Confidential

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Vladimir Khrustalev reports from Vladivostok:

NORTH KOREA'S NUCLEAR MISSILE PROBLEM: WHAT IS TO BE DONE?

SUMMARY

Today the international community is anxiously tracking the situation on the Korean peninsula, where North Korea has massively expanded its programme of rocket and missile testing, and where the US and South Korea are holding unprecedented-in-scale military exercises.

Against these troubling trends, Russia Confidential is continuing to publish on the North Korean problem. In this issue, we are offering readers an insight into the situation from an expert based in the Far East: Vladimir Khrustalev from Vladivostok, a respected specialist in North Korea's military programme, shares his vision of the contemporary developments and his estimates of future scenarios.

The expert anticipates that in the foreseeable future North Korea could carry out its first tests on a national ICBM and, if successful, the first ICBMs could be accepted into Pyongyang's armed forces quite soon. At the same time, an alternative to the arms race and mutual deterrence is the threat of a limited nuclear war. Now the risk of a crisis has significantly grown, especially of an unplanned escalation, the expert argues.

In the light of these trends and forecasts, the question 'What is to be done?' is particularly appropriate.

The virtually uninterrupted flow of alarming news from the Korean peninsula forms a worrying trend: Pyongyang is displaying significantly greater activity in its nuclear weapons tests and in its programmes to create new and improve existing ballistic missiles.

WHAT ARE THEIR GOALS?

North Korea's military and political leadership is currently focused on resolving several key issues.

- ***First: achieving the transition from 'minimal' nuclear deterrence (when there is only the theoretical possibility of a nuclear response to enemy attack) to 'reliable' (high likelihood), and ideally 'guaranteed', i.e. with the maximum survivability and efficiency of nuclear forces in a wide range of unfavorable military scenarios.***
- ***Second: the transition from indirect deterrence of the USA (threats to strike US bases in the region, and US allies) to direct deterrence (threats to strike targets on US soil, ideally in the continental US).***

NEW MISSILES

The frequency of missile launches in 2016-2017 has enabled North Korea to conduct the first successful flight tests of the following **ballistic missiles**:

- Hwasong-10 (Musudan) – a liquid-propellant, single-stage, medium-range ballistic missile, with a maximum range of 3,000 km;
- Pukkuksong-1 (KN-11) – solid-propellant, two-stage, submarine-launched missile with a maximum range of about 1,100-1,250 km;
- Pukkuksong-2 (KN-15) – solid-propellant, two-stage, road-mobile ballistic missile cold-launched from a tracked transporter-erector launcher, with an approximate maximum range of 1,100-1,250 km.

In addition to these new missiles, **new launch systems** are also being developed.

- It is known that North Korea is currently constructing its first, relatively battle-ready **submarines**, each equipped with several submarine-launched ballistic missiles (SLBMs), with a displacement of about 3,000 tonnes. According to published information, there are submarines of 6,000 tonnes and even 9,000 tonnes at different stages of development (the last, presumably, are at the *concept* development stage).
- On the materials published by the DPRK media, a new launcher based on crawler transporter is also visible. There is no reason why North Korea should struggle to produce tracked **caterpillar platforms** seeing that it manufactures caterpillar vehicles for both civilian and military industries.

Furthermore, in 2016 North Korea successfully put an earth observation **satellite** (*Kwangmyongsong-4*, 200 kg) into orbit, further demonstrating the *Unha-3* carrier rocket's efficiency. Further plans regarding space exploration and developing orbital groups have been announced, and they would require new rockets and new engines.

Currently, North Korea has displayed three new, powerful, liquid-fuelled **rocket engines**. One of those is described as intended for space, another as multipurpose, and the third as for an ICBM. The first has a stated thrust of 80 tonnes and a running time of 200 seconds (on film, this engine only seemed to have one chamber, and such thrust from one chamber would be a massive jump in capacity).

> ➢ ***A preliminary evaluation of the engine parameters and reconstruction work on the Western Sea Cosmodrome (resulting in larger launch facilities) indicate that North Korea's stated targets for their space programme are realistically achievable in the next 3-5 years. This includes putting heavier applied satellites into orbit and launching their own communications satellite into geostationary orbit.***

The North Korean authorities have repeatedly announced their plans to create and test the first national **military ICBM**. In 2016, tests on warhead thermal protection and its proposed layout were demonstrated, together with some disassembled *combat multi-stage rocket*. Also, materials on "testing the ICBM engine" were published.

North Korea's success in creating new fuel-oxidant pairs, developing and testing a variety of multi-stage rockets (military and for space exploration), in mastering ever more powerful engines with increasingly complex control systems all indicate that in the foreseeable future we could see the country test its first ICBM. If successful, the first ICBMs could be accepted into Pyongyang's military arsenal by 2020. There may not be many of them, and they may not be very fully developed (quite vulnerable to an enemy's first strike) but they would certainly be transportable and combat-ready.

It is also worth noting that some of North Korea's launches are not solely, or even mostly, about testing missiles – they are more focused on developing approaches to overcoming the enemy's **anti-missile defence systems**: ripple (mass launch), high trajectory launches, etc. On 12 February 2017, the first test was allegedly carried out that involved the ability to manoeuver a warhead in flight after separation.

> ➢ ***The positioning of missile defence systems and forces in the region actively prompts Pyongyang to take countermeasures, since these missile defence systems are viewed as an important component in any potential attack on the country. And vice versa, demonstrating the ability to overcome missile defence systems is seen as a way of increasing deterrence credibility.***

THE MILITARY ATOM: REALITY AND FORECASTS

The increase in the force of explosions registered and reported in North Korean media indicates that Pyongyang's nuclear capability is growing. In 2016 two nuclear tests were carried out, with the second becoming its most successful test to date in terms of force (over 30-35 kilotonnes by some estimates). Official press releases indicate that North Korea is testing both specific *thermonuclear options* (*boosted* fission bombs, one- and two-stage thermonuclear weapons) as well as ordinary military charges. Here we are dealing with different **levels of thermonuclear technology**.

- In the former case, thermonuclear material is used as an effective source of additional neutrons, which make it possible to increase the force with the same outlay of uranium or plutonium, or to achieve the same force with less.
- The latter case refers to devices that are either classified as *boosted* fission bombs or as different types of thermonuclear devices. This is similar to the first Soviet and British declared thermonuclear devices, which, in addition to fissile material, featured one or more layers of thermonuclear fuel, as well as layers of natural or depleted uranium. A key example of this is the Soviet *RDS-6*.
- The third, and final, option is a classic nuclear device that has a nuclear fuse and thermonuclear bundle included separately. These have only been successfully tested by the five leading nuclear powers.

The increasing intensity of tests indicates that Pyongyang no longer suffers from a lack of fissile material. It is now known that North Korea's nuclear scientists are able to produce not only military-grade plutonium and weapons-grade uranium, but also, most likely, Lithium-6 and Tritium. That means that **over the period 2017-2020** we may see them test a relatively powerful single-stage nuclear device (of over 100 kilotonnes), and **by 2022-2023** - a relatively compact two-stage nuclear device that can be mounted on rockets and have a force of up to 300 kilotonnes. The most recent available data indicate that North Korea's nuclear test site is well suitable for testing this power device. All that would, however, require that they keep up their current pace of technological development and nuclear test frequency.

- ***As of today, North Korea's nuclear arsenal is likely to comprise between 20 and 50 charges, and in the near future could rise to 50-100 charges. This is the author's estimate based on, inter alia, a number of auxiliary indications, such as the planned construction of a nuclear power plant (NPP), which evidences that North Korea has greater centrifugal abilities than we are aware of. Pyongyang would not be likely to launch this kind of project unless it had sufficient resources in terms of enriched uranium for its military and civilian programmes.***

The model of a nuclear warhead shown to the media externally resembles more modern warheads (USA, early 1950s) rather than their earliest predecessors. It is also worth considering the possibility that certain economies could be made in the use of fissile material, such as for example combining Plutonium and Uranium in one warhead. The USA first tested this kind of device in 1948.

ATOMS FOR PEACE

Last year, Pyongyang repeatedly announced its plans to build **a new NPP.** While interacting with Russian specialists that visited North Korea in 2016 it was even argued that construction work on it is already underway - and it was not about the light water reactor in Yongbyon. North Korea is currently building a facility on the shore of the Sea of Japan that resembles a future NPP. This is likely to gain media and open source intelligence attention in the near future.

North Korea's attempts to build an NPP via international cooperation failed: it did not receive imported NPPs from the USSR in exchange for joining the NPT, nor under the KEDO project. The construction of new gas graphite reactors, suspended in 1994, was essentially sabotaged. Construction sites (reactors with a power capacity of 50 and 200 megawatts) were left to fall into complete disrepair while the Framework Agreement was in place, and it was deemed impossible to restore them. And that is a key reason why Pyongyang will be unlikely to compromise over its new reactor.

GENERAL POLITICAL SITUATION

Looking at this complex picture, it is possible to draw the following conclusions.

1) Pyongyang believes that not only will the United States refuse to enter into any dialogue with them unless they have a sufficient nuclear potential, it will also seek to destroy them militarily. Therefore, North Korea has no intention of giving up its nuclear weapons, especially on the back of the unprecedented levels of military activity displayed by the US and South Korea on the Korean Peninsula. This is particularly important since North Korea is highly cognisant of the extent to which the US and South Korea overpower them in terms of conventional weapons.

   The clearest evidence of this **real concern** can be found in the complex measures taken by North Korea's armed forces in response to each major US and South

Korean training exercise. Military equipment is despatched to underground sites, leaves are cancelled, and tens of thousands of service personnel are transferred to underground service – all of which is cancelled as soon as the training exercises end.

2) Pyongyang clearly has no intention of launching a suicidal war: all their rhetoric indicates that they would only launch nuclear weapons **if they came under attack** – or if they became aware that such an attack was imminent.

3) It is clear that Pyongyang's nuclear weapons are not aimed at containing **Russia and China.** They are targeting South Korea, the US, and Japan (chiefly South Korea and the US). That is why our country faces something of a paradox.

> ➢ ***On one hand, Russia needs a North Korea that does not spark an extension of the US missile defence systems or issues urgent challenges to the global nuclear balance, but, at the same time, a North Korea that is able to reliably deter the United States and its allies from any military adventures against it. However, only a country that itself poses a serious military threat is capable of deterring the US and its allies. A non-nuclear and militarily weak North Korea simply would not carry sufficient weight to be taken seriously as a deterrent by its opponents in any crisis scenario.***

4) Pyongyang will only countenance mutual concessions. And even those would have to be serious ones. But, in any case, one can only consider **interim solutions** here – such as 'no new nuclear tests' or 'no ICBM tests'. Such essential things as the right to peaceful space exploration, are hardly likely to be among the concessions that North Korea would be willing to make. They are keen to show transparency about these programmes, not to close them down.

   Similarly, there can be no talk of **destroying their nuclear arsenal.** It is clear for Pyongyang proceeding from *bad end* of agreements of 1994 and 2005, when North Korea came away with no real guarantees of non-aggression, no nuclear power plant, and no let-up in hostile pressure. At the same time, its nuclear infrastructure was dealt a severe blow with the dismantling and mothballing of equipment at its nuclear sites, followed by significant outlay on their renovation. For North Korea, it is indicative that the United States never takes very long to start putting pressure on North Korea in other areas (sanctions over human rights, *the war on terror*, etc.) after signing agreements.

   In turn, for the United States, any concessions over North Korea, even mutual ones, entail a major ***reputational hit***, which would set the precedent for successful rebellion against the United States by a *rogue state*.

5) There is the risk of this developing into **a crisis that quickly escalates** out of control. This is not a very high risk, but, equally, it should not be ignored.

> ➢ ***The very high concentration of forces in a state of high combat readiness, well equipped with command information systems and long-range weapons, increases the likelihood that unintended incidents and mistakes could escalate into a 'war by error', and there is a risk that that war would be nuclear. The ever-more extensive exercises, perceived by North Korea as a build-up of huge military attack forces on its borders, boost the likelihood that this nightmare scenario could come to pass.***

6) Currently, there is a real risk that the United States might try to carry out a **disarmament operation against North Korea.** This risk is not high, but it has grown significantly compared to previous years. In some US circles, there is a clamour to seize the moment – while Pyongyang still does not have

ICBMs and therefore response (even nuclear) to any attack could only reach Japan and South Korea, while the US mainland would be guaranteed safety. It is likely that, after North Korea has developed delivery vehicles capable of reaching Hawaii, the risk of a US military operation would significantly decrease.

The current military and political crisis in North East Asia closely resembles a situation in which the alternative to an arms race and mutual deterrence is the threat of limited nuclear war. The risk is not that great, but it is real and has increased recently. However, it is most likely that the situation will continue to develop as an arms race, albeit an asymmetrical one, until the sides develop a mutual readiness to embrace real compromise, however slight or not very significant.

WHAT IS TO BE DONE?

First, **Russia and official Russian media should retain clear neutrality in relation to the crisis**, and not be drawn into *psy-ops* on either side. The policy of equitable dialogue as the only reasonable alternative to crisis should be retained.

Second, since there is no quick and easy solution, **it is worth considering interim solutions.** Chiefly, *second track* diplomacy and a *crisis channel* between different sides could be quite useful. Recent problems relating to the sudden cancellation of the North Korean delegation's US visa when they were heading to planned consultations raises the idea that a new platform should be found. And this could be Russia. Russia's Vladivostok is in the same time-zone as the crisis region and most of its capital cities, and it also hosts diplomatic representation of all interested parties – including the United States and North Korea.

What could realistically be on the agenda for talks right now? Preventing unplanned military actions, minimal confidence building measures, etc. That is the main problem today: Nobody wants a war by error. And yet there is still no consensus, so it would not be very wise to tackle major, highly disputed issues.

Third, in future (if it is possible to quash the crisis, and it would only make sense after the issue relating to the new president of South Korea has been resolved), it would be wise to **desist from the purely nuclear format for talks. The region needs to see the creation of a new six-party format for discussions of the whole range of security concerns that takes into account the perspectives of all participants.** It would not make sense to discuss North Korea's nuclear issue without also looking at missile defence and the rising non-nuclear attack potential of countries in the region, or without looking at the problems relating to uncertainty over diplomatic relations. And within any discussion it is vital that issues open to interim deals are identified. If the 1994 and 2005 agreements taught us anything, it is that, no matter how imperfect they may be, the situation was very different when Pyongyang was bound by them and believed they were also being fulfilled in general by the other side.

Put metaphorically, we are witnessing a sharp uptick in a chronic illness. You cannot just cure it, first you need to deal with the acute phase, and then, calmly and methodically, spend years following the treatment course.

It is important to note that Pyongyang is ready for transparency, presuming it retains its principled right to master certain technology. Space exploration is a key example of this. The North Koreans are not willing to stop launching their own satellites, although they could, in principle, let internationals in to their space exploration facilities and deal with these concerns. There was some experience of

admitting international media to their Cosmodrome in Spring 2012, which was, after all, an attempt to demonstrate their openness. However, the negative external reaction prompted North Korea to view this openness as unjustified. Time has shown that similar constructive steps towards each other can be made, which would mean greater openness from North Korea on other issues, e.g. issues of nuclear facility safety in neighbouring countries.

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Dmitry Polikanov