



Unclassified Summary of a National Intelligence Estimate

Foreign Missile Developments and the Ballistic Missile Threat Through 2015

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*Prepared under the auspices of the National Intelligence Officer for
Strategic and Nuclear Programs. Inquiries may be directed to the NIO
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Preface

Foreign Missile Developments and the Ballistic Missile Threat Through 2015

The Senate Select Committee on Intelligence has requested that the Intelligence Community (IC) produce annual reports containing the latest intelligence on ballistic missile developments and threats and a discussion of nonmissile threat options. This paper is an unclassified summary of the National Intelligence Estimate (NIE) that is the fourth annual report.

The NIE describes new missile developments and our projections of possible and likely ballistic missile threats to the United States, US interests overseas, and military forces or allies through 2015; updates assessments of theater ballistic missile forces worldwide; discusses the evolving proliferation environment; and provides a summary of forward-based threats and cruise missiles. We examine future ballistic missile capabilities of several countries that have ballistic missiles and ballistic missile development programs. Each country section includes a discussion of theater-range systems and current and projected long-range systems.

Our assessments of future missile developments are inexact and subjective because they are based on often fragmentary information. Many countries surround their ballistic missile programs with extensive secrecy and compartmentalization, and some employ deception. Although such key milestones as flight-testing are difficult to hide, we may miss others. To address these uncertainties, we assess both the earliest date that countries *could* test various missiles, based largely on engineering judgments made by experts inside and outside the Intelligence Community, on the technical capabilities and resources of the countries in question, and, in many cases, on continuing foreign assistance; and when countries would be *likely* to test such missiles, factoring into the above assessments potential delays caused by technical, political, or economic hurdles. We judge that countries are much less likely to test as early as the hypothetical “could” dates than they are by our projected “likely” dates.

In making these projections, we examine the level of success and the pace individual countries have experienced in their missile development efforts and consider foreign technology transfers, political motivations, military incentives, and economic resources. We have not attempted to address all of the potential political, economic, and social changes that could occur; we have projected missile developments between now and 2015 independent of *significant* political and economic changes. For example, some countries that currently have hostile or friendly intentions toward the United States could change significantly over the next fifteen years. As we prepare each annual report, we review strategic trends that could indicate such changes in order to make any necessary adjustments in our projections.

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Key Judgments

Foreign Missile Developments and the Ballistic Missile Threat Through 2015

Most Intelligence Community agencies project that before 2015 the United States most likely will face ICBM threats from North Korea and Iran, and possibly from Iraq—barring significant changes in their political orientations—in addition to the longstanding missile forces of Russia and China. One agency assesses that the United States is unlikely to face an ICBM threat from Iran before 2015.

Short- and medium-range ballistic missiles already pose a significant threat overseas to US interests, military forces, and allies.

- Emerging ballistic missile states continue to increase the range, reliability, and accuracy of the missile systems in their inventories—posing ever greater risks to US forces, interests, and allies throughout the world.
- Proliferation of ballistic missile-related technologies, materials, and expertise—especially by Russian, Chinese, and North Korean entities—has enabled emerging missile states to accelerate missile development, acquire new capabilities, and potentially develop even more capable and longer range future systems.

Unless Moscow significantly increases funding for its strategic forces, the Russian arsenal will decline to less than 2,000 warheads by 2015—with or without arms control.

- Although Russia still maintains the most comprehensive ballistic missile force capable of reaching the United States, force structure decisions resulting from resource problems, program development failures, weapon system aging, the dissolution of the Soviet Union, and arms control treaties have resulted in a steep decline in Russian strategic nuclear forces over the last 10 years.

The Intelligence Community projects that Chinese ballistic missile forces will increase several-fold by 2015, but Beijing's future ICBM force deployed primarily against the United States—which will number around 75 to 100 warheads—will remain considerably smaller and less capable than the strategic missile forces of Russia and the United States.

- China has three new, mobile strategic missiles in development—the road-mobile DF-31 ICBM; the longer range road-mobile DF-31 follow-on; and the JL-2 submarine-launched ballistic missile (SLBM).
- These programs date from the mid-1980s and are the basis of Beijing's efforts to field a modern, more survivable strategic deterrent to the United States and Russia.

North Korea's multiple-stage Taepo Dong-2, which is capable of reaching parts of the United States with a nuclear weapon-sized (several hundred kg) payload, may be ready for flight-testing.

- North Korea in May 2001, however, extended its voluntary moratorium on long-range missile flight-testing until 2003, provided that negotiations with the United States proceed.
- A Taepo Dong-2 test probably would be conducted in a space launch configuration, like the Taepo Dong-1 test in 1998.
- The North continues to develop missiles.

Iran is pursuing short- and long-range missile capabilities.

- Tehran has 1,300-km-range Shahab-3 medium-range ballistic missiles (MRBMs) that could be launched in a conflict.
 - Iran is pursuing an ICBM/space launch vehicle (SLV) system. All agencies agree that Iran *could* attempt a launch in mid-decade, but Tehran is *likely* to take until the last half of the decade to flight test an ICBM/SLV; one agency further believes that Iran is unlikely to conduct a successful test until after 2015.

Iraq, constrained by international sanctions and prohibitions, wants a long-range missile and probably retains a small, covert force of Scud-variant missiles.

- If UN prohibitions were eliminated or significantly reduced, Iraq would be likely to spend several years reestablishing its short-range ballistic missile (SRBM) force, developing and deploying solid-propellant systems, and pursuing MRBMs.
- All agencies agree that Iraq *could* test different ICBM concepts before 2015 if UN prohibitions were eliminated in the next few years. Most agencies, however, believe that it is *unlikely* to do so, even if the prohibitions were eliminated. Some believe that if prohibitions were eliminated Iraq would be *likely* to test an ICBM masked as an SLV before 2015, possibly before 2010 if it received foreign technology.

Several countries *could* develop a mechanism to launch SRBMs, MRBMs, or land-attack cruise missiles from forward-based ships or other platforms; a few are *likely* to do so—more likely for cruise missiles—before 2015.

Nonmissile means for delivering weapons of mass destruction do not provide the same prestige, deterrence, and coercive diplomacy as ICBMs; but they are less expensive, more reliable and accurate, more effective for disseminating biological warfare agents, can be used without attribution, and would avoid missile defenses.

Foreign nonstate actors—including terrorist, insurgent, or extremist groups that have threatened or have the ability to attack the United States or its interests—have expressed an interest in chemical, biological, radiological, or nuclear (CBRN) materials.

Discussion

Foreign Missile Developments and the Ballistic Missile Threat Through 2015

Introduction

The ballistic missile remains a central element in the military arsenals of nations around the globe and almost certainly will retain this status over the next fifteen years. States willingly devote often scarce resources in efforts to develop or acquire ballistic missiles; build the infrastructures necessary to sustain future development and production; and actively pursue technologies, materials, and personnel on the world market to compensate for domestic shortfalls, gain increased expertise, and potentially shorten development timelines.

Most US Intelligence Community agencies project that during the next 15 years the United States most likely will face ICBM threats from North Korea and Iran, and possibly Iraq—barring significant changes in their political orientations—in addition to the strategic forces of Russia and China. One agency assesses that the United States is unlikely to face an ICBM threat from Iran before 2015.

The threats to the US homeland, nevertheless, will consist of dramatically fewer warheads than today owing to significant reductions in Russian strategic forces. China has been modernizing its long-range strategic missile force since the mid-1980s, shifting from reliance primarily on silo-based liquid-propellant CSS-4s to mobile solid-propellant systems. The Intelligence Community projects that by

2015, the total number of Chinese strategic warheads will rise several-fold, though it will remain still well below the number of Russian or US forces.

North Korea has extended until 2003 the missile launch moratorium it announced late in 1999, although the North continues to work on the Taepo Dong-2 program. The Taepo Dong-2—capable of reaching parts of the United States with a nuclear weapon-sized payload—may be ready for flight-testing. The initial test likely would be conducted in a space launch configuration. Iran also is pursuing a longer range missile capability.

Short- and medium-range ballistic missiles, particularly if armed with WMD, already pose a significant threat overseas to US interests, military forces, and allies. Moreover, the proliferation of missile technology and components continues, contributing both to the production of SRBMs and MRBMs and to the development of even longer range systems.

The trend in ballistic missile development worldwide is toward a maturation process among existing ballistic missile programs rather than toward a large increase in the number of countries possessing ballistic missiles. Emerging ballistic missile states continue to increase the range, reliability, and accuracy of the missile systems in their inventories—posing ever greater risks to US forces, interests, and allies throughout the world. A decade ago, US and allied forces abroad faced threats from SRBMs—primarily the Scud and its variants. Today, countries have deployed or are on the verge of deploying MRBMs, placing greater numbers of targets at risk.

Proliferation of ballistic missile-related technologies, materials, and expertise—especially by Russian, Chinese, and North Korean entities—has enabled emerging missile states to accelerate the development timelines for their existing programs, acquire turnkey systems to gain previously non-existent capabilities—in the case of the Chinese sale of the M-11 SRBM to Pakistan—and lay the groundwork for the expansion of domestic infrastructures to potentially accommodate even more capable and longer range future systems.

North Korea has assumed the role as the missile and manufacturing technology source for many programs. North Korean willingness to sell complete systems and components has enabled other states to acquire longer range capabilities earlier than otherwise would have been possible—notably the sale of the No Dong MRBM to Pakistan. The North also has helped countries to acquire technologies to serve as

the basis for domestic development efforts—as with Iran’s reverse-engineering of the No Dong in the Shahab-3 program. Meanwhile, Iran is expanding its efforts to sell missile technology.

States with emerging missile programs inevitably will run into problems that will delay and frustrate their desired development timelines. The impact of these problems increases with the lack of maturity of the program and depends on the level of foreign assistance. Most emerging missile states are highly dependent on foreign assistance at this stage of their development efforts, and disturbance of the technology and information flow to their programs will have discernible short-term effects. The ready availability of assistance from multiple sources, however, makes it likely that most emerging missile states will be able to resolve such problems and advance their missile programs, albeit with a slippage in development time.

Projecting When a Country *Could* and Is *Likely* To Test an ICBM

Expertise from inside and outside the Intelligence Community was used to examine many possible options for ICBM development and to determine when a country *could* test each option, based largely on technical, industrial, and economic capabilities. These judgments indicate when countries would be capable of testing if they met certain conditions, such as beginning engine testing by a certain date. This formulation also addresses what a country may be capable of achieving if a decision were made to try to field a missile as rapidly as possible and if the program progressed without significant delays. Other factors—including potential technical problems, motivations and intentions, and political and economic delays—then were applied to assess the likely timing of the country testing an ICBM. These judgments provide the Intelligence Community assessments of the most *likely* course of events based on a variety of factors.

Providing assessments of when a country *could* and is *likely* to test an ICBM takes into account uncertainties and cases where a solid evidentiary base is not available for making more definitive assessments. The availability of foreign assistance is frequently a critical driver in both formulations, and is so noted, especially when foreign assistance accelerates the program dramatically. These assessments of future missile developments are, by their nature, subjective. This Estimate examines the level of success and the pace individual countries have experienced in their missile development efforts and considers foreign technology transfers, political motivations, military incentives, and economic resources. But it does not attempt to address *all* of the potential political, economic, and social changes that could occur; it projects missile developments between now and 2015 independent of *significant* political and economic changes. As each annual report is prepared, we review strategic trends that could indicate such changes and make necessary adjustments to the projections.

The probability that a missile with a weapon of mass destruction will be used against *US forces or interests* is higher today than during most of the Cold War, and it will continue to grow as the capabilities of potential adversaries mature. More nations have ballistic missiles,¹ and they have already been used against US and allied forces during the Gulf war. Although the missiles used in the Gulf war did not have WMD warheads, Iraq had weaponized ballistic missile warheads with BW and CW agents and they were available for use.

Some of the states armed with missiles have exhibited a willingness to use chemical weapons with other delivery means. In addition, some nonstate entities are seeking chemical, biological, radiological, and nuclear (CBRN) materials and would be willing to use them without missiles. In fact, US territory is more likely to be attacked with these materials from nonmissile delivery means—most likely from terrorists—than by missiles, primarily because nonmissile delivery means are less costly, easier to acquire, and more reliable and accurate. They also can be used without attribution. Nevertheless, the missile threat will continue to grow, in part because missiles have become important regional weapons in the arsenals of numerous countries. Moreover, missiles provide a level of prestige, coercive diplomacy, and deterrence that nonmissile means do not.

Russia

Russia maintains the most comprehensive ballistic missile force capable of reaching the United States, although force structure decisions resulting from resource problems,

¹ Although during the Cold War many Warsaw Pact nations had ballistic missile units, a decision to use these missiles would have been made by the USSR—not independently by the Warsaw Pact nations.

program development failures, weapon system aging, the dissolution of the Soviet Union, and arms control treaties have resulted in a steep decline in Russian strategic nuclear forces over the last 10 years. From a high of approximately 10,000 warheads in 1990, Russia now maintains almost 4,000 warheads on its ICBMs and SLBMs.

- Russia currently has about 700 ICBMs with 3,000 warheads and a dozen SSBNs² equipped with 200 launchers for SLBMs that can carry 900 warheads.
- In the current day-to-day operational environment—with all procedural and technical safeguards in place—an unauthorized or accidental launch of a Russian strategic missile is highly unlikely.

Strategic Missile Forces

ICBMs. Russia's Strategic Rocket Forces (SRF) is extending the service lives of its older ICBMs—silo-based SS-18s and SS-19s, and road-mobile SS-25s—in part to compensate for the slow deployment of its newest ICBM, the SS-27.

Russia's ICBMs and US Missile Defense

Concerns over the US Missile Defense (MD) program have led several high-ranking Russian political, military, and industry officials to openly discuss military countermeasures to the system. The SS-27—developed in the 1980s as a response to the Strategic Defense Initiative—probably is the basis for Russia's most credible responses to MD.

SLBMs. The disintegration of the Soviet Union, developmental problems, and resource constraints have resulted in significant

² SSBN is the acronym for nuclear-powered ballistic missile submarine.

SSBN/SLBM program delays and the requirement to simultaneously extend the service lives of older systems while maintaining newer, more capable systems.

The Intelligence Community has various projections of Russia's strategic forces for 2015, all less than 2,000 deployed nuclear weapons. The availability of resources, inclusion of missiles with multiple independently targetable reentry vehicles (MIRVs), and the success of development programs are the key factors in determining the ultimate force size.

Theater Ballistic Missile Force

Russia has the most technologically evolved and best-equipped, maintained, and trained theater ballistic missile force in the world today. The SS-21 and SS-26 SRBMs provide Russian general-purpose ground forces with a rapid, precision-guided, theater deep-strike capability.

China

Strategic Missile Forces

China's current ICBM force consists of large, liquid-propellant missiles armed with single nuclear warheads. Of these ICBMs, about 20 are CSS-4 silo-based missiles that can reach targets in the United States. The Chinese also have about a dozen CSS-3 ICBMs that are almost certainly intended as a retaliatory deterrent against targets in Russia and Asia. China also has a medium-range SLBM (the CSS-NX-3/JL-1).

Beijing is concerned about the survivability of its strategic deterrent against the United States and has a long-running modernization program to develop mobile, solid-propellant ICBMs. The IC projects that by 2015, most of China's strategic missile force will be mobile.

China has three new, mobile, solid-propellant strategic missiles in development—the road-mobile CSS-X-10 ICBM (also called the DF-31), which is now in the flight-test stage; a longer range version of the DF-31; and the JL-2 SLBM. This modernization effort, which dates from the mid-1980s, forms the foundation of Beijing's efforts to field a modern, mobile, and more survivable strategic missile force.

- China could begin deploying the DF-31 ICBM during the first half of the decade.
- Beijing could begin deploying the DF-31 follow-on ICBM and JL-2 SLBM in the last half of the decade.

China has had the capability to develop and deploy a multiple reentry vehicle system³ for many years, including a MIRV system. The IC assesses that China could develop a multiple RV system for the CSS-4 ICBM in a few years. Chinese pursuit of a multiple RV capability for its *mobile* ICBMs and SLBMs would encounter significant technical hurdles and would be costly.

The IC has differing projections of the overall size of Chinese strategic ballistic missile forces over the next 15 years, ranging from about 75 to 100 warheads deployed primarily against the United States. MIRVing and missile defense counter-measures would be factors in the ultimate size of the force. In addition, China would have about two dozen shorter range DF-31 and CSS-3 ICBMs that could reach parts of the United States.

Theater Ballistic Missile Force

China maintains a robust CSS-5 MRBM force and continues to increase the capabilities of its SRBM force deployed opposite Taiwan.

³ Multiple reentry vehicle payload systems include those that independently target each RV in the system (MIRVs) and those that do not provide independent targeting for each RV (MRV).

Conventionally Armed Ballistic Missiles

China's leaders calculate that conventionally armed ballistic missiles add a potent new dimension to Chinese military capabilities, and they are committed to continue fielding them at a rapid pace. Beijing's growing SRBM force provides China with a military capability that avoids the political and practical constraints associated with the use of nuclear-armed missiles. The latest Chinese SRBMs provide a survivable and effective conventional strike force and expand conventional ballistic missile coverage.

The IC projects an SRBM force in 2005 of several hundred missiles.

North Korea

North Korea has hundreds of Scuds and No Dong missiles and continues to develop the longer range Taepo Dong-2, which will enable the North to target the United States. In May 2001, however, Kim Chong-il unilaterally extended the North's voluntary flight-test moratorium—in effect since 1999—until 2003, provided negotiations with the United States proceeded.

Ballistic Missile Programs

Taepo Dong-2. The multiple-stage Taepo Dong-2—capable of reaching parts of the United States with a nuclear weapon-sized payload—may be ready for flight-testing. The North probably also is working on improvements to its current design. The Taepo Dong-2 in a two-stage ballistic missile configuration could deliver a several-hundred-kg payload up to 10,000 km—sufficient to strike Alaska, Hawaii, and parts of the continental United States. If the North uses a third stage similar to the one used on the Taepo Dong-1 in 1998 in a

ballistic missile configuration, then the Taepo Dong-2 could deliver a several-hundred-kg payload up to 15,000 km—sufficient to strike all of North America. A Taepo Dong-2 flight test probably would be conducted as an SLV with a third stage to place a small payload into the same orbit the North Koreans tried to achieve in 1998.

No Dong. The 1,300-km-range No Dong remains the longest-range ballistic missile North Korea has deployed.

WMD Payload Options

The Intelligence Community judged in the mid-1990s that North Korea had produced one, possibly two, nuclear weapons, although the North has frozen plutonium production activities at Yongbyon in accordance with the Agreed Framework of 1994. North Korea also has chemical and biological weapons programs.

Foreign Assistance

North Korea is nearly self-sufficient in developing and producing ballistic missiles and has demonstrated a willingness to sell complete systems and components that have enabled other states to acquire longer range capabilities earlier than would otherwise have been possible and to acquire the basis for domestic development efforts.

Iran

Iran's missile inventory is among the largest in the Middle East and includes some 1,300-km-range Shahab-3 MRBMs, a few hundred SRBMs, and a variety of unguided rockets. Tehran's longstanding commitment to its ballistic missile programs—for deterrence and war-fighting—is unlikely to diminish.

Ballistic Missile Programs

Shahab-3. The 1,300-km-range Shahab-3 MRBM—based on the North Korean No Dong—is in the late stages of development. **ICBMs/SLVs.** In addition to SRBM and MRBM development, Iran is likely to develop space launch vehicles to put satellites into orbit and to establish the technical base from which it could develop IRBMs/ICBMs capable of delivering payloads to Western Europe and the United States. Iran is likely to test these vehicles initially as SLVs and not as ballistic missiles to demonstrate an inherent IRBM/ICBM capability without risking the potential political and economic costs of a long-range missile test. Iran certainly is aware of the North Korean SLV/missile program and the benefits P’yongyang has tried to gain from the inherent ICBM capability posed by the Taepo Dong-1 and -2.

- All agencies agree that Iran *could* attempt to launch an ICBM/SLV about mid-decade, although most agencies believe Iran is *likely* to take until the last half of the decade to do so. One agency further judges that Iran is unlikely to achieve a successful test of an ICBM before 2015.
- Iranian acquisition of complete systems or major subsystems—such as North Korean TD-2 or Russian engines—could accelerate its capability to flight-test an ICBM/SLV.
 - If Iran were to acquire complete TD-2 systems from North Korea, it could conduct a flight test within a year of delivery, allowing time to construct a launch facility. Iran is unlikely to acquire complete ICBM/SLV systems from Russia.
 - In contrast, a halt or substantial decrease in assistance would delay

by years the development and flight-testing of these systems.

WMD Payload Options

The Intelligence Community judges that Iran does not yet have a nuclear weapon. Most agencies assess that Tehran could have one by the end of the decade, although one agency judges it will take longer. All agree that Iran could reduce this time frame by several years with foreign assistance. Iran has biological and chemical weapons programs.

Foreign Assistance

Foreign assistance—particularly from Russia, China, and North Korea—will remain crucial to the success of the Iranian missile program for the duration of this Estimate.

Iraq

Baghdad’s goal of becoming the predominant regional power and its hostile relations with many of its neighbors are the key drivers behind Iraq’s ballistic missile program. Iraq has been able to maintain the infrastructure and expertise necessary to develop missiles, and the IC believes it has retained a small, covert force of Scud-type missiles, launchers, and Scud-specific production equipment and support apparatus. For the next several years at least, Iraq’s ballistic missile initiatives probably will focus on reconstituting its pre-Gulf war capabilities to threaten regional targets and probably will not advance beyond MRBM systems.

Ballistic Missile Programs

Prior to the Gulf war, Iraq had several programs to extend the range of the Scud SRBM and became experienced working with liquid-propellant technology. Since the Gulf war, despite UN resolutions limiting the range of Iraq’s missiles to 150 km, Baghdad has been able to maintain the infrastructure and

expertise necessary to develop longer range missile systems.

- A military parade in December 2000 showcased Al Samoud missiles on new transporter-erector-launchers (TELs). The liquid-propellant Al-Samoud SRBM probably will be deployed soon.
- The IC assesses that Iraq retains a small covert force of Scud-variant missiles, launchers, and conventional, chemical, and biological warheads.

We cannot project with confidence how long UN-related sanctions and prohibitions will remain in place. They plausibly will constrain Iraq during the entire period of this Estimate. Scenarios that would weaken the prohibitions several years from now also are conceivable, allowing Iraq to reconstitute its missile infrastructure and begin developing long-range missiles before the end of the decade. The discussion that follows addresses developments that *could* and are *likely* to occur should UN prohibitions be significantly weakened in the future.

Iraq is likely to use its experience with Scud technology to resume production of the pre-Gulf war 650-km-range Al Hussein, the 900-km-range Al Abbas, or other Scud variants, and it could explore clustering and staging options to reach more distant targets. Iraq *could* resume Scud-variant production—with foreign assistance—quickly after UN prohibitions ended.

- With substantial foreign assistance, Baghdad *could* flight-test a domestic MRBM by mid-decade. This possibility presumes rapid erosion of UN prohibitions and Baghdad's willingness to risk detection of developmental steps, such as static engine testing, earlier. An MRBM flight test is *likely* by 2010. An imported MRBM *could* be flight-tested within months of acquisition.

For the first several years after relief from UN prohibitions, Iraq probably will strive to reestablish its SRBM inventory to pre-Gulf war numbers, continue developing and deploying solid-propellant systems, and pursue MRBMs to keep pace with its neighbors. Once its regional security concerns are being addressed, Iraq may pursue a first-generation ICBM/SLV.

Although Iraq *could* attempt before 2015 to test a rudimentary long-range missile based on its failed Al-Abid SLV, such a missile almost certainly would fail. Iraq is unlikely to make such an attempt. After observing North Korean missile developments the past few years, Iraq would be more likely to pursue a three-stage TD-2 approach to an SLV or ICBM, which would be capable of delivering a nuclear weapon-sized payload to the United States. Some postulations for potential Iraqi ICBM/SLV concepts and timelines from the beginning of UN prohibition relief include:

- If Iraq could buy a TD-2 from North Korea, it *could* have a launch capability within a year or two of a purchase.
- It *could* develop and test a TD-1-type system within a few years.
- If it acquired No Dong from North Korea, it *could* test an ICBM within a few years of acquisition by clustering and staging the No Dongs—similar to the clustering of Scuds for the Al Abid SLV.
- If Iraq bought TD-2 engines, it *could* test an ICBM within about five years of the acquisition.
- Iraq *could* develop and test a Taepo Dong-2-type system within about ten years of a decision to do so.

Most agencies believe that Iraq is *unlikely* to test before 2015 any ICBMs that would threaten the United States, even if UN prohibitions were eliminated or significantly

reduced in the next few years. Some believe that if prohibitions were eliminated in the next few years, Iraq would be *likely* to test an ICBM probably masked as an SLV before 2015, possibly before 2010. In this view, foreign assistance would affect the timing and the capability of the missile.

WMD Payload Options

Baghdad had a crash program to develop a nuclear weapon for missile delivery in 1990, but coalition bombing and IAEA and UNSCOM activities significantly set back the effort. The Intelligence Community estimates that Iraq, unconstrained, would take several years to produce enough fissile material to make a weapon. Iraq has admitted to having biological and chemical weapons programs before the Gulf war and maintains those programs.

Foreign Assistance

Foreign assistance is key to Iraqi efforts to develop quickly longer range missiles. Iraq relied on extensive foreign assistance before the Gulf war and will continue to seek foreign assistance to expand its current capabilities.

Libya

Ballistic Missile Programs

The imposition of UN sanctions has impeded Libyan efforts to obtain foreign assistance for its longer range missile programs. Nevertheless, even if Libya were to obtain a No Dong-class MRBM, Tripoli would be likely to continue to try for longer range systems to increase the number of US and NATO targets it can hold at risk. If a missile were offered with range sufficient to strike 2,500 kilometers into Europe, Libya would try to obtain it.

Libya lacks the infrastructure required to develop by 2015 a ballistic missile system

with sufficient range to target US territory. Libya's paths to obtaining an ICBM during the time frame of this Estimate probably would be to purchase a complete missile system or to set up a foreign assistance arrangement where foreign scientists and technicians design, develop, and produce a missile and the necessary infrastructure in Libya.

WMD Payload Options

Libya has biological and chemical weapons programs. Libya would need significant foreign assistance to acquire a nuclear weapon, but Tripoli's nuclear infrastructure enhancements remain of concern.

Foreign Assistance

Libya's missile program depends on foreign support, without which the program eventually would grind to a halt.

Syria

Missile Programs

Syria maintains a ballistic missile and rocket force of hundreds of FROG rockets, Scuds, and SS-21 SRBMs. With considerable foreign assistance, Syria progressed to Scud production using primarily locally manufactured parts.

Syrian regional concerns may lead Damascus to seek a longer range ballistic missile capability such as North Korea's No Dong MRBM. The IC judges that Syria does not now have and is unlikely to gain an interest in an ICBM capability during the time frame of this Estimate.

WMD Payload Options

Syria has developed CW warheads for its Scuds and has an offensive BW program. The IC remains concerned about Syria's intentions regarding nuclear weapons.

Foreign Assistance

Foreign assistance is critical to Syrian efforts to improve its production capabilities and to gain access to export-controlled components and technology.

India

New Delhi believes that a nuclear-capable missile delivery option is necessary to deter Pakistani first use of nuclear weapons and thereby preserve the option to wage limited conventional war in response to Pakistani provocations in Kashmir or elsewhere. Nuclear weapons also serve as a hedge against a confrontation with China. New Delhi views the development, not just the possession, of nuclear-capable ballistic missiles as the symbols of a world power and an important component of self-reliance.

Missile Programs

Growing experience and an expanding infrastructure are providing India the means to accelerate both development and production of new systems. New Delhi is making progress toward its aim of achieving self-sufficiency for its missile programs, but it continues to rely on foreign assistance.

Converting the Indian SLV into an ICBM?

Rumors persist concerning Indian plans for an ICBM program, referred to in open sources as the Surya. Some Indian defense writers argue that possession of an ICBM is a key symbol in India's quest for recognition as a world power and useful in preventing diplomatic bullying by the United States. Most components needed for an ICBM are available from India's indigenous space program. India could convert its polar space launch vehicle into an ICBM within a year or two of a decision to do so.

- The 150-km-range Prithvi I SRBM continues to be India's only deployed ballistic missile.
- The Prithvi II SRBM is a modified Prithvi I with an increased range of 250 km.
- The Agni series, which probably will be deployed during this decade, will be the mainstay of India's nuclear-armed missile force.
- The Sagarika SLBM probably will not be deployed until 2010 or later.

Foreign Assistance

India continues to push toward self-sufficiency, especially in regard to its missile programs. Nevertheless, New Delhi still relies heavily on foreign assistance.

Pakistan

Pakistan sees missile-delivered nuclear weapons as a vital deterrent to India's much larger conventional forces, and as a necessary counter to India's nuclear program. Pakistan pursued a nuclear capability more for strategic reasons than for international prestige.

Ballistic Missile Programs

Since the 1980s, Pakistan has pursued development of an indigenous ballistic missile capacity in an attempt to avoid reliance on any foreign entity for this key capability. Islamabad will continue with its present ballistic missile production goals until it has achieved a survivable, flexible force capable of striking a large number of targets throughout most of India. Pakistan's missiles include:

- The short-range Hatf I, which Pakistan also is attempting to market, as it is relatively inexpensive and easy-to-operate.

- M-11 missiles that Pakistan acquired from China in the 1990s. (The M-11 SRBM—called the Hatf III in Pakistan—is a single-stage, solid-propellant missile capable of carrying a payload at least 300 km.)
- Ghauri/No Dong MRBMs that Pakistan acquired from North Korea.
- The Shaheen I, a Pakistani-produced single-stage, solid-propellant SRBM.
- The Shaheen II, a road-mobile two-stage solid-propellant MRBM that Pakistan is developing. (Based on several mockups publicly displayed in Pakistan, the Shaheen II probably would be able to carry a 1,000-kg payload to a range of about 2,500 kilometers.)

Foreign Assistance

Foreign support for Pakistan’s ambitious solid-propellant ballistic missile acquisition and development program has been critical.

Forward-Based Missile Threats to the United States

Several countries are technically capable of developing a missile launch mechanism to use from forward-based ships or other platforms to launch SRBMs and MRBMs, or land-attack cruise missiles (LACMs) against the United States. Some of these are likely to develop and deploy forward-based systems—more likely cruise missiles—during the period of this Estimate.

Nevertheless, long-distance strikes against the United States probably would be operationally difficult. Other methods would be less complicated—CBRN terrorism, for example.

Ballistic Missile Threats

An SRBM or MRBM could be launched at the United States from a forward-based sea

platform within a few hundred kilometers of US territory. Using such a sea platform would not pose major technical problems, but the accuracy of the missile probably would be reduced significantly because of the movement of the ocean. Still, the accuracy probably would be better than for some of the ICBMs discussed in this Estimate. The simplest method for launching a shipborne ballistic missile would be to secure a TEL onboard the ship and launch the missile from the TEL. Somewhat greater accuracy could be obtained by placing the TEL on a stabilization platform to compensate for wave movement. Another option would be to add satellite-aided (GPS or GLONASS) navigation to the missile.

The Land-Attack Cruise Missile Threat

One to two dozen countries probably will possess a land-attack cruise missile (LACM) capability by 2015 via indigenous development, acquisition, or modification of such other systems as antiship cruise missiles or unmanned aerial vehicles. Most LACMs will have a range of a few hundred km—posing primarily a theater-level threat—but with sufficient range to be forward-deployed on air- or sea-launch platforms.

Cruise Missile Threats

From a technical standpoint, cruise missiles are a better alternative than ballistic missiles in launching from forward areas. Many countries would therefore see these missiles as advantageous in attacking the United States. The most plausible alternative for a forward-based launch would be a covertly equipped commercial vessel.

Technically, cruise missiles can be launched from fighter, bomber, or even commercial transport aircraft outside US airspace. Both the perceived US capability to detect and track threats approaching the coast, and the

limited range of most foreign fighter and bomber aircraft, however, tend to mitigate such a threat. Modifying a commercial aircraft to become a cruise missile platform would entail significant aerodynamic, structural, electrical, and possibly flight control system modifications. Cruise missile launches from a submarine would have the advantage of being relatively covert. The technical sophistication required to design or to modify a cruise missile for launch from torpedo or missile tubes, however, almost certainly would require detailed assistance from the defense industry of a major naval power.

Nonmissile WMD Threats to the United States

Nonmissile means of delivering weapons of mass destruction do not provide the same prestige or degree of deterrence and coercive diplomacy associated with ICBMs. Nevertheless, concern remains about options for delivering WMD to the United States without missiles by state and nonstate actors. Ships, trucks, airplanes, and other means may be used. In fact, the Intelligence Community judges that US territory is more likely to be attacked with WMD using nonmissile means, primarily because such means:

- Are less expensive than developing and producing ICBMs.
- Can be covertly developed and employed; the source of the weapon could be masked in an attempt to evade retaliation.
- Probably would be more reliable than ICBMs that have not completed rigorous testing and validation programs.
- Probably would be much more accurate than emerging ICBMs over the next 15 years.

- Probably would be more effective for disseminating biological warfare agent than a ballistic missile.
- Would avoid missile defenses.

Terrorist Interest in CBRN

Foreign nonstate actors—including terrorist, insurgent, or extremist groups—have used, possessed, or expressed an interest in CBRN materials. Most of these groups have threatened the United States, and all of them have the ability to attack the United States or its interests. The events of September 11 and its aftermath have caused the Intelligence Community to focus significantly more resources on the threat from terrorism, and we are obtaining more information on potential terrorist actions.

