

Persia in Space: Implications for U.S. National Security

By James Mazol
Research Associate, George C. Marshall Institute

The state-run Islamic Republic News Agency (IRNA) reported that Iran successfully launched a Safir-2 rocket carrying an Omid research and telecommunications satellite into orbit on February 2.¹ The Omid satellite's capabilities are not as troubling as the advanced rocket system used to deliver the Iranian Sputnik into space. Indeed, the former head of Israel's space program, Isaac Ben-Israel described the Omid as "quite primitive" and "not so much a satellite as a box that can collect data."² The Safir rocket that propelled the Omid through the atmosphere is a much more serious concern for U.S. national security.

Iran has now joined the elite ranks of space-faring nations. The launch's timing, of course, coincided with the 30th anniversary of the Iranian Revolution's triumph in Tehran and just days before the U.N.'s Security Council members plus Germany met in Frankfurt to discuss Iran's uranium enrichment program. Iran first orbited a satellite in 2005, but aboard a Russian rocket.³ This indigenous launch shows Iran's growing technical capacity and mastery of ballistic missiles.

The Iranian government said "promoting the national space industry"⁴ remains the main objective of its indigenous space program. Iranian President Ahmadinejad told state television, "We need [space-related] science for friendship, brotherhood, and justice."⁵ America should be skeptical: Iran can and probably is using space-related science to develop intercontinental ballistic missiles (ICBMs) capable of carrying nuclear payloads. The U.S. Department of Defense (DoD) expressed similar concerns after confirming Iran's claims. A spokesman said: "The mere fact that this launch involves dual-purpose capabilities is what causes concern to us in this government. The technology that's used to...propel this satellite into space is one that could also be used to propel long-range ballistic missiles."⁶ A newly space-faring Iran only provides further impetus for constructing the comprehensive, multi-layered missile defense system America has begun building in Europe and at home.

The Safir-2 is a two- (or possibly three-) staged liquid-propulsion rocket. Israeli experts stated the Safir-2 is "a product of nearly 20 years of ballistic missile cooperation between Iran and North Korea, whose No-Dong served as the baseline for Tehran's Shihab [or Shahab] series."⁷ February 2's launch represents a significant advance for Iran's space program; an earlier attempt to test the Safir-2's suborbital capabilities failed in August 2008. The Shahab-3 medium range ballistic missile (MRBM) probably powers the Safir's initial boost before an additional propulsion system takes over. Iran's successful Shahab-3 test in July 2008 was confirmed by western intelligence services, despite Tehran's awkward choice to manipulate official photographs of the test.⁸

The Safir-2 vehicle significantly increases the Shahab-3's 1200 kilometer (km) range. If the Iranians can reach low earth orbit (LEO), they are on track to build an ICBM. Last November, Iran improved its effective targeting range by demonstrating the two-stage Sajjil intermediate range ballistic missile (IRBM). In contrast to the

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liquid-fueled Shahab, the solid-fueled Sajjil is more mobile and less susceptible to pre-emptive strikes.⁹

Iran could utilize its space-launch capability in other ways besides building long-range ballistic missiles to threaten the U.S. and its friends and allies. Tehran might mimic the Chinese and develop an anti-satellite (ASAT) capability. The ASAT presents a challenge to the American military's "Achilles heel: its space based assets and their related ground installations."¹⁰ On January 11, 2007, the Chinese military destroyed an aging weather satellite in LEO using an MRBM. The ballistic missile's "kill vehicle" collided with the satellite at an altitude of 864 kilometers. The Chinese realize both the importance and vulnerability of American military space assets. One People's Liberation Army (PLA) analyst concluded U.S. military space assets constitute its "soft ribs" and "for countries that can never win a war with the United States by using the method of tanks and planes, attacking the U.S. space system may be an irresistible and most tempting choice."¹¹ Iran may take the necessary steps, including developing a kinetic kill vehicle, to build up an ASAT program (perhaps, with Chinese assistance).

Also, Iran could punch America's soft ribs by launching an Electromagnetic Pulse (EMP) attack in space. In 2001, the Rumsfeld Commission warned that the United States could face a "space Pearl Harbor."¹² The consequences of a space Pearl Harbor would be particularly harmful to the United States given our dependence on space. As space defense analyst Robert Butterworth notes: "Far more than any other country, the U.S. depends on space for national and tactical intelligence, military operations, and civil and commercial benefits. A 'scorched space' attack...would hurt the U.S. most of all."¹³ This option is particularly salient in light of Iranian reluctance to suspend its nuclear program. Iran could elect to detonate a nuclear weapon (or multiple weapons) in space, causing an EMP. In this worst-case-scenario,

the mere ability to wreak havoc on U.S. satellites in orbit affords the Iranians significant leverage. The Claremont Institute's Brian Kennedy reminds us, "Twice in the last eight years, in the Caspian Sea, the Iranians have tested their ability to launch ballistic missiles in a way to set off an EMP."¹⁴

A separate Commission, specifically designed to assess the EMP threat, concluded a space-based EMP detonation would probably produce "widespread and long-lasting disruption and damage to the critical infrastructures that underpin the fabric of U.S. society."¹⁵ The gamma rays from the explosion would obliterate most electronic devices and, more importantly, shut down the transformer stations distributing power throughout the country. Communication channels, lights, and water treatment stations would cease operation, among many other critical services reliant on electricity.¹⁶ Such an attack would have "long-term catastrophic consequences."¹⁷

Rather than exploding the nuclear warhead in space, the Iranians could conceivably forgo space and fly an ICBM over the United States before detonating the warhead. The aforementioned EMP Commission examined the consequences of a high-altitude, terrestrial EMP attack over the continental U.S. In testimony before the House Armed Services Committee, EMP Commission Chairman William Graham said such an explosion would cause "unprecedented cascading failures of major infrastructures."¹⁸ Systemic failures in interdependent infrastructure sectors (e.g., transportation, emergency services, finance and banking, and water delivery) might become "mutually reinforcing until at some point the degradation of infrastructure could have irreversible effects on the country's ability to support its population."¹⁹ Chairman Graham also discussed the Iranian EMP threat in his testimony before Congress:

"Iran has also tested high-altitude explosions of the Shahab-III, a test mode consistent with EMP attack, and des-

cribed the tests as successful. Iranian military writings explicitly discuss a nuclear EMP attack that would gravely harm the United States. While the Commission does not know the intention of Iran in conducting these activities, we are disturbed by the capability that emerges when we connect the dots.”²⁰

At the very least, Iran continues to provide ample evidence that it places a priority on investments in long-range missiles. The emergence of a space-capable Iran should spur accelerated deployment of a missile shield across western and central Europe. Great progress has been made as the Czech government approved radar tracking stations last year and Poland appears set to allow interceptor missiles on its territory. Working with its NATO partners, the U.S. is quickly moving towards a reliable, comprehensive, cost-effective, multi-lateral system providing maximum asset and ally coverage.²¹

Notes

1. “Iran puts Omid data-processing satellite into orbit,” Islamic Republic News Agency, February 3, 2009, <http://www5.irna.ir/En/View/FullStory/?NewsId=335811&idLanguage=3>
2. Roi Mandel, “Expert: Iranian launch capabilities cause for concern,” *YNet News*, February 3, 2009, <http://www.ynetnews.com/articles/0,7340,L-3666064,00.html>
3. Stephen Clark, “Iran puts satellite into Earth orbit,” *Spaceflight Now*, February 3, 2009, <http://www5.irna.ir/En/View/FullStory/?NewsId=335811&idLanguage=3>
4. “Iran puts Omid data-processing satellite into orbit,” Islamic Republic News Agency, February 3, 2009, <http://www5.irna.ir/En/View/FullStory/?NewsId=335629&idLanguage=3>
5. Nasir Karimi, “Iran claims first launch of its own satellite,” *Yahoo News*, February 3, 2009, http://news.yahoo.com/s/ap/20090203/ap_on_re_mi_ea/ml_iran_space
6. Borzou Daragahi, “Iran makes its first satellite launch,” *Los Angeles Times*, February 4, 2009, <http://www.latimes.com/news/nationworld/world/la-fg-iran-satellite4-2009feb04,0,4385361.story>
7. Barbara Opall-Rome, “Iranian sat launch triggers concern, kudos,” *Defense News*, February 9, 2009.
8. “Expert: Iran ‘Doctored’ Photos of Missile Launch,” ABC News on-line, July 10, 2008, <http://abcnews.go.com/International/wireStory?id=5350772>.
9. Paul Reynolds, “Iran’s slow but sure missile advance,” BBC News on-line, February 3, 2009, http://news.bbc.co.uk/2/hi/middle_east/7866742.stm.
10. Ashley Tellis, “Punching the U.S. Military’s ‘Soft Ribs’: China’s Antisatellite Weapon Test in Strategic Perspective,” *Carnegie Endowment for International Peace Policy Analysis*, Policy Brief No. 51, June 2007, p. 3.
11. People’s Liberation Army (PLA) analyst Wang Hucheng, quoted in Tellis, “‘Soft Ribs,’” p. 3.
12. Jean-Michel Stoullig, “Rumsfeld Commission Warns Against ‘Space Pearl Harbor,’” *Agence France Press*, January 11, 2001, Archived at <http://www.spacedaily.com/news/bmdo-01b.html>.
13. Robert Butterworth, “Comment: Provoke or Deter,” in Robert Butterworth and R. Cargill Hall, *Military Space and National Policy: Record and Interpretation*, The George C. Marshall Institute, May 1, 2006, p. 29.

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14. Brian Kennedy, "What a Single Nuclear Warhead Could Do," *Wall Street Journal*, November 24, 2008, <http://online.wsj.com/article/SB122748923919852015.html>.
 15. William R. Graham et. al., Report of the Commission to Assess the Threat to the United States from Electromagnetic Pulse (EMP) Attack, April 2008, p. vi.
 16. Kennedy, "Warhead."
 17. *Ibid.*
 18. Dr. William R. Graham, Chairman of the Commission to Assess the Threat to the United States from Electromagnetic Pulse (EMP) Attack, "Testimony before the House Armed Services Committee," July 10, 2008, p. 4, <http://www.empcommission.org/docs/GRAHAMtestimony10JULY2008.pdf>.
 19. Dr. William R. Graham, et. al., *Report of the Commission to Assess the Threat to the United States from Electromagnetic Pulse (EMP) Attack: Executive Report*, 2004, p. 2.
 20. Graham, "Testimony," p. 4.
 21. NATO recently endorsed American missile defense plans in Europe. In its Summit Declaration, NATO heads of state said the alliance will be "exploring ways to link this capability with current NATO missile defence efforts as a way to ensure that it would be an integral part of any future NATO wide missile defence architecture." See, Bucharest Summit Declaration Issued by the Heads of State and Government participating in the meeting of the North Atlantic Council in Bucharest, April 3, 2008, http://www.summitbucharest.ro/en/doc_201.html.