

## **Developments in the North Korean Asymmetric Threat: Missiles and Electronic Warfare<sup>1</sup>**

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### Abstract

This article will address how North Korea welcomed the Kim Chong-un era in 2012 with new developments in its military systems. Pyongyang conducted a largely unsuccessful test of the Taepo Dong 2 missile in 2012, and showed that it continues to plan for and develop its long-range ballistic missile systems - though many problems remain. North Korea also publicly displayed what may (or may not) be a new long-range missile, capable of being launched from a mobile transporter-erector-launcher – which, if successful, will potentially raise the level of the missile threat that North Korea poses to the United States. Pyongyang also conducted electronic warfare attacks against GPS systems for both aircraft and maritime craft in South Korea during April and May of 2012. These new developments and ongoing provocative behavior prove that the new regime intends to carry on the policies of Kim Chong-il. Thus deterrence and readiness will remain an important aspect of the ROK-US alliance for the foreseeable future.

Keywords: North Korean Long-Range Missile, Taepo Dong, Cyber Warfare, Electronic Warfare, North Korean Military Capabilities.

The Kim Chong-il era has ended in North Korea. It was an era dominated by violent military provocations and nuclear brinkmanship - and not the collapse of the regime (as many predicted). It was also an era of uncertainty and some would say turmoil, during the last years of Kim Chong-il's life. If there is anything that the first months of the Kim Chong-un era have taught us, it is that continuity appears to be the order of the day - at least for now (2012). The anti-ROK rhetoric has continued, as has the brinkmanship and the repositioning of those absolutely loyal to the Kim family to key positions within institutions in the government and the party.

During the early months of 2012, following Kim Chong-il's death, one was able to see an adjustment of the system that had probably been planned for - well in advance - by the "Dear Leader." It will be the purpose of this article to examine two key aspects of North Korea's continuing military development in the first months of the Kim Chong-un regime - long-range ballistic missiles and cyber/electronic warfare. By looking at these continuing developments, one will be able to make an early assessment regarding how the North Korean military will carry on under Kim Chong-un - and the implications this holds for the ROK-US alliance. I will first address the North Korean Taepo Dong 2 test-launch of 2012, as well as the context surrounding the event, and what it bodes for North Korea's future missile development (and the region). Next I will address the relatively new developments that have occurred in North Korea's cyber and electronic warfare capabilities. Events in the first six months of 2012 show that North Korea is intent on developing these capabilities in a way that can threaten South Korea and others. Finally, I will offer some concluding thoughts about what we can expect from Pyongyang and its military developments as we look to 2013.

### **The North Korean Taepo Dong 2 Test of 2012**

North Korea has proven it has a ballistic missile capability that can threaten all of South Korea and Japan. This proven threat against South Korea has been shown through several tests of SCUD missiles with ranges of 350 to 850 kilometers.<sup>3</sup> Pyongyang has also tested the No Dong missile series (the key missile that would threaten Japan) several times, and it is believed to have a range of 1300-1500 kilometers.<sup>4</sup> When it comes to the long-range ballistic missiles that have an "intercontinental" capability however, the North Koreans have been less successful. Tests of the Taepo Dong missiles conducted in 1998, 2006, and 2009, all proved to be less than successful.<sup>5</sup> These provocative tests showed that North Korea had the intention of developing a capability to hit the United States. With Kim Chong-il's death in December of 2011, some analysts thought there might be a "resting period" as his son consolidated power, a period in which there would not be acts of brinkmanship or provocations.<sup>6</sup> Yet, soon after the "young general" assumed many of the titles (or similar titles) that his father had held, the strategy of "pushing the edge of the envelope" continued - with a missile test that caused angst all over the Pacific.

North Korea chose to conduct yet another missile test-launch in the spring of 2012. The North Koreans formally announced that they would conduct a "satellite launch" on March 16, 2012. They called the launch platform the "Unha-3," when in reality it was the three-stage, long-range ballistic missile platform commonly known as the "Taepo Dong 2"). The launch was announced by Pyongyang's state-sponsored propaganda outlet, KCNA. Pyongyang informed the International Civil Aviation Administration and the International Maritime Organization that the first stage of the rocket would land in the water approximately 140 kilometers west of the Byeonsan Peninsula in South Korea, and the second stage would land approximately 190 kilometers east of the Philippines. The launch was from the new North Korean facility (not used to this point) at Tongchang-ni.<sup>7</sup> The North Koreans formally indicated that the launch would occur sometime during a five-day period from April 12 to 16, 2012, between seven in the morning until noon.<sup>8</sup>

The site at Tongchang-ni (near the west coast) is interesting because it is an upgrade from the facilities that North Korea has used for long-range missile launches in the past (at Musudan on the east coast). The facilities at Tongchang-ni have some similarities to the Iranian launch facility at Shahid Hemrat, east of Tehran. Reportedly, the static rocket motor test stand at Tongchang-ni looks much like the one located in Iran - indicating probable collaboration on launch facilities between the Iranians and the North Koreans. (The North Koreans had been building the site at Tongchang-ni for at least 10 years, and may have aided the Iranians in some of their construction as well.) Missiles launched from the site at Tongchang-ni also can achieve a higher altitude before passing maritime ballistic missile defense platforms (like the American Aegis equipped ships), thus increasing survivability in a potential conflict. There are other advantages as well to the new site - such as an underground pipeline equipped with a fuel tank next to the launch pad that can hide fueling operations from potential satellite coverage.<sup>9</sup>

On March 19, 2012, it was revealed that South Korean and American officials planned to search for debris from the first stage after it fell into the waters west of South Korea, though these waters are known to be quite muddy and difficult ones in which to conduct debris searches.<sup>10</sup> South Korean and U.S. officials also reportedly believed that the North Koreans had been planning the launch since 2011. North Korean officials told U.S. administration officials during bilateral talks held days before Kim Chong-il's death, that Pyongyang intended to launch a

satellite in commemoration of Kim Il-sung's 100th birthday. During the bilateral talks, U.S. Special Envoy Glyn Davies warned Kim Kye-gwan, the North Korean first vice foreign minister, that such a launch (which the U.S. and South Korea consider a missile test in reality) would violate bilateral agreements. Following this exchange, the North Koreans reached an agreement with the U.S. that involved U.S. food aid going to North Korea in exchange for a moratorium on missile launches and an opening of nuclear facilities for inspection (among other things). Despite this, several days after an agreement was reached and announced on February 29, 2012, the North Koreans announced the upcoming launch of a satellite, thus breaking the agreement and creating puzzlement in diplomatic circles on both sides of the Pacific.<sup>11</sup>

On March 21, 2012, aircraft flying between the Philippines and Japan were cautioned about the upcoming North Korean Taepo Dong 2 launch (called Unha-3 by the North Koreans). Routes going from the eastern coast of Mindanao in the Philippines to the Kyushu island chain and routes going north of Manila were affected. Seoul also announced that aircraft flights would be affected, specifically airline flights leaving Cheju Island bound for Beijing.<sup>12</sup> Of note, North Korea announced that the purpose of the upcoming missile launch (in reality a test of the Taepo Dong 2) was to launch a satellite called "Kwangmyongsong-3" into orbit. It also announced that the "satellite" would broadcast remote data in the UHF band and video in the X-band, according to the International Telecommunications Union.<sup>13</sup> In an apparent response to North Korea's intentions, South Korea announced efforts to deter Pyongyang's launch of the Taepo Dong 2. Government officials stated they would refer the effort to the UN Security Council if the launch went forward.<sup>14</sup> Japan also took action very quickly. The Japanese government made an announcement that they would mobilize both PAC-3 ballistic missile defense forces and deploy three Aegis equipped ships in reaction to the launch (falling debris from the missile was the key concern). If the launch were to go as planned, it would fly over Okinawa Prefecture.<sup>15</sup>

By March 26, 2012, North Korea had moved the missile by special train from the factory to the launch site at Tongchang-ni. According to a statement by Col. Lee Bung-woo of the South Korean JCS Office, "North Korea has transported the body of its long-range missile to Dongchang-ri and is making preparations inside a building for the blastoff."<sup>16</sup> The reactions of the international community were by this time starting to mount. A senior American official reportedly stated that

debris from the rocket could cause casualties, raising concerns for both the South Koreans and the Japanese.<sup>17</sup> By March 29, the North Koreans had reportedly begun several key preparations. According to "38 North," a web site run by the US-Korea Center at the Johns Hopkins University School of Advanced International Studies (the report is based on imagery from Digital Globe Inc.), "The mobile launch pad is seen sitting on tracks next to the gantry tower. All the work platforms have been folded back and the crane on top is at a 45 degree angle relative to the pad, indicating that equipment is being loaded onto the gantry. On the pad and at the base of the gantry, are numerous small objects and several people. There is also a plate under the mobile launch stand to cover the entrance into the flame trench that is still in place and will be removed prior to launch. A crew appears to be cutting brush away from the concrete in the brown dirt area that extends from in front of the pad up the right side." The report further stated, in part, "At the two largest propellant storage buildings to the right of the launch pad, containing large tanks to supply the Unha-3's first stage, trucks can be seen delivering fuel and oxidizer to small tanks."<sup>18</sup>

By March 30, the North Koreans had begun assembly work on the first and second stage rocket for the long-range missile, according to South Korean officials. North Korea announced that the "Kwangmyongsong-3" satellite to be mounted on the top of the three-stage missile would weigh 100 kilograms. In an unprecedented move, the North Koreans also announced that they would invite international observers to the launch. Both South Korea and the U.S. declined this invitation.<sup>19</sup> Also on March 30, the Obama administration announced that it had dropped plans to provide 240,000 metric tons of food aid to North Korea because of Pyongyang's plans to conduct a long-range missile launch, a direct violation of the February 29 agreement. President Obama stated that the launch could also lead to further economic sanctions against North Korea.<sup>20</sup> In a likely reaction to North Korean refusal to halt launch preparations, the U.S. dispatched a sea-based X-Band radar to track North Korean operations.<sup>21</sup> The first of three Japanese Aegis-equipped destroyers left port on March 31, and PAC-3 ballistic missile systems left their home bases bound for deployment in lieu of the North Korean missile launch on the same day.<sup>22</sup>

By April 1, a mobile radar trailer with a dish antenna (likely radar tracking equipment) was detected at the Tongchang-ni site. The radar tracking equipment was identified by using analysis from imagery on

March 28. The mobile trailer and its accompanying equipment was likely brought to the site in order to recover important telemetry data from the missile's engines and guidance system, and to ensure that it remained on the correct trajectory.<sup>23</sup> The technology North Korea has thus far used in attempting to perfect a three-stage missile appears to be rather primitive when compared to other nation-states who have already launched a similar platform. While there is some disagreement regarding the actual make-up of the missile, many analysts agree that the first stage (the bottom) appears to be a "cluster" of No Dong engines. This stage needs the most power as the missile is launched. The second stage appears to be made up of a Musudan missile (or key parts and the engine of a Musudan missile, which is the North Korean version of the old Soviet SSN-6). The third stage is unknown, though some analysts have said that it seems similar to the top stage of the Iranian Safir-2 platform, which was likely designed by the Iranians with a great deal of help from the North Koreans. The Taepo Dong 2 launched in 2012 was approximately 32 meters long, though some analysts have assessed it to be slightly longer or slightly shorter.<sup>24</sup>

By April 2, the Pentagon had activated its global missile defense shield in reaction to North Korea's imminent long-range missile launch. According to national security reporter Bill Gertz, "The measures include stepped-up electronic monitoring, deployment of missile interceptor ships, and activation of radar networks to areas near the Korean peninsula and western Pacific." Mr. Gertz also reported that, "Current U.S. missile defense systems include networks of radar and space tracking gear, including ground- and sea-based radar, Aegis ships, and long-range interceptor missiles based in Alaska and California. A total of 30 three-stage interceptors are deployed." He also commented in part, that, according to US officials, "the initial phases of the U.S. missile defense activation include stepped-up intelligence gathering by spy satellites and RC-135 Cobra Ball aircraft based at Kadena Air Base in Okinawa, Japan."<sup>25</sup> By April 4, the South Korean government had also confirmed that it intended to send at least two Aegis-equipped ships to the waters near the west coast and the south coast of the Korean Peninsula. By this time, South Korea, the United States, and Japan, had all dispatched Aegis-equipped ships to waters where they could track the missile, or possibly shoot it down, if necessary.<sup>26</sup>

On April 8, South Korean press sources confirmed that media from around the world had arrived in Pyongyang. North Korea's official

propaganda agency (KCNA) stated that more than 20 media outlets had arrived in the isolated country, including the AP, CNN, Reuters, AFP, BBC, Kyodo News, and NHK.<sup>27</sup> On the same day, North Korea had moved all three stages of the missile into position on the launch pad, in full view of foreign news agencies.<sup>28</sup> Meanwhile, North Korea's announced plans for an imminent missile launch prompted several Asian airlines to adjust their routes further during the time the launch was scheduled. Philippine Airlines announced that about a dozen of its flights would fly routes away from the missile's flight path, as did two South Korean airlines. Japan Airlines and All Nippon Airways announced that they would alter flight paths on routes between Tokyo and Manila, and Singapore and Indonesia.<sup>29</sup> On April 10, Ryu Kum-chol, the deputy director of North Korea's space development department, announced that they were ready to complete the assembly of the missile by adding the satellite payload. He also announced that debris from the missile in its flight path posed "no danger to countries in the region."<sup>30</sup> On April 11, North Korean engineers were observed pumping fuel into the missile, which was mostly covered with a green tarp.<sup>31</sup>

According to press reports, days before North Korea actually conducted the test-launch of the Taepo Dong 2, a secret U.S. delegation made a one-day trip to Pyongyang. The trip was apparently undertaken to convince the North Koreans to cancel the test-launch of the long-range missile. When reporters asked about the last minute, secret trip, Glyn Davies, the American special envoy for North Korea policy, stated, "I don't have anything for you on that. I understand your need to ask those questions, but I can't help you."<sup>32</sup> According to a diplomatic source quoted in the press, Sydney Seiler, a member of the White House National Security Council staff, and Joseph DeTrani, the director of the National Counter-Proliferation Center, departed from Guam on April 7, aboard a U.S. Air Force 737, that carried them to Pyongyang.<sup>33</sup> If the purpose of the trip was to convince North Korea not to launch the missile, it was unsuccessful.

On April 13, the North Koreans conducted their fourth test of a long-range ballistic missile. The Taepo Dong 2 (called "Unha-3 by the North Koreans) was launched at 7:39 a.m., Korea time. The missile launch did not go well. The platform apparently exploded approximately two minutes after launch, and the missile broke into about 20 pieces, all of which fell into the ocean roughly about 165 kilometers southwest of Seoul. The cause of the failure may have been a fuel leakage or a flawed

engine in the first stage rocket. Some analysts believe the North Koreans may have intentionally aborted the flight because of a problem with the staging system. Other possibilities also exist. The missile launch may have failed because the first stage propellant failed to separate from the rest of the system. Most analysts agree that the failure was possibly a result of a flaw in the first stage of the missile. By April 17, South Korean ships searching for debris from the missile off the west coast of the Korean Peninsula were ready to shut down operations - with no debris reportedly found. Lt. Gen. Patrick J. O'Reilly, commanding Washington's ballistic missile defense program, remarked later that he saw little progress in North Korea's program. Meanwhile, another (apparently duplicate) missile remained near Tongchang-ni at an assembly plant.<sup>34</sup>

Immediately following North Korea's failed launch of the Taepo Dong 2, the UN Security Council condemned the action. According to U.S. Ambassador to the UN Susan Rice, "Members of the Security Council deplored this launch which is in violation of Security Council resolutions 1718 and 1874. Members of the Security Council agreed to continue consultations on an appropriate response in accordance with its responsibilities given the urgency of the matter."<sup>35</sup> The United States also immediately announced that it was nullifying its previous deal with North Korea to provide food aid in return for a moratorium on ballistic missile launches (in addition to other actions previously agreed to).<sup>36</sup> In response to the UN Security Council's condemnation, the North Korean foreign ministry defiantly issued a statement that said in part, "Firstly, we resolutely and totally reject the unreasonable behavior of the UNSC to violate the DPRK's legitimate right to launch satellites. . ." The North Korean statement also tersely dismissed the actions taken by the U.S., saying in part, "We have thus become able to take necessary retaliatory measures, free from the agreement. The U.S. will be held wholly accountable for all the ensuing consequences."<sup>37</sup>

According to Japanese press sources, the U.S. sought to gain more sanctions against Pyongyang as a result of the launch, and submitted a list to the UNSC of at least 17 North Korean entities (seeking asset freezes - though the list reportedly grew to 40 entities).<sup>38</sup> On May 3, the UNSC imposed sanctions on three North Korean state owned companies, Green Pine Conglomerate, Korea Heungjin Trading Company, and Amroggang Development Banking Corporation, a drastically shortened list at the insistence of China.<sup>39</sup> In my view, the sanctions, though much



less than Washington would have preferred, were an important international action, and added to sanctions the United States had imposed during 2010.

The results of North Korea's "satellite launch" on April 13, are important and should be addressed. First of all, it was not simply a "satellite launch" as claimed by the North Koreans. The technology for a three-stage ballistic missile or a platform for a satellite are exactly the same, only the payload is different (satellite or warhead).<sup>40</sup> Thus the threatening and provocative nature of the event, and the negative international reaction, are understandable. Another important aspect of the launch was that it was the first to occur from the facility at Tongchang-ni, though this improved facility does not yet apparently give the North Koreans the ability to conduct a covert long-range missile launch, a key for warning U.S. ballistic missile defense systems. Other aspects of this launch, when compared to 1998, 2006, and 2009, is that North Korea invited the international press to attend the event, and openly admitted (publicly) that the launch was unsuccessful.

The political aspects and the context surrounding the launch are important as well. This launch showed that Kim Chong-il's policies, as planned before his death, were continued under his son, and the test-launch is one of the very first examples that this would happen. According to former acting assistant secretary of state Evans Revere, the North Koreans informed him during July of 2011: "We have the sovereign right to launch a satellite and we will never give up that right no matter what."<sup>41</sup> This statement would seem to indicate that Pyongyang had begun plans to conduct a long-range missile launch at least as early as mid-year, 2011. There were other political aspects of this episode, dealing with the transition of power from father to son and the same policy being carried forward. As I said in a press piece March 26, 2012, ". . . there may still be some confusion within the 'new' government in North Korea with Kim Jong-un as its leader. Reportedly, during bilateral talks just days before Kim Jong-il's death, U.S. officials, when notified of plans for a test-launch, told the North Koreans that a ballistic missile launch (no matter what the "purpose") would violate U.N. Security Council Resolution 1874 and breach agreements. And yet the North Koreans went ahead with a new deal for inspections and a moratorium on ballistic missile testing — and then announced the "satellite test launch" soon thereafter (showing either obvious confusion in the decision-making process or a sudden decision reversal). Perhaps

the North Korean succession process is not proceeding as "smoothly" as many have assumed."<sup>42</sup> It seems reasonable to assume that while the launch would have occurred if Kim Chong-il were still alive (since it was a carry-over of his policy), the diplomatic confusion that ensued under his son's regime would not have occurred under the elder Kim.

The last - and perhaps most compelling - aspect of the test-launch conducted in April, 2012, is related to proliferation. According to press sources, a twelve-member Iranian delegation was sent to North Korea to observe the launch. The Iranians were engineers from the Shahid Hemat Industrial Group (SHIG) and arrived in North Korea to watch all the launch and pre-launch activities. The engineers reportedly were to exchange information regarding the high thrust engines and separation technology for a three-stage missile. In keeping with past exchanges between Iran and North Korea, Tehran is said to have helped to fund the launch in exchange for valuable data that could be used for their own programs. SHIG is in charge of Iran's Shahab-3 program (among others), which is Iran's version of the North Korean-built No Dong. It has long been sanctioned by the United States.<sup>43</sup> A future successful launch of the Taepo Dong missile system will mean hundreds of millions of dollars (or more) in sales for North Korea from Iran. But even before that happens, the sale of development technology between Pyongyang and Tehran continues to be mutually beneficial for both nations.

North Korea's missile programs have all been successful - and have been widely deployed and proliferated, with the exception of their long-range missile program (the Taepo Dong series). North Korea is apparently developing yet another long-range missile, this one perhaps capable of being deployed and launched from a mobile transporter-erector-launcher (TEL). In December of 2011, national security reporter Bill Gertz broke the story that North Korea was developing a new ICBM, this one perhaps a variant of the already developed, deployed, tested, and proliferated Musudan missile (which has a range of 4,000 kilometers). Then-Secretary of Defense Bill Gates may have first spoken of this when he said in a speech in June of 2011 in Singapore, "With the continued development of long-range missiles and potentially a road-mobile intercontinental ballistic missile and their continuing development of nuclear weapons ... North Korea is in the process of becoming a direct threat to the United States."<sup>44</sup>

The missile described above was apparently the model put on display in a parade in Pyongyang in April, 2012. While many analysts said that the missile appeared to be a "mock-up," North Korea has never displayed missiles in parades that were not either in development or already deployed. The missile is rumored to have boosters that would give it a maximum range of 6,200 miles - which means it could hit the continental United States - and appears to be longer than the Musudan missile that it may have originally been modeled on. But arguments remain about whether the missile displayed was, in actuality, a medium range ballistic missile (MRBM) like the Musudan, or, in fact, an ICBM. Of interest, the TEL that the missile was displayed on appeared to be of Chinese design, which would put Beijing in violation of UNSC-imposed sanctions. The 16-wheel TEL appears to have been of a design consistent with the one produced by the 9th Academy of China Aerospace Science and Industry Corporation. A Chinese firm (suspected to be Hubei Sanjiang) may have sold the designs or the chassis for the vehicle to the North Koreans, "not realizing" it was a dual-use technology. The Chinese government denied allegations that it had violated UN sanctions. According to press reports, a Chinese firm sold eight of the vehicles to North Korea. The vehicles are equipped with U.S.-manufactured diesel engines and have German-made transmissions. American officials have reportedly voiced their concerns to Chinese officials about the unconfirmed proliferation.<sup>45</sup> In Congressional testimony, Defense Secretary Leon Panetta commented on Chinese assistance to North Korea's missile program, stating in part, "I'm sure there's been some help coming from China. I don't know, you know, the exact extent of that," further commenting, "But clearly there's been assistance along those lines," and declining to give more details because of "the sensitivity of that information."

### **Answering the North Korean Missile Threat: What Moves Should Seoul Make?**

The unsuccessful long-range missile test, and the display of what may (or may not) be an ICBM that can be launched from a TEL caused a great deal of public discussion regarding South Korea's ability to protect itself from a ballistic missile attack. But there had already been important developments in the works before these North Korean actions occurred. The United States and South Korea signed an agreement to engage in bi-lateral cooperation of Seoul's developing Ballistic Missile Defense system (BMD) in 2011. But, despite this, and perhaps for very

sensitive political reasons, South Korea continues to oppose joining the U.S. - led global missile defense system, as other nations have done. Many of the systems and updates that the South Koreans plan to initiate are also inferior in both technology and numbers to their Japanese neighbor. Japan has already initiated plans for advanced Patriot BMD systems near key bases and population centers all over the country. In addition, Japan will be equipping all six of its Aegis-equipped destroyers with more advanced SM-3 missile interceptor systems. The two BMD systems are designed to go after incoming missiles at different levels and altitudes (PAC-3 and SM-3). Of utmost importance, Japan has also joined in the U.S. - led global missile defense system.<sup>46</sup> South Korean policy makers would be wise to consider the Japanese example, because North Korea presents far more of a missile threat to South Korea than to Japan. As already discussed, North Korea can literally threaten every inch of the South Korean landmass with its ballistic missiles.

An alternative to an upgraded indigenous BMD - or to joining the U.S.-led BMD system currently in place - is for South Korea to increase the range of missiles that can strike targets deep in North Korea. Doing this, South Korea would be able to ensure it struck targets deep in North Korea if Pyongyang attacked using SCUDs and other missiles. In fact, this is a plan that has been put forward by the government in Seoul and embraced by some think tanks in South Korea. Government officials and others in South Korea have stated that a range of 800 kilometers is needed for South Korean missiles to meet the North Korean threat. Currently, under an agreement signed in 1979 and revised in 2001 with the United States, South Korea is limited to a range of 300 kilometers for its ballistic missiles.<sup>47</sup> Unfortunately, this plan will still not protect South Korea's military bases and population centers from a North Korean ballistic missile attack, though there have been reports that the United States and South Korea may be close to resolving this problem.<sup>48</sup> In fact, even if this plan is adopted - and South Korea does not acquire its own advanced BMD systems capable of shooting down DPRK missiles or join the U.S.-led BMD system, the potential for hundreds of thousands of casualties in Seoul and other major cities will continue to exist. Currently the only advanced PAC-3 systems on the Korean Peninsula protect U.S. bases.<sup>49</sup> The best answer to the North Korean ballistic missile threat for South Korea is to acquire advanced PAC-3 BMD systems to protect its bases and cities, and SM-3 BMD systems for its Aegis-equipped ships.

## **North Korean Advances in Cyber and Electronic Warfare**

While not commonly thought of as an "asymmetric capability," cyber warfare is something that the North Koreans have now apparently adopted. In 2011, the North Koreans were behind massive cyber attacks that targeted dozens of South Korean government agencies and military entities. The attacks were so effective that the South Korean government was actually compelled to chart out a national cyber security strategy. The effort will reportedly be led by South Korea's most prominent intelligence organization, the National Intelligence Service.<sup>50</sup> According to press reports, the South Korean Ministry of National Defense is also considering doubling the number of personnel in its Cyber Command, to 1,000 people and putting the command under a two-star general.<sup>51</sup> North Korea has also been pinpointed as being responsible for the jamming of GPS systems, both military and civilian, in South Korea in 2011 (North Korea has also reportedly offered its GPS jammer system up for sale to nations in the Middle East.)<sup>52</sup>

During 2012, North Korea once again stepped up its GPS jamming operations against targets in South Korea. Beginning as early as April 30, Pyongyang began jamming GPS systems in operations that were reportedly conducted from near the border. By May 3, the jammers had interfered with at least 250 civilian aircraft flights. The North Koreans reportedly purchased the GPS jamming equipment from the Russians, and the systems are said to be effective to a range of 150 miles.<sup>53</sup> By May 4, North Korean GPS jamming systems had also interfered with the navigation systems of at least 120 ships, including South Korean coast guard craft, fishing boats, and passenger vessels. Unclassified order of battle indicates North Korea has an electronic warfare (EW) regiment in Pyongyang and several battalions with the same mission near the DMZ. North Korea may have as many as 5,000 personnel engaged in EW operations. According to Lee Sang-wook of South Korea's Electronics and Telecommunications Research Institute, the interference caused by North Korea during the spring of 2012 was more advanced and large scale than the 2011 operations.<sup>54</sup> By May 10, at least 687 aircraft had been affected by the GPS jamming systems, including aircraft from several foreign countries transiting into South Korea. Typically, civilian aircraft simply switched to alternate navigation systems when the jamming occurred. Civilian aircraft were likely targeted because they used equipment that was easily targeted. Military navigation systems are

far more difficult to jam, though the disruption of civilian aircraft and ships can have a profound impact on both commerce, and, in wartime, support to military operations.<sup>55</sup>

North Korea apparently ceased its GPS jamming operations against the South around May 14. While the jamming operations did not affect military operations and no casualties or damage was reported, it did have an impact on both civilian flight patterns in and around Seoul, and, to a greater extent, on maritime civilian craft. This was particularly true for craft operating near the west coast, which are more reliant on GPS systems for navigation. South Korea at the time was essentially unable to do anything to stop the electronic warfare attacks on GPS navigational systems operating in its territory except to file an official protest with the International Civil Aviation Organization.<sup>56</sup> Operations in 2012 prove that military cyber and EW operations are likely to continue under Kim Chong-un just as they did under his father. North Korea's electronic warfare and cyber warfare capabilities have the potential to present a significant threat during a conflict with South Korea. As ROK Navy Captain Duk-ki Kim states when describing a likely scenario of attack during a large-scale North-South conflict, "It is expected that the North Korean regime will first conduct a simultaneous and multifarious cyber offensive on the Republic of Korea's society and basic infrastructure, government agencies, and major military command centers while at the same time suppressing the ROK government and its domestic allies and supporters with nuclear weapons. If the North succeeds in developing and deploying its EMP weapons, it will be able to paralyze electronic functions as well."<sup>57</sup>

## **Conclusions**

Events that occurred in the first six months of 2012 show that the Kim family dynasty will continue with the same scope and focus that dominated the Kim Chong-il regime. Just months after his death, Kim's son oversaw a nation that again chose to conduct the provocative test of a long-range ballistic missile. Soon thereafter, the North Korean military paraded yet another missile in an event in Pyongyang that showed Pyongyang continues to push for advances in its long-range missile systems. Indeed, the active attacks on South Korean GPS systems in April and May of 2012 prove that Pyongyang will not hesitate to engage in provocations designed to weaken its neighbor to the South, and create problems that will potentially affect both international commerce and

military operations. As Kim Chong-un and those who surround him work to consolidate the power and prestige of the new government, these events indicate that the goals of the North Korean regime continue to maintain an atmosphere of hostility and fear on the Korean Peninsula. Those who plan for the national defense of the ROK-US alliance would be well advised to keep this in mind.

## Notes:

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<sup>1</sup> This article contains information that will be published in the author's new book, whose working title is: "The Last Days of Kim Chong-il: The North Korean Threat in a Changing Era." It is scheduled for publication in April of 2013.

<sup>2</sup> The views expressed in this paper are those of the author and do not necessarily reflect the official policy or position of Angelo State University.

<sup>3</sup> See: Joseph S. Bermudez Jr., "A History of Ballistic Missile Development in the DPRK: CNS Occasional Paper #2," *Center for Non-Proliferation Studies, The Monterey Institute*, 1999, URL: <http://cns.miis.edu/pubs/opapers/op2/index.htm>. "Syria Improves Its SCUD D Missile With Help From North Korea," *Geostrategy-Direct*, February 22, 2006, URL: <http://www.geostrategy-direct.com/geostrategy%2Ddirect/>. Kim Min-seok and Brian Lee, "Pyongyang Reportedly Tests New Scud," *Joongang Ilbo*, July 19, 2006, URL: <http://joongangdaily.joins.com/200607/18/200607182138351479900090309031.html>.

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<sup>57</sup> Captain Duk-Ki Kim, Republic of Korea Navy, "The Republic of Korea's Counter Asymmetric Strategy: Lesson from ROKS Cheonan and Yeonpyeong Island," *Naval War College Review*, Vol. 65, No. 1 (Winter 2012), 58.