



# DPRK'S FAILING MISSILE TESTS: SPECULATIONS ON THE EMPLOYMENT OF CYBER WARFARE FOR MISSILE DEFENCE

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Recent news reports speculate on the possibility of US cyber warfare efforts behind the failed North Korean ballistic missile launches.<sup>1</sup> North Korea has been very active in recent years with its ballistic missile development and testing. What is more important is that DPRK has graduated to developing solid fuel missile boosters and canisterised launch system. The speculations are based on policy announcements and statements made by serving and former US government officials. This has kicked up discussions on a new type of missile defence using cyber tools.

North Korean missile launch failure is not a new phenomenon as numerous failures have happened due to faulty technology and engineering. Most of DPRK's ballistic missiles are based on the old Soviet Scud missiles until recently when the communist state managed to

test solid fuelled ballistic missiles. In 2014, North Korea got very active with provocative missile tests by launching a series of short range missiles. The same year the then US President Barack Obama ordered efforts to be stepped up to counter North Korean ballistic missile program via cyber and electronic warfare.<sup>2</sup> The following year, North Korea continued to successfully test SRBMs. In 2016, of the three new SLBM tests that were carried out by N Korea, the first two failed and the last was reported to be a success.<sup>3</sup> Attributing these two failures to US covert cyber warfare would conflict with logic as SLBM is a complex technology, particularly more so for a country like North Korea. What is surprising is that the third test was a success.

The year 2016 was the year of intense activity for DPRK's ballistic missile and nuclear program. Several missile tests and two nuclear

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tests – with one being a fusion device – were conducted in 2016. Among the ballistic missiles tested, eight were with the intermediate-range Musudan missile; of these, seven tests failed with just one test conducted in June reported to be a partial success. In addition to this there were test firings of the Nodong missile, with all being successful. Further, there was one successful test of an SLBM. This year too there were, several missile launches. For the first time the land based version of the KN-11 SLBM; the Pukguksong-2 was successfully tested followed by some successful Nodong test launch in March. In April there were two unsuccessful test launches of an unidentified ballistic missile.<sup>4</sup>

It is clearly obvious that most of the failed launches were the Musudan intermediate range ballistic missile and a couple of failures of the KN-11 SLBM. However, the SLBM test succeeded after DPRK switched to solid fuel boosters.<sup>5</sup> If at all there was any interference with the launch by the US via cyber means, it could have only been with the Musudan IRBM. However, the Musudan missiles are new systems developed based on an older Russian ballistic missile. Given North Korea's poor technical and engineering capability, it is possible that the launch failures were the result of poor development. The US President Donald Trump, too, though diplomatically, hinted that the North Korean missile could have been faulty. When asked about the possibility of a US cyber attack,

President Trump said "I'd rather not discuss it. But perhaps they're just not very good missiles".<sup>6</sup>

However, one cannot completely ignore the possibility of a US cyber hand in the failed launches of the Musudan IRBM. The question is, is it possible to hack the ballistic missiles? Technically, it is possible to write malwares to manipulate a missile system as it employs digital computation components loaded with firmware and software. But it requires deep knowledge on the working of the programmable logic control<sup>7</sup> of the missile and guidance feed systems. Since the Musudan is based on the older Russian R-27 missile,<sup>8</sup> it is quite possible that the technical details of the missiles might have been known to the United States of America. Already, there are declassified CIA technical documents available from the sixties on Soviet ballistic missiles in the public domain.<sup>9</sup> But the primary challenge here is the delivery of the payload to the target systems. It is highly likely that the missile and associated systems will be air-gapped for security reasons. In such conditions, HUMINT is the only way to deliver the payload. In a tightly controlled country like North Korea penetrating into secretive and high secure military programs is no easy task.

The use of cyber capabilities as a tool for missile defence is an attractive concept. While, as mentioned, it is quite possible to develop advanced malwares to manipulate the missile guidance and control systems – which in fact

might be the easiest part in the kill chain – delivering the payload would be the most difficult part. It may be possible that the US might have managed to penetrate the Musudan missile program causing most of the launches to fail. Nevertheless, the success of using cyber warfare as a missile defence component tool depends on the persistent penetration of the missile programs at the human level (to deliver the malware). As far as the future is concerned, the bigger threat is the fully functional and deployed Nodong, the SRBMs and the emerging solid fuelled IRBM and SLBM.

*(Disclaimer: The views and opinions expressed in this article are those of the author and do not necessarily reflect the position of the Centre for Air Power Studies [CAPS])*

## Notes

<sup>1</sup> “North Korea’s Unsuccessful Missile Launch ‘may have been thwarted by US cyber attack’”, <http://www.telegraph.co.uk/news/2017/04/16/north-korea-makes-unsuccessful-missile-launch-day-massive-show/>, 16 April 2017, accessed on 10 May 2017.

<sup>2</sup> *ibid*

<sup>3</sup> “chronology of U.S.-North Korean Nuclear and Missile Diplomacy”, <https://www.armscontrol.org/factsheets/dprkchron>, April 2017, accessed on 10 May 2017

<sup>4</sup> *ibid*

<sup>5</sup> “KN-11 (Pukkuksong-1)”, <https://missilethreat.csis.org/missile/kn-11/>, *Missile threat*, accessed on 11 May 2017

<sup>6</sup> “Trump Hints that the US may be Sabotaging North Korea’s Nuclear Program”, <http://www.businessinsider.in/Trump-hints-that-the-US-may-be-sabotaging-North-Koreas-nuclear-program/articleshow/58449632.cms>, 30 April 2017, accessed on 9 May 2017

<sup>7</sup> “Failed North Korean Missile Tests: Faulty Engineering or a Covert US Offensive Plan?”, <http://thediplomat.com/2017/04/failed-north-korean-missile-tests-faulty-engineering-or-a-covert-us-offensive-plan/>, 27 April 2017, accessed on 9 May 2017

<sup>8</sup> “New DPRK ICBM Engine”, <http://www.armscontrolwonk.com/archive/1201278/north-korea-tests-a-fancy-new-rocket-engine/>, 9 April 2016, accessed on 8 May 2017

<sup>9</sup> “Soviet Propellants for ballistic missiles”, [https://www.cia.gov/library/readingroom/docs/DOC\\_0000449444.pdf](https://www.cia.gov/library/readingroom/docs/DOC_0000449444.pdf), 18 September 1962, accessed on 10 May 2017