ACA
THE ARMS CONTROL ASSOCIATION

Iran Nuclear Brief
Analysis from the "Solving the Iranian Nuclear Puzzle" Briefing Series

BY GREG THIELMANN,
SENIOR FELLOW,
MAY 7, 2014

Iranian Missiles and the Comprehensive Nuclear Deal

The international community has been acutely concerned for many years about Iran's increasing capacity to produce material for nuclear weapons. With sufficient fissile material and a warhead design, Iran could use its existing ballistic missiles to pose a credible nuclear threat throughout the region. Consequently, after repeatedly directing Iran to suspend uranium enrichment, the UN Security Council decided in 2010 that Iran also had to halt all activities related to ballistic missiles capable of delivering nuclear weapons.

Now that serious negotiations are under way to curtail Iran's ability to dash for a bomb, seeking ballistic missile limits as part of a comprehensive nuclear deal would be unwise. Getting adequate and verifiable constraints on Iran's nuclear program remains the highest priority. To also demand severe limits on conventional weapons that Iran regards as vital to its self-defense would jeopardize the negotiations' key objective.

HIGHLIGHTS

- A comprehensive deal between Iran and the P5+1 (China, France, Germany, Russia, the United Kingdom, and the United States) that verifiably limits Iran's uranium-enrichment capacity, effectively blocks plutonium-production pathways, and enhances verification to assure detection of prohibited nuclear-weapons-related activities would dramatically reduce the potential dangers posed by Iran's ballistic missiles.

- In 2010, the UN Security Council broadened previous sanctions by adopting Resolution 1929, an effort to increase pressure on Tehran to negotiate seriously to resolve international concerns about its nuclear program by limiting sensitive nuclear-weapons-related activities.
    - o Resolution 1929 was adopted at a time when the International Atomic Energy Agency's questions about weapons-related experiments were not being answered, Iran's capacity to produce fissile material was increasing, and Iran's nuclear weapons development potential was growing.
    - o The resolution's prohibition on "any activity related to ballistic missiles capable of delivering nuclear weapons, including launches using ballistic missile technology" was never intended by the Security Council to be permanent.

- Today, Iran is assessed to have deployed several dozen Shahab-3 and Ghadr-1 medium-range ballistic missiles with ranges of 1,000 to 1,600 kilometers, as well as dozens more short-range ballistic missiles with ranges of 150 to 500 kilometers.
    - o All ballistic missiles with the capability of delivering a 500-kilogram payload 300 kilometers or more are commonly considered "nuclear capable."
    - o To prevent Iran from having any such capability would require severe restrictions, such as the 150-kilometer missile flight-testing limit imposed on vanquished Iraq in 1991.
    - o Iran has been adamant that it will not accept removal of the only weapons systems it can reliably employ beyond the battlefield.

- Limits on Iranian ballistic missiles could be more effectively pursued outside the nuclear talks in a multilateral, regional context.
    - o The initial objective could be reciprocal confidence-building measures among neighboring countries.
    - o Multilateral limits, such as a regional ban on intermediate-range and intercontinental ballistic missiles – could also be pursued.

Background

For more than a decade, the international community has been concerned about Iran's growing capacity to enrich uranium and its failure to adequately address allegations that it had engaged in nuclear-weapons-related experiments. There has also been concern that, if Iran were to develop and deploy nuclear weapons, it would use its ballistic missiles as the means of delivery.

Following the assumption of power by the more moderate and pragmatic administration of President Hassan Rouhani, the previously intermittent and ineffectual negotiations became regular and productive, leading to the November 24, 2013 agreement in Geneva on a Joint Plan of Action. This first-phase agreement has verifiably halted the most worrisome Iranian nuclear activities and thus provides time to negotiate a comprehensive agreement. Rouhani has also renewed discussions between Tehran and the International Atomic Energy Agency (IAEA) to resolve concerns about weapons-related experiments.

Nevertheless, some critics of the first-phase agreement argue that limits on nuclear-capable missiles should also have been built into the agreement, and many believe limits on Iran's nuclear-capable ballistic missiles should be on the agenda of ongoing negotiations between Iran and the P5+1 powers (China, France, Germany, Russia, the United Kingdom, and the United States). Advocates of including missile limits in the nuclear talks cite UN Security Council Resolution 1929, adopted in 2010, which declares *inter alia* that "Iran shall not undertake any activity related to ballistic missiles capable of delivering nuclear weapons, including launches using ballistic missile technology."

A bill introduced earlier this year by Senators Robert Menendez (D-N.J.) and Mark Kirk (R-Ill.), S. 1881, would require that any comprehensive agreement include specific limits on Iranian missiles. In response to such congressional advocacy, senior administration officials have provided assurances that missiles would be "addressed, in some way"[1] during the ongoing negotiations, but they have not elaborated.

Iranian officials, for their part, oppose any discussion of Iran-specific ballistic missile limitations in the nuclear talks. They argue that Iran's missiles are a legitimate means of self-defense in an unstable region where other countries are threatening to attack it, and they note that the first-phase agreement made no mention of missiles in its framework for a final deal.

The missile issue is certainly relevant to the issue of Iran's future nuclear weapons potential, but it must be handled very carefully. Attempts by the P5+1 to impose specific, binding limits on Iran's ballistic missile capabilities at this point could jeopardize chances to conclude an agreement that establishes verifiable limits on its ability to produce material for nuclear weapons. Without Iran's ability to produce nuclear weapons, its

ATTA KENARE/AFP/Getty Images

A military truck carries a Sejjil medium-range ballistic missile during an annual military parade in Tehran on September 22, 2013. The parade featured twelve Sejjil and 18 Ghadr MRBMs. The range and survivability of the two-stage, solid-fueled Sejjil would make it a more formidable weapon than the Shahab-3 or Ghadr-1 missiles deployed by Iran. However, the Sejjil has not been flown for over three years and it is "unknown" whether or not the system has been deployed, according to the latest unclassified U.S. intelligence community assessment.

missiles pose much less of a threat to its neighbors.

Addressing the Missile Issue

Those who believe that Resolution 1929 requires that the talks between Iran and the P5+1 set limits on Iran's missile capabilities overlook the fact that the situation today is very different from the situation in 2010, when the resolution was adopted.

Then, Iran was refusing to negotiate constructively to resolve concerns about its nuclear program. The intent of the resolution was to slow Iran's progress toward a rapid breakout capability and raise the cost to Tehran of failing to fulfill its obligations toward the IAEA.

Today, Iran and the IAEA are working through the outstanding compliance issues and progress is being made on negotiation of a final agreement to establish a monitoring and limitation regime that ensures Iran's nuclear program is peaceful. Success in reaching a satisfactory deal would allow the costs imposed by the UN and others to be removed.

As the lead U.S. negotiator, Undersecretary of State Wendy Sherman, noted in a February 4 hearing of the Senate Foreign Relations Committee, "[I]f we can get to the verifiable assurance that [the Iranians] cannot obtain a nuclear weapon, …then a delivery mechanism, important as it is, is less important."[2] In other words, the most effective way to address the potential threat of nuclear-armed Iranian ballistic missiles is to conclude a robust deal between Iran and the P5+1 to prevent Iran from being able to build nuclear weapons.

Missile Limits: A Reality Check

The ability of a missile to deliver a nuclear warhead depends on the size and weight of the weapon's "physics package," which is determined in large part by the technological sophistication of the nuclear weapon design, and the power of the missile's engine in propelling the warhead a sufficient distance. Resolution 1929 refers to but does not define "nuclear capable ballistic missiles." In fact, the demarcation between missiles that are nuclear capable and those that are not is imprecise.

The Missile Technology Control Regime criterion of being able to deliver a 500-kilogram payload to a distance of 300 kilometers is the closest thing to an internationally accepted demarcation.[3] However, the Menendez-Kirk bill, which was sponsored by a majority of U.S. senators, envisioned imposing new sanctions on Iran if it conducted any tests for ballistic missiles with a range exceeding 500 kilometers.

The last time the international community was in a good position to forestall the emergence of a

Figure 1: Iranian Medium-Range Ballistic Missile Launches

Iran's first medium-range ballistic missiles (MRBMs) were derived from North Korea's Nodong, but Iran's development and testing program for MRBMs has been more intensive and rigorous. Iran has conducted some 26 MRBM launches of solid- and liquid-fueled MRBMs over a 14-year period, compared to North Korea's launch of nine liquid-fueled MRBMs over 24 years.

DATE		MISSILE TYPE
1998	(*July*)	**Shahab-3**
	(*Nov.*)	Sejjil
1999		----
2000	(*July*)	**Shahab-3**
	(*Sept.*)	**Shahab-3**
2001		----
2002	(*May*)	**Shahab-3**
	(*July*)	**Shahab-3**
2003	(*July*)	**Shahab-3**
2004	(*Aug.*)	**Ghadr-1**
	(*Oct.*)	**Ghadr-1**
2005		----
2006	(*Jan.*)	**Shahab-3**
	(*May*)	**Ghadr-1**
	(*Nov.*)	**Ghadr-1**
	(*Dec.*)	**Ghadr-1**
2007	(*Nov.*)	Ashura
2008	(*July*)	**Shahab-3**
	(*July*)	**Shahab-3**
	(*Nov.*)	Sejjil
2009	(*May*)	Sejjil-2
	(*Sept.*)	**Ghadr-1**
	(*Sept.*)	Sejjil-2
	(*Dec.*)	Sejjil-2
2010	(*Oct.*)	Sejjil-2
2011	(*Feb.*)	Sejjil-2
	(*Feb.*)	**Shahab-3**
	(*June*)	**Ghadr-1**
2012	(*July*)	**Shahab-3**
2013		----
2014		----

Source: Various

Note: Launchers of the liquid-fueled Shahab-3 and its more advanced derivative, the Ghadr-1, are shown in bold. It has not always been possible to differentiate these systems from each other in flight tests, based on publicly available information.

DIETER NAGL/AFP/Getty Images

Hans-Dieter Lucas of Germany (left), Wendy Sherman of the United States, and Jacques Audibert of France lead their respective countries' delegations at P5+1 nuclear talks with Iran in Vienna on February 18.

nuclear-capable ballistic missile threat from a state of proliferation concern was following the defeat of Saddam Hussein's Iraq in 1991. The limit imposed on Baghdad in connection with the cease-fire was a ban on any ballistic missiles with ranges in excess of 150 kilometers. Iraqi flight-testing at ranges slightly over this line, arguably of little military significance, was one of the "violations" of constraints on weapons of mass destruction (WMD) that the United States and the UK cited to justify their 2003 invasion of Iraq.

What Would the Basis for Missile Limits Be?

Any of these range ceilings for ballistic missiles would be judged in Iran as very restrictive, a humiliating denial of sovereign rights. Viewed from Tehran, there is no legal basis for asserting a right to demand limits on ballistic missiles. Unlike the limitations on nuclear programs that Iran and other states-parties to the nuclear Nonproliferation Treaty (NPT) have accepted, there are no equivalent international treaty limitations for ballistic missiles, other than the U.S.-Russian New Strategic Arms Reduction Treaty and Intermediate-Range Nuclear Forces Treaty.

Moreover, the United States and Israel, the two countries that regularly assert a right to launch preventive attacks against Iran, both have nuclear-armed aircraft and nuclear-armed ballistic missiles. Tehran complains that Israel is not a party to the NPT (or any other WMD treaty) and charges that the United States, although a party to the NPT, is ignoring its disarmament obligations under Article VI of the treaty. Iran's regional and religious rival, Saudi Arabia, although also a party to the NPT as a non-nuclear-weapon state, has deployed longer-range ballistic missiles than has Iran. The Saudi missiles would certainly be capable of delivering nuclear warheads if such warheads were available.

How Invested Is Iran in Its Missiles?

As noted in a recent analysis by Shahram Chubin of the Carnegie Endowment for International Peace, "by orthodox standards Iran is militarily weak" and "its military expenditure is slight compared to that of its smaller Gulf neighbours."[4] With an aging and ineffective air force and an army unsuited for operating far afield, Iran relies heavily on conventionally armed missile systems for national defense.

Iran has already developed and deployed several dozen Shahab-3 and Ghadar-1 medium-range ballistic missiles (MRBMs), able to strike regional area targets as far away as Israel. "[These missiles] represent one of Iran's few capabilities to deter attack, intimidate regional rivals, and boost military morale and national pride," according to Michael Elleman of the International Institute for Strategic Studies.[5] Iran has devoted considerable energy and resources to acquiring and then improving these systems (see figure 1). They are now considered more advanced and reliable than North Korea's Nodong MRBM, from which they were originally derived.

Iran deploys dozens of short-range ballistic missiles, which have greater relevance for scenarios close to its borders – involving targets on the battlefield, in adjacent waters, or on the other side of the Persian Gulf. According to Elleman, Iran has more recently shifted its development efforts to improving these short-range missiles and defeating missile defenses.[6]

Official Iranian sources claim that one of the two new ballistic missiles flight-tested on February 3, the Qiam, was capable of delivering a 746-kilogram payload with multiple warheads 800 kilometers. The U.S. defense intelligence agencies assess that Iran now may have almost 100 launchers for ballistic missiles with ranges between 150 kilometers and 500 kilometers,[7] a short-range ballistic missile force roughly comparable in size to that of Iraq at the beginning of the 1991 war.

Iran also has serious ambitions to be a spacefaring nation, already successfully launching satellites and conducting biological research by launching monkeys and other life forms into space. Looking at the international community's severe strictures on North Korea, Tehran would have little doubt that its space program would fall victim to any limits on ballistic missile activity that were inserted into the nuclear talks.

Notably absent, despite the fevered rhetoric of certain Members of Congress,[8] is evidence that Iran is seriously pursuing intercontinental-range ballistic missiles. If such a threat were to materialize, it would be unlikely to appear before the end of the decade, according to Elleman.[9]

Alternative Approaches for Addressing Missiles

The best way to address Iran's potential to exploit nuclear-capable missiles is to ensure that Iran's nuclear program is sufficiently limited and transparent that missile limits become unnecessary. The primary means of doing so would be to strictly limit Iran's stockpile of enriched uranium. This would entail ensuring that production is significantly reduced in the short term and is commensurate with Iran's "practical needs" for its civilian power program, as foreseen in the Joint Plan of Action. The IAEA would thereby have confidence that Iran did not have sufficient fissile material to assemble the several warheads necessary to pose a credible nuclear threat to other countries, and the international community would have many months to mount an effective response if Iran sought to break out of the NPT to build nuclear weapons.

The best way to address Iran's potential to exploit nuclear-capable missiles is to ensure that Iran's nuclear program is sufficiently limited and transparent that missile limits become unnecessary.

The IAEA will also need to gain sufficient understanding of the "possible military dimensions" of Iran's past nuclear program to be confident that the program remains peaceful in the future. This includes Tehran adequately addressing allegations that Iran adapted a Shahab-3 MRBM front section to accommodate installation of a nuclear warhead. The final deal between Iran and the P5+1 should provide direction to the IAEA and Tehran on resolving outstanding issues.

It might also be possible to persuade Iran to make a voluntary commitment to greater transparency with regard to its missile activities, such as notifications of flight tests, exercises, and field deployments. This appears unlikely as part of a comprehensive agreement on Iran's nuclear program, but it might be possible to negotiate a side agreement in which Iran pledged to join the Hague Code of Conduct Against Ballistic Missile Proliferation, a confidence-building regime to which 137 states subscribe. The code's provisions include commitments to provide prelaunch notifications of launches and test flights of ballistic missiles and space launch vehicles. Subscribing states also commit to submitting an annual declaration of their policies on ballistic missiles and space launch vehicles.

Because none of Iran's key regional neighbors currently subscribes to the Hague Code of Conduct, an approach to Iran alone does not seem propitious. Yet, an agreement constituting a historic resolution of nuclear proliferation issues with Iran would create a powerful new impetus for beginning the talks on a WMD-free zone in the Middle East, to which the international

community is committed by the final document of the 2010 NPT Review Conference. Confidence-building measures for missiles (the Hague Code of Conduct or a hybrid borrowing elements from it) could be introduced in this forum, facilitating progress in other areas of nonproliferation.

If such measures could gain a foothold at a conference on a Middle Eastern WMD-free zone or elsewhere, bans on flight tests beyond a certain range might become feasible. It is not difficult to see that a ban on testing and deployment of ballistic missiles with ranges of greater than 3,000 kilometers would serve the interests of Europe, the United States, and Russia by obviating the need for deploying the third phase of the European Phased Adaptive Approach to missile defense, saving money and lowering tensions between NATO and Russia. Such a ban could also be achieved without impinging on the self-proclaimed security interests of the key regional players in the Middle East—Iran, Saudi Arabia, and Israel.

Missile Limits Would Be Good, But Nuclear Limits Are Vital

From the perspective of Washington, nothing could be more logical than wishing to include missile limits in the P5+1 talks with Iran as a way to buttress the objective of preventing Iran from acquiring nuclear weapons. Moreover, even if the missiles carry only conventional warheads, it is still desirable for the United States to minimize the missile arsenal of a belligerent Iran, which sits astride a vital world energy artery and threatens U.S. friends and allies.

Nevertheless, the U.S. interest in limiting Iran's missiles that *could* carry nuclear warheads is secondary to the interest in achieving adequate and verifiable constraints on Iran's ability to build the nuclear warheads in the first place. A comprehensive deal between Iran and the P5+1 that verifiably limits Iran's uranium-enrichment capacity, effectively blocks plutonium-production pathways, and enhances verification to assure detection of prohibited nuclear-weapons-related activities would dramatically reduce the potential dangers posed by Iran's ballistic missiles.

ENDNOTES

1. "Background Briefing on EU Coordinated P5+1-Iran Negotiations," Vienna, Austria, March 19, 2014, https://www.google.com/webhp?tab=mw&ei=1tdoU_enCIOXqAbo7oLoAw&ved=0CAUQqS4oAg#q=BAckground+briefing%3A+Senior+Administration+Official+on+EU+coordinated+P5%2B1-Iran+negotiations.

2. Wendy Sherman, Testimony before the Senate Committee on Foreign Relations, February 4, 2014. http://www.shearman.com/~/media/Files/Services/Iran-Sanctions/Iran-Joint-Plan-of-Action-and-related-documents/Joint-Plan-of-Action/4-Feb-2014--Transcript-of-Senate-Foreign-Relations-Committee-Hearing-on-the-Iran-Nuclear-Negotiations-Panel-1.pdf.

3. This capability corresponds to that of the ubiquitous Soviet Scud B missile, which is known to have had a nuclear delivery mission during the Cold War.

4. Shahram Chubin, "Is Iran a Military Threat?" *Survival: Global Politics and Strategy*, April-May 2014. http://www.iiss.org/en/publications/survival/sections/2014-4667/survival--global-politics-and-strategy-april-may-2014-3f8b/56-2-07-chubin-d0b9.

5. Frederick Dahl, "Iran's Ballistic Missiles May Become Hurdle in Nuclear Talks." April 8, 2014, http://www.reuters.com/article/2014/04/08/us-iran-nuclear-missiles-idUSBREA370TB20140408.

6. Michael Elleman, "Behind Tehran's Boasts, the Facts on Its Missiles," Manama Voices, December 3, 2013, http://www.iiss.org/en/manama%20voices/blogsections/2013-e202/irans-ballistic-missiles-fb63.

7. National Air and Space Intelligence Center, *Ballistic and Cruise Missile Threat*, July 2013.

8. See Greg Thielmann, "Another Congressional Sighting of Iranian ICBMs," Arms Control Now, December 13, 2013, http://armscontrolnow.org/2013/12/13/another-congressional-sighting-of-iranian-icbms/; "What Kind of Glasses Do You Need to See Iranian ICBMs?" Arms Control Now, July 26, 2013, http://armscontrolnow.org/2013/07/26/what-kind-of-glasses-do-you-need-to-see-iranian-icbms/.

9. International Institute of Strategic Studies, "Iranian ICBMs: A Distant Prospect," Strategic Comments, November 13, 2013, http://www.iiss.org/en/publications/strategic%20comments/sections/2013-a8b5/iranian-icbms--a-distant-prospect-b8df.

The Arms Control Association (ACA) is an independent, membership-based organization dedicated to providing authoritative information and practical policy solutions to address the dangers posed by the world's most dangerous weapons. The "Solving the Iranian Nuclear Puzzle" briefing series is made possible with the support of the Ploughshares Fund and contributions from individual ACA members. For more information, visit www.armscontrol.org.