Institute for Science and International Security

ISIS REPORT

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Excerpts from Internal IAEA Document on Alleged Iranian Nuclear Weaponization

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Writing in the trade publication *Nucleonics Week*, Mark Hibbs describes a debate taking place within the International Atomic Energy Agency (IAEA) regarding the extent to which the Agency should publicize its findings regarding potential weaponization activities by Iran. This debate is also described in a September 17, 2009 article by Associated Press journalist George Jahn, which revealed excerpts from internal IAEA documents assessing the veracity of the allegations about Iran as well as the Agency's assessment on Iran's current capability to make nuclear weapons. This report contains further excerpts from what ISIS understands to be a working document and not necessarily a final report.

ISIS understands that IAEA experts, including one nuclear weapons specialist, prepared the document. Their objective was to summarize and assess the set of records from 2004 and earlier obtained by the IAEA about the possible military dimensions of Iran's nuclear program. The information analyzed included documents and data from electronic media procured inside Iran and obtained by the United States, information and documents from other member states about suspected nuclear weaponization activities inside Iran, and procurement data. This document also included the IAEA's expert assessments of the information. Olli Heinonen, Deputy Director General for Safeguards, described some of this information in a technical briefing for member states in February 2008. The September 17 AP article contains extensive quotes about assessments by IAEA experts, possibly in consultation with nuclear weapon experts in member states.

The information below is taken from one version of this IAEA assessment cited by the AP; it is a 67-page long report titled "Possible Military Dimensions of Iran's Nuclear Program." ISIS is not certain of the date of this document but understands it was authored in the past 6 to 12 months.

Much of the IAEA's information, including test data, reports, diagrams, and videos, was reportedly contained on a laptop. This laptop has received considerable attention since its public revelation in 2005. ISIS now understands that the term "laptop" might refer to the method by which the United States shares sensitive data and not the form in which the

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data were removed from Iran. ISIS has learned from intelligence officials with direct knowledge of the case that electronic media was smuggled out of Iran by the wife of an Iranian who was recruited by German intelligence. Iranian authorities had discovered his activities, and one of his last acts before arrest was the passing of the records to his wife. Intelligence officials told ISIS that they assume he is dead. His wife fled to Turkey and turned the electronic media over to U.S. authorities.

Questions have arisen about the authenticity of these records, which are inevitable given the sensitivity of this issue. For several years, ISIS has queried nuclear and other experts who have examined these data and documents. They have consistently told ISIS that the information appears authentic. One intelligence official who examined the information said that the electronic media contains extensive amounts of data obtained in experiments, and noted that it would be extremely difficult to falsify such a large quantity of data.

It is also important to note that the IAEA has addressed this issue in its most recent safeguards report, stating that "the information contained in that documentation appears to have been derived from multiple sources over different periods of time, appears to be generally consistent, and is sufficiently comprehensive and detailed that it needs to be addressed by Iran with a view to removing the doubts which naturally arise, in light of all of the outstanding issues, about the exclusively peaceful nature of Iran's nuclear programme."

In addition to the electronic media records, other member states have provided information relevant to this issue, which also forms the basis for the assessments contained in this internal IAEA document. Less controversy surrounds the authenticity of this information.

ISIS emphasizes that these excerpts appear to be from a working document that has been revised at least once. Its author is unknown. It is subject to revision both substantively and editorially.

Excerpts

The following texts are taken from the internal IAEA report; the headings are ISIS's own.

The Role of the Ministry of Defense in the Development of a Nuclear Payload for the Shahab 3 Missile

"The Agency[1] has information, known as the Alleged Studies, that the Ministry of Defence of Iran has conducted and may still be conducting a comprehensive programme aimed at the development of a nuclear payload to be delivered using the Shahab 3 missile system.

[1] The use of the word "Agency" by the author or authors of this internal report does not reflect IAEA approval of the contents of this report.

The information, which originates from several Member States and the Agency's own investigations, points to a comprehensive project structure and hierarchy with clear responsibilities, timeline and deliverables. The information, which has been obtained from multiple sources, is detailed in content and appears to be generally consistent. The information refers to known Iranian persons and institutions under both the military and civil apparatuses, as well as to some degree to their confirmed procurement activities[2]."

Alleged Studies

"The Alleged Studies conducted by Iran refer, inter alia, to the development work performed to redesign the inner cone of the Shahab 3 missile re-entry vehicle to accommodate a nuclear warhead. The Studies further describe the development and testing of high voltage detonator firing equipment and multiple exploding bridge wire (EBW) detonators as well as an underground testing infrastructure and the probable testing of one full-scale hemispherical explosively driven shock system that could be applicable to an implosion-type nuclear device. Another aspect concerns the conversion of (UO_2) to uranium tetrafluoride (UF_4), also known as Green Salt."

On Whether the Missile Re-entry Vehicle is Intended to be Nuclear

"From the documents presented by a number of Member States and the Agency's own activities, it is possible to assess that in early 2002 Iran formally declared the start of its warhead development programme, which very likely comprised at least two projects under the leadership and auspices of the Ministry of Defence – Project 111 and Project 110. Project 111 was to design the inner cone of the Shahab 3 missile re-entry vehicle and the production of an explosives operations control set (ECS). Project 110 was to produce the contents of the spherical warhead payload. The Agency assesses that the development work to design a suitable chamber inside the re-entry vehicle is intended to accommodate a new warhead payload that is quite likely to be nuclear."

Did Iran develop a high explosive implosion system small enough to fit inside the Shabah 3 missile re-entry vehicle?

"Information received from a Member State indicates a round, semi-round and semi-spherical shock generator system for which an EBW detonator is being developed. It is said that the shock generator was fired in field test conditions with one detonator using a firing cable.

Without knowledge as to what exactly is being referred to under the term 'shock generator system,' the Agency assesses that it is highly likely to be some form of distributed explosive-filled channel system for initiating hemispherical high explosive charges."

[2] ISIS has learned that this also refers to studies of supposed warhead flight characteristics conducted by a university group.

"The significance of the information is that Iran may have developed an effective high explosive implosion system, which could be contained within a payload container believed to be small enough to fit into the re-entry body chamber of the Shahab 3 missile."

In October 2005, the Agency was able to examine the 15-page uranium metal document amongst centrifuge-related material in Iran. Based on the information in the document, the Agency assesses that it is possible that Iran has knowledge regarding the contents of a nuclear package, including fissile components that would be inserted inside the high explosive charge.

The Agency suspects that this document belongs to a larger package that Iran may have obtained but which has not yet come to the Agency's attention. The Agency is concerned that Iran may have nuclear weapon design information which could be used in a specific nuclear package which would fit within the mass and volume constraints as seen in projects 110 and 111."

Steady Progress on Nuclear Fuel Cycle

"The Agency assesses that Iran is steadily making progress in the development of its own indigenous nuclear programme. Iran has been reporting on a regular basis major achievements in mastering the various parts of the nuclear fuel cycle, which the Agency has been able to verify."

High Explosive Manufacturing Industry for Nuclear Weapons

"It is believed that Iran has developed exploding bridgewire detonators and associated electronic high voltage firing systems. The Agency assesses that Iran has managed to develop a high explosives industry capable of synthesizing and formulating the raw materials into explosive compositions and that could be used in a nuclear weapon. It is very likely that Iran has the required engineering skills to machine explosives into the weapon components. It is assessed that Iran has succeeded in combining its detonator development work with other related studies to manufacture a relatively compact high explosives initiation system that has probably been tested with comprehensive diagnostic equipment."

Sufficient Information to Design and Build a Crude Nuclear Weapon

"The Agency further assesses that Iran has sufficient information to be able to design and produce a workable implosion nuclear device based upon HEU as the fission fuel. The necessary information was most likely obtained from external sources and probably modified by Iran. The Agency believes that non-nuclear experiments conducted in Iran would give confidence that the implosion system would function correctly.

The Agency has evidence from which it is possible to assess that Iran has the ability to make a neutron initiator which may have been tested. Provided Iran has relevant

detectors, it should be possible to diagnose whether any product made would function satisfactorily."

On Finishing a Nuclear Warhead for the Shabab 3 Missile

"The Agency assesses that Iran has conducted studies relating to the aspects necessary to incorporate a device into a conventional delivery system such as the Shahab 3 missile. Further studies on payload integration are also accompanied by the electronic engineering studies to produce an arming and fuzing system. From the evidence presented to the Agency it is possible to suggest that, for the Shahab 3 delivery system, Iran has conducted R&D into producing a prototype system. However, further work is necessary to manufacture a more robust unit capable of producing an airburst fuzing option that would function both safely and reliably[3].

Overall the Agency does not believe that Iran has yet achieved the means of integrating a nuclear payload into the Shahab 3 missile with any confidence that it would work. Nonetheless, with further effort it is likely that Iran will overcome problems and confidence will be built up."

[3] This is because Iran was using an unsophisticated fusing system.