



The IAEA's Latest Iran NPT Safeguards Report: Tehran Continues to Stonewall Inspectors

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This analysis summarizes and assesses information in the International Atomic Energy Agency (IAEA's) periodic safeguards report, *NPT (Nuclear Non-Proliferation Treaty) Safeguards Agreement with the Islamic Republic of Iran*, the most recent of which was issued on February 23, 2021. The IAEA report itself represents a thorough overview of the IAEA's investigation in Iran since 2018 and Tehran's continued stonewalling of IAEA requests for explanations and clarifications about undeclared nuclear material and activities. The IAEA calls on Iran to "clarify and resolve these issues without further delay."

Key Findings and Recommendations:

- The report's major finding is that there has been "lack of progress in clarifying the safeguards issues" related to the agency's investigation into undeclared nuclear material and activities at four locations in Iran.
- The IAEA reports that it detected "anthropogenic uranium particles" at two undeclared sites in Iran. Iran has not provided credible technical explanations to the agency to account for the presence of the particles. In January 2020, the IAEA first requested access to the sites, one called the Tehran site, and the other called Marivan, but Iran refused. Under international pressure, Iran finally acquiesced and the IAEA visited and took samples in August and September 2020.
- The IAEA reports that "after 18 months, Iran has not provided the necessary, full and technically credible explanation for the presence of nuclear material particles" that the agency detected in February 2019 at a warehouse location in Iran, commonly referred to as Turquz-Abad.
- Iran has not explained to the IAEA where nuclear material in the form of a metal disc is now located, which allegedly relates to Iran's early efforts to develop a uranium deuteride neutron initiator for nuclear weapons at the undeclared Lavisian-Shian site.

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- Iran’s decision to stop implementing the Additional Protocol (AP) to its comprehensive safeguards agreement (CSA) on February 23, 2021 does not free Iran from its legal requirements to answer the IAEA’s questions and provide access to requested sites. Any attempt by Iran to use its recent actions to reduce IAEA monitoring and refuse answering the IAEA’s questions or hinder verification activities at undeclared locations should be severely condemned as a violation of its comprehensive safeguards agreement, which Iran pledged to continue to implement “fully and without limitation.”
- The IAEA correctly points out in its report that it seeks answers relating to the “correctness and completeness of Iran’s declarations,” the traditional manner of dealing with the possibility of undeclared materials and activities under the CSA. As a NPT state party that implements a CSA, Iran is required to answer the IAEA’s questions about undeclared nuclear material and activities, with or without an AP in force. Thus, the IAEA is empowered to continue requesting access to undeclared locations if its concerns pertain to potentially undeclared nuclear material and activities, and if necessary, request special inspections, a CSA provision that enables IAEA access to non-declared sites in a country, including both military and civilian sites.
- Iran notified the IAEA that it will no longer implement the CSA’s Modified Code 3.1, which requires Iran to provide the IAEA with notification as a decision is taken to construct a nuclear facility and related design information, rather than much closer to the facility’s date of operation with nuclear material. Iran has claimed this code is a voluntary JCPOA commitment, but the IAEA has reminded Iran that implementation of Modified Code 3.1 is a legal CSA obligation - not a voluntary measure - and “cannot be modified unilaterally.” In the past, Iran has unilaterally suspended its implementation of Modified Code 3.1, in violation of its safeguards agreement. The IAEA noted that this would be a violation of Iran’s CSA.
- Iran’s continued refusal to cooperate with the agency on these matters, combined with its steady and provocative nuclear advances and rhetoric over the past months, call for more IAEA oversight, not less. Iran’s actions and refusal to explain undeclared nuclear material and activities underscore that the international community has diminishing confidence that its nuclear program is devoted strictly to peaceful uses.
- At its meeting from March 1-5, 2021, the IAEA Board of Governors should pass a resolution demanding Iran’s cooperation with the IAEA’s outstanding questions and concerns with a firm deadline. If Iran continues to deny cooperation, the Board should vote to refer the matter to the UN Security Council.

Four Locations of Interest

In this report, the IAEA describes in detail its attempts to verify Iran’s safeguards declarations based on evidence it obtained that alleges Tehran’s undeclared use or storage of nuclear

material at four locations. The IAEA refers to these as Locations 1, 2, 3, and 4. It obliquely identified them or provided information enabling their identification in past reporting.²

Location 1 is an open-air warehouse in Tehran, informally known as the Turqz-Abad site, where Iran likely stored undeclared nuclear material and equipment.³ Location 2 involves questions about Iran's alleged production of uranium deuteride for a neutron initiator at Lavisian-Shian, the headquarters of its early nuclear weapons program.⁴ Location 3 is the former location of a pilot uranium conversion facility, which Iran referred to as the "Tehran site" in its own documentation.⁵ Location 4 is a former high explosive test site used to test highly sensitive components of nuclear weapons, called Marivan.⁶ The IAEA reports that all four of these locations underwent significant sanitization or leveling. Some of the concealment activities happened recently, while others occurred several years ago.

Information about Iran's alleged activities at the sites came, in part, from an archive of nuclear weapons documentation that Israel seized from a Tehran warehouse in 2018.⁷ The archive contained significant new information about Iran's nuclear weapons activities under its late 1990s to 2003 crash nuclear weapons program, codenamed the "Amad Plan." The IAEA obtained a copy of this information and independently assessed it, finding it legitimate, particularly when combined with information it already had in its possession about Iran's military nuclear activities. The agency is pursuing inspections at sites where Iran may have produced, used, or stored, undeclared nuclear material or conducted undeclared nuclear-related activities.

² David Albright, Sarah Burkhard, Frank Pabian, and Andrea Stricker, "Iran Defies the International Atomic Energy Agency: the IAEA's Latest Iran Safeguards Report," *Institute for Science and International Security*, June 10, 2020, <https://isis-online.org/isis-reports/detail/iran-defies-the-international-atomic-energy-agency/8#fn6>

³ David Albright, Sarah Burkhard, Olli Heinonen, and Frank Pabian, "Presence of Undeclared Natural Uranium at the Turqz-Abad Nuclear Weaponization Storage Location," *Institute for Science and International Security*, November 20, 2019, <https://isis-online.org/isis-reports/detail/presence-of-undeclared-natural-uranium-at-the-turqz-abad-nuclear-weaponiza>

⁴ "Neutron Source: Iran's Uranium Deuteride Neutron Initiator," *Institute for Science and International Security*, May 13, 2019, <https://isis-online.org/isis-reports/detail/neutron-source-irans-uranium-deuteride-neutron-initiator-1/>

⁵ David Albright, Sarah Burkhard, and Frank Pabian, "The Amad Plan Pilot Uranium Conversion Site, Which Iran Denies Ever Existed," *Institute for Science and International Security*, November 9, 2020, <https://isis-online.org/isis-reports/detail/the-amad-plan-pilot-uranium-conversion-site/8>

⁶ David Albright, Sarah Burkhard, and Frank Pabian, "Abadeh is Marivan: A Key, Former Secret Nuclear Weapons Development Test Site," *Institute for Science and International Security*, November 18, 2020, <https://isis-online.org/isis-reports/detail/abadeh-is-marivan-irans-former-secret-nuclear-weapons-development-test-site>

⁷ David E. Sanger and Ronen Bergman, "How Israel, in Dark of Night, Torched its Way to Iran's Nuclear Secrets," *The New York Times*, July 15, 2018, <https://www.nytimes.com/2018/07/15/us/politics/iran-israel-mossad-nuclear.html>. Israel reportedly provided the IAEA with separate information about the Turqz-Abad warehouse that came from intelligence monitoring. See: "Israel Accuses Iran of Having Secret Atomic Warehouse Near Tehran," *Radio Free Europe/Radio Liberty*, September 28, 2018, <https://www.rferl.org/a/israeli-prime-minister-netanyahu-accuses-iran-having-secret-atomic-warehouse-outside-tehran/29514107.html>

Location 1: Turquz-Abad warehouse

The IAEA included in this report its findings about undeclared uranium particles it detected at Turquz-Abad. It previously included such reporting in its separate report on Iran's compliance with UN Security Council resolution 2231, the resolution associated with the Joint Comprehensive Plan of Action (JCPOA). The IAEA reports that it "continued to assess that the explanations provided by Iran for the uranium-rich particles found at location 1 to be not technically credible."

In September 2018, the IAEA obtained information from Israel that the open-air Turquz-Abad warehouse site contained cargo containers which housed undeclared nuclear material and equipment relating to Iran's past nuclear weapons program.⁸ The IAEA observed activities consistent with "sanitization of the location." Commercial satellite imagery acquired and assessed by the Institute indicated that over the summer of 2018, following Israel's disclosure of the archive seizure, Iran removed the cargo containers and scraped the ground at the Turquz-Abad site, likely in an effort to defeat future IAEA environmental sampling.⁹

Nonetheless, the IAEA requested access to the site and inspected it in February 2019. The results of sampling indicated "the presence of natural uranium particles of anthropogenic origin, the composition of which indicated that they might have been produced through uranium conversion activities." The IAEA also detected "isotopically altered particles of low enriched uranium, with a detectable presence of U-236, and of slightly depleted uranium." The IAEA added in a footnote that "the compositions of these isotopically altered particles were similar to particles found in Iran in the past, originating from imported centrifuge components." Pursuant to its investigation into the origins of the particles, the IAEA also took environmental samples at two related, declared locations in Iran.

The IAEA assessed Iran's subsequent explanation for the presence of the undeclared nuclear material to be "unsatisfactory" because it was "not technically credible." The IAEA concluded, "After 18 months, Iran has not provided the necessary, full and technically credible explanation for the presence of nuclear material particles." The IAEA iterated that it is "deeply concerned that undeclared nuclear material may have been present at this undeclared location and that such nuclear material remains unreported by Iran under its Safeguards Agreement."

Through exchanges of letters between Iran and the agency, the IAEA reported that "regarding the presence of particles of natural uranium of anthropogenic (man-made) origin and, in relation to the presence of isotopically altered particles, Iran said that 'no reason or basis had

⁸ John Irish and Arshad Mohammed, "Netanyahu, in U.N. Speech, Claims Secret Iranian Nuclear Site," *Reuters*, September 27, 2018, <https://www.reuters.com/article/us-un-assembly-israel-iran/netanyahu-in-un-speech-claims-secret-iranian-nuclear-site-idUSKCN1M72FZ>.

⁹ David Albright, Sarah Burkhard, Olli Heinonen, and Frank Pabian, "Presence of Undeclared Natural Uranium at the Turquz-Abad Nuclear Weaponization Storage Location," *Institute for Science and International Security*, November 20, 2019, <https://isis-online.org/isis-reports/detail/presence-of-undeclared-natural-uranium-at-the-turquz-abad-nuclear-weaponiza>

been found for such an assertion.” Thus, without any reason, Iran essentially denied the IAEA’s findings from environmental sampling. In a letter dated January 25, 2021, the IAEA asked Iran to provide “substantial additional clarifications” within two weeks. Despite the IAEA sending a reminder letter dated February 10, 2021, Iran has not replied to the agency.

Location 2: Lavisan-Shian

The IAEA also has questions about “the possible presence in Iran between 2002 and 2003 of natural uranium in the form of a metal disc, with indications of it having undergone drilling and processing, which may not have been included in Iran’s declarations; the origin of this disc; and where such material is currently located.” Earlier IAEA reporting obliquely identified the site where Iran may have carried out this work as Lavisan-Shian, the headquarters of Iran’s early nuclear weapons program in the 1990s under the Physics Research Center (PHRC). The IAEA noted that the site “had undergone extensive sanitization and levelling in 2003 and 2004.” Commercial satellite imagery from that time period indicates that Tehran tore down the buildings, removed the earth, and built a recreational park in its place.¹⁰

Iran’s nuclear archive revealed how Iran carried out work on producing uranium deuteride for a neutron initiator. Amad Plan documents sketch out the procedures it used to make uranium deuteride, including drilling into a piece of uranium metal. Included in the documentation are photos of the drilling equipment, located inside a glove box.

The IAEA reported:

In relation to its questions concerning location 2, the Agency decided to conduct additional verification activities at a declared facility in Iran where uranium metal had been previously produced (1995-2000) [or early 2002?].¹¹ The uranium metal produced at this facility was declared to the Agency in 2003 and has since been under Agency seal there. The purpose of the verification activities would be to verify whether the natural uranium in the form of a metal disc identified at location 2 is currently stored at this facility.

The site the IAEA visited is called the Jabr Ibn Hayan Multipurpose Research Laboratory (JHL) at the Tehran Nuclear Research Center in Tehran. The IAEA reported that these additional verification activities in September 2020 were “inconclusive,” and that it requires “an additional

¹⁰ David Albright, Paul Brannan, and Andrea Stricker, “The Physics Research Center and Iran’s Parallel Military Nuclear Program,” *Institute for Science and International Security*, February 23, 2012, https://isis-online.org/uploads/isis-reports/documents/PHRC_report_23February2012.pdf

¹¹ There is a discrepancy in the dates among IAEA safeguards reports. A 2003 report discusses carrying out a PIV at JHL to “re-verify the natural uranium in the form of metal declared by Iran in 2003 as having been produced during previously undeclared conversion experiments carried out between 1995 and early 2002” (see GOV/2003/75, Annex 1, para. 25 and GOV/2004/60, Annex, para. 2). A June 2020 safeguards report also uses the early 2002 date (GOV/2020/30).

verification at the declared facility.” It concluded, “The current location of the natural uranium in the form of a metal disc remains to be clarified.”

The IAEA appears, in part at least, to want to conduct another physical verification inventory (PIV) at JHL, a standard procedure under a CSA designed to ensure that the total inventory of material, in this case uranium metal, recorded by Iran is correct. The IAEA would do so by verifying the declared amount of uranium metal and associated uranium waste materials.

The IAEA previously conducted a PIV at JHL in August 2011, where it “identified a possible discrepancy of several kilogrammes of natural uranium in the accountancy records”¹² related to Iran’s undeclared, secret experiments to convert uranium tetrafluoride (UF₄) into uranium metal prior to early 2002.¹³ However, in 2014, the IAEA reevaluated this information, asserting that “the amount of natural uranium involved was within the uncertainties associated with nuclear material accountancy and related measurement.”¹⁴ This 2014 conclusion is likely worth a further reevaluation in light of new information.

A new PIV at the JHL and closer scrutiny of its past activities therefore seems warranted. However, a more fruitful approach may be obtaining a resolution from the Board of Governors insisting that Iran promptly produce a complete declaration.

Locations 3 and 4: The Tehran Site and the Marivan Site

Location 3 is identified in the Nuclear Archive as the Tehran site, a secret Amad Plan pilot uranium conversion site, located near the village of Mobarakiyeh, about 75 kilometers southeast of Tehran.¹⁵ According to the IAEA report, this location is of concern because it involves “the possible use or storage of nuclear material and/or conducting of nuclear-related activities, including research and development activities related to the nuclear fuel cycle. This location may have been used for the processing and conversion of uranium ore including fluorination in 2003. This location also underwent significant changes in 2004, including the demolition of most buildings.” Fluorination of uranium usually refers to the production of uranium hexafluoride.

Location 4 is the secret Marivan site, near Abadeh.¹⁶ According to the IAEA report, this site involved “the possible use and storage of nuclear material where outdoor, conventional explosive testing may have taken place in 2003, including in relation to testing of shielding in

¹² IAEA Director General, *Final Assessment on Past and Present Outstanding Issues Regarding Iran’s Nuclear Programme*, GOV/2015/68, December 2, 2015, http://isis-online.org/uploads/isis-reports/documents/IAEA_PMD_Assessment_2Dec2015.pdf.

¹³ GOV/2003/75, Annex 1, para. 25 and GOV/2004/60, Annex, para. 2. The difference in the dates of 2000 versus early 2002 is unresolved (see footnote 11).

¹⁴ *Final Assessment on Past and Present Outstanding Issues Regarding Iran’s Nuclear Programme*.

¹⁵ “The Amad Plan Pilot Uranium Conversion Site, Which Iran Denies Ever Existed.”

¹⁶ “Abadeh is Marivan: A Key, Former Secret Nuclear Weapons Development Test Site.”

preparation for the use of neutron detectors.” The IAEA added, “From July 2019 onwards, the Agency observed activities consistent with efforts to sanitize part of the location.”

The IAEA’s findings about sanitization and concealment activities at these two sites are supported by satellite imagery independently analyzed by the Institute.

After the IAEA notified Iran of its need for access to these two sites, Iran refused to grant the request. In response to Iran’s intransigence, the Board of Governors passed a resolution on June 19, 2020, calling on Iran, to “fully cooperate with the Agency and satisfy the Agency’s requests without any further delay, including by providing prompt access to the locations specified by the Agency.”¹⁷

After delaying for several more months, Iran finally allowed the IAEA to access these two sites and take environmental samples in August and September 2020.

According to the IAEA report,

The analytical results of the environmental samples taken at locations 3 and 4 indicated the presence of anthropogenic uranium particles that required explanation by Iran. On 14 January 2021, the Agency conveyed to Iran in separate letters the results of the analysis and related Agency questions in connection with locations 3 and 4. Iran has yet to provide answers to the Agency’s related questions.

During a visit to Tehran from February 20-21, 2021, IAEA Director General Rafael M. Grossi registered its concern with Iran about “the lack of progress in clarifying the safeguards issues outlined above” and called on it to “resolve these issues without further delay.”

¹⁷ IAEA Board of Governors, “NPT Safeguards Agreement with the Islamic Republic of Iran: Resolution adopted by the Board of Governors on 19 June 2020,” GOV/2020/34, <https://www.iaea.org/sites/default/files/20/06/gov2020-34.pdf>