**Behind the scenes of UN nuclear inspection of Iran**

It's only been two months since Olli Heinonen left the IAEA, where he worked for 27 years. In a first interview with an Israeli media outlet, he cautiously explains what is known about Iran's nuclear program

By Yossi Melman

October 22, 2010

Haaretz

*http://www.haaretz.com/weekend/week-s-end/behind-the-scenes-of-un-nuclear-inspection-of-iran-1.320599*

CAMBRIDGE, Massachusetts - On the desk of his fourth-floor office at the Belfer Center for Science and International Affairs, at Harvard University, Dr. Olli Heinonen has a map detailing nuclear sites in the Middle East. The map, produced by the U.S. Department of Energy, indicates that Israel has a nuclear research reactor at Nahal Soreq, as well as the Dimona reactor for plutonium production with facilities for uranium enrichment and laser enrichment. When Heinonen visited Israel 15 years ago, he was allowed to visit Nahal Soreq, but the Dimona reactor was off-limits to him as it is to most Israelis and all foreigners.

"A few days ago, an Indian scholar visited me," he says, smiling. "When I unfurled a map of nuclear sites in India and Pakistan, his curiosity soared even higher than your own."

The Finnish scientist's interview with Haaretz is his first with any Israeli media outlet, and only his second since he left his post at the International Atomic Energy Agency this past summer, after 27 years. His final position at the agency was deputy director general and head of its safeguards department. Among other things, Heinonen was responsible for inspectors who monitor Iran's nuclear facilities, the cameras installed by the IAEA at these sites, the collection of samples at the sites, and the gathering of information from all available sources, including intelligence agencies.

As part of this senior IAEA position, Heinonen paid "countless" visits to Iran, toured its nuclear facilities and met with officials involved with its nuclear project (these meetings included one encounter with President Mahmoud Ahmadinejad; he is not inclined, however, to talk about his impression of the Iranian leader ). Heinonen says he was aware that he was monitored and followed during these visits. Several times, his hosts offered him gifts, which Heinonen - believing they might be interpreted as bribes - politely declined.

The Iranians' evasive behavior worries Heinonen because of its implications for Syria. In September 2007, foreign sources said the Israel Air Force demolished a Syrian nuclear reactor for producing plutonium, built near the Euphrates river with North Korean technology and staff.

The IAEA demanded that Syria provide information about the site. Damascus stalled its response, and in the months following the attack it staged a massive cover-up operation, replacing the soil at the site. Remains of equipment and materials were transported to undisclosed locations.

Only in June 2008 did Syria allow IAEA inspectors, led by Heinonen, to visit the site. They did not meet Dr. Ibrahim Othman, the head of the Syrian Nuclear Energy Commision. Heinonen and his inspectors managed to obtain soil samples from the site and found traces of uranium. Since then Syria has refused to cooperate with the IAEA.

Heinonen believes Syria has to be under "special inspection," a higher level of monitoring that could lead to a referral to the UN Security Council, much the way the Iran case has been handled.

"I'm asked, why are you concerned with a site that was attacked?" says Heinonen. "If it was indeed a nuclear reactor, it does not exist anymore. My answer is that if it was a nuclear reactor, it would have been a precedent: the first time that an IAEA member state was constructing a plutonium rector on such a large scale. And if it was a reactor, what happened to those who built it? Are they implementing their know-how and technology somewhere else? As more time passes, the chances of discovering the truth become slimmer. The equipment gets rusty, sand storms cover the site and people we wanted to talk to disappear."

General Mohammed Suleiman, a senior intelligence officer who accompanied them on their tour of the site, was shot dead on a Syrian beach two months after their meeting.

Time to leave

Though his contract at IAEA was due to continue for another few years, Heinonen decided to resign recently, "since I felt that the time had come to do that, after 27 years with the organization." He immediately received several job offers at research institutes in Europe, Asia and the United States and decided to work as a senior fellow at the Belfer Center, which is part of Harvard's Kennedy School of Government.

He was born 64 years ago in Finland, where he earned a doctorate in radiochemistry, and worked in a research institute in his homeland that deals with nuclear-waste disposal. During his nearly three decades at the IAEA, he spent most of his time in inspection and monitoring roles, before assuming his final roles there as head of the safeguards department and number two in the organization. Upon leaving the IAEA, he signed a confidentiality agreement - for this reason, he speaks very carefully about the agency's work.

"The challenge faced by the international community in coping with Iran's nuclear effort is huge," he states in the interview. "We have about a year, until the end of 2011, or perhaps the start of 2012, to solve the problem."

What could happen then?

Heinonen: "What is called the 'break-out capacity.' Iran could announce that it is no longer party to the nuclear Non-Proliferation Treaty, prohibit the inspectors from monitoring, remove cameras that relay the imagery to the IAEA, and act as it sees fit."

For years, the Iranians have alleged that some IAEA inspectors operate at the behest of "foreign elements" - meaning Israel and the United States. Iran has made a systematic attempt to undermine the IAEA's status: It bars the entry of inspectors it doesn't like, and claims that some sites are beyond the inspectors' purview. It also disregards decisions reached by the agency and by the UN Security Council.

Should Iran quit the Non-Proliferation Treaty, it would be able to enrich uranium at a level of 90 percent, and produce fissile materials for nuclear weapons, correct?

"Yes, correct."

Do you believe that Iran is taking steps toward the production of nuclear weapons?

"We do not have enough information about the military aspect of the Iranian nuclear program; we need information that Iran is avoiding supplying to us. But when you look at what is happening at Natanz [a facility for uranium enrichment], it becomes clear that they are having difficulty moving ahead with uranium enrichment. They have installed 8,000 centrifuges at the facility, but only 3,000 of these are currently operating, and they produce a steady monthly average of 120 kilograms of low-grade enriched uranium hexafluoride. They have today about three tons of low-grade enriched uranium."

That should be sufficient to allow them to build at least one bomb, should they decide to enrich to a higher grade of 90 percent. In fact, 1,000 centrifuges would suffice for the production of a nuclear weapon, no?

"The answer is yes and no. Theoretically, that is correct, but in reality, their situation is much more complicated. The centrifuges are not operating well, and some of them are failing. They are losing materials because of this; and so, with this defective equipment, they will have a hard time enriching the material to a level high enough to enable the production of nuclear weapons. They have a lot of problems, and they are not there yet."

There is a troubling impression that the IAEA failed in its inspections of Iran, that right behind the inspectors' backs, Iran established secret nuclear facilities like the plant at Natanz and the reactor for plutonium production at Arak. Iran's effort was exposed eight years ago by an Iranian opposition organization, perhaps with the help of information relayed by Western intelligence organizations.

"I don't believe we failed on the Arak and Natanz matters. States that belong to the IAEA are obligated to report to us about nuclear facilities, equipment and materials in their possession. Should they not do that, we cannot discover things on our own, unless information comes to our attention. The moment information came to us, we launched an investigation that has proceeded since then."

In what sense did the IAEA fail?

"We failed in that we did not identify the start of their research-and-development nuclear program earlier - when they started, in 1985, in the middle of the war with Iraq, a nuclear research-and-development effort. Incidentally, the program was initiated when Mir Hossein Mousavi, today the opposition leader, served as prime minister."

To Heinonen's credit, after Iran's secret - which is to say, undeclared - facilities were exposed, he emerged as an energetic public servant, and relentlessly monitored the Iranians' work. Angry with him, the Iranians threatened to block his entry to the country, tried to bribe him, and watched every step he took. Nor was he deterred by senior IAEA colleagues, who tried diplomatically to doctor the language of the inspectors' reports, lest the Iranians become incensed. Today, he is not prepared to comment on his relations with other senior IAEA officials.

His relations with IAEA director general Dr. Mohamed ElBaradei, who also left the agency recently and is vying to become Egypt's president, were occasionally tense.

"It is true that we had some arguments," Heinonen admits. "And it is true that there were some at the organization who tried to drive a wedge between us by spreading rumors. I am a technical person, and he deals on the diplomatic-political level. Sometimes there was disagreement between us regarding the timing and the course to take; but, in fact, none of these arguments and differences of opinion did any harm to the agency's mission of reporting what we saw. I know what I did, and I did everything I could to present the facts, in the technical sense."

Frequent Iranian trips

Accompanied by several inspectors, Heinonen visited Iran with greater frequency after preliminary reports surfaced, in 2002, regarding the Natanz facility for uranium enrichment. When he asked to visit the workshop in Tehran where the first centrifuges were manufactured, the Iranians claimed it was a factory for electronic clocks. They showed a plant that was empty of machinery and stored a few dozen clocks, one of which they offered him as a gift. He insisted on purchasing the clock, which was decorated with Persian calligraphy, and which he exhibited in his Vienna office. His persistence forced the Iranians to confess to their lies, after initially issuing a series of denials.

His turbulent relations with Iran reached their peak in the matter referred to as "Chariots of Fire." That's the name given to a brief video, of a few minutes, evidently shot in Iran, showing what appears to be the manufacturing of a mock-up of a missile reentry vehicle, likely designed for a nuclear payload. The clip's producer embellished the film by using the dramatic theme music from the 1981 film of that name. The Iranians vehemently denied the video existed; then they claimed it was a CIA-Mossad fabrication. They did, however, agree that it was likely a "reentry vehicle of a nuclear missile, but a fake."

Heinonen says that it was not just one video clip that somehow reached IAEA officials; there were, he explains, several short films and documents that, taken together, comprised a detailed dossier.

Heinonen refuses to say how it, and other related information, got into the hands of the IAEA. What this reporter learned from various other sources, however, is that an Iranian who had access to the materials smuggled them out to the West on a laptop. According to one report, the source relayed the materials in 2004 to the German intelligence agency, BND, and they subsequently reached the CIA, the Mossad and other intelligence bodies. Those organizations then reviewed the materials and concluded that they were authentic and important, before relaying them to the IAEA.

"We had the bulk of the material in 2005," Heinonen emphasizes. "It came from several sources, and we concluded that much of it was evidently authentic."

How did you draw that conclusion?

"In our view, this was, indeed a missile warhead, but we wondered about its goal. What was the purpose of such a warhead? All of the material made clear to us that this was an attempt to simulate an explosion at a height of 600 meters aboveground. This is not a height at play when a conventional weapons device is detonated, nor is it the right height for a chemical weapons warhead. The device also had a microsecond timer for triggering the explosion. It did not have the characteristics of electromagnetic pulse equipment that is designed to destroy electricity grids and communication lines as well as power stations - all these things point in the nuclear direction. We tried to speak with the Iranians. In the end, they admitted that, logically, the information pointed to a nuclear warhead, but they insisted that the materials were fabricated, and did not come from Iran."

What happened in the end?

"We tried to persuade them to reply to our questions. In turns, they agreed and refused, and claimed that the IAEA has no mandate to investigate something that was essentially a conventional military matter. It was also clear that the editor of the video clips had erased background images of workshops. We were able to identity these facilities, and we asked to visit them. I traveled to Iran, and they assented to a tour, but at the last minute, in my opinion due to the intervention of a very high official, they withdrew this authorization to visit the workshops. Had we visited them, we would have had a clearer sense of what was seen in these materials."

So what conclusions did you reach from the "Chariots of Fire."

"That this was likely part of a feasibility study into examining aspects of the assembling of a nuclear warhead, but not, at this stage, the actual manufacturing of a nuclear device."

In an unprecedented step, in February 2008, Heinonen and ElBaradei decided to present the information to the IAEA board of governors. The Iranians announced that they would never again allow Heinonen to visit their country. A month later, they withdrew the threat.

Heinonen believes that Iran is still having trouble moving ahead with its nuclear program. Two factors might account for these apparent difficulties. The first is problems in the design of centrifuges: The ones they produce are of the P-1 design, originally a Dutch model that was stolen by the Pakistanis and secretly sold to Iran. The second factor is difficulty in attaining raw materials (including sensitive metals needed for the centrifuges ), both because of international sanctions and the close intelligence surveillance of Iranian procurement networks. Finally, says Heinonen, "perhaps they have a secret plant for uranium enrichment that we do not know about, but there is no solid information pointing to such an operation on a large scale."

Do you believe that the defects in centrifuge production could be caused by the sabotage efforts of intelligence agencies, such as the CIA or the Mossad?

"Possibly the centrifuges were damaged by sabotage or the acquisition of faulty equipment, but the main thing is that the Iranians wanted to do everything on their own. In contrast to Libya, which purchased all the materials from a smuggling ring headed by the Pakistani Dr. Abdul Qadeer Khan, and intended to establish an enrichment plant, Iran decided to purchase only the technology from Pakistan, but to produce everything by itself. In my opinion, the flaws in the centrifuges derive from two interconnected reasons: lack of sufficient knowledge, and difficulty obtaining high-quality material."