



# Parchin in the IAEA's Final Assessment on the Possible Military Dimensions to Iran's Nuclear Program

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The Parchin issue has been one of the main key outstanding issues to the International Atomic Energy Agency (IAEA) in resolving its concerns about Iran's past and possibly on-going nuclear weapons work and military fuel cycle activities. The Parchin Military Complex in Iran became of particular public interest in early 2012 after the IAEA requested access to the site to investigate information it had suggesting Iran conducted high explosive tests relating to the development of nuclear weapons.<sup>1</sup> Despite repeated requests by the IAEA and its Board of Governors to allow IAEA inspectors to access this specific site, Iran denied access, and instead, undertook substantial reconstruction and site modifications.<sup>2</sup> A comprehensive timeline of all the site modifications can be found [here](#) and seen in figures 1, 2, 3, and 4.<sup>3</sup>

In the IAEA's December 2, 2015 [Final Assessment on Past and Present Outstanding Issues Regarding Iran's Nuclear Programme](#), it was able to make very limited additional progress on fully resolving this issue. The IAEA should be given the authority in the upcoming IAEA Board of Governors resolution to undertake additional investigatory efforts, including sampling, visits, and interviews, at the Parchin site in order to draw a full conclusion about what occurred there.

## IAEA Assessment

Until September 2015, the IAEA had only been able to monitor activities at the Parchin site using satellite imagery. In parallel to the Joint Comprehensive Plan of Action (JCPOA), Iran and the IAEA also agreed on a "Road-map for the Clarification of Past and Present Outstanding Issues Regarding Iran's Nuclear Programme," which allowed for limited environmental samples to be taken by Iran under IAEA direction

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<sup>1</sup> The IAEA first requested access to Parchin because it possessed information indicating that Iran had "manufactured simulated components for a nuclear explosive device from high density materials, and that these may have included features relevant to the dynamic compressive testing of the components, i.e. hydrodynamic testing." This testing involves high speed diagnostic equipment to monitor the symmetry of the compressive shock of the simulated core of a nuclear explosive device. The IAEA's information indicated that Iran had installed the chamber and then built the building around it which was in use until late 2003.

<sup>2</sup> In its May 2012 Safeguards Report, the IAEA stated that "based on satellite imagery, at this location, where virtually no activity had been observed for a number of years, the buildings of interest to the Agency are now subject to extensive activities that could hamper the Agency's ability to undertake effective verification." See Director General, International Atomic Energy Agency, *Implementation of the NPT Safeguards Agreement and relevant provisions of Security Council resolutions in the Islamic Republic of Iran*, GOV/2012/23, May 25, 2012, [http://isis-online.org/uploads/isis-reports/documents/IAEA\\_Iran\\_Report\\_25May2012.pdf](http://isis-online.org/uploads/isis-reports/documents/IAEA_Iran_Report_25May2012.pdf).

<sup>3</sup> See David Albright and Serena Kelleher-Vergantini, *Modifications at the Parchin Site: A Comprehensive Timeline; New Imagery Suggests Re-Asphalting*, ISIS Report, February 11, 2015, [http://isis-online.org/uploads/isis-reports/documents/Parchin\\_February\\_11\\_2015\\_Final.pdf](http://isis-online.org/uploads/isis-reports/documents/Parchin_February_11_2015_Final.pdf); *Renewed Activity at the Parchin Site in Iran*, August 5, 2015, [http://isis-online.org/uploads/isis-reports/documents/Renewed\\_Activity\\_at\\_Parchin\\_August\\_4\\_2015\\_FINAL.pdf](http://isis-online.org/uploads/isis-reports/documents/Renewed_Activity_at_Parchin_August_4_2015_FINAL.pdf).

from inside a building of interest and visual observation through a ceremonial visit to the building of interest by the Director General and Deputy Director General for Safeguards.<sup>4</sup>

In its report, the IAEA assessed and reported the following:

- Iran attempted to contest the IAEA's imagery-derived analysis about the existence of **a large cylindrical-shaped object that was made and installed at the site in the summer of 2000** by providing Iranian aerial photography showing the object absent. The IAEA used its own new imagery from various sources to reinforce its previous assessment that the object was present at that time.
- The IAEA stated that additional information indicates that **this cylinder matched the parameters of an explosives firing chamber featured in publications of a foreign expert**. The IAEA has evidence that a former Soviet nuclear weapons expert, identified by ISIS as Vyacheslav Danilenko, aided in the development of a high-explosive testing chamber that was located inside a building and possibly provided help in using sophisticated diagnostic equipment for testing the spherical symmetry of high explosive shaped charges.<sup>5</sup>
- The visit by the Director General and Deputy Director General allowed the IAEA to assess that as of September 20, 2015, **the cylinder or any associated equipment was no longer present inside the building, and recent signs of internal refurbishment, such as a floor with an unusual cross-section and an incomplete ventilation system, were visible**.
- **Although Iran argued that the building of interest had always been used as a storage for chemical material for the production of explosives, this purpose was not supported by the results of the analysis of the environmental samples**, which did not detect any explosive compounds or precursors required for the storage of chemical explosives.
- Instead, **the results of the environmental samples identified two particles that appeared to be "chemically man-made particles of natural uranium."** However, the IAEA stated that the number of particles with this composition was not enough to assert the use of nuclear material at the site, although without any explanation.
- The IAEA stated that **extensive activities undertaken by Iran since February 2012 seriously undermined its ability to conduct effective verification at this site**.

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<sup>4</sup> For more information on problematic issues relating to the visit and environmental sampling process see David Albright, Olli Heinonen, and Serena Kelleher-Vergantini, *IAEA Visit to the Parchin Site*, ISIS Report, September 22, 2015, [http://isis-online.org/uploads/isis-reports/documents/IAEA\\_Visit\\_to\\_the\\_Parchin\\_Site\\_September\\_22\\_2015\\_Final\\_1.pdf](http://isis-online.org/uploads/isis-reports/documents/IAEA_Visit_to_the_Parchin_Site_September_22_2015_Final_1.pdf).

<sup>5</sup> See David Albright and Robert Avagyan, *Revisiting Danilenko and the Explosive Chamber at Parchin: A Review Based on Open Sources*, ISIS Report, September 17, 2012, <http://isis-online.org/isis-reports/detail/revisiting-danilenko-and-the-explosive-chamber-at-parchin-a-review-based-on/8>, and Mark Gorwitz, *Revisiting Vyacheslav Danilenko: His Origins in the Soviet Nuclear Weapons Complex*, ISIS Report, September 17, 2012, [http://isis-online.org/uploads/isis-reports/documents/Gorwitz\\_Revisiting\\_Vyacheslav\\_Danilenko\\_17Sept2012.pdf](http://isis-online.org/uploads/isis-reports/documents/Gorwitz_Revisiting_Vyacheslav_Danilenko_17Sept2012.pdf). An excerpt from the former ISIS report follows:

*Danilenko's writings describe a chamber that he designed in 1999 and 2000 that is strikingly similar to the one at Parchin. According to Olli Heinonen, a senior fellow at the Belfer Center at Harvard University and former Deputy Director General of IAEA, the IAEA obtained a photo of the chamber installed at Parchin that was built by the Iranian company Azar AB Industries. The Associated Press obtained a description and drawing of the chamber built for the Parchin site from a country tracking Iran's nuclear program. The drawing was based on information from a person who had seen the chamber at the Parchin site. Based on this information, the IAEA concluded that the chamber at Parchin is akin to one designed by Danilenko and described in his 2003 book, titled *Sintez i Spekanie Almaza Vzryvom (Explosive Synthesis and Sintering of Diamonds)*, which a European intelligence agency said he wrote based on the lectures he delivered in Iran. In his book, parts of which ISIS has translated from Russian, he states that in 1999-2000, he designed a cylindrical chamber of 4.6 x 19 m<sup>2</sup> with a volume of 315 m<sup>3</sup> capable of withstanding multiple explosions of devices up to 70 kg. The chamber's air-water system is pictured in figure 3.3 (figure 1 in this report). The external part of the central section of a length of 9 meters is strengthened with a reinforced concrete square section of 7.6 x 7.6 m<sup>2</sup> and a mass of 700 tonnes. Before an explosion, the chamber can be showered with water, and a vacuum can be created.<sup>8</sup> These dimensions and characteristics of this chamber are similar to those of the Parchin chamber described by the media.<sup>9</sup> (The footnotes in the excerpt can be found in the original report.)*

## Analysis

The IAEA did not draw full conclusions about what occurred at the Parchin site given Iran's limited cooperation and continued denials and obfuscation. Its evidence relating to past nuclear weapons related high explosives testing, help from a foreign expert, and sanitization of those efforts was not addressed by Iran. The IAEA was only able to determine that the evidence does not support Iran's claim that the building of interest was used as storage for chemical explosives.

Although the results of the limited environmental samples taken by Iran under the IAEA's direction identified two particles that appear to be "chemically man-made particles of natural uranium" the IAEA did not make a definitive conclusion about the use of nuclear material at the site. But these samples could be evidence supporting the allegation that Iran conducted high explosive work on a uranium deuteride neutron initiator at Parchin.

Iran's extensive sanitization activities since 2012 have seriously interfered in the IAEA's ability to draw conclusions, particularly without a more rigorous investigation about what occurred there.

Since Iran did not seriously cooperate with the investigation, including detailing what actually occurred at the site, and the IAEA's discovery of uranium particles, the IAEA requires a continuation of its Parchin investigation. It should be granted a mandate from the Board of Governors in its upcoming resolution stating its authority to conduct additional visits to Parchin, take additional, in-person samples, and interview persons of interest it identifies as having worked on past efforts. The Parchin file can in no way be considered closed. It should remain open and the IAEA should continue its investigation into the activities that took place at the site. It is time that Iran starts to admit what really happened at Parchin.



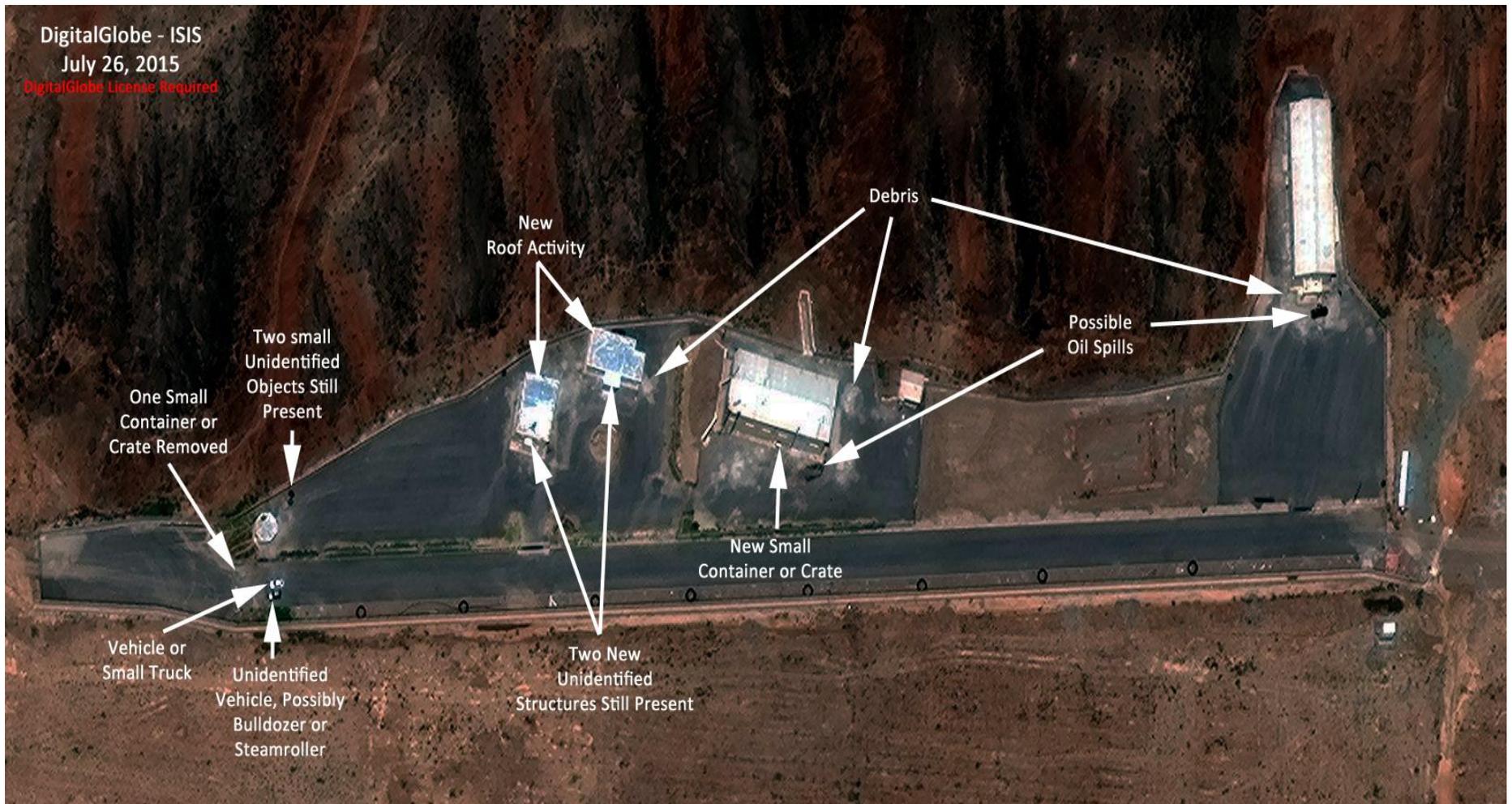
**Figure 1.** GeoEye/Digital Globe high resolution satellite imagery showing changes at the alleged high explosive test site at the Parchin military complex between December 2011 and December 2012.



**Figure 2.** Digital Globe high resolution satellite imagery showing changes at the alleged high explosive test site at the Parchin military complex between January 2013 and November 2013.



**Figure 3.** Digital Globe/Airbus high resolution satellite imagery showing changes at the alleged high explosive test site at the Parchin military complex between January 2014 and January 2015.



**Figure 4.** July 26, 2015 DigitalGlobe imagery showing renewed activity at a site at the Parchin Military Complex that has been linked to high explosive work related to the development of nuclear weapons.