Re-entry Vehicles and Rhetoric in Pyongyang

The NAPSNet Policy Forum provides expert analysis of contemporary peace and security issues in Northeast Asia. As always, we invite your responses to this report and hope you will take the opportunity to participate in discussion of the analysis.



Recommended Citation

"Re-entry Vehicles and Rhetoric in Pyongyang", NAPSNet Policy Forum, January 31, 2013, https://nautilus.org/napsnet/napsnet-policy-forum/re-entry-vehicles-and-rhetoric-in-pyongyang/

Go to the weekly report for 31 January 2013

After 5 test firings (failures in 1998, 2006, 2009, 2012, and success, December 12, 2012) we know that DPRK long range rockets have ~20% chance of success, every 3 years. We know it has not mastered satellite technology. We know it has tested a nuclear warhead twice, once successfully, giving it a roughly 50% warhead reliability.

What past and the most recent launches do *not* tell us is whether the DPRK has built re-entry vehicles (RVs) that will work on long-range rockets. The DPRK has not tested RVs on its long-range rockets to date, or if it did, the rocket failed before the RVs deployed.

In the Iran-Iraq War of the Cities, scores of North Korean intermediate range missiles were fired. Although urban populations were terrorized, these missiles were unreliable and inaccurate. RVs on the DPRK's shorter and medium-range rockets work at much lower velocities and re-entry angles.

RV technology for long range missiles is an extremely challenging field. It took the United States and others many years of research and development to overcome challenges posed by extreme temperature, pressure, atmospheric buffeting, ablation etc so that a RV could deliver its warhead without burning up.

Admittedly, much of the fundamental information and even early test data of heat shields is in the public domain. Some technical obstacles can be circumvented either by avoiding known or surmised dead-ends, or by importing knowledgeable technicians.

Nonetheless, it is a huge leap from RVs for intermediate-range to RVs for long range missile RVs. RVs for ICBMs are simply in a different class with respect to every parameter of the technology and physics involved. No country has deployed an operational ICBM without testing missile-specific RV technology. If the DPRK were to do so, then its leaders could not be confident that the missiles are a realistic delivery system, whatever their symbolic potency.

The United States conducts 40 or more tests of a new missile system, including its RVs, to achieve system (launch to target) reliability of 80% per missile fired over a known range. The DPRK does not need to achieve US standards of missile reliability to field a potent threat and can use a blunt RV to slow re-entry and reduce the heating problem at a cost to accuracy.

Overall, the probability of success of 20% for the rocket * 50 % for the warhead * unknown RV %--but let's assume 50%--equals a 5% probability of system success. To some extent, this low probability of operational success of a deployed, untested missile could be overcome by deploying a large number, and firing many of them at a target—some of which may then destroy each other as they explode, posing a new problem—and by using very large nuclear explosions to substitute firepower for accuracy.

Due to lack of fissile material, missiles, and high megatonnage warheads, the DPRK cannot rely on these work-arounds. Firebreathing North Korean rhetoric (NDC statement, KCNA January 24, 2013) cannot substitute for operational RVs.

-Peter Hayes, NAPSNet contributor

View this online at: https://nautilus.org/napsnet/napsnet-policy-forum/re-entry-vehicles-and-rh-toric-in-pyongyang/

Nautilus Institute
608 San Miguel Ave., Berkeley, CA 94707-1535 | Phone: (510) 423-0372 | Email: nautilus@nautilus.org