Institute for Science and International Security

ISIS REPORT

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IAEA Iran Report: Enrichment at Natanz improving; entire LEU tank moved to PFEP; no progress on weaponization

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The International Atomic Energy Agency (IAEA) released on February 18, 2010 its latest report on the implementation of NPT safeguards in Iran and the status of Iran's compliance with Security Council Resolutions 1737, 1747 and 1803. The following analysis addresses the key issues raised in the report including continued production of low enriched uranium at the Natanz Fuel Enrichment Plant (FEP), activity at the pilot fuel enrichment plant (PFEP) in support of Iran's recently announced plans to produce its own fuel for the Tehran Research Reactor, and ongoing concerns about possible weaponization-related research and development.

LEU Production at Natanz Fuel Enrichment Plant

In the current period, from November 23, 2009 to January 29, 2010, Iran estimated its production of LEU to be 257 kg, bringing its total production to date to 2065 kg of LEU hexafluoride.[1] (The IAEA confirmed in November 2009, during a physical inventory verification (PIV) inspection, that Iran had produced 1808 kg of low enriched uranium hexafluoride and introduced a total of 21,140 kg of natural UF6 into its cascades at the Natanz FEP. The 2065 is the result of adding the 257 to the 1808 kg.) The average month production during this reporting period is 117 kg of LEU.

In the previous reporting period, from August 1 to October 30, 2009, Iran produced a total of 255 kg of low enriched uranium hexafluoride, which corresponds to a rate of approximately 86 kilograms per month, up slightly from its rate of 84.5 kilograms per month over the prior period.

On February 11, ISIS released a report examining the status of Iran's gas centrifuge program. The report found that the Fuel Enrichment Plant at Natanz had experienced in 2008 a drop in performance and had not yet recovered its earlier performance. Despite these problems, ISIS found that the time Iran would need to produce enough weapon-grade uranium for a nuclear weapon had not shifted significantly from earlier ISIS estimates, though more centrifuges may be needed to meet earlier time estimates. Because Natanz has so many centrifuges, Iran can do so. **In a breakout scenario using low enriched uranium,**

[1] The IAEA report notes in footnote 2 that during the 23 Nov-29 Jan period, a total of 159 kg of LEU hexafluoride was off-loaded into UF6 cylinders. the IAEA measured leu in cylinders that had been removed from the cascade module; that measurement does not include leu held up inside the module, in particular its cold traps, making it lower than Iran's estimates of total production for that period. This material would be removed and measured during PIV inspections.

Natanz could currently produce enough weapon-grade uranium for a weapon in six months or less.

This report also concluded that the Fordow enrichment plant **is** capable of producing enough weapon-grade uranium for a weapon, under conservative assumptions about the performance of the P1 centrifuges. Thus, the Fordow plant is suitable as a military facility in any Iranian effort to produce nuclear weapons. This result confirms the Obama administration's estimate that Fordow is large enough to produce enriched uranium for a weapons program.

Number of Centrifuges

As of January 31, 2010 the number of centrifuges enriching uranium at the Natanz Fuel Enrichment Plant (FEP) stands at 3,772, down from 3,936 which Iran has been operating since February 2009. Iran has installed an additional 2624 centrifuges. This is down from the 4,756 centrifuges previously reported as installed but not enriching. The report notes that some 11 cascades are being dismantled.

Activity at the Pilot Fuel Enrichment Plant

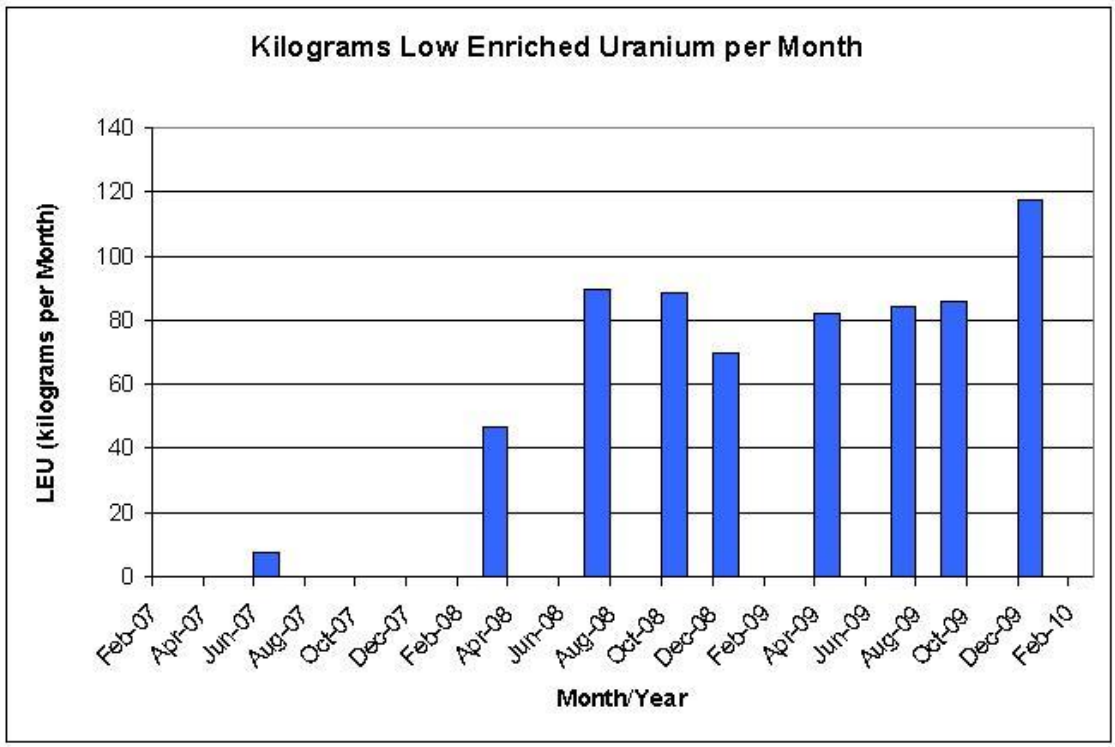
Iran is using a single cascade of centrifuges at the Pilot Fuel Enrichemnt Plant (PFEP) in its effort to produce 19.75 percent low enriched uranium for the Tehran Research Reactor. **Of note, the IAEA states that on February 14, 2010, Iran moved "approximately 1950 kg of low enriched UF6" from the FEP to the PFEP feed station.** This indicates that Iran may plan eventually to convert most of its accumulated stock of LEU hexafluoride to 20 percent LEU, a quantity far in excess of the TRR's needs (this quantity of LEU hexafluoride would yield just under 200 kg of 19.75 percent LEU. Previous ISIS reports note that if operated at its capacity of 5 MW-th per year, the TRR would require between 9.2 and 18.4 kg LEU annually, and if operated at lower output, as has been its history, would require between 5.5 to 11 kg of LEU per year.)

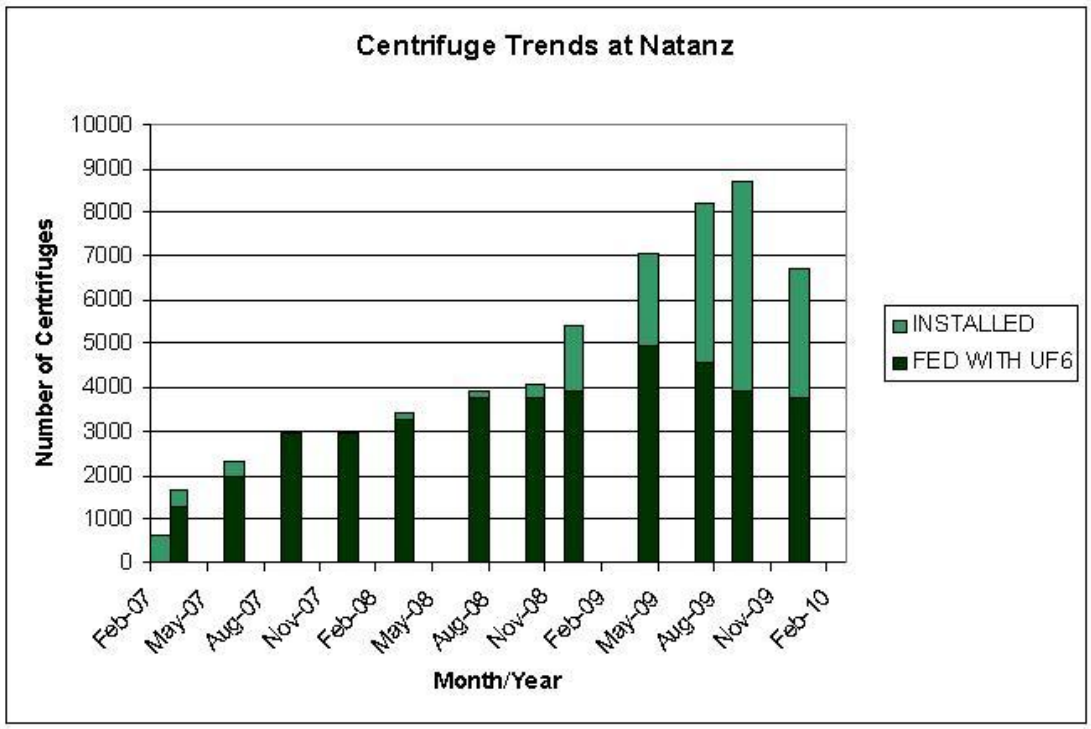
Significant work on Fuel Fabrication lines at Esfahan:

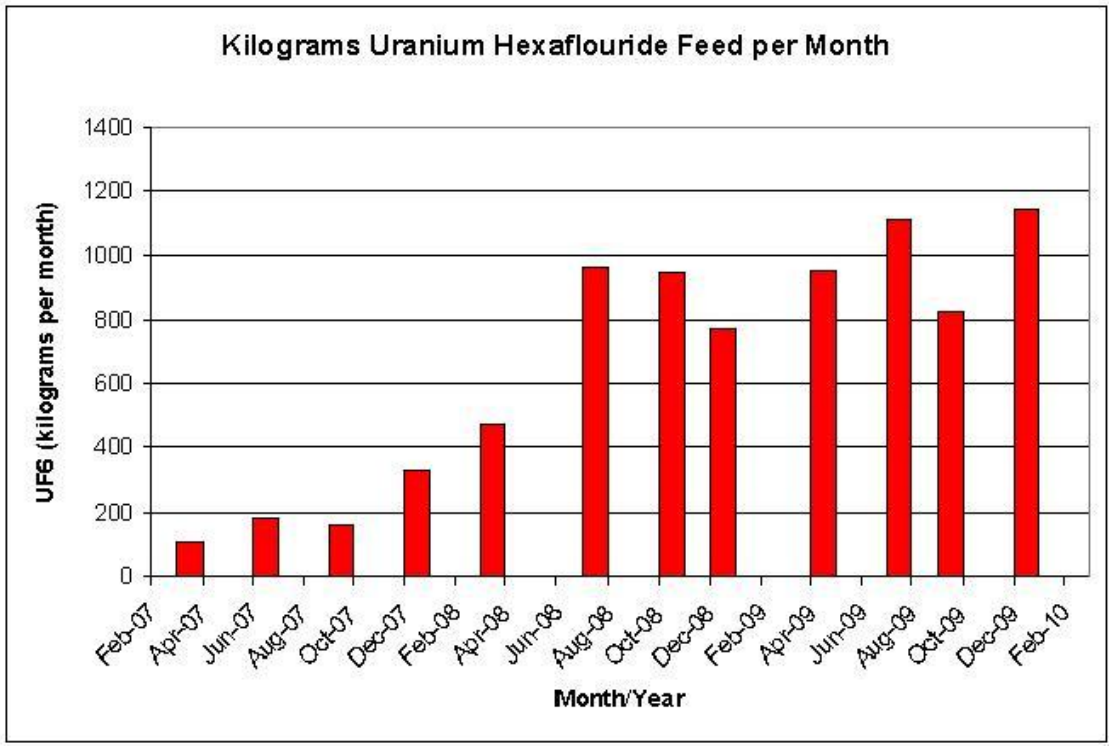
Iran has installed or plans to install a surprising number of lines for the production of natural, depleted, and enriched uranium metal. The line for enriched uranium is declared as for material enriched up to 19.7 percent. These lines raise suspicions that Iran could use them to make metal components for weapons.

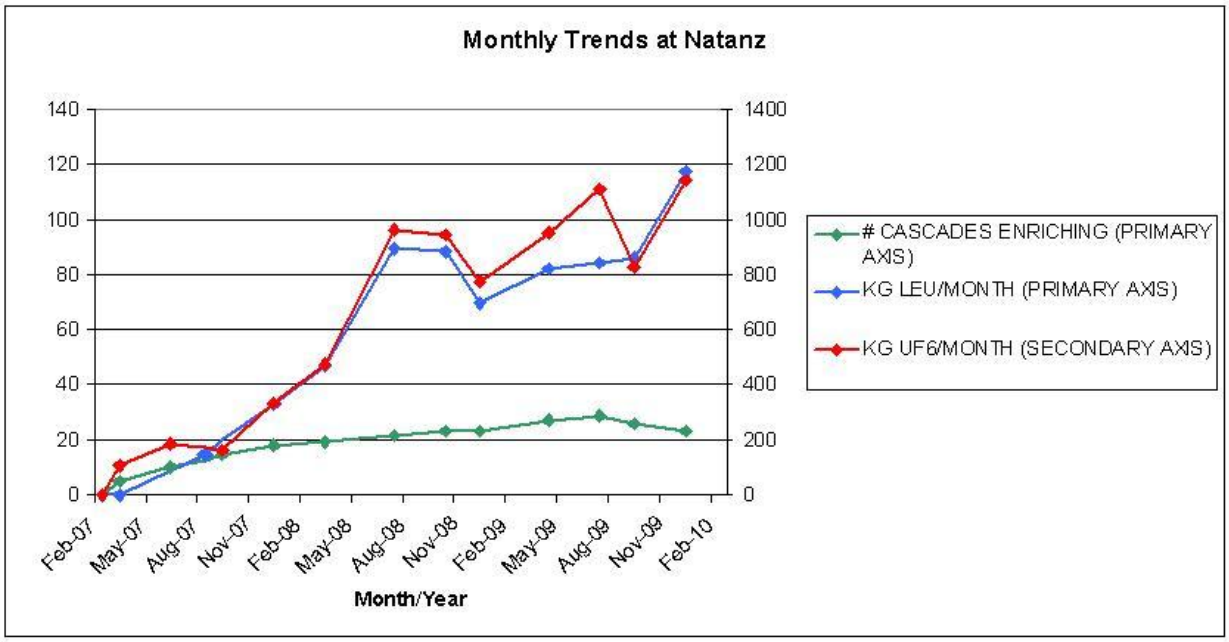
New assessment on weaponization issues

The IAEA reports no progress with Iran in addressing outstanding issues related to the possible "military dimensions" of its nuclear program, and continues to await Iran's reply to overtures for information about its alleged activities. The latest report notes that the information available to the IAEA is "extensive and has been collected from a variety of sources over time." It adds that "**Altogether, this (information) raises concerns about the possible existence in Iran of past or current undisclosed activities related to the development of a nuclear payload for a missile**." The IAEA continues to seek discussions with Iran on a number of other issues, including "details relating to the manufacture of components for high explosives initiation systems; and experiments concerning the generation and detection of neutrons." The report further states that "**Addressing these issues is important for clarifying the Agency's concerns about these activities and those described above, which seem to have continued beyond 2004."** This language suggests that the IAEA is concerned that Iran may be currently working on developing a warhead for a missile.


Kilograms Low Enriched Uranium per Month
LEU (kilograms per Month)
140
120
100
80
60
40
20
0
Feb-07
Apr-07
Jun-07
Aug-07
Oct-07
Dec-07
Feb-08
Apr-08
Jun-08
Aug-08
Oct-08
Dec-08
Feb-09
Apr-09
Jun-09
Aug-09
Oct-09
Dec-09
Feb-10
Month/Year


Centrifuge Trends at Natanz
Number of Centrifuges
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Feb-07
May-07
Aug-07
Nov-07
Feb-08
May-08
Aug-08
Nov-08
Feb-09
May-09
Aug-09
Nov-09
Feb-10
Month/Year
INSTALLED
FED WITH UF6


Kilograms Uranium Hexaflouride Feed per Month
UF6 (kilograms per month)
1400
1200
1000
800
600
400
200
0
Feb-07
Apr-07
Jun-07
Aug-07
Oct-07
Dec-07
Feb-08
Apr-08
Jun-08
Aug-08
Oct-08
Dec-08
Feb-09
Apr-09
Jun-09
Aug-09
Oct-09
Dec-09
Feb-10
Month/Year


Monthly Trends at Natanz
140
120
100
80
60
40
20
0
1400
1200
1000
800
600
400
200
0
Feb-07
May-07
Aug-07
Nov-07
Feb-08
May-08
Aug-08
Nov-08
Feb-09
May-09
Aug-09
Nov-09
Feb-10
Month/Year
CASCADES ENRICHING (PRIMARY AXIS)
KG LEU/MONTH (PRIMARY AXIS)
KG UF6/MONTH (SECONDARY AXIS)