

# Ballistic Missiles: A Serious and Growing Threat

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## IN BRIEF

- The ballistic missile threat from potential aggressors like Iran is increasing.
- Ballistic missiles are a uniquely destabilizing weapon.
- The United States should continue to use a combination of diplomatic, cooperative, technological, and military tools to manage ballistic missile threats.

## Introduction

Ballistic missile threats to the United States and its allies are growing as more states augment and expand their missile arsenals.<sup>1</sup> To protect American interests, policy-makers must focus on diplomatic strategies and technological investments to manage and reduce these threats.

During the Cold War, the Soviet Union maintained large arsenals of nuclear-tipped ballistic missiles targeted against the United States and its allies. Since the demise of the Soviet Union and the progressive reconciliation between the United States and Russia, concern about missile strikes has shifted from the threat posed by the strategic forces of a rival superpower to missile threats from regional outliers. The United States and Russia maintain strategic nuclear forces as a form of deterrence although neither side now fears a deliberate attack from its former adversary.

Unlike advanced strike aircraft and even cruise missiles, ballistic missiles are targeted for

### What is a ballistic missile?

Ballistic missiles have long been targeted for control because of certain characteristics that make them useful for offensive operations and surprise attack, including the relative ease with which they can be clandestinely deployed, range (providing distance from enemy targets), high speed, difficulty of interception (compared to slower flying aircraft, for example), and particular utility for delivering nuclear, biological, or chemical warheads.

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international control because they are widely perceived to have uniquely destabilizing effects on regional balances and the risk of conflict. The association of ballistic missiles as platforms for non-conventional (nuclear, chemical, or biological) payloads along with the speed with which they can be launched against distant targets have encouraged efforts to stem their spread for decades.<sup>2</sup> Restrictions on the trade in ballistic missile technologies such as the Missile Technology Control Regime, the Proliferation Security Initiative, and various other sanctions and inducements to discourage missile exports are supported and enforced by a large number of countries.<sup>3</sup>

The Obama administration's response to the emerging ballistic missile threat combines trade controls with technological investments to blunt the threat of emerging missile programs from countries such as North Korea and Iran, including ballistic missile defenses. The United States has developed a dual strategy for missile defenses, including a homeland defense system on U.S. territory and a series of programs known as the European Phased Adaptive Approach based on cooperative programs among NATO allies to develop and deploy regional missile defenses.<sup>4</sup>

## Emerging Adversary Missile Capabilities

Few states outside of the industrial world had ballistic missile programs during the Cold War. Today, missile programs and missile arsenals are located in some of the world's most dangerous and unstable regions. The presence of missiles in conflict-prone or unstable regions increases the lethality of potential conflicts and could heighten the costs of miscalculations, posing added risks to the United States, its allies, and its deployed forces overseas.

**Iran:** Iran's missile capabilities are considered to be significant and growing. With over 1,000 short- and long-range missiles in its arsenal, Iran has the highest number of deployed ballistic missiles in the region.<sup>5</sup> Iran's ballistic missile program began in the 1970s under the Shah and continued after the 1979 revolution with North Korean, Chinese, and Russian assistance.<sup>6</sup> Iran's deployed ballistic missile arsenal includes the Shahab-3, with a range of up to 1,000 kilometers, and a variety of shorter-range systems. Iran is actively working on developing more capable, longer-range ballistic missiles.<sup>7</sup>



Iran does not currently possess an intercontinental ballistic missile (ICBM) capable of striking the United States. Analysts do not agree on when or even whether Iran will develop ICBM capabilities.<sup>8</sup> Some estimates say it may be possible for Iran to test an ICBM as early as 2015 given sufficient levels of foreign assistance. Such estimates do not guarantee, however, that Iran could have a long range missile force that is either reliable or fully operational.<sup>9</sup>

Iran's recent missile tests indicate that its technical competence is on the rise. During a 10-day military exercise beginning in late June 2011, Iran test-fired several types of missiles, including an updated version of the Shahab-3. According to Iran's Islamic Revolution Guard Corps (IRGC), these tests were successful and accomplished their objectives.<sup>10</sup> Amir Ali Hajizadeh, head of the IRGC's aerospace branch, stated,

“The range of our missiles has been designed on the basis of the distance to the Zionist regime and the U.S. bases in the Persian Gulf region.”<sup>11</sup>

In addition to the missile launches, Iran recently revealed new underground ballistic missile silos which it claims to have developed indigenously.<sup>12</sup>

**North Korea:** North Korea has been an exporter of ballistic missiles and ballistic missile components since the 1980s.<sup>13</sup> North Korea has been adding to its missile production capabilities with the intermediate-range Taepodong missile beginning in the late 1990s, a system based on the less advanced Nodong medium-range ballistic missile program developed during the 1980s. The Taepodong-1, first launched in August 1998, has a range of over 1,500 kilometers. Were it to function to full design capacity, the Taepodong is believed to have a potential range of 3,800-5,900 kilometers.<sup>14</sup> The follow-on Taepodong-2 missile also could have a range of several thousand kilometers depending on its payload. During the missile’s first flight test in 2006, however, the system disintegrated after approximately 40 seconds.<sup>15</sup>



North Korea reportedly possesses over 800 ballistic missiles.<sup>16</sup> Analysts believe that North Korea is intent on developing an ICBM capable of striking the United States. Former Secretary of Defense Robert Gates stated in January, “North Korea will have developed an intercontinental ballistic missile within [5 years];” giving the country “a very limited (ICBM) capability.”<sup>17</sup>

**Syria:** Syria began trying to acquire missiles from the Soviet Union in the 1970s but has progressed since then with assistance from China, North Korea, Iran, and also possibly Russia.<sup>18</sup>



Syria possesses several hundred Scud and SS-21 short-range ballistic missiles.<sup>19</sup> Syrian missiles are capable of striking targets in several countries in the region including Israel, Iraq, Jordan, and Turkey. Syria is believed to be trying to develop more advanced or longer-range missiles or to purchase them from other suppliers.<sup>20</sup>

## American Responses to Missile Proliferation

**Cooperative institutions and U.S. export controls:** The United States took the lead in creating the Missile Technology Control Regime (MTCR) in the 1980s. The MTCR is an association of 34 countries that agree to coordinate their export laws and to abide by several levels of restrictions on missile and missile-related technologies.<sup>21</sup> The United States also maintains national export control policies to prohibit the export of items and technologies that could aid a would-be ballistic missile proliferator as well as to limit risks that “dual use” technologies (with both legitimate and illicit applications) get diverted from their intended applications. The Proliferation Security Initiative is another US-led effort to

stem the trade in missile components by devising strategies to detect and interdict illicit shipments.<sup>22</sup>

**Ballistic Missile Defense:** The centerpiece of U.S. ballistic missile defense development currently is the European Phased Adaptive Approach, which calls for the phased deployments of U.S. missile defense assets in Europe to protect against limited ballistic missile strikes.<sup>23</sup> The European Phased Adaptive Approach is based on the seaborne Aegis Ballistic Missile Defense System and the Standard Missile 3 (SM-3) interceptor, both proven technologies with a record of successful tests.

American missile defense assets are intended to be “mobile and relocatable” in order to match regional requirements and to respond to threats as they emerge and evolve.<sup>24</sup>

The Defense Department has spent more than \$100 billion on ballistic missile defense since the 1980s. The Missile Defense Agency, a part of the Defense Department, receives approximately \$10 billion annually.<sup>25</sup>

## Conclusion

The United States and its allies remain vulnerable to threats or coercion by countries with ballistic missile programs, especially if such programs are accompanied by efforts to develop and deploy nuclear warheads. The steady improvement of ballistic missile programs among key regional adversaries constitutes a serious threat to American national security and global interests.

A combination of intelligence, diplomacy, cooperative constraints, and technological responses such as ballistic missile defense can all play a vital role in addressing this 21<sup>st</sup> century challenge.

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### (Endnotes)

1 A ballistic missile uses liquid or solid fueled engines to launch, and then is propelled by the gravitational force of the earth after it exits the atmosphere. Ballistic missiles are classified according to the maximum distance (with ranges that vary from short to medium to long) that they can carry their intended payload (warhead). Advanced strategic ballistic missiles of the type deployed by the United States and Russia can carry large payloads and strike distant targets with high accuracy. Most ballistic missiles under development around the world are much more limited in capability, can travel a relatively limited distance, and in many cases are not fully operational.

Crail, Peter, “Worldwide Ballistic Missile Inventories,” Arms Control Association, <http://www.armscontrol.org/factsheets/missiles> (accessed July 22, 2011).

2 Pollack, Joshua, “Ballistic Trajectory: The Evolution of North Korea’s Ballistic Missile Market,” *Nonproliferation Review*, July 2011, vol. 18, No. 2, p. 414, [http://cns.miis.edu/npr/pdfs/npr\\_18-2\\_pollack\\_ballistic-trajectory.pdf](http://cns.miis.edu/npr/pdfs/npr_18-2_pollack_ballistic-trajectory.pdf) (accessed July 22, 2011).

3 For a further exploration of missile control, see:

Pollack, Joshua, “Missile Control: A Multi-decade Experiment in Nonproliferation,” *Bulletin of the Atomic Scien-*

tists, August 1, 2011, <http://thebulletin.org/print/web-edition/columnists/joshua-pollack/missile-control-multi-decade-experiment-nonproliferation> (accessed August 25, 2011).

4 A recent White House fact sheet on the European Phased Adaptive Approach specifically cites current and potential Iranian missile developments as a justification for missile defenses. See:

The White House, "Fact Sheet: Implementing Missile Defense in Europe," September 15, 2011, <http://www.whitehouse.gov/the-press-office/2011/09/15/fact-sheet-implementing-missile-defense-europe/> (accessed September 15, 2011).

5 Nuclear Threat Initiative, "Iran Profile: Missile Overview," October 2010, [http://www.nti.org/e\\_research/profiles/iran/missile/index.html](http://www.nti.org/e_research/profiles/iran/missile/index.html) (accessed July 22, 2011).

6 Ibid.

and

Nuclear Threat Initiative, "China's Missile Exports and Assistance to Iran," September 2003, <http://www.nti.org/db/china/miranpos.htm> (accessed July 22, 2011).

7 Nuclear Threat Initiative, "Iran Profile: Missile Overview."

8 The debate about a potential Iranian ICBM capability is highly contentious. The range of a missile is partially determined by the weight of the payload that it carries, and a lighter payload (or no payload) will technically boost the "range" of the missile. Furthermore, in order for an ICBM to deliver a nuclear warhead, the warhead must be miniaturized and fitted to the missile. Lastly, a notional capability is not the same as a usable weapon, and extensive testing of the missile itself would be required before it could be considered a militarily usable asset. For more, see:

Elleman, Michael, "Could Iran Deliver a Bomb? Four Basics about Iran's Ballistic Missiles," *United States Institute of Peace*, January 21, 2011, <http://iranprimer.usip.org/blog/2011/jan/21/could-iran-deliver-bomb-four-basics-about-iran's-ballistic-missiles> (accessed July 22, 2011).

9 Bruno, Greg, "Iran's Ballistic Missile Program," *Council on Foreign Relations*, October 15, 2009, <http://www.cfr.org/iran/irans-ballistic-missile-program/p20425> (accessed July 22, 2011).

10 Mu, Xuequan, "Iran's IRGC says Missile Maneuver 'Successful,'" *Xinhua News Agency*, July 6, 2011, [http://news.xinhuanet.com/english2010/world/2011-07/06/c\\_13969735.htm](http://news.xinhuanet.com/english2010/world/2011-07/06/c_13969735.htm) (accessed July 22, 2011).

11 Nuclear Threat Initiative, "Iran Reveals Subterranean Missile Launch Facilities," *Global Security Newswire*, June 28, 2011, [http://www.globalsecuritynewswire.org/gsn/nw\\_20110628\\_3837.php](http://www.globalsecuritynewswire.org/gsn/nw_20110628_3837.php) (accessed July 22, 2011).

12 Ibid.

13 Pollack, Joshua, "Ballistic Trajectory: The Evolution of North Korea's Ballistic Missile Market," p. 414, (accessed July 22, 2011).

14 Hildreth, Steven A., "North Korean Ballistic Missile Threat to the United States," *Congressional Research Service*, February 24, 2009, <http://www.fas.org/sgp/crs/nuke/RS21473.pdf> (accessed July 22, 2011).

15 Federation of American Scientists, "North Korea's Taepodong and Unha Missiles," <http://www.fas.org/programs/spp/nukes/nuclearweapons/Taepodong.html> (accessed July 22, 2011).

16 Nuclear Threat Initiative, "North Korea Profile: Missile Overview," June 2011, [http://www.nti.org/e\\_research/profiles/NK/Missile/index.html](http://www.nti.org/e_research/profiles/NK/Missile/index.html) (accessed August 29, 2011).

17 Stewart, Phil, "U.S. Sees North Korea Becoming Direct Threat, Eyes ICBMs," *Reuters*, January 11, 2011, <http://www.reuters.com/article/2011/01/11/us-usa-korea-gates-idUSTRE70A1XR20110111> (accessed July 22, 2011).

18 Nuclear Threat Initiative, "Syria Profile: Missile Overview," October 2010, [http://www.nti.org/e\\_research/profiles/Syria/Missile/index.html](http://www.nti.org/e_research/profiles/Syria/Missile/index.html) (accessed July 22, 2011).

19 Ibid.

20 Ibid.

21 The MTCR was formally established in 1987:

Missile Technology Control Regime, "The Missile Technology Control Regime," <http://www.mtcr.info/english/index.html> (accessed July 22, 2011).

22 Gormley, Dennis M., "Winning on Ballistic Missiles but Losing on Cruise: The Missile Proliferation Base," *Arms Control Today*, December 2009, [http://www.armscontrol.org/act/2009\\_12/Gormley](http://www.armscontrol.org/act/2009_12/Gormley) (accessed July 22, 2011).

23 The White House, "Fact Sheet on U.S. Missile Defense Policy: A 'Phased, Adaptive Approach' for Missile Defense in Europe," September 17, 2009, [http://www.whitehouse.gov/the\\_press\\_office/FACT-SHEET-US-Missile-Defense-Policy-A-Phased-Adaptive-Approach-for-Missile-Defense-in-Europe/](http://www.whitehouse.gov/the_press_office/FACT-SHEET-US-Missile-Defense-Policy-A-Phased-Adaptive-Approach-for-Missile-Defense-in-Europe/) (accessed July 22, 2011).

24 U.S. Department of Defense, *Ballistic Missile Defense Review Report*, February, 2010, [http://www.defense.gov/bmdr/docs/BMDR%20as%20of%2026JAN10%200630\\_for%20web.pdf](http://www.defense.gov/bmdr/docs/BMDR%20as%20of%2026JAN10%200630_for%20web.pdf) (accessed July 22, 2011).

25 Francis, Paul, "Defense Acquisitions: Assessment of DOD Efforts to Enhance Missile Defense Capabilities and Oversight," U.S. Government Accountability Office, February 26, 2008, p. 2, <http://www.gao.gov/new.items/d08506t.pdf> (accessed September 22, 2011).

## **Building a New American Arsenal**

The American Security Project (ASP) is a bipartisan initiative to educate the American public about the changing nature of national security in the 21st century.

Gone are the days when a nation's strength could be measured by bombers and battleships. Security in this new era requires a New American Arsenal harnessing all of America's strengths: the force of our diplomacy; the might of our military; the vigor of our economy; and the power of our ideals.

We believe that America must lead other nations in the pursuit of our common goals and shared security. We must confront international challenges with all the tools at our disposal. We must address emerging problems before they become security crises. And to do this, we must forge a new bipartisan consensus at home.

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