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On Thursday, 19 February 2015, the IAEA issued its periodic report on the "Implementation of the NPT Safeguards Agreement and relevant provisions of Security Council resolutions in the Islamic Republic of Iran," for the upcoming IAEA Board of Governors meeting on 2-6 March 2015. The report updates the information provided in the previous periodic inspection report from 7 November 2014, and interim report from 20 January 2015.

No Major Developments in Iran's Nuclear Activity

According to the new report, there are no major developments in Iran's nuclear activity. Iran is continuing to comply with the provisions of the Joint Plan of Action (JPA) specified in the interim agreement, but has not supplied the IAEA with answers regarding "Clarification of Unresolved Issues" in connection with the "Possible Military Dimensions" of the nuclear program, and has not allowed the Agency inspectors access to the controversial Parchin site (contrary to at least one media report that access had been granted and the inspectors had visited there). Iran therefore appears to be in compliance with the agreement made on 24 November 2013 with the P5+1 (the interim agreement and the subsequent JPA), but not in compliance with the agreement made separately with the IAEA on 11 November 2013 that stipulated Iran must clarify unresolved issues in connection with their suspected nuclear weapons work ("Possible Military Dimensions"). Indeed, the current IAEA Report specifically refers to Iran's continued silence on the issues of high explosives in connection with the possible development of an implosion design to detonate a nuclear weapon and neutron transport calculations in connection with the initiation and conduct of a nuclear explosion fission chain reaction.

In connection with the compliance with the JPA, the report also notes that Iran:

- Has not operated any centrifuges additional to those in operation on the day the JPA took effect, on 20 January 2014
- Has not installed any centrifuges additional to those already installed as of 20 January 2014 (in fact the freeze on those two items has been in effect since the June 2013 election of Rouhani, even before the interim agreement of November 2013 and the JPA in January 2014 were reached)
- Does not have any uranium enriched beyond the 5% LEU level (i.e. does not have any 20% enriched uranium) in UF₆ form – having long since (i.e. as of last summer) disposed of its entire stock of 20% enriched uranium in UF₆ form either by downblending it to the LEU level, or turning it into U₃O₈ oxide then used to produce fuel plates for the Teheran Research Reactor (TRR)

- Has not installed any components at the IR-40 Arak heavy water reactor since 20 January 2014, nor produced any additional (natural uranium) fuel for the reactor since 20 January 2014
- Has resumed or is continuing to feed virtually all LEU produced as UF₆ into the EUPP (Esfahan Enriched UO₂ Oxide Powder Plant) to turn into oxide, albeit with occasional pauses and without specifying how much oxide has been produced, for reasons as yet unknown
- Continues to allow the Agency unfettered access to centrifuge production facilities, uranium mines, and other sites as agreed in the JPA – although not to sites which the Agency suspects as being of relevance to Iran's nuclear weapons work and wants to visit, such as Parchin.

Many Parameters of Report Remained Unchanged

- **Natanz (underground) Fuel Enrichment Plant (FEP): the number of centrifuges remains unchanged:** as of the inspectors' visit on 8 February 2015, the current report tells of 90 IR-1 type centrifuge cascades installed (unchanged from the previous report). The number of cascades in operation is 54 (unchanged from the previous report). So the number of IR-1 centrifuges installed at FEP remains at 15,420 (unchanged from the previous report). Additionally, preparatory installation work for another 36 IR-1 cascades has been completed (unchanged from the previous report).
- **No installation of IR-2m centrifuges:** as of the IAEA inspection of 8 February 2015, Iran has not installed any more IR-2m centrifuges, and retains the now fully installed 6 IR-2m cascades (comprising 1008 centrifuges, unchanged from the previous report), with preparatory work having been completed towards the installation of 12 additional IR-2m cascades (unchanged from the previous report).
- **Fordow Fuel Enrichment Plant (FFEP):** as of 20 January 2014, enrichment to the 20 percent level at FFEP ceased, and the 4 cascades doing so since January 2012 were switched to LEU production (unchanged from the previous report). Altogether, there are 2710 IR-1 centrifuges (in 16 cascades – 4 operating and 12 installed but not operated) installed at FFEP (unchanged from the previous report).
- **Natanz (above ground) Pilot Fuel Enrichment Plant (PFEP) Production area:** the two cascades (IR-1) previously producing 20 percent enriched uranium (from January 2010 until January 2014) continue producing LEU (unchanged from the previous report).
- **Esfahan Uranium Conversion Facility (UCF)** – the current report essentially repeats the findings of the previous report: Iran has produced 550 tons of UF₆ at the UCF since its launching (unchanged from the previous report), of which approximately 170 tons (up from 163 in the previous report) have been sent to Natanz FEP.
- At the (adjacent to the Esfahan UCF) **Fuel Manufacturing Plant (FMP)**, as of the inspection on 15 February 2015, Iran is continuing its freeze on the production of fuel assemblies for the IR-40 reactor (unchanged from the previous report). Moreover, all of the fuel assemblies already produced remain at FMP (unchanged from the previous report).
- **Esfahan Enriched UO₂ Powder Plant (EUPP):** this is the facility for the conversion of UF₆ enriched up to 5% U-235 (LEU) into UO₂ (uranium oxide) powder. The current report repeats the findings already issued in the 20 January 2015 interim report that 2720 kg of LEU

in UF6 form have been fed into the process for conversion into oxide (up from 1505 kg in the previous reports of 5 September and 7 November 2014, i.e. 1215 kg since then).

- **Downblending of 2% LEU into natural uranium:** as reported in the previous inspection report, as of 19 October 2014, Iran had downblended about 4118 kg of 2% U-235 to natural uranium. This is another compliance with the JPA. The material was the tail product of the LEU and 20% enrichment effort between February 2007 and January 2014.
- **Heavy water related projects:** as of 8 February 2015, the Agency conducted a DIV at the IR-40 Arak reactor, and observed that none of the reactor's remaining major components had been installed (unchanged from the previous report and in compliance with the provisions of the JPA).

Updates Regarding Iranian Compliance with the JPA

Arak Heavy Water Production Plant (HWPP): the current report states that a managed access inspection took place on 8 December 2013 (for the first time since August 2011). Similarly the Agency was granted managed access in February 2014 to the heavy water stored at the UCF in order to take samples, "which enabled the Agency to characterize the heavy water."

Quantities of LEU produced: At Natanz, Iran has now produced FEP 13,730 kg of LEU (up from 12,945 kg in the November report – an addition of 785 kg, or about 6%, normal for such an interim), leaving – together with the small additional quantities produced at PFEP and FFEP – 7952.9 kg of LEU stored as UF6 (down from 8390.3 kg, a decrease of 337.4 kg, or about 4%, as Iran continues to divert LEU produced as UF6 to process into oxide at EUPP). This is enough for about five or six nuclear weapons, if further enriched to weapons grade HEU, give or take, depending on Iran's effective utilization of this inventory being more or less than optimal.

Bushehr Nuclear Power Plant (BNPP): During an inspection conducted by the IAEA at BNPP on 14 and 15 February 2015, the reactor was found to be operating at 70% of its nominal power (the previous report omitted any mention of BNPP, which was unusual, the one before that stated that it was operating at 100%).

Iranian Production of LEU: Iran is also producing LEU, following the terms of the JPA, using the six cascades (4 at Fordow FFEP and 2 at Natanz PFEP) which were previously being used to produce 20 percent enriched uranium, and has produced 64.3 kg (238.3 kg up from 174 kg in the previous report) of LEU at FFEP and 28.3 kg (91 kg up from 62.7 kg in the previous report) of LEU at PFEP, thus making up the difference, and bringing the total produced since enrichment began in February 2007 to 14,174.9 kg, according to the report. This is an increase of 877.6 kg, or almost 6%, typical for the reporting period.

Reprocessing activities – The report states that on 9 and 10 February 2015, the Agency conducted a DIV and other verifications at the hot cells of the Tehran Research Reactor (TRR) and the Molybdenum, Iodine and Xenon Radioisotope Production (MIX) Facility, and the Agency can confirm (with respect to those facilities only) that there are no ongoing reprocessing related activities.

Fuel Plate Fabrication Plant (FPFP): The report also states that as of the inspection of 10 February 2015, the FPFP transferred 32 TRR-type fuel assemblies (up from 30 in the previous report) to the Tehran Research Reactor (TRR).

The report repeats the information stated in previous reports that Iran had fed 337.2 kg of UF₆ enriched to the 20% U-235 level (unchanged from the previous report) into the conversion process at FPFP, thus making it unavailable for further enrichment for weapons. Iran also produced 162.8 kg (up from 162.3 kg) of 20 percent enriched uranium in the form of U₃O₈ oxide.

Between 9 and 17 February 2015, the Agency conducted an inspection and DIV (Design Inspection Verification) at FPFP during which it confirmed that there was no process line at the plant for the reconversion of uranium oxide into UF₆.

Advanced Model Centrifuges at PFEP R&D area: in the realm of advanced centrifuges at Natanz PFEP, the previous report stated that Iran had begun to intermittently feed the single IR-5 centrifuge previously installed with UF₆. Media reporting alleged that this was a violation of the JPA; regardless, Iran has since disconnected both the IR-5 centrifuge and the IR-8 centrifuge at the facility, according to the current report. PFEP also has R&D cascades of 40 IR-1 centrifuges (up from 28), 2 IR-2m centrifuges (down from 10), 35 IR-4 centrifuges (up from 13), 13 IR-6 centrifuges (down from 19), and 0 IR-6s centrifuges (unchanged). It also has the previously installed full 164-centrifuge IR-4 and 162-centrifuge IR-2m cascades in operation to enrich uranium on an R&D scale.

Current Centrifuge Capabilities:

Overall Iran continues to operate over 10,100 centrifuges to enrich uranium, and has almost 10,000 more installed and ready to begin enriching, including 1008 of the advanced IR-2m type which the Iranians are especially eager to start operating for enrichment, as they are reported capable of enrichment at double the rate of the antiquated IR-1 type machines. These numbers are significant when considering the details of a possible comprehensive agreement between Iran and the P5+1, in which "rollback" could include Iran curtailing the number of centrifuges in its inventory, and disconnecting, disabling, or dismantling and storing the remainder, all under rigorous IAEA oversight.

There are of course other additional issues subject to negotiation, such as the fate of Iran's existing enriched uranium stocks, and the period of duration of an agreement. In addition, Iran has completed preparatory work for the installation of almost 9,000 more centrifuges, which could be installed and operated rapidly too if there is no agreement, thus bringing the total to almost thirty thousand.

Concerns over Military Dimensions of the Iranian Nuclear Program:

The current report repeats previous concerns, elaborated upon in great detail in the November 2011 inspection report Annex, regarding undisclosed nuclear related activities involving military related organizations, including activities related to the development of a nuclear payload for a missile. The Agency repeats that it has found the information at its disposal to be, overall, credible and Iran has largely dismissed the Agency's concerns as "unfounded allegations." For example, in a letter to the

Agency dated 28 August 2014, Iran restated that “most of the issues” in the Annex were “mere allegations and do not merit consideration.”

Using strong language, the Agency protests the fact that Iran has done nothing at all to clear up the issues of the two outstanding practical measures relating to the initiation of high explosives and to neutron transport calculations. It also repeats that Iran continues to refuse the Agency access to the site in question at Parchin, which has been under construction by Iran since February 2012: “It remains important for Iran to provide answers to the Agency's questions and access to the particular location at the Parchin site.” The November 2011 annex detailed the IAEA concerns that the site contained a thermodynamic testing facility constructed to test the Shahab 3 nuclear payload capable warhead, and that it was active between the years 2000 and 2003.

The report also reiterates that Iran is not implementing the Additional Protocol, and that therefore the Agency is in no position to provide credible assurances about the absence of undeclared nuclear material and activities in Iran.

Assessment

The gist of the current report is that there are no major developments regarding the Iranian nuclear program. For the period reviewed by the report, Iran is continuing to comply with the provisions of the JPA. However, it is continuing, as before, to refuse to cooperate regarding Iran's nuclear weapons development work, especially on the issue of high explosives testing for implosion devices, neutron transport calculations for initiation of nuclear weapons, and access to the controversial Parchin facility, where extensive construction has taken place to obfuscate previous activities there (such as thermodynamic testing of the Shahab 3 nuclear payload warhead).

At this point, it appears unlikely that Iran will change course and provide the IAEA with the full evidence of its past nuclear weapons work, as it denies any such activity had ever taken place, asserts that the country has no intention of developing or producing nuclear weapons, that their nuclear activities are purely for peaceful purposes, and always have been so, and that Iran is in fact prohibited from pursuing nuclear weapons by religious edict (fatwa). Thus, the IAEA can only continue to compile information on this issue, including suspected nuclear weapons work that may have continued beyond 2003, until at least 2011.

As the deadlines for concluding a first principles agreement and then a comprehensive agreement between the P5+1 and Iran draw near, it is useful to note that Iran has about ten thousand centrifuges in operation enriching uranium, another ten thousand centrifuges installed and ready for immediate operation but not yet operational – including the cherished IR-2m type said to be capable of enrichment at double the pace of the antiquated IR-1 type – and has completed preparations for the short order installation of almost ten thousand more centrifuges of both IR-1 and IR-2m type.

Whether Iran is willing to restrict those numbers, and to dismantle and store the remainder, or disconnect them, or otherwise disable them, remains a hotly debated topic in the negotiations. Another debated topic is the fate of the 7600 kg of LEU in UF₆ form, which the interim agreement allowed Iran to retain, enough for five to six nuclear weapons if further enriched to weapons grade

HEU. Another key sticking point is the fate of the Arak reactor, theoretically capable of producing plutonium sufficient for one nuclear weapon per annum if reprocessed (Iran currently does not have such a reprocessing facility, and has agreed not to construct one for the duration of the interim agreement and if an overall agreement is reached). Reports from the negotiations intimate that Arak would be modified so that it would not be able to produce militarily significant quantities of plutonium. The negotiations are also stuck regarding the duration of the proposed agreement – the P5+1 stance is fifteen years, Iran has offered only five.

Lately there are reports that the P5+1, led by the U.S., might be willing to increase the number of centrifuges allowed in Iran, possibly to 6 thousand or more, conditional on a satisfactory settlement of the other issues listed above, i.e. as a "trade-off", for elimination of existing enriched uranium stocks completely or almost completely, dismantling and storing of the remaining inventory of centrifuges, severe limitations on the type and production rate of the centrifuges allowed to remain, and a fifteen year duration for the agreement. Whether the new proposals are politically viable in Teheran remains to be seen.

U.S. President Obama has stated that the technical aspects of the negotiations have reached a terminal point, and that from here on political decisions must be made by Iran regarding their willingness to compromise on core issues. It has thus far been evident that the Iranian negotiating team has been unable, or unauthorized, to deviate substantially from the "five-year-freeze-with-no-rollback" position approved by Supreme Leader Khamenei at, despite the fact that the P5+1 has moved substantially closer to the Iranian offer.

It is still unclear whether this new P5+1 offer will be accepted by Tehran, as it does entail significant rollback and extension of "breakout warning time" from the current two months (as stated by U.S. Secretary of State Kerry) to about a year or more – something the Iranians have thus far refused to compromise on. On the other hand, Israel and other critics of the negotiations consider the current P5+1 offer as too lenient and insufficient to prevent breakout.