

## **Outline/Script - Hypersonic Weapons and the New Delivery Systems (#HyperHype)**

*Tim Thies, Matej Rafael Risko*

**Introduction:** basic informations about guest and about the interviewer, basic informations about the project, outline

### **First block** (15-20min):

Theory of the hypersonics - using the shock wave for generating upthrust, manoeuvrability in high speed, boost-glide systems versa boost-powered systems versa ramjets/scramjets, profiles of flight, terminal phase and guidance systems. Basic categorization of the delivery platforms/systems (HGV, HCM etc). Burevestnik – preliminary

### **Second block** (20min):

1. HGVs
  - 1.1 Avangard and UR-100N UTTX. What we know about, what we suppose, history, project Rubezh, strategic stability, arms control after 2026
  - 1.2 DF-17/DF-ZF and FOBS integration – strategic stability, how to discriminate, PRC wants also to use DF-17 as a conventional weapon system
2. HCMs
  - 2.1 3M22 Zirkon (SS-N-33). Ramjet or solid motor boosted missile – (RU 2148180 patent unveiled part of the missile?).
  - 2.2 PGS - How the global conventional strike capability will change the strategic environment. How is possible to discriminate in system with (possible) dual use capability? Is this “damage limitation option”? Will this increase new arms races? What are the possibilities of accidental escalation in this case?
  - 2.3 DF-17 discrimination between dual use. Similar tasks as in PGS case.
3. Nuclear powered cruise missiles
  - 3.1 9M33 Burevestnik

### **Third block** (20-25min):

1. Proliferation and Arms Control of these kind of weapon systems
  2. Conclusion
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### **First block; (mainly Matej):**

What means “hypersonic”? How we can define this kind of weapons? Does the really mean only on the speed? (MIRVs or any other missiles, even AD missiles are technically “hypersonic”) What is the difference between gliders and powered hypersonic vehicles? Why the form shapes the flight profile, manoeuvrability, what means to use the shockwave for generating upthrust? Does “plasma stealth” exist and what it means? How we can describe the flight profile of these kinds of weapons and what are the advantages and what are the disadvantages? How are the missiles guided? (Inertial, semi-

radar homing, radar homing) Is it necessary to slow down in terminal phase for the hypersonic cruise missiles?

What is the nuclear propulsion? How this (cruise) missile works? (Question to Tim)

### **Second part; Questions to Tim:**

HGVs.

What we know about Avangard? History of the project. Was the module integrated with the delivery platform (UR-100N UTTX/ 15A35)? How is the module guided? Do you suppose, that main targets for this weapon system are components of the US ABM system in Alaska (according to gen. Karakayev statement for TopWar, 24. 12. 2018). What is the yield estimation of the warhead? What we know about project Rubezh? How the Avangard HGV and new nuclear capable systems will influence the future of arms control, especially after the New Start treaty will definitely expire (2026)? How the implementation of this weapon system will influence the strategic stability (and we can talk about reaction times, new “arms races”

What is your expert opinion on Chinese development in the field of hypersonic technologies? According to the new US report about China we know, that China is building the new silos and is extending its own capabilities (almost 150 more new ICBMs). Should we expect a “Chinese Avangard”? What is the DF-DZ/DF-17? Why China is doing experiments with FOBS? Is this the way how China would like to penetrate the US ABMs or basically to avoid NORAD? What are the reaction times?

Tell us more about western development, what we know about LRHW?

What does the Zirkon missile is? Does Russia really use the scramjets/ramjets in that case or it is much more prosaic and it is solid booster in the first stage and second stage hypersonic missile/module with its own solid propellant motor as some observation and patents (RU 2148180) suggest?

What we know about HACM project, what about DF-17? How these missiles are guided if the target is moveable and relatively small? (aircraft carriers and warships) Radar homing is practically almost impossible up to M3 due to the plasma cloud.

Prompt Global Strike – what is it? What are the possibilities of accidental escalation? Isn't it a return to 50s sort of approach to strategy? What could be the negative impacts on the international stability? Putin in Kyrgyzstan was saying about American approach in conventional capabilities we basically can describe as a (dual-use) damage limitation option.

What the Burevestnik is for? What is the strategic reason for acquiring such kind of a weapon? Is it useful or not? How Russia is dealing with proclaiming additional second strike capability? What is the yield estimation of the warhead? What are the risks in strategic stability, how to count these weapons?

### **Third part; Tim and Matej:**

Is the Arms Control dead as a discipline in this specific field? Is it possible to count and control these weapons systems? What it changes? What are the ways that states are using for horizontal and vertical proliferation of this kind of weapons? How it would influence the proliferation of the nuclear weapons and fissile materials (especially looking on 9M33). In which kind of relation are these kind of weapons in terms of questions of entanglement conventional and nuclear strategic systems. How to discriminate between the use, because lot of these systems are dual-use capable.

## **Conclusions**