it stated that it had taken measures "due to change in level of enrichment" and that the measures "are temporarily taken during the first step implementation of the JPA".<sup>29</sup> Since the JPA took effect, Iran has not operated Cascades 1 and 6 in an interconnected configuration.<sup>30</sup>

24. As of 20 January 2014, when it ceased production of UF<sub>6</sub> enriched up to 20% U-235, Iran had fed 1630.8 kg of UF<sub>6</sub> enriched up to 5% U-235 into Cascades 1 and 6 since production began in February 2010 and had produced a total of 201.9 kg of UF<sub>6</sub> enriched up to 20% U-235, all of which has since been withdrawn from the process and verified by the Agency. Between 20 January 2014 and 10 October 2014, Iran fed 660.4 kg of natural UF<sub>6</sub> into Cascades 1 and 6 at PFEP and produced a total of 62.7 kg of UF<sub>6</sub> enriched up to 5% U-235.<sup>31</sup>

25. **R&D area:** Since the Director General's previous report, Iran has been intermittently feeding natural UF<sub>6</sub> into the IR-5 centrifuge and IR-6s centrifuge as single machines and into IR-1, IR-2m, IR-4 and IR-6 centrifuges, sometimes into single machines and sometimes into cascades of various sizes.<sup>32</sup> The Agency confirms that a prototype IR-8 centrifuge remains in place but without connections.<sup>33</sup>

26. Between 19 August 2014 and 10 October 2014, a total of approximately 166.2 kg of natural UF<sub>6</sub> was fed into centrifuges in the R&D area, but no LEU was withdrawn as the product and the tails were recombined at the end of the process.

27. Between 20 January 2014 and 20 July 2014, Iran downblended 108.4 kg of its inventory of UF<sub>6</sub> enriched up to 20% U-235.<sup>34</sup>

28. Based on the results of the analysis of environmental samples taken at PFEP,<sup>35</sup> and other verification activities, the Agency has concluded that the facility has operated as declared by Iran in the relevant DIQ.

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<sup>28</sup> As of 15 October 2014, Cascades 1 and 6 contained a total of 328 IR-1 centrifuges (unchanged).

<sup>29</sup> Iran and the E3/EU+3 have since agreed to extend the JPA.

<sup>30</sup> GOV/2014/10, para. 28. The Agency has applied additional containment and surveillance measures to confirm that Cascades 1 and 6 are not interconnected.

<sup>31</sup> Based on the amounts of UF<sub>6</sub> enriched up to 5% U-235 verified by the Agency (as of 13 September 2014) and the amounts of UF<sub>6</sub> enriched up to 5% U-235 estimated by Iran (covering the period from 14 September 2014 to 10 October 2014).

<sup>32</sup> On 15 October 2014, there were 14 IR-1 centrifuges, 13 IR-4 centrifuges, one IR-5 centrifuge, 19 IR-6 centrifuges and one IR-8 prototype centrifuge installed in Cascade 2; 14 IR-1 centrifuges and ten IR-2m centrifuges installed in Cascade 3; 164 IR-4 centrifuges installed in Cascade 4; and 162 IR-2m centrifuges installed in Cascade 5.

<sup>33</sup> This item was referred to in previous reports of the Director General as a "casing". On 12 October 2014, Iran provided the Agency with access to the components inside the "casing" and the Agency was able to confirm that this was a prototype centrifuge containing a rotor, but without some other essential components.

<sup>34</sup> By 20 July 2014, in line with the JPA, the downblending process had been completed.

<sup>35</sup> Results are available to the Agency for samples taken up to 19 July 2014.

## D.2. Fordow

29. **Fordow Fuel Enrichment Plant:** FFEP is, according to the DIQ of 18 January 2012, a centrifuge enrichment plant for the production of UF<sub>6</sub> enriched up to 20% U-235 and the production of UF<sub>6</sub> enriched up to 5% U-235.<sup>36</sup> The facility, which was first brought into operation in 2011, is designed to contain up to 2976 centrifuges in 16 cascades, divided between Unit 1 and Unit 2. To date, all of the centrifuges installed are IR-1 machines. On 8 February 2014, Iran provided an update to parts of the DIQ in which it stated that it had taken measures “due to change in level of enrichment” and that the measures “are temporarily taken during the first step implementation of the JPA”.<sup>37</sup>

30. As previously reported, Iran has ceased feeding UF<sub>6</sub> enriched up to 5% U-235 into the four cascades of Unit 2 previously used for this purpose and is feeding them with natural UF<sub>6</sub> instead. Since the JPA took effect, Iran has not operated these cascades in an interconnected configuration.<sup>38</sup> As of 11 October 2014, none of the other 12 cascades in FFEP had been fed with UF<sub>6</sub>.<sup>39</sup>

31. As of 20 January 2014, when it ceased production of UF<sub>6</sub> enriched up to 20% U-235, Iran had fed 1806 kg of UF<sub>6</sub> enriched up to 5% U-235 into the cascades at FFEP since production began in December 2011 and had produced a total of 245.9 kg of UF<sub>6</sub> enriched up to 20% U-235, all of which has since been withdrawn from the process and verified by the Agency. Between 20 January 2014 and 11 October 2014, Iran fed 1683.4 kg of natural UF<sub>6</sub> into the cascades at FFEP and produced a total of 174.0 kg of UF<sub>6</sub> enriched up to 5% U-235.

32. Based on the results of the analysis of environmental samples taken at FFEP,<sup>40</sup> and other verification activities, the Agency has concluded that the facility has operated as declared by Iran in the relevant DIQ.

## D.3. Other Enrichment Related Activities

33. Iran continues to provide the Agency with regular managed access to centrifuge assembly workshops, centrifuge rotor production workshops and storage facilities.<sup>41</sup> Such access, as well as associated mutually agreed information, was also provided by Iran pursuant to one of the practical measures agreed in relation to the Framework for Cooperation (see Annex I). As part of this managed access, Iran has also provided the Agency with an inventory of centrifuge rotor assemblies to be used to replace those centrifuges that fail. The Agency has analysed the information provided by Iran and, upon request, has received additional clarifications. Since the JPA took effect, based on analysis of all the information provided by Iran, as well as the managed access and other verification activities carried out by the Agency, the Agency can confirm that centrifuge rotor manufacturing and assembly are consistent with Iran’s replacement programme for failed centrifuges.<sup>42</sup>

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<sup>36</sup> GOV/2009/74, paras 7 and 14; GOV/2012/9, para. 24. Iran has provided the Agency with an initial DIQ and three revised DIQs with different stated purposes for FFEP. In light of the difference between the original stated purpose of the facility and the purpose for which it is now being used, additional information from Iran is still required.

<sup>37</sup> Iran and the E3/EU+3 have since agreed to extend the JPA.

<sup>38</sup> GOV/2014/10, para. 36. The Agency has applied additional containment and surveillance measures at FFEP to confirm that only the four IR-1 cascades are used to enrich UF<sub>6</sub> and that they are not interconnected.

<sup>39</sup> The number of centrifuges installed at FFEP (2710) was also unchanged.

<sup>40</sup> Results are available to the Agency for samples taken up to 22 July 2014.

<sup>41</sup> This relates to one of Iran’s undertakings in the JPA.

<sup>42</sup> This relates to one of Iran’s undertakings in the JPA.

## E. Reprocessing Activities

34. Iran is required, pursuant to the relevant resolutions of the Board of Governors and the Security Council, to suspend its reprocessing activities, including R&D.<sup>43</sup> As previously reported, Iran stated in January 2014 that “during the first step time-bound (six months), Iran will not engage in stages of reprocessing activities, or construction of a facility capable of reprocessing”.<sup>44</sup> In a letter to the Agency dated 27 August 2014, Iran indicated that this “voluntary measure” had been extended in line with the extension of the JPA.

35. The Agency has continued to monitor the use of hot cells at TRR<sup>45</sup> and the Molybdenum, Iodine and Xenon Radioisotope Production (MIX) Facility.<sup>46</sup> The Agency carried out an inspection and a design information verification (DIV) at TRR on 6 October 2014, and a DIV at the MIX Facility on 7 October 2014. The Agency can confirm that there are no ongoing reprocessing related activities with respect to TRR, the MIX Facility and the other facilities to which the Agency has access in Iran.

## F. Heavy Water Related Projects

36. Contrary to the relevant resolutions of the Board of Governors and the Security Council, Iran has not suspended work on all heavy water related projects.<sup>47</sup> However, since the JPA took effect, Iran has neither installed any major components at the IR-40 Reactor nor produced nuclear fuel assemblies for the IR-40 Reactor at the Fuel Manufacturing Plant (FMP) (see para. 50 below).

37. **IR-40 Reactor:** The IR-40 Reactor, which is under Agency safeguards, is a 40 MW heavy water moderated research reactor designed to contain 150 fuel assemblies containing natural uranium in the form of UO<sub>2</sub>.

38. On 16 October 2014, the Agency carried out a DIV at the IR-40 Reactor and observed that, since the Director General’s previous report, none of the reactor’s remaining major components had been installed.<sup>48</sup> As indicated in the Director General’s previous report, pursuant to one of the practical measures agreed in relation to the Framework for Cooperation, Iran concluded with the Agency a safeguards approach for the IR-40 Reactor in August 2014.<sup>49</sup>

39. **Heavy Water Production Plant:** The Heavy Water Production Plant (HWPP) is a facility for the production of heavy water with a design capacity to produce 16 tonnes of reactor-grade heavy water per year.

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<sup>43</sup> GOV/2013/56, footnote 28.

<sup>44</sup> This relates to one of Iran’s undertakings in the JPA.

<sup>45</sup> The TRR is a 5 MW reactor which operates with 20% U-235 enriched fuel and is used for the irradiation of different types of targets and for research and training purposes.

<sup>46</sup> The MIX Facility is a hot cell complex for the separation of radiopharmaceutical isotopes from targets, including uranium, irradiated at TRR.

<sup>47</sup> GOV/2013/56, footnote 32.

<sup>48</sup> GOV/2013/56, para. 34.

<sup>49</sup> GOV/2014/43, para. 46.



40. As previously reported, although the HWPP is not under Agency safeguards, the plant was subject to managed access by the Agency on 8 December 2013.<sup>50</sup> During the managed access, Iran also provided the Agency with mutually agreed relevant information. In addition, access to the heavy water storage location at the Uranium Conversion Facility (UCF) at Esfahan in February 2014 enabled the Agency to characterize the heavy water.<sup>51</sup>

## G. Uranium Conversion and Fuel Fabrication

41. Iran is conducting a number of activities at UCF, the Enriched UO<sub>2</sub> Powder Plant (EUPP), FMP and the Fuel Plate Fabrication Plant (FPFP) at Esfahan, as indicated below, which are in contravention of its obligations to suspend all enrichment related activities and heavy water related projects, notwithstanding that the facilities are under Agency safeguards.

42. Since Iran began conversion and fuel fabrication at its declared facilities, it has, inter alia:

- Produced 550 tonnes of natural UF<sub>6</sub> at UCF, of which 163 tonnes have been transferred to FEP.
- Transferred four tonnes of natural UF<sub>6</sub> from UCF to EUPP.<sup>52</sup> In addition, 4.3 tonnes of UF<sub>6</sub> enriched up to 5% U-235 have been transferred from FEP to EUPP.
- Fed into the conversion process at EUPP 1505 kg of UF<sub>6</sub> enriched up to 5% U-235.
- Fed into the R&D conversion process at UCF 53 kg of UF<sub>6</sub> enriched to 3.34% U-235 and produced 24 kg of uranium in the form of UO<sub>2</sub>.<sup>53</sup>
- Fed into the conversion process at FPFP 337.2 kg of UF<sub>6</sub> enriched up to 20% U-235 (unchanged since the Director General's previous report) and produced 162.8 kg of uranium in the form of U<sub>3</sub>O<sub>8</sub>.<sup>54</sup>

43. **Uranium Conversion Facility:** UCF is a conversion facility for the production of both natural UF<sub>6</sub> and natural UO<sub>2</sub> from uranium ore concentrate (UOC). It is planned that UCF will also produce UF<sub>4</sub> from depleted UF<sub>6</sub>, and uranium metal ingots from natural and depleted UF<sub>4</sub>.

44. On 26 July 2014, Iran informed the Agency that Iran would conduct R&D activities at UCF on uranium recovery from liquid and solid scrap resulting from conversion activities at UCF.

45. As a result of the PIV carried out by the Agency at UCF between 17 and 21 May 2014, the Agency has verified, within the measurement uncertainties normally associated with such a facility, the inventory as declared by Iran on 16 May 2014.

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<sup>50</sup> GOV/2014/10, para. 13.

<sup>51</sup> GOV/2013/56, para. 39.

<sup>52</sup> GOV/2013/40, footnote 44.

<sup>53</sup> GOV/2012/55, para. 35.

<sup>54</sup> Since the Director General's previous report, 0.5 kg of uranium in the form of U<sub>3</sub>O<sub>8</sub> was produced from nuclear material in the process.

46. Iran has declared that, as of 14 October 2014, it had produced 13.8 tonnes<sup>55</sup> of natural uranium in the form of  $\text{UO}_2$  through the conversion of  $\text{UOC}$ .<sup>56</sup> The Agency has verified that, as of the same date, Iran had transferred 13.2 tonnes<sup>57</sup> of natural uranium in the form of  $\text{UO}_2$  to FMP.

47. **Enriched  $\text{UO}_2$  Powder Plant:** EUPP is a facility for the conversion of  $\text{UF}_6$  enriched up to 5% U-235 into  $\text{UO}_2$  powder.<sup>58</sup> As previously reported, Iran began commissioning the facility in May 2014 using natural uranium. As part of the commissioning, as of 14 October 2014, Iran had fed a total of 4174 kg of natural  $\text{UF}_6$  into the conversion process and produced 553 kg of uranium in the form of  $\text{UO}_2$ . Since the plant began operations in July 2014, Iran has fed 1505 kg of  $\text{UF}_6$  enriched up to 5% U-235 into the conversion process for the production of  $\text{UO}_2$ .<sup>59,60</sup>

48. **Fuel Manufacturing Plant:** FMP is a facility for the fabrication of nuclear fuel assemblies for power and research reactors (see Annex III).

49. On 31 August 2014 and 1 September 2014, the Agency carried out a PIV and a DIV at FMP, the results of which are now being evaluated by the Agency.

50. On 14 October 2014, the Agency conducted an inspection and a DIV at FMP and verified that Iran had continued its cessation of production of nuclear fuel assemblies using natural  $\text{UO}_2$  for the IR-40 Reactor and that all of the fuel assemblies that had been produced previously remained at FMP.

51. **Fuel Plate Fabrication Plant:** FPPF is a facility for the conversion of  $\text{UF}_6$  enriched up to 20% U-235 into  $\text{U}_3\text{O}_8$  and the manufacture of fuel assemblies made of fuel plates containing  $\text{U}_3\text{O}_8$  (see Annex III).

52. As previously reported, Iran stated in January 2014 that “during the first step of time-bound (six months), Iran declares that there is no reconversion line to reconvert uranium oxide enriched up to 20% U-235 back into  $\text{UF}_6$  enriched up to 20% U-235”.<sup>61</sup> In a letter to the Agency dated 27 August 2014, Iran indicated that this “voluntary measure” had been extended in line with the extension of the JPA. On 18 and 19 October 2014, the Agency conducted an inspection and a DIV at FPPF during which it confirmed that there was no process line at the plant for the reconversion of uranium oxide into  $\text{UF}_6$ .

53. The Agency has verified that, as of 17 October 2014,<sup>62</sup> Iran had fed a total of 337.2 kg of  $\text{UF}_6$  enriched up to 20% U-235 (227.6 kg of uranium) into the conversion process of FPPF and had produced 162.8 kg<sup>63</sup> of uranium in the form of  $\text{U}_3\text{O}_8$ .<sup>64</sup> The Agency also verified that 54.4 kg of

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<sup>55</sup> Unchanged from the figure indicated in the Director General’s previous report.

<sup>56</sup> This amount only refers to nuclear material qualified for fuel fabrication.

<sup>57</sup> Unchanged from the figure indicated in the Director General’s previous report.

<sup>58</sup> GOV/2013/40, para. 45.

<sup>59</sup> Pursuant to Iran’s undertaking under the JPA to convert into oxide “ $\text{UF}_6$  newly enriched up to 5% during the six-month period”.

<sup>60</sup> Unchanged from the figure indicated in the Director General’s previous report.

<sup>61</sup> This relates to one of Iran’s undertakings in the JPA.

<sup>62</sup> As the total of Iran’s declared inventory of  $\text{UF}_6$  enriched up to 20% U-235 had been further processed by 20 July 2014, Iran has not been feeding such nuclear material into the conversion process at FPPF since that date.

<sup>63</sup> See footnote 55.

<sup>64</sup> 76.4 kg of this nuclear material has been used for the production of fuel items for TRR (17.1 kg of which have been used since 20 July 2014).

uranium were contained in solid and liquid scrap. The remainder of the uranium that was fed into the process remains in the process and in waste.

54. The Agency has verified that, as of 17 October 2014, Iran had produced at FPF one experimental fuel assembly and 30 TRR-type fuel assemblies. Twenty-eight of these fuel assemblies, including the experimental assembly, had been transferred to TRR.

## H. Possible Military Dimensions

55. Previous reports by the Director General have identified outstanding issues related to possible military dimensions to Iran's nuclear programme and actions required of Iran to resolve these.<sup>65</sup> The Agency remains concerned about the possible existence in Iran of undisclosed nuclear related activities involving military related organizations, including activities related to the development of a nuclear payload for a missile. Iran is required to cooperate fully with the Agency on all outstanding issues, particularly those which give rise to concerns about the possible military dimensions to Iran's nuclear programme, including by providing access without delay to all sites, equipment, persons and documents requested by the Agency.<sup>66</sup>

56. The Annex to the Director General's November 2011 report (GOV/2011/65) provided a detailed analysis of the information available to the Agency at that time, indicating that Iran has carried out activities that are relevant to the development of a nuclear explosive device. This information is assessed by the Agency to be, overall, credible.<sup>67</sup> The Agency has obtained more information since November 2011 that has further corroborated the analysis contained in that Annex.

57. In February 2012, Iran dismissed the Agency's concerns, largely on the grounds that Iran considered them to be based on unfounded allegations,<sup>68</sup> and in August 2014, Iran stated that "most of the issues" in the Annex to GOV/2011/65 were "mere allegations and do not merit consideration".<sup>69</sup>

58. As indicated above (para. 8), Iranian and Agency officials held technical meetings in Tehran on 7 October 2014 and 2 November 2014, during which they discussed the two outstanding practical measures relating to the initiation of high explosives and to neutron transport calculations (see Annex I).

59. Since the Director General's previous report, at a particular location at the Parchin site, the Agency has observed through satellite imagery that the construction activity that appeared to show the removal/replacement or refurbishment of the site's two main buildings' external wall structures appears to have ceased.<sup>70</sup> This activity is likely to have further undermined the Agency's ability to

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<sup>65</sup> For example: GOV/2011/65, paras 38–45 and Annex; GOV/2011/29, para. 35; GOV/2011/7, Attachment; GOV/2010/10, paras 40–45; GOV/2009/55, paras 18–25; GOV/2008/38, paras 14–21; GOV/2008/15, paras 14–25 and Annex; GOV/2008/4, paras 35–42.

<sup>66</sup> Security Council resolution 1929, paras 2 and 3.

<sup>67</sup> GOV/2011/65, Annex, Section B.

<sup>68</sup> GOV/2012/9, para. 8.

<sup>69</sup> GOV/2014/43, para. 64.

<sup>70</sup> GOV/2014/43, para. 67.

conduct effective verification.<sup>71</sup> It remains important for Iran to provide answers to the Agency's questions<sup>72</sup> and access to the particular location in question.<sup>73</sup>

60. As indicated in previous reports and as reiterated by the Director General following his meetings in Tehran in August 2014, the Agency needs to be able to conduct a "system" assessment of the outstanding issues contained in the Annex to GOV/2011/65. This will involve considering and acquiring an understanding of each issue in turn, and then integrating all of the issues into a "system" and assessing that system as a whole. In this regard, the Agency is ready to accelerate the resolution of all outstanding issues under the Framework for Co-operation. This can be realised by increased co-operation by Iran and by the timely provision of access to all relevant information, documentation, sites, material and personnel in Iran as requested by the Agency. Once the Agency has established an understanding of the whole picture concerning issues with possible military dimensions, the Director General will report on the Agency's assessment to the Board of Governors.

## **I. Design Information**

61. Under the terms of its Safeguards Agreement and relevant resolutions of the Board of Governors and the Security Council, Iran is required to implement the provisions of the modified Code 3.1 of the Subsidiary Arrangements General Part concerning the early provision of design information.<sup>74</sup>

## **J. Additional Protocol**

62. Contrary to the relevant resolutions of the Board of Governors and the Security Council, Iran is not implementing its Additional Protocol. The Agency will not be in a position to provide credible assurance about the absence of undeclared nuclear material and activities in Iran unless and until Iran provides the necessary cooperation with the Agency, including by implementing its Additional Protocol.<sup>75</sup>

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<sup>71</sup> For a list of the most significant developments observed by the Agency at this location between February 2012 and the publication of the Director General's May 2013 report, see GOV/2012/55, para. 44; GOV/2013/6, para. 52; and GOV/2013/27, para. 55.

<sup>72</sup> GOV/2011/65, Annex, Section C; GOV/2012/23, para. 5.

<sup>73</sup> The Agency has information provided by Member States indicating that Iran had constructed a large explosives containment vessel (chamber) at this location in which to conduct hydrodynamic experiments. Such experiments would be strong indicators of possible nuclear weapon development (GOV/2011/65, Annex, paras 49–51).

<sup>74</sup> In a letter dated 29 March 2007, Iran informed the Agency that it had suspended implementation of the modified Code 3.1 of the Subsidiary Arrangements to its Safeguards Agreement (GOV/INF/2007/8). In accordance with Article 39 of Iran's Safeguards Agreement, agreed Subsidiary Arrangements cannot be changed unilaterally; nor is there a mechanism in the Safeguards Agreement for the suspension of provisions agreed to in the Subsidiary Arrangements. Therefore, the modified Code 3.1, as agreed to by Iran in 2003, remains in force. Iran is further bound by operative para. 5 of Security Council resolution 1929 (2010).

<sup>75</sup> Iran's Additional Protocol was approved by the Board of Governors on 21 November 2003 and signed by Iran on 18 December 2003, although it has not been brought into force. Iran provisionally implemented its Additional Protocol between December 2003 and February 2006.

## K. Other Matters

63. On 6 October 2014, the Agency confirmed that 13 fuel assemblies which had been produced in Iran and which contain uranium that was enriched in Iran up to 20% U-235 were in the core of TRR.<sup>76</sup> On the same date, the Agency observed that the Mini IR-40 prototype fuel assembly was in the storage pool.<sup>77</sup>

64. As of 7 October 2014, the Agency confirmed that one fuel plate (the same one as indicated in the Director General's previous report), containing a mixture of U<sub>3</sub>O<sub>8</sub> (enriched up to 20% U-235) and aluminium, remains at the MIX facility, having been transferred from FFPF, and was being used for R&D activities aimed at optimizing the production of <sup>99</sup>Mo, <sup>133</sup>Xe and <sup>132</sup>I isotopes.<sup>78</sup>

65. The visa for one member of the Agency team to visit Iran for the technical meeting in Tehran in October 2014 was not issued. This is the fourth occasion on which this staff member has been unable to participate in technical meetings in Tehran as a result of Iran not issuing a visa. For the Agency to be able to address the outstanding issues effectively, it is important that any staff member identified by the Agency with the requisite expertise is able to participate in the Agency's technical activities in Iran.

## L. Summary

66. While the Agency continues to verify the non-diversion of declared nuclear material at the nuclear facilities and LOFs declared by Iran under its Safeguards Agreement, the Agency is not in a position to provide credible assurance about the absence of undeclared nuclear material and activities in Iran, and therefore to conclude that all nuclear material in Iran is in peaceful activities.<sup>79</sup>

67. Iran and the Agency held technical meetings on two separate occasions in Tehran to discuss the two outstanding practical measures agreed in May 2014 in the third step of the Framework for Cooperation.

68. Iran has not provided any explanations that enable the Agency to clarify the outstanding practical measures, nor has it proposed any new practical measures in the next step of the Framework for Cooperation.

69. The Agency is ready to accelerate the resolution of all outstanding issues under the Framework for Co-operation. This can be realised by increased co-operation by Iran and by the timely provision of access to all relevant information, documentation, sites, material and personnel in Iran as requested by the Agency. Once the Agency has established an understanding of the whole picture concerning issues

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<sup>76</sup> On 6 October 2014, the core of TRR comprised a total of 33 fuel assemblies.

<sup>77</sup> GOV/2013/40, para. 64.

<sup>78</sup> GOV/2013/40, para. 65.

<sup>79</sup> The Board of Governors has confirmed on numerous occasions, since as early as 1992, that para. 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 and GOV/OR.865, paras 53–54).

with possible military dimensions, the Director General will report on the Agency's assessment to the Board of Governors.

70. The Agency continues to undertake monitoring and verification in relation to the nuclear-related measures set out in the JPA, as extended.

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

## **Annex I**

### **Practical Measures agreed to date by the Agency and Iran, and to be implemented by Iran, in relation to the Framework for Cooperation**

#### **FIRST STEP: Six (Initial) Practical Measures, agreed on 11 November 2013**

1. Providing mutually agreed relevant information and managed access to the Gchine mine in Bandar Abbas.
2. Providing mutually agreed relevant information and managed access to the Heavy Water Production Plant.
3. Providing information on new research reactors.
4. Providing information with regard to the identification of 16 sites designated for the construction of nuclear power plants.
5. Clarification of the announcement made by Iran regarding additional enrichment facilities.
6. Further clarification of the announcement made by Iran with respect to laser enrichment technology.

#### **SECOND STEP: Seven Practical Measures, agreed on 9 February 2014**

1. Providing mutually agreed relevant information and managed access to the Saghand mine in Yazd.
2. Providing mutually agreed relevant information and managed access to the Ardakan concentration plant.
3. Submission of an updated Design Information Questionnaire (DIQ) for the IR-40 Reactor.
4. Taking steps to agree with the Agency on the conclusion of a Safeguards Approach for the IR-40 Reactor.
5. Providing mutually agreed relevant information and arranging for a technical visit to Lashkar Ab'ad Laser Centre.
6. Providing information on source material, which has not reached the composition and purity suitable for fuel fabrication or for being isotopically enriched, including imports of such material and on Iran's extraction of uranium from phosphates.
7. Providing information and explanations for the Agency to assess Iran's stated need or application for the development of Exploding Bridge Wire detonators.

#### **THIRD STEP: Five Practical Measures, agreed on 20 May 2014**

1. Exchanging information with the Agency with respect to the allegations related to the initiation of high explosives, including the conduct of large scale high explosives experimentation in Iran.
2. Providing mutually agreed relevant information and explanations related to studies made and/or papers published in Iran in relation to neutron transport and associated modelling and calculations and their alleged application to compressed materials.
3. Providing mutually agreed information and arranging a technical visit to a centrifuge research and development centre.
4. Providing mutually agreed information and managed access to centrifuge assembly workshops, centrifuge rotor production workshops and storage facilities.
5. Concluding the safeguards approach for the IR-40 Reactor.

## **Annex II**

### **List of Declared Nuclear Facilities and LOFs in Iran**

#### **Tehran:**

1. Tehran Research Reactor (TRR)
2. Molybdenum, Iodine and Xenon Radioisotope Production (MIX) Facility
3. Jabr Ibn Hayan Multipurpose Laboratories (JHL)

#### **Esfahan:**

4. Miniature Neutron Source Reactor (MNSR)
5. Light Water Sub-Critical Reactor (LWSCR)
6. Heavy Water Zero Power Reactor (HWZPR)
7. Uranium Conversion Facility (UCF)
8. Fuel Manufacturing Plant (FMP)
9. Fuel Plate Fabrication Plant (FPFP)
10. Enriched UO<sub>2</sub> Powder Plant (EUPP)

#### **Natanz:**

11. Fuel Enrichment Plant (FEP)
12. Pilot Fuel Enrichment Plant (PFEP)

#### **Fordow:**

13. Fordow Fuel Enrichment Plant (FFEP)

#### **Arak:**

14. Iran Nuclear Research Reactor (IR-40 Reactor)

#### **Karaj:**

15. Karaj Waste Storage

#### **Bushehr:**

16. Bushehr Nuclear Power Plant (BNPP)

#### **Darkhovin:**

17. 360 MW Nuclear Power Plant

#### **Shiraz:**

18. 10 MW Fars Research Reactor (FRR)

#### **LOFs:**

Nine (all situated within hospitals)



## Annex III

**Table 1: Summary of UF<sub>6</sub> Production and Flows**

	Date	Quantity	Enrichment
Produced at UCF	17 October 2014	550 000 kg	Natural
Produced by downblending of UF <sub>6</sub> enriched up to 2% U-235	19 October 2014	7706 kg	Natural
Fed into FEP, PFEP and FFEP	October 2014	149 199 kg	Natural
Produced at FEP, PFEP and FFEP	October 2014	13 181.7 kg	Up to 5%
Produced by downblending of UF <sub>6</sub> enriched up to 20% U-235	20 July 2014	115.6 kg	Up to 5%
Fed into PFEP	20 January 2014	1630.8 kg	Up to 5%
Produced at PFEP	20 January 2014	201.9 kg	Up to 20%
Fed into FFEP	20 January 2014	1806.0 kg	Up to 5%
Produced at FFEP	20 January 2014	245.9 kg	Up to 20%

**Table 2: Inventory of UF<sub>6</sub> Enriched up to 20% U-235**

Produced at FFEP and PFEP	447.8 kg
Fed into conversion process	337.2 kg
Downblended	110.0 kg*
Stored as UF <sub>6</sub>	0.6 kg**

\* The figure includes 1.6 kg that was previously downblended (GOV/2012/55, para. 10).

\*\* See footnote 22 of this report.

**Table 3: Conversion at UCF**

Conversion process	Quantity produced	Transferred to FMP
UF <sub>6</sub> (~3.4% U-235) into UO <sub>2</sub>	24 kg U	24 kg U
Natural UOC into UO <sub>2</sub>	13 792 kg U*	13 229 kg U

\* Uranium content in material qualified for fuel fabrication.

**Table 4: Conversion of UF<sub>6</sub> Enriched up to 20% U-235 into U<sub>3</sub>O<sub>8</sub> at FFPF**

Feed quantity	Quantity produced
337.2 kg of UF <sub>6</sub> (227.6 kg U)	162.8 kg U

**Table 5: Conversion of UF<sub>6</sub> into UO<sub>2</sub> at EUPP**

Feed quantity	Quantity produced
4174 kg of natural UF <sub>6</sub> (2815.1 kg U)	553 kg U*
1505 kg of UF <sub>6</sub> enriched up to 5% U-235 (1016 kg U)	- *

\* The rest of the nuclear material is in different stages of the process.

**Table 6: Fuel Manufacturing at FMP**

Item	Number produced	Enrichment	Item mass (g U)	Number irradiated
Test fuel rod for IR-40 Reactor	3	Natural uranium	500	1
Test fuel rod	2	3.4%	500	-
Fuel rod assembly	2	3.4%	6 000	1
Mini IR-40 prototype fuel assembly	1	Natural uranium	10 000	1
IR-40 prototype fuel assembly	36	Natural uranium	35 500	Not applicable
IR-40 fuel assembly	11	Natural uranium	56 500	-

**Table 7: TRR Fuel Fabrication at FFPF**

Item	Number produced	Enrichment	Item mass (g U)	Present at TRR	Irradiated
TRR test plate (Natural Uranium)	4	Natural uranium	5	2	1
TRR test plate	5	19%	75	5	2
TRR control fuel assembly	9	19%	1 000	8	5
TRR standard fuel assembly	21	19%	1 400	19	9
Test assembly (with 8 plates)	1	19%	550	1	-