



COMMENTARY

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WASHINGTON, October 9, 2006— The Center for Strategic and International Studies (CSIS) Arleigh A. Burke Chair in Strategy Anthony H. Cordesman has prepared a short commentary “The Meaning of the North Korean Nuclear Weapons Test.” Dr. Cordesman’s commentary can be found below:

The Meaning of the North Korean Nuclear Weapons Test

By Anthony H. Cordesman
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It is far too early to really determine the nature of a North Korean nuclear test, if as seems to be the case, one actually occurred. Assuming that the test reports are real, the seismic event is relatively small.

The USGS has reported that measured a seismic event with a preliminary magnitude of 4.2 but it was unable to tell whether it was the result of an atomic explosion or a natural earthquake.

AP Reports state that Russian military monitoring systems "detected the test of a nuclear weapon in North Korea." AP reports that the ITAR-Tass news agency quoted Lt. Gen. Vladimir Verkhovtsev as saying. "It is 100 percent (certain) that it was an underground nuclear explosion," the agency quoted Verkhovtsev, the head of a Defense Ministry department, as saying.

AP also reports that,

- Australia and South Korea said there was seismic confirmation that pointed to a nuclear test.
- South Korean intelligence officials said the seismic wave had been detected in North Hamkyung province, according to South Korea's Yonhap news agency. It said the test was conducted at 10:36 a.m. (9:36 p.m. EDT Sunday) in Hwaderi near Kilju city on the Northeast coast, citing defense officials.
- An official at South Korea's seismic monitoring center confirmed a tremor was felt at the time North Korea said it conducted the test and said it was not a natural occurrence. The official spoke to The Associated Press on condition his name not be used, because he was not authorized to talk about the sensitive information to the media.

So far, the only source attempting to establish a yield seems be Park Chang-soo, spokesman at the Korea Institute of Geoscience and Mineral Resources, a state-run South Korean geological institute, which AP says stated that the magnitude of the tremor could indicate the test was equivalent to the force of 550 tons of TNT.

It is far from clear that this is a reliable source, and statements referring to a "550 ton" yield seems too precise and too early in calling for such a small yield to allow immediate verification. It should be noted that That the weapon the United States dropped on Hiroshima, Japan on Aug. 6, 1945, was equivalent to 11,000-15,000 tons of TNT.

If anything under a kiloton yield does prove to be true, it could be an indication of several things:

- A "fizzle" or failed test of a larger design. It is far easier to get some yield than an efficient weapon. Such a failure could come from either a gun or implosion device.
- A "test of principle design" that uses minimal fissile material to conserve a limited amount of total weapons grade material -- indicating a relatively advanced -- but possible, nuclear test effort.
- A test of material that is highly enriched but short of true weapons grade.
- A very advanced capability to make modern implosion weapons with minimal mounts of weapons grade material (too advanced, very unlikely).
- Test of a core assembly for a boosted weapon. (Too advanced, very unlikely).

These uncertainties will interact with other factors to influence the US and international reaction and US military options:

- Fissile material is easy to conceal and disperse and almost impossible to attack. Even a successful precision strike largely leave it intact because it is so small, dense, and malleable.
- Small research and manufacturing facilities are very difficult to locate, easy to bury, and the equipment can be palletized and easily moved and dispersed.
- Reactors like the one at Yongbyon, major enrichment, and major missile production facilities can be struck if they can be located. They do, however, require multiple hits. Single cruise missiles or precision weapon per target will not do the job.

Motives as to timing and the nature of the test are inevitably uncertain, but:

- The Hill statement that North Korea cannot be allowed to have a weapon is exactly the kind of statement likely to trigger North Korean reactions
- North Korea is as aware of our election as any American. The timing may be designed to send a signal to influence it, although it could easily miscalculate the US reaction.
- North Korea has recently taken a hard-line towards any new diplomatic options and outside pressure.
- A test may be seen as compensation for failure of long-range booster test on July 4th.

Any US statements that North Korea cannot be allowed to acquire nuclear weapons are meaningless bluster.

- US intelligence agencies have said for at least two years that North Korea almost certainly has the capability to explode some form of nuclear device. Most experts feel it has enough nuclear material to create 4-11 nuclear weapons. The range is so great because so much depends on the nature of the weapon and the efficiency of its design.
- This uncertainty is compounded by the fact that the US claimed at one point that North Korea had a second source of weapons grade material in addition to its use of spent reactor fuel. The US never defined the nature and location of this facility. It may or may not exist.
- No one can know how far North Korea has gotten with its weapons designs and the nature and yield of the test would be the first real indication of its capability. Within limits, it is possible to get a reasonable idea of the efficiency and nature of the device used in a surface test from seismic data and air sampling.

Underground testing simply reveals yield, but a low yield would be an indication that North Korea had only simple fission devices, not boosted weapons.

One major uncertainty is whether North Korea has the technology to build an efficient bomb and/or warhead for a missile reentry vehicle.

- The answer would normally be that it might take several underground tests to develop this capability. Advances in non-fissile testing and simulation, however, may well have changed this situation. Pakistan and India both seem to have used such techniques to some degree.
- Moreover, the transfer of Libyan nuclear weapons program data to the US revealed that Libya had acquired many elements of a missile warhead design from North Korea, copied from a Chinese design. The exact nature of this technology transfer has never been declassified.

As a result, a test could mean many different things, particularly if it does not vent enough material into the atmosphere to allow sampling. Even if a low yield is confirmed, this is no indication of what North Korea meant to test and this creates the following uncertainties as to what North Korea was attempting to test:

- ***Test of a crude gun type device too heavy for real weapons use.*** This would mean several years at a minimum to the development of an efficient weapon, either in terms of yield or making the best use of weapons grade material. This would buy time for more diplomacy, creating missile defenses, or military options.
- ***Test of a relatively efficient, but relatively low yield bomb-capable device.*** This would show North Korea could build an implosion weapon suitable for air delivery. It would, however, mean it was probably still some years away from an efficient device for a missile warhead.
- ***Test of a compact, relatively low yield device suitable for relatively rapid deployment on North Korean MRBMs/IRBMs.*** This seems far too advanced for North Korea at the present time, but would be a time-urgent test in terms of US and other outside reactions. Any Yield from 7 kilotons upwards could do devastating damage to any Asian city with the current level of North Korean MRBM/IRBM missile reliability and accuracy, particularly as a ground burst.

Such a capability would pose a major threat to South Korea and Japan, create major new problems for China in terms of regional stability, and threaten the global economy. The US is critically dependent on trade from Northeast Asia, as are all industrial economies. North Korea would suddenly have the ability to pose a global threat without an ICBM of any kind.

It also would demonstrate that its nuclear weapons technology was far enough along so that it could make the high range of total nuclear of weapons from a given amount of fissile material.

However, an implosion device with yields under 30 kilotons would create major uncertainties about North Korean ability to arm an ICBM in the next half decade with a weapon large enough to compensate for its problems with accuracy and reliability. It would mean Korea at best would have a terror weapon that would be an unreliable "city buster" suitable for only the largest area targets.

- ***Although extremely, a preliminary test of a boosted weapon or thermonuclear weapon.*** The only way North Korea could do this would be with major technical aid from scientists working on weapons programs in nations like Russia and China.

If North Korea could build a weapon with yields above 60-80 kilotons, however, it would begin to have the capability to deploy ICBMs with yields large enough to compensate for its accuracy problems. It also would indirectly demonstrate that it was far enough along to make far more weapons with a given amount of

weapons grade material. Any yield above 100 kilotons would be a warning that North Korea had a far more mature nuclear weapons program than any expert has yet warned.

One caution is that North Korea has never tested anything approaching a successful ICBM design. The much-publicized long-range missile it recently tested, and which failed shortly after launch, was a satellite booster aimed toward an equatorial orbit.

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