

North Korean Uranium Nuclear Test Would Raise Stakes

FOSTER KLUG, Associated Press

SEOUL, South Korea (AP) — As North Korea warns that it plans its third nuclear test since 2006, outside governments and analysts are trying to determine a crucial question: Just what will Pyongyang's scientists explode?

The last two tests are believed to have been of plutonium devices, but the next logical step for Pyongyang's ambitious nuclear program could be to conduct a highly enriched uranium explosion. That would be a major accomplishment for North Korea — and a worrying development that would raise already high stakes for the United States and its allies.

Here's why:

Easy to Hide

Nuclear bombs can be produced with highly enriched uranium or plutonium. North Korea is believed to have exploded plutonium devices in the two tests it has conducted so far, in 2006 and 2009.

Uranium bombs worry Washington and North Korea's neighbors because plants making highly enriched uranium are much easier to hide than plutonium facilities. The latter are larger and generate more heat than uranium enrichment plants, making them simpler for outsiders to monitor and for satellites to detect.

Uranium can be enriched for use in bombs by using centrifuges that can be operated almost anywhere: in small factories or even in tunnels and caves. They can be spread around the country out of sight of nuclear inspectors. And it would take a relatively small amount of highly enriched uranium to build a simple bomb similar to the one dropped on Hiroshima at the end of World War II.

"A uranium test would be a big deal because a centrifuge plant is much easier to conceal than a plutonium reactor, which is practically impossible to hide," said Daniel Pinkston, a Seoul-based expert on North Korea with the International Crisis Group think tank.

It is also simpler in some ways to build a nuclear bomb with highly enriched uranium than one with plutonium.

"While a plutonium bomb requires the assembly of a complicated weapons system to deal with pre-detonation issues, a HEU bomb is relatively easy to construct," Harvard physicist Hui Zhang wrote in an analysis for the Bulletin of the Atomic Scientists. "Moreover, unlike plutonium, HEU poses no significant health hazards

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Published on Chem.Info (<http://www.chem.info>)

during the construction phase because of its low level of radiation."

Scientist and nuclear expert Siegfried Hecker said plutonium is considered better for building small warheads, which North Korea is believed to be attempting to develop so it can threaten the U.S. with long-range nuclear-tipped missiles.

"Switching to HEU at this point actually increases the technical challenge" for North Korean scientists to build miniaturized nuclear warheads, James Acton, a physicist at the Carnegie Endowment for International Peace, said in an email.

It's not clear whether North Korea has made bomb-grade uranium. But Pyongyang confirmed long-held worries that it was enriching uranium in late 2010, when it showed foreign experts a facility at its well-known Yongbyon nuclear reactor site. Analysts strongly suspect Pyongyang has other uranium enrichment facilities, and it is feared that hidden plants could be producing large amounts of weapons-grade uranium.

Easy to Dig Up

North Korea says the program is for peaceful, energy-generating purposes. But while uranium enriched to low levels is used in power reactors, centrifuges can also be made to enrich uranium to the high levels needed for bombs.

North Korea apparently decided a few years ago to focus on highly enriched uranium rather than plutonium, Acton said. That's probably because its leaders realized that "with a given amount of investment, it could produce more bombs-worth of HEU than plutonium," he said.

North Korea has large deposits of uranium ore, and is far less able to acquire plutonium.

Hecker estimated that Pyongyang has only 24 to 42 kilograms of plutonium — enough for perhaps four to eight rudimentary bombs similar to the plutonium weapon used on Nagasaki in World War II. It does not appear to be making more; its plutonium reactor north of Pyongyang was shut down during disarmament negotiations.

"It's only logical that it would now test an HEU device, since that would be most helpful for designing its future arsenal," Acton said, though he didn't exclude the possibility of a plutonium test.

Acton, Hecker and other analysts have raised the possibility that North Korea may try to test both plutonium and uranium devices simultaneously.

An Open Secret

Even as Pyongyang negotiated with the world to scrap its plutonium efforts in the latest round of nuclear disarmament talks, which began in 2003 and were last held in late 2008, its scientists were apparently working on a secret uranium program.

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Outsiders have long raised suspicions of such a program.

James Kelly, a U.S. envoy during the George W. Bush administration, confronted North Korean officials with claims about uranium enrichment during a 2002 visit to Pyongyang, sparking a nuclear crisis that led to the creation of the now-stalled six-nation disarmament talks.

Former Pakistani President Pervez Musharraf has said North Korea worked with A.Q. Khan, creator of Pakistan's atomic bomb, to obtain the centrifuges needed for uranium enrichment before Khan's operation was disrupted in 2003. Musharraf wrote in his 2006 memoir that Khan transferred nearly two dozen centrifuges to North Korea.

In 2007, then-U.S. nuclear envoy Christopher Hill said Washington knew Pyongyang had bought equipment only used for uranium enrichment.

North Korea finally revealed at least some of its uranium enrichment equipment in November 2010 to visiting Americans. They saw what appeared to be a sophisticated, modern uranium enrichment facility with 2,000 centrifuges.

Pyongyang's long pursuit of uranium "is the clearest indication that North Korea intends to retain and enhance its nuclear weapons capabilities and has no intention to give up these capabilities," according to Jonathan Pollack, a North Korea analyst at the Brookings Institution think tank in Washington. "That is the fundamental fact that all outside powers must address."

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Source URL (retrieved on 03/05/2015 - 1:55am):

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