



Nautilus Institute Policy Forum Online: Assessment of the North Korean Missile Threat



The NAPSNet Policy Forum provides expert analysis of contemporary peace and security issues in Northeast Asia. As always, we invite your responses to this report and hope you will take the opportunity to participate in discussion of the analysis.

Recommended Citation

"Nautilus Institute Policy Forum Online: Assessment of the North Korean Missile Threat", NAPSNet Policy Forum, March 18, 2003, <https://nautilus.org/napsnet/napsnet-policy-forum/nautilus-institute-policy-forum-online-assessment-of-the-north-korean-missile-threat/>

Nautilus Institute Policy Forum Online: Assessment of the North Korean Missile Threat

Nautilus Institute Policy Forum Online: Assessment of the North Korean Missile Threat

PFO 03-20: March 18, 2003

Assessment of the North Korean Missile Threat

By David C. Wright

CONTENTS

[I. Introduction](#)

[II. Essay by David C. Wright](#)

[III. Nautilus Invites Your Responses](#)

I. Introduction

David Wright, Co-Director and Senior Scientist for the Global Security Program at the Security Studies Program at the Massachusetts Institute of Technology, provides a brief assessment of North Korea's long-range missile program and capability. Wright argues against the belief that North Korea possesses long-range nuclear missile capability or even has the ability to rapidly acquire one. In reality, a more likely threat is short-range missiles launched from ships, which uses simpler technology and appears far more feasible for a country like North Korea.

The views expressed in this article are those of the author and do not necessarily reflect the official policy or position of the Nautilus Institute. Readers should note that Nautilus seeks a diversity of views and opinions on contentious topics in order to identify common ground.

II. Essay by David C. Wright

"Assessment of the North Korean Missile Threat"

By David C. Wright

Co-Director and Senior Scientist, Global Security Program, Security Studies Program,
Massachusetts Institute of Technology

There is significant concern in the United States about the North Korean ballistic missile program and its ability to threaten US territory and allies. Since the mid-1980s, North Korea has likely with significant foreign assistance developed and produced a series of ballistic missiles of increasing range. It now deploys missiles with ranges able to reach all of South Korea and Japan, and is developing longer range missiles. It is also known to have transferred missile technology, as well as complete missiles, to other countries.

Assessments of North Korea's military capability often portray North Korea as possessing a long-range nuclear missile capability, or as able to rapidly acquire one. This is not true.

North Korea has short-range variants of the Scud missile, with ranges up to 500-600 kilometers for a payload of 500 kilograms, that are well tested. These missiles can reach all of South Korea with nuclear, biological, or chemical warheads, if North Korea has developed such warheads for missile delivery. North Korea has sold large numbers of these missiles to other countries.

The longest range missile currently deployed by North Korea is the No Dong missile, with an estimated range of 1,300 kilometers for a payload of about 700 kg. Such a range would allow North Korea to target all of Japan. North Korea is believed to have flight tested the No Dong only once in May 1993. While Pakistan may have provided North Korea with information from the tests of its Ghauri missile, which is believed to consist largely or entirely of North Korean technology, and North Korea is believed to have used a modified No Dong as the first stage of the Taepo Dong 1 (TD-1) launched in 1998, North Korea nonetheless has limited information about the reliability and accuracy of the missile. The No Dong uses a larger, more powerful engine than the Scud missile. This engine, which is believed to have been developed with foreign assistance, is believed to be used in the longer range missiles North Korea is developing.

The only test of a longer range missile occurred in August 1998, when the three-stage TD-1 missile was launched in an attempt to place a small satellite in orbit. This effort was not successful due to a failure of the missile's third stage. The test did demonstrate for the first time North Korea's technical capability to launch missiles with multiple stages, as well as its access to solid fuel technology, which was used in the third stage. However, the missile cannot be considered

operational without further testing.

Even if the TD-1 were successfully tested in the future, it would have limited capability and could at best deliver a small payload as far as Alaska or Hawaii. As noted in the September 1999 National Intelligence Estimate, if North Korea decided to develop an intercontinental range missile it would likely try to develop the Taeop Dong 2 (TD-2), which could carry larger payloads, rather than the TD-1.

The TD-2 has never been flight tested, although US National Intelligence Estimates (NIE) have stated since 1998 that it was believed ready for flight testing. Even if true, this does not mean that North Korea could quickly turn it into an operational missile once it decided to begin flight testing.

The TD-2 is significantly different than any missile North Korea has built or tested. It would be significantly larger than the TD-1, with a maximum diameter nearly twice that of the TD-1. It would be three times as massive as the TD-1 and would generate greater thrust, so that the mechanical stresses on the body would be more severe than on previous missiles. Moreover, North Korea is expected for the first time to use a cluster of four engines in the large first-stage booster of the TD-2, which increases the complexity of the missile. Most discussions of the TD-2 assume that it will include a third stage, which is required for the ranges usually attributed to it, but North Korea has not successfully launched such a stage.

Moreover, North Korea has not flight tested a reentry heat shield for a long-range missile, and would need to do so before it could use it to deliver a warhead.

As a result of these uncertainties, there is no basis for assuming that early tests of a TD-2 would be successful. Even if they were, some number of flight tests-possibly small but more than a couple-would be required to provide an estimate of the reliability of the missile. While North Korea might field a missile based on one or two tests, its confidence in its ability to use such a missile would be very low.

Knowing the reliability of a missile has important implications for the type of warhead that might be used on it. North Korea is believed to have separated enough plutonium for one or two nuclear weapons. Even if it had developed a working nuclear weapon, any leader would be reluctant to place such a valuable, scarce resource on a missile of unknown reliability, reserving it instead for other means of delivery.

The possible range of the TD-2 is also controversial. The December 2001 NIE projected that a two-stage TD-2 "could deliver a several-hundred-kg payload up to 10,000 km-sufficient to strike Alaska, Hawaii, and parts of the continental United States." It further projected that including a third stage could increase the range to 15,000 km, which would allow it reach all of North America.

These range estimates assume that the technology used in the TD-2 is significantly better than that used in the TD-1; in particular, they appear to assume that the body is made of significantly lighter materials, and that the engines provide higher thrust. Without these upgrades, for example, the two-stage TD-2 with a 500-kilogram payload may be able to reach parts of Alaska, but appears unlikely to be able to reach the continental United States or even the main Hawaiian islands. Similarly, the range of the three-stage TD-2 would likely be sufficient to reach all of Alaska and Hawaii, but only the northwest corner of the continental United States. If this is the case, the capability of the TD-2, while still troubling, is considerably less than typically presented.

If the TD-2 does incorporate these improvements, they would represent significant changes from past missiles, with implications for the design and fabrication of the TD-2. They would therefore

result in additional uncertainties that would have to be addressed by flight testing.

If one is concerned about near-term capabilities for missile delivery of lethal payloads to US territory, a more likely threat is short-range missiles launched from ships, which uses simpler technology than long-range missiles and appears feasible for a country like North Korea. Such forward-based threats have a number of advantages compared to using intercontinental missiles, since they use short-range missiles, are likely to have higher accuracy, and do not pin-point the country of origin. They could also not be engaged by the planned Ground-based Midcourse or Aegis-LEAP missile defenses, but would require large-scale deployment of short-range defenses around coastal cities.

III. Nautilus Invites Your Responses

The Northeast Asia Peace and Security Network invites your responses to this essay. Please send responses to: napsnet-reply@nautilus.org . Responses will be considered for redistribution to the network only if they include the author's name, affiliation, and explicit consent.

Produced by The Nautilus Institute for Security and Sustainable Development
Northeast Asia Peace and Security Project (napsnet-reply@nautilus.org)

[Return to top](#)

[back to top](#)

View this online at: <https://nautilus.org/napsnet/napsnet-policy-forum/nautilus-institute-policy-forum-online-assessment-of-the-north-korean-missile-threat/>

Nautilus Institute

608 San Miguel Ave., Berkeley, CA 94707-1535 | Phone: (510) 423-0372 | Email:

nautilus@nautilus.org