



PERSPECTIVES

THE BEGIN-SADAT CENTER FOR STRATEGIC STUDIES

Is It Zero Hour? Pyongyang's Nuclear Power Is Developing at a Dizzying Pace

Lt. Col. (ret.) Dr. Refael Ofek

BESA Center Perspectives Paper No. 580, September 6, 2017

EXECUTIVE SUMMARY: Tensions between the US and North Korea, which greatly increased following North Korea's two ICBM launches on July 4 and July 28, are now near the boiling point. North Korea's sixth nuclear test, which it conducted on September 3, seemed to indicate that it has reached an advanced capability to develop nuclear weapons. Despite Kim's provocations and concern that Pyongyang's military power will reach a point of no return, one cannot confidently predict that President Trump will risk a ground offensive. Nor, however, does it appear that the war of words is having any effect on Kim. Trump may have to order an operation to destroy North Korean strategic targets from the air.

It appeared several months ago that Pyongyang was going to conduct a sixth nuclear test, and that moment arrived on September 3. According to the US Geological Survey, the explosion caused an earthquake at a seismic level of 6.3 in the area of Punggye-ri, North Korea's nuclear test site. Another earthquake at a magnitude of 4.6 was detected in China, apparently resulting from an underground collapse of rocks set off by the test. The detonation yield of this latest test is estimated at 100 kilotons or more. According to North Korea's KCNA news service, "The hydrogen bomb test was a perfect success" and "marked a very significant occasion in attaining the final goal of completing the state nuclear force."

That was not all. Several hours before the nuclear test, KCNA announced that North Korea had succeeded in developing a thermonuclear bomb with "great destructive power" that can be loaded onto an intercontinental ballistic missile (ICBM). KCNA said the bomb's explosive power was adjustable from tens to

hundreds of kilotons, and that it can be detonated at high altitudes for a super-powerful electromagnetic pulse (EMP) attack.

North Korean leader Kim Jong-un, who visited his country's nuclear weapons institute accompanied by nuclear scientists, was photographed as he "watched an H-bomb get loaded into a new ICBM." The photos released by KCNA showed him inspecting a peanut-shaped, silver-covered bomb; on the adjacent wall hung a concept diagram showing a cross-section of a ballistic missile's warhead with the peanut-shaped bomb fitted inside. Kim was quoted as saying the hydrogen bomb was entirely "homemade," adding that North Korea can produce powerful nuclear weapons – "as many as it wants."

Although several seismologists said the detonation yield in the latest test was above 100 kilotons, caution is in order. North Korea is using its media to aggrandize its nuclear capability. The message is directed both at the world, with the aim of deterring the US; and at the domestic audience, as a plank of Kim Jong-un's personality cult.

North Korea's fourth nuclear test, conducted on January 6, 2016, was also claimed to be thermonuclear. Western scientists were skeptical, however, because of the relatively low detonation yield, which was about that of a regular nuclear bomb.

On March 9, 2016, the North Korean media released a series of photos showing Kim Jong-un observing a silver spherical device they claimed was a miniaturized nuclear implosion device. The relative proportions of the sphere and the people standing beside it give the impression that its diameter was about 60 cm, which may accord with the dimensions of American nuclear bombs from the 1950s and 1960s. Some Western experts assert that the spherical device was only a mockup. After its fifth test on September 9, 2016, Pyongyang claimed it had already activated a miniaturized nuclear implosion device.

David Albright, president of the Washington-based Institute for Science and International Security (ISIS), has suggested that the peanut-shaped device shown in the photos released by KCNA on September 3 might also have been a mockup. He also doubts Pyongyang's claim that the nuclear explosive device tested on that day was in fact a miniaturized device that can be fitted onto an ICBM's warhead.

The detonation yield in tests of thermonuclear implosion devices comes to about a megaton, several times greater than the latest test's reported yield of about 100 kilotons or more. Therefore, the test could not possibly have been thermonuclear.

Prof. Siegfried Hecker, one of the former heads of the American nuclear program, has specialized for two decades in North Korea's nuclear capability and has visited the country several times. Addressing the issue at a conference in Seoul on June 27 of this year, he said North Korea's capability to produce tritium, the hydrogen isotope used in a thermonuclear explosion, indicates that Pyongyang is trying to develop an hydrogen bomb – but added that it would need considerable time to achieve it.

An updated report by ISIS says a facility to produce lithium-6, an explosive material used in thermonuclear weapons or for the production of tritium, has apparently been built near the city of Hungnam on North Korea's eastern coast. That assessment is based on efforts made by Pyongyang in 2012 to procure equipment and materials, efforts that were exposed via intercepted communications with foreign suppliers. (Lithium-6 is a stable isotope that exists in nature with a content of 7.5% lithium metal. Its separation from lithium-7, the most abundant lithium isotope, is performed via a chemical enrichment process.)

The result reportedly achieved in the latest test was much higher than that of a nuclear test at the magnitude of Hiroshima and Nagasaki. It thus appears that the test was conducted with a nuclear implosion device boosted with thermonuclear material. According to American experts, the boosting process makes it possible to reduce the quantity of chemical explosive enveloping the fissile material core in a nuclear implosion device. As it is that chemical explosive that compresses the core to create a chain reaction, this process enables the miniaturization of a nuclear implosion device.

Tensions between Pyongyang and Washington have greatly increased over the past two months and are now near the boiling point. Pyongyang's tests of the Hwasong-14 ICBMs on July 4 and July 28 stunned the world. At the US's initiative, the UN Security Council voted unanimously on August 5 to impose sanctions on North Korea. From that point on, something like a ping-pong game has ensued.

Pyongyang spurned the Security Council's resolution, claiming it was illegal. North Korean Foreign Minister Ri Yong-ho added that the issue of North Korea's nuclear weapons and ballistic missiles is not subject to negotiations under any circumstances. He also noted that the entire US mainland is within range of his country's missiles.

It appears that the last straw for Trump was an August 8 article by *The Washington Post* claiming that according to a classified American intelligence report, North Korea now has the capability to develop a miniaturized nuclear

bomb that can be fitted onto a ballistic missile warhead. Should it do this, North Korea would cross the threshold to becoming a nuclear power.

Trump's immediate reaction, issued the same day, was to promise North Korea "fire and fury" if its nuclear threats against the US do not stop. But the war of words continued. Pyongyang responded that it was seriously considering a plan to simultaneously fire four intermediate-range Hwasong-12 ballistic missiles at the US bases in Guam in the Pacific Ocean, 3,400 kilometers from North Korea. Trump replied that apparently his "fire and fury" threat was "not tough enough."

Although the rhetoric briefly subsided and Kim Jong-un's threat to attack Guam was lifted, the situation quickly escalated once again. Using the annual joint US-South Korea military exercise that started on August 21 as an excuse, North Korea provoked the US on August 26 by firing three short-range missiles into the sea. Three days later, it launched a Hwasong-12 that passed directly over Japan and crashed above the sea in the midst of the joint military drill.

As a show of force and a response to North Korea's provocations, the US and South Korea wrapped up the exercise with an aerial demonstration of two B-1B supersonic bombers and four F-35 stealth fighter jets of the US Air Force, joined by four South Korean F-15 fighters, which practiced the destruction of enemy targets over South Korean territory.

The questions now are whether zero hour has really arrived and what Trump intends to do about it. Though the US initiated the Security Council's imposition of economic sanctions on North Korea in early August, it does not appear that Kim Jong-un was much impressed, and it will take considerable time in any case for the sanctions to become effective.

Trump does not seem likely to risk a "boots on the ground" offensive against Pyongyang after the US's bloody campaigns in Afghanistan and Iraq – but the war of words alone does not seem to be leaving a mark on Kim. If he continues to provoke, Trump may have to order an operation to destroy North Korean strategic targets from the air to prevent Pyongyang's nuclear power from reaching a point of no return.

Lt. Col. (ret.) Dr. Refael Ofek is an expert in the field of nuclear physics and technology, who served as a senior analyst in the Israeli intelligence community.