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Iran's Ballistic Missile Programs: An Overview

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Summary

Iran is acknowledged to have an active interest in developing, acquiring, and deploying a broad range of ballistic missiles. But there remains considerable uncertainty and disagreement over specifics. This short report[1] seeks to provide an overview of the reported or suspected range of Iranian ballistic missile programs. Because there remains widespread public divergence over particulars, however, this report does not provide specificity to what Iran may or may not have, or is in the process of developing. This report may be updated.

Iran's ballistic missile program dates to the late 1970s after the Shah was overthrown and the Islamic Republic of Iran established. The new Iranian government embarked on a ballistic missile program marked by considerable secrecy. Many consider that Iran's effort was in full force by the mid-1980s during its protracted war against Iraq, during which Iran reportedly launched more than 600 ballistic missiles.

Today, there is little disagreement among most experts that Iran has acquired some number of ballistic missiles from other countries and has developed other ballistic missiles indigenously or in cooperation with others. Iranian ballistic missile proliferation has been a matter of U.S. and international concern. At the same time, however, there has been considerable public disagreement over precisely what kinds of ballistic missile systems Iran has or is developing. This is because there is little transparency in Iran's ballistic missile programs, which has led to a lack of confidence in Iran's public assertions. Finally, details about Iranian ballistic missile programs remain classified in the United States. Because of the secrecy inherent in the development of weapon systems, especially in less open societies, open-source analyses reflect a wide-range of technical views.

[1] This report replaces CRS Report RS21548, *Iran's Ballistic Missile Programs*, by Andrew Feickert.

This report provides a brief description of what is publicly discussed regarding Iran's ballistic missile programs[2]; it does not discuss Iranian cruise missiles[3] or rockets.[4] These latter weapons have been a recent issue because some Iranian-made rockets and other missiles may have been used by Hezbollah against Israel in 2006.[5] Charges of Iranian military support to Iraqi insurgents do not include Iranian-made rockets or missiles, however. This report first examines Iran's long-range ballistic missile programs because those efforts generally drive the greatest concerns within the United States, especially when coupled with development of Iran's nuclear capabilities. An overview of Iran's medium and short-range ballistic missile programs then follows.

Long-Range Ballistic Missiles

Traditionally, the United States has defined long-range or Intercontinental Ballistic Missiles (ICBMs) as those ballistic missiles capable of ranges greater than 5,500 kilometers. To date, five countries have deployed operational ICBMs (all with nuclear weapons): the United States, Russia, China, France, and Britain. Other countries, such as Iran, are believed to have ICBM programs in varying stages of development.

In 1999, the U.S. intelligence community assessed that at some point the United States would probably face ICBM threats from Iran.[6] This remains the official U.S. position, that "Iran *could test* an ICBM in the last half of the next decade using Russian technology and assistance" (emphasis in original). A similar report was issued in 2001.[7]

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[2] After an initial powered phase of flight, a ballistic missile leaves the atmosphere (about 100 kilometers) and follows an unpowered trajectory or flight path before reentering the atmosphere toward a predetermined target. Ballistic missile ranges can vary from a hundred or so kilometers to more than 10,000 kilometers.

[3] A cruise missile is a guided missile that normally uses some form of jet propulsion system to allow sustained flight within the atmosphere toward its target. Cruise missile ranges can vary from a few hundred to more than 1,500 kilometers.

[4] After an initial powered launch, a military rocket will head toward its intended target without leaving the atmosphere. Military rocket ranges are relatively short and can be guided or unguided.

[5] For instance, see CRS Report RL32048, *Iran: U.S. Concerns and Policy Responses*, by Kenneth Katzman, and "The Rocket Campaign Against Israel During the 2006 Lebanon War," by Uzi Rubin, *Mideast Security and Policy Studies*, no. 71, June 2007. There remains uncertainty over the extent of Hezbollah's rocket and missile inventory and what was actually fired during the 2006 war. This includes the Chinese-built anti-ship missile (C-802), which Iran imported in the early 1990s. At least one such C-802 may have been transferred to Hezbollah and used to nearly sink an Israeli naval corvette ship in July 2006. Reports of a "Fajr-3" Iranian-made artillery rocket used in the 2006 war are sometimes erroneously confused with an Iranian medium-range ballistic missile.

[6] National Intelligence Council, "Foreign Missile Developments and the Ballistic Missile Threat to the United States through 2015," September 1999. This unclassified National Intelligence Estimate was provided in open testimony to the Senate Foreign Relations Committee on September 16, 1999, by Robert D. Walpole, National Intelligence Officer for Strategic and Nuclear Programs, Central Intelligence Agency.

[7] National Intelligence Council, "Foreign Ballistic Missile Threat Through 2015," December
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These statements serve as the official U.S. basis for assessing the Iranian ICBM threat to the United States and its friends and allies. These assessments drive U.S. military efforts designed to respond to such threats, such as the U.S. Ballistic Missile Defense (BMD) program, as well as U.S. diplomatic efforts to curb Iranian long-range ballistic missile programs.[8] These assessments, in conjunction with official U.S. assessments of Iranian nuclear weapons development, contribute U.S. concerns over Iranian threats to U.S. and international security.

These assessments do not mean, however, that there is universal agreement within the U.S. intelligence community on the issue of an Iranian ICBM. According to these unclassified statements, some argue that an Iranian ICBM test is likely before 2010, and very likely before 2015. Other U.S. officials believe, however, that there is "less than an even chance" for such a test before 2015. Furthermore, U.S. assessments are also conditional in that an Iranian ICBM capability would have to rely on access to foreign technology, from, for example, North Korea or Russia.[9] Finally, it is argued that an Iranian ICBM could develop from an Iranian space program under which a space-launch vehicle program might be converted into an ICBM program. Some have argued that Iran could develop and test such a space launch vehicle by 2010.

Some observers argue that although the U.S. position may be based upon a realistic assessment, it is also a worst-case analysis of the potential threat from Iran. They argue that "with rare exception this level of threat has rarely turned out to be the historical reality."[10]

Beyond these general U.S. public statements about Iranian ICBM developments, there are few unclassified details. Further, non-official public sources reflect little technical or program consensus regarding an Iranian ICBM program. Some have referred to a program called the Shahab-6 (or Kosar in some instances) as a potential ICBM development program, perhaps derived from North Korean or Russian missile technology, or both.[11] Although Iran continues to declare it has no plans to develop an ICBM program, there appears to be considerable public uncertainty as to whether the Shahab-6 is an actual design study concept, or an active or abandoned Iranian ICBM or space-

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[7] (...continued)
2001, Unclassified Summary of a National Intelligence Estimate.

[8] See CRS Report RL34051, *Long-Range Ballistic Missile Defense in Europe*, by Steven A. Hildreth and Carl Ek, and CRS Report RL32048, *Iran: U.S. Concerns and Policy Responses*, by Kenneth Katzman.

[9] See National Intelligence Council, "Foreign Missile Developments, 1999," and Robert D. Walpole, "The Ballistic Missile Threat to the United States," Statement Before the Senate Subcommittee on International Security, Proliferation and Federal Services, February 9, 2000.

[10] For instance, see Charles P. Vick, "North Korean, Iranian, and Pakistani Common Russian, Chinese Nuclear Weapons Heritage and Tests, What does it Reveal about the Missile Borne Warhead Development Status?" Part 1, March 20, 2007, at [http://www.globalsecurity.org/wmd/world/dprk/nuke-warhead-dev1.htm].

[11] See, for instance, "Shahab-6 IRSL-X-4," at [http://www.fas.org/nuke/guide/iran/missile/Shahab-6.htm], and "Shahab-6," at [http://www.missilethreat.com/missilesoftheworld/id.110, css.print/missile_detail.asp].

launch program. And in January 2004, Iran's Defense Minister reportedly announced that Iran would launch a satellite within 18 months. Although many were concerned over this statement, such a launch has not yet occurred.

Medium and Intermediate-Range Ballistic Missiles

Many experts believe that Iran's Shahab-3, which sometimes appears also to be called the Zelzal-3 ballistic missile, is a derivative of the North Korean No-Dong 1 ballistic missile. It has a reported range of about 1,000 to 1,500 kilometers. This could reach potential targets throughout much of the Middle East. Some have speculated that North Korea, Iran, and Pakistan entered into a cooperative effort at one point to develop a missile of this range and capability. Other observers have alleged Russian assistance in Iranian development of this missile. Some reports suggest that Iran has already deployed a number of medium-range ballistic missiles (MRBMs). Of all Iranian ballistic missile programs, there seems to be more publicly available information in relative terms about this particular missile system than others.[12] Even so, there remains considerable and varying differences in open sources about this system.

Longer range versions of the Shahab-3, variously referred to as Shahab-3 variants, the Shahab-3A, Shahab-3B, and Shahab-4, and a BM-25, may have range capabilities of 1,500-2,500 kilometers. These missiles potentially could reach targets throughout the Middle East, Turkey, and in southern Europe. Some have reported that perhaps several dozen or more of these missile types may be deployed and operational. Some Chinese, North Korean, or Russian involvement is suspected. In 2006, Iran announced the successful test of a Fajr-3 MRBM comparable to the Shahab-3, although U.S. and Israeli intelligence analysts have reportedly expressed skepticism.

Reports have also surfaced over Iran's development of a much longer MRBM with ranges of 4,000-5,000 kilometers, or even a space launch vehicle derived from these efforts that some refer to as the Shahab-5. The degree to which this effort might be actually underway also is highly uncertain.

Short-Range Ballistic Missiles

Iran is widely believed to have deployed a number of short-range ballistic missiles (SRBMs) — those with ranges less than 1,000 kilometers. In addition, Iran is believed to have various other SRBMs under development, either indigenously or in varying degrees of cooperation with countries such as China, North Korea, or Russia.

Beyond these speculations, however, open source materials do not reflect a consensus over technical capabilities or performance. Additionally, there appear to be considerable differences in descriptions of the numbers of systems operational or deployed and even the agreed-upon names of SRBMs ascribed to Iran. Some of the more commonly referred to Iranian missiles are discussed briefly.

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[12] See, for instance, the Federation of American Scientists: [http://www.fas.org/nuke/guide/iran/missile/shahab-3.htm] and [http://www.missilethreat.com/missilesoftheworld/id.107,css.print/missile_detail.asp].

Some believe that Iran may have imported perhaps 200 Chinese CSS-8 (or Tondar-69) SRBMs in the late 1980s, as well as a number of associated launch systems for their operational deployment.[13] The CSS-8 may have a range of about 150 kilometers.

Iran may have developed an SRBM in the 1990s called the Fateh A-110 (also apparently referred to as the Mershad or Zelzal-2 variant). According to various reports, this missile may have been developed with Chinese, Syrian, and North Korean involvement. This missile may have a range of about 200 kilometers and may have become operational around 2004.

Some believe that Iran acquired several dozen Chinese M-11 or CSS-7 SRBMs and associated launch vehicles in the mid-1990s, although China has denied this. The M-11 reportedly has a range of around 280 kilometers.[14]

Iran may also possess a number of SRBMs with ranges of 200-300 kilometers that it might have acquired from Libya or North Korea. Some may have been produced or modified indigenously. These have variously been referred to as the SCUD-B, SCUD-B variants, or Shahab-1 SRBMs.

Iran might also possess a few hundred SRBMs with a range of about 500-700 kilometers or so. These SRBMs have sometimes been referred to as the SCUD-C and Shahab-2. Analysts have expressed uncertainty over whether the Iranians developed and built these missiles on their own, or had help from China and North Korea.

Finally, there are some reports of an operational SRBM with a range up to 800 kilometers, which may possibly be referred to as an M-9 variant, DF-15, or CSS-6. Reportedly, the PRC produced the M-9 for export and Iran has acquired some number of them.

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[13] The International Institute for Strategic Studies, *The Military Balance 2007*, p. 224.

[14] [http://missilethreat.com/missilesoftheworld/id.66,css.print/missile_detail.asp].