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# THE RUSSIAN OPERATIONAL- TACTICAL ISKANDER MISSILE SYSTEM

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# THE RUSSIAN OPERATIONAL-TACTICAL ISKANDER MISSILE SYSTEM

Stefan Forss

**Land- and sea-based long-range ballistic nuclear missiles and air-launched cruise missiles play a central role in upholding Russia's strategic nuclear deterrent. So-called intermediate-range missiles were banned and eliminated as a result of the INF Treaty between the United States and the Soviet Union, signed in December 1987. Short- and intermediate-range ballistic missiles have, since then, been taken into widespread use in several nation-states, not least in states neighbouring Russia. The Iskander missile system is a logical response to this development.**

The INF Treaty<sup>1</sup> did not cover short-range tactical ballistic missiles or short-range land-based cruise missiles. The importance of these weapons, considerably lighter than strategic weapons, in military defence is high both in conventional and nuclear roles. As a result of the rapid development in weapons technology in recent decades, the accuracy of these weapons systems has dramatically improved. Extremely expensive stealth aircraft aside, an air force's ability to conduct conventional bombings in heavily defended airspace nowadays requires absolute air superiority. In these circumstances, the importance of ballistic missiles and cruise missiles as replacements for ground-attack fighter aircraft and bombers capable of penetration is emphasised. Since 2007, Russia's new ballistic missile system Iskander has been deployed with a training unit at the Kapustin Yar Missile Test Range, in the Southern (former North Caucasian) Military district.<sup>2</sup> The missile was

also tested in combat, during the August 2008 Russo-Georgian War. The deployment of these missiles to Luga, in the Western Military District, neighbouring Estonia and Finland, raises questions of a possible political message.

## **The role of Iskander missile system in Russian military policy**

The commander of the Russian Ground Forces, Colonel General Alexander Postnikov, said in an interview by the Ekho Moskvyy radio station on 17 July 2010 that the first new Iskander missile complex had been taken into service in the former Leningrad Military District.<sup>3</sup>

Postnikov stressed that these new missile systems would first be deployed at the country's north-western border, in the Leningrad Military District. The missiles would be deployed with the 26th Missile Brigade, 'Nemanskaya', stationed in Luga.<sup>4</sup> US

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<sup>1</sup> The INF Treaty's official name is 'The Treaty between the United States of America and the Union of Soviet Socialist Republics on the Elimination of Their Intermediate-Range and Shorter-Range Missiles'.

<sup>2</sup> Mikhail Barabanov, *Iskander the Great*, editorial, Moscow Defense Brief, No. 4, 2008 [<http://mdb.cast.ru/mdb/4-2008/>]; see also Mikhail Barabanov, *The Iskander factor*, Kommersant, 9.11.2008 [<http://www.kommersant.com/>]

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p1052937/r\_527/Iskander\_missiles\_to\_counterbalance\_American\_AMD\_systems/].

<sup>3</sup> ITAR-TASS, *First Iskander system accepted for service in Leningrad mil district*, Moscow ITAR-TASS, 17.7.2010.

<sup>4</sup> Ivan Konovalev and Vladislav Litovchenko, *Generals will always find Luga in a pocket – Russia decided to deploy theater missile Iskander near Estonia* (Kommersant, 26.2.2010), Defense & Se-

sources agreed that Russia had begun to deploy new tactical missile systems and nuclear warheads close to the borders of NATO member-countries in the spring of 2010.<sup>5</sup>

It is not uncommon for Russia to declare units armed with new weapons to be operational even when they are still markedly under-strength. This was the case with the Iskander unit, declared operational on 14 December 2010.<sup>6</sup>

On 20 October 2011, Brigade Commander Colonel Alexei Sakharov stated that rearming of the brigade with Iskander missiles – to replace the SS-21 Tochka-U missiles, which are being retired – took place in stages and is now complete. The brigade was now at full strength, according to an announcement by the Russian Ministry of Defence.<sup>7</sup> A full-strength missile brigade has 12 launchers.

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curity, No. 21 (1.3.2010) [<http://dlib.eastview.com/browse/doc/21366520>].

<sup>5</sup> Classified US intelligence about Russia's movement of tactical nuclear weapons to the facilities has been shared with Congressional committees. See Adam Entous and Jonathan Weisman, *Russian missiles fuel U.S. worries*, *The Wall Street Journal*, 30.11.2010

[[http://online.wsj.com/article/SB10001424052748704584804575645212272670200.html?mod=WSJEUROPE\\_newsreel\\_world](http://online.wsj.com/article/SB10001424052748704584804575645212272670200.html?mod=WSJEUROPE_newsreel_world)].

<sup>6</sup> RIA Novosti, *Western Military District gets first Iskander tactical missile system*, 14.12.2010 [[http://en.rian.ru/military\\_news/20101214/161766995.html](http://en.rian.ru/military_news/20101214/161766995.html)]. A complete Iskander system consists of six vehicles, command and staff vehicle, life support vehicle, transporter erector launcher vehicle (TEL), transporter loader vehicle (TLV), mobile data processing centre and maintenance vehicle. RIA Novosti, *Iskander (SS-26 Stone) tactical missile system and its target coverage in Europe*. *INFOgraphics*, [<http://en.rian.ru/infographics/20081113/118288712.html>], (accessed 30.4.2012).

<sup>7</sup> РИА Новости, *"Искандер" поражает цель на расстоянии до 400 километров. Видеосучений*, 20.10.2011 [[http://www.ria.ru/tv\\_defense\\_safety/20111020/465733453.html](http://www.ria.ru/tv_defense_safety/20111020/465733453.html)] and Министерство обороны Российской Федерации, *На полигоне, расположенном на территории Ленинградской*



Image 1: Missile Complex 9K720, Missile 9M723 Iskander-M (SS-26). (Leonid Yakutin, *Военно-Промышленный курьер*, <http://vpk-news.ru/photographs/gallery/384/>)

During the Cold War, Soviet ground forces had a versatile inventory of dual-purpose artillery and missile weapons, whose range varied from a few kilometres to nearly a thousand (the Temp-S, or SS-12 Scaleboard missile). These weapons systems played a central role in the armed forces' contingency plans and operations.

The situation changed decisively after the United States and the Soviet Union signed the INF Treaty, eliminating land-based intermediate-range and shorter-range ballistic missiles, in December 1987. The treaty is in force for an unlimited duration, and it bans the possession, production, and flight testing of ground-launched ballistic and cruise missile systems with a range of 500–5,500 kilometres.

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*области, началось тактическое учение ракетного соединения Западного военного округа*, 20.10.2011 [<http://structure.mil.ru/structure/okruga/west/news/more.htm?id=10745977@egNews>]. See also Brezjnev's Blog, *Förbandsövning Iskander sydost Narva*, 22.10.2011 [<http://brezjnev.wordpress.com/2011/10/22/forbandsovning-iskander-sydost-narva/>].

With the implementation of the treaty, all launchers and missiles of weapons systems belonging to this category, approximately 2,700 missiles (incl. cruise missiles) were destroyed by the summer of 1991. The Soviet Union accounted for 1,846 missiles. Actual nuclear warheads are not covered by the treaty. On-site inspection rights related to treaty verification ended on 31 May 2001.

Russian military circles were especially unhappy with the fact that the shorter-range missile Oka (9K714, OTR-23, SS-23 Spider) was among the missiles destroyed. Sacrificing this weapon system was mostly seen as the fault of the weak President Gorbachev.<sup>8</sup> Equipped with a heavy conventional warhead, the missile would probably have had a range of below 500 km, but with a lighter nuclear warhead, it would have exceeded the permitted limit.

In November 2007, Colonel General Vladimir Zaritsky, then commander of the Ground Forces' Artillery and Rocket Forces, emphatically stated that the Iskander missile system will plug the gap in Russia's operational-tactical missile arsenal, created by the INF Treaty.<sup>9</sup> The general's statement reflected the views of the country's political and military leadership. This interpretation is supported by later information, for instance in emails obtained illegally from the U.S. firm *Stratfor* and disclosed by *Wikileaks* in February 2012.<sup>10</sup>

<sup>8</sup> Mikhail Barabanov, *Iskander the Great*, editorial, Moscow Defense Brief, No. 4, 2008 [<http://mdb.cast.ru/mdb/4-2008/>].

<sup>9</sup> RIA Novosti, *Russia to compensate for INF losses with Iskander system*, 14.11.2007 [<http://en.rian.ru/russia/20071114/88066432.html>].

<sup>10</sup> Wikileaks Global Intelligence Files, [*STRATFOR Eurasia*] [*Fwd: INSIGHT - RUSSIA - Iskander Missile*], [[http://wikileaks.org/gifiles/docs/1739377\\_-eurasia-fwd-insight-russia-iskander-missile.html](http://wikileaks.org/gifiles/docs/1739377_-eurasia-fwd-insight-russia-iskander-missile.html)]. The date of the original mail was 13.12.2009.

The first possible public allusion to Russia's new position on the INF Treaty was received in September 2004, when Russian Minister of Defence Sergei Ivanov told reporters that Russia hoped to be able to pull out of the INF Treaty.<sup>11</sup> After this, Russian defence authorities repeatedly raised the INF question in talks with the United States, despite the objections of the Russian Ministry of Foreign Affairs. On his visit to Washington in January 2005, Minister of Defence Sergei Ivanov asked his counterpart Donald Rumsfeld how the United States would react if Russia were to withdraw from the INF Treaty. This was repeated in August 2006, when the defence ministers met each other in Fairbanks, Alaska.<sup>12</sup>

In February 2007, Russian President Vladimir Putin stated that the INF Treaty no longer served Russia's interests. He made this statement at the prestigious forum of the Munich *Wehrkunde* Security Conference on 10 February 2007:

“Today many other countries have these missiles, including the Democratic People's Republic of Korea, the Republic of Korea, India, Iran, Pakistan and Israel. Many coun-

<sup>11</sup> Nikolai Zlobin, *A close look at Russia's leaders: Meeting Putin and Ivanov*, The Defense Monitor, Vol. XXXIII, No. 5 (September–October 2004) [<http://www.cdi.org/news/defense-monitor/DMSepOct04.pdf>].

<sup>12</sup> Hubert Wetzels, Demetri Sevastopulo, and Guy Dinmore, *Russia confronted Rumsfeld with threat to quit key nuclear treaty*, 9.3.2005 [<http://www.ft.com/cms/s/0/0cdfdaf8-9043-11d9-9a51-00000e2511c8.html>] and STRATFOR, *Geopolitical diary: A polite meeting about missiles*, 29.8.2006 [<http://www.stratfor.com/print/40257>]. See also Nikolai Sokov, *Russia military debates withdrawal from the INF Treaty*, WMD Insights, 10/2006 [[http://www.wmdinsights.com/I9/I9\\_R1\\_RussianMilitary.html](http://www.wmdinsights.com/I9/I9_R1_RussianMilitary.html)] and Pavel Podvig, *Russia wants to pull out of the INF Treaty*, Russian strategic nuclear forces blog, 25.8.2006 [[http://russianforces.org/blog/2006/08/russia\\_wants\\_to\\_pull\\_out\\_of\\_th.shtml](http://russianforces.org/blog/2006/08/russia_wants_to_pull_out_of_th.shtml)].

tries are working on these systems and plan to incorporate them as part of their weapons arsenals. And only the United States and Russia bear the responsibility to not create such weapons systems. It is obvious that in these conditions we must think about ensuring our own security.”<sup>13</sup> There was no mention of China.

President Putin often returned to these issues. In an interview granted to reporters from the G8 countries on 3 June 2007, he commented outspokenly on, among other things, the US missile defence program, nuclear weapons policy, and Russia's possible countermeasures.<sup>14</sup> Putin thought the deterioration of Russia's relations with the United States was caused specifically by the US missile defence project:

“Eastern Europe is receiving new weapons, two new military bases are being set up in Romania and in Bulgaria, and there are two new missile launch areas – a radar in Czech Republic<sup>15</sup> and missile systems in Poland. And we are asking ourselves the question: what is going on? Russia is disarming unilaterally. But if we disarm unilaterally then

<sup>13</sup> Russian President Vladimir Putin (delivered on 10.2.2007), transcript: *Putin's prepared remarks at 43rd Munich Conference on Security Policy*, The Washington Post, 12.2.2007

[<http://www.washingtonpost.com/wp-dyn/content/article/2007/02/12/AR2007021200555.html>].

<sup>14</sup> OFFICIAL WEBPORTAL, President of Russia, *Interview with newspaper journalists from G8 member countries*, 4.7.2007 [[http://archive.kremlin.ru/eng/text/speeches/2007/06/04/2149\\_type82916\\_132716.shtml](http://archive.kremlin.ru/eng/text/speeches/2007/06/04/2149_type82916_132716.shtml)].

<sup>15</sup> The radar in the Czech Republic was eventually abandoned as the Obama administration began to implement its policy on missile defence in Europe. The White House (Office of the Press Secretary), *Fact sheet on U.S. missile defense policy: A 'phased, adaptive approach' for missile defense in Europe*, 17.9.2009 [[http://www.whitehouse.gov/the\\_press\\_office/FACT-SHEET-US-Missile-Defense-Policy-A-Phased-Adaptive-Approach-for-Missile-Defense-in-Europe](http://www.whitehouse.gov/the_press_office/FACT-SHEET-US-Missile-Defense-Policy-A-Phased-Adaptive-Approach-for-Missile-Defense-in-Europe)].

we would like to see our partners be willing to do the same thing in Europe. On the contrary, Europe is being pumped full of new weapons systems. And of course we cannot help but be concerned.”

Putin was also direct about the intentions behind the missile defence program:

“How do they justify this? By the need to defend themselves against Iranian missiles. But there are no such missiles. Iran has no missiles with a range of 5,000 to 8,000 kilometres. In other words, we are being told that this missile defence system is there to defend against something that doesn't exist. Do you not think that this is even a little bit funny? But it would only be funny if it were not so sad. We are not satisfied with the explanations that we are hearing. There is no justification whatsoever for installing a missile defence system in Europe. Our military experts certainly believe that this system affects the territory of the Russian Federation in front of the Ural Mountains. And of course we have to respond to that.”

Putin emphasised that the missile defence system planned for Europe was not just for missile defence,

“[s]ince if this missile system is put in place, it will work automatically with the entire nuclear capability of the United States'. 'It will be an integral part of the U.S. nuclear capability. [...] [F]or the first time in history [sic!] [...] there are elements of the U.S. nuclear capability on the European continent, Putin said, emphasising: It simply changes the whole configuration of international security”.<sup>16</sup>

<sup>16</sup> The Russian president's perception of the nuclear threat to Russia raises serious questions about the competence of his advisers and assistants and the quality of the 'facts' they present to him. Two outstanding Russian missile experts, missile designer Yuri Solomonov and former Chief of Staff of the Strategic Rocket Forces Viktor Esin, strongly dis-

An Italian journalist [*Corriere Della Sera*] asked the following question: ‘If the United States continues building a strategic shield in Poland and the Czech Republic, will we not return to the situation and times in which the former Soviet Union’s nuclear forces were focused on European cities, on European targets?’<sup>17</sup> Mr. Putin:

“Certainly. Of course we will return to those times. And it is clear that if part of the United States’ nuclear capability is situated in Europe and that our military experts consider that they represent a potential threat then we will have to take appropriate retaliatory steps. What steps? Of course we must have new targets in Europe. And determining precisely which means will be used to destroy the installations that our experts believe represent a potential threat for the Russian Federation is a matter of technology. Ballistic or cruise missiles or a completely new system. I repeat that it is a matter of technology.”

The Russian leadership's mistrust of the Bush administration's missile defence program was very strong. Even the possibility that missiles easily converted into intermediate-range nuclear missiles would be deployed in missile defence silos in Poland

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agree with the view that the planned US/NATO missile defence system is going to constitute a threat to Russia’s nuclear deterrent for several decades. See Pavel Felgenhauer, *Moscow Sees Military Threats from All Directions*, Eurasia Daily Monitor, 22.3.2012 [[http://www.jamestown.org/single/?no\\_cache=1&tx\\_ttnews\[tt\\_news\]=39167&tx\\_ttnews\[backPid\]=587](http://www.jamestown.org/single/?no_cache=1&tx_ttnews[tt_news]=39167&tx_ttnews[backPid]=587) and <http://premier.gov.ru/eng/visits/ru/18238/events/18248/>], See also NTI, Global Security Newswire, *Russian nukes not undercut by U.S. missile defense*, 18.11.2011 [<http://www.nti.org/gsn/article/russian-nukes-not-undercut-by-us-missile-defense-state-expert-says/>] and Rysslands röst (Voice of Russia), *Utveckling av ryska ballistiska robotar*, 24.11.2011 [<http://swedish.ruvr.ru/2011/11/24/60959244.html>].<sup>17</sup> President of Russia, *Interview with newspaper journalists from G8 member countries*, 4.6.2007 [[http://archive.kremlin.ru/eng/text/speeches/2007/06/04/2149\\_type82916\\_132716.shtml](http://archive.kremlin.ru/eng/text/speeches/2007/06/04/2149_type82916_132716.shtml)].

was not ruled out. A Russian diplomat, Dr Vladimir Kozin, made this interpretation in his talk in a seminar at the National Defence University's Department of Strategic and Defence Studies in October 2007.<sup>18</sup> The possibility that Russia would withdraw from the INF Treaty was also clearly presented in the talk.<sup>19</sup>

On Russia's initiative, the United States and Russia jointly proposed before the 2007 UN General Assembly and at the Disarmament Conference that the INF Treaty should be made universally binding.<sup>20</sup> This appeal was not successful, however.

President Medvedev's hard-line speech to the Federation Council on 5 November 2008, when Barack Obama had just won the US presidential elections, con-

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<sup>18</sup> Senior Political Counsellor Vladimir P. Kozin, Ph.D. (a senior researcher with the Embassy of the Russian Federation in the Republic of Finland), *Russia's threat assessment & security policy in the Baltic Sea area*, Strategy Seminar, ‘Comparing Regional Security Dimensions: The Baltic Sea & the Malacca Strait’, National Defence University, Department of Strategic and Defence Studies, Helsinki, 11–12.10.2007. See the appendix.

<sup>19</sup> Ibid. Some days after Putin's speech in Munich, General Yuri Baluyevsky, then Chief of the General Staff of the Russian Armed Forces, said that pulling out of the INF Treaty was possible, especially if the United States were to implement their missile defence plans in Poland and the Czech Republic. RIA Novosti, *Russia to compensate for INF losses with Iskander system*, 14.11.2007 [<http://en.rian.ru/russia/20071114/88066432.html>].

<sup>20</sup> Embassy of the United States (Moscow), *Joint U.S.–Russian statement on the Treaty on the Elimination of Intermediate-Range and Shorter-Range Missiles at the 62nd Session of the UN General Assembly*, 25.10.2007

[[http://moscow.usembassy.gov/st\\_10252007.html](http://moscow.usembassy.gov/st_10252007.html)] and Vitaly I. Churkin, *Statement by Vitaly I. Churkin, the Russian Federation's Permanent Representative to the UN, in the UN General Assembly's first committee introducing the joint Russian – United States statement on the INF Treaty*, 25.10.2007 [[http://www.un.int/russia/new/Main-Root/docs/off\\_news/291007/newen1.html](http://www.un.int/russia/new/Main-Root/docs/off_news/291007/newen1.html)].

tained a stern message to the United States. He listed measures that Russia would take if the missile defence system were to be built. Among the measures, he mentioned, was deployment of ‘the Iskander missile system in the Kaliningrad Region to be able, if necessary, to neutralise the missile defence system’.<sup>21</sup>

It is rare for the head of state of a major power to mention a tactical weapon system still in the development stage by name in a policy speech, no matter that Army General Nikolai Makarov, Chief of the General Staff of the Armed Forces of Russia, does consider the Iskander system one of the weapon systems at the forefront of the modernisation and rearmament of the nation's armed forces. The system would have an impact in power politics particularly if it were considered a serious deterrent – i.e., also a potential nuclear weapon.<sup>22</sup> In this context, it should indeed be kept in mind that the dual-capability Iskander missile system is the new main weapons system of missile brigades belonging to the Rocket Troops and Artillery (Ракетные войска и артиллерия), an Arm of the Russian Army. The military role of

this arm is ‘the primary means of destruction of the enemy by [conventional] and nuclear fire during combined arms operations (warfare)’.<sup>23</sup>

Speaking at the nuclear Global Zero Summit in Paris on February 2nd 2010, Swedish Foreign Minister Carl Bildt stated:

“Together with my Polish colleague Radek Sikorski I am now urging the leaders of the United States and Russia to commit themselves to early measures to substantially reduce these so called tactical nuclear weapons in Europe. We do understand the difference in that Russia is a European power, but we still urge Moscow to make the commitment to withdraw these nuclear weapons from areas adjacent to European Union member states – the Kaliningrad and Kola areas are of particular importance in these respects.”<sup>24</sup>

The Swedish Defence Research Agency, FOI, published a report about technical aspects of Russian tactical nuclear weapons in the Baltic Sea area in December 2011, using tactical Tochka and Iskander missiles as examples.<sup>25</sup>

<sup>21</sup> President of Russia Dmitri Medvedev, *Address to the Federal Assembly of the Russian Federation*, President of Russia, addresses to the Federal Assembly of 5.11.2008 [[http://archive.kremlin.ru/eng/speeches/2008/11/05/2144\\_type70029type82917type127286\\_208836.shtml](http://archive.kremlin.ru/eng/speeches/2008/11/05/2144_type70029type82917type127286_208836.shtml)]. See also YouTube, Medvėdėv: Iskander proti USA PRO v Evropě [‘Medvedev: Iskander against USA SDI in Europe’], 5 November 2008 [[www.youtube.com/watch?v=q6MkSjPWok8](http://www.youtube.com/watch?v=q6MkSjPWok8)].

<sup>22</sup> Sergei Balmasov, *Russia shows Iskander missiles to NATO*, Pravda.ru, 17.12.2010 [<http://english.pravda.ru/russia/politics/17-12-2010/116249-iskander-0/>]. See also RIA Novosti, *Russian army to receive 120 Iskander tactical missile systems*, 2.8.2011 [[http://en.rian.ru/military\\_news/20110802/165508090.html](http://en.rian.ru/military_news/20110802/165508090.html)] and RIA Novosti, *Russia to deploy Iskander missiles in all military districts*, 14.10.2010 [[http://en.rian.ru/military\\_news/20101014/160955507.html](http://en.rian.ru/military_news/20101014/160955507.html)].

<sup>23</sup> Минобороны России, *Ракетные войска и артиллерия* [‘Rocket troops and artillery, RT &A’] [<http://www.structure.mil.ru/structure/forces/ground/structure/rvia.htm>] and [<http://www.eng.mil.ru/en/structure/forces/ground/structure/rvia.htm>], (accessed on 24.1.2012).

<sup>24</sup> Carl Bildt, *Remarks by Carl Bildt at the Global Zero Summit*, Regeringskansliet, 2.2.2010 [<http://www.regeringen.se/sb/d/7417/a/138949>]. See also Carl Bildt and Radek Sikorski, *Next, the tactical nukes*, The New York Times, 1.2.2010 [<http://www.nytimes.com/2010/02/02/opinion/02iht-edbildt.html>].

<sup>25</sup> Eva Dahlberg, Martin Goliath, and Mårten Stenmark, *Några tekniska aspekter på ryska taktiska kärnvapen i Östersjöområdet*, FOI-R-- 3255-- SE, 12/2011. This report applies a method of assessing the effects of nuclear weapons on targets. One focus has been the interplay between damage radius and the accuracy of the missile system. The method is illustrated in connection with the Russian tactical missile systems Tochka and Iskander.



Russian suspicions of US missile defence plans were not dissipated in the wake of President Obama's new missile defence plans, supposedly lighter in comparison with those of the Bush administration. Russian Minister of Defence Anatoli Serdyukov said in Washington in September 2010 that 'our calculations show their missile shield is aimed against us'.<sup>26</sup> President Medvedev stated in his speech to the nation on 30 November 2010 that there are two possible alternatives for the coming decade:

"Either we reach an agreement on missile defence and create a full-fledged cooperation mechanism, or (if we can't come to a constructive agreement) we will see another escalation of the arms race. We will have to make a decision to deploy new attack forces. It is obvious that that would be a very unfavourable scenario."<sup>27</sup>

Thanks to the 'reset' policy in the early phase of the Obama administration, the United States, NATO, and Russia made rhetorical, hopeful statements on the possibilities of co-operation in missile defence for some time, but the parties were deadlocked in 2011. The United States and NATO continued development of the missile shield according to plan, despite the strong objections of Russia. Agreeing on practical questions seems particularly difficult. For example, Russia's proposal for splitting up missile defence into sectors with responsibilities carried accordingly, did not resonate well with the Western per-

ception.<sup>28</sup> Russia is already planning asymmetric countermeasures, and Kalinin-grad has again surfaced as it did in 2008. President Medvedev made the following statement on 23 November 2011:

"Regrettably, the USA and other NATO partners have not showed enough willingness to move in this direction. Rather than showing themselves willing to hear and understand our concerns over the European missile defence system at this stage, they simply repeat that these plans are not directed against Russia and that there is no point for us to be concerned. That is the position of the executive authorities, but[,] legislators in some countries openly state, the whole system is against Russia."<sup>29</sup>

President Medvedev then outlined a number of Russian countermeasures for application in the event that a mutually acceptable arrangement with the USA and NATO would not be found. The fifth and last point was the following:

"If the above measures prove insufficient, the Russian Federation will deploy modern offensive weapon systems in the west and south of the country, ensuring our ability to take out any part of the US missile defence system in Europe. One step in this process will be to deploy Iskander missiles in Kalinin-grad Region."<sup>30</sup>

<sup>26</sup> NTI Global Security Newswire, *U.S. missile defenses aimed at Russia, minister asserts*, 17.9.2010 [[http://gsn.nti.org/gsn/nw\\_20100917\\_6316.php](http://gsn.nti.org/gsn/nw_20100917_6316.php)].

<sup>27</sup> President of Russia, *Presidential Address to the Federal Assembly of the Russian Federation*, 30.11.2010 [<http://eng.kremlin.ru/transcripts/1384>].

<sup>28</sup> Pavel Felgenhauer, *Putin and Medvedev raise the prospect of a new arms race*, Eurasia Daily Monitor, Vol. 7, No. 215 (2.12.2010)

[[http://www.jamestown.org/programs/edm/single/?tx\\_ttnews%5Btt\\_news%5D=37229&tx\\_ttnews%5BbackPid%5D=484&no\\_cache=1](http://www.jamestown.org/programs/edm/single/?tx_ttnews%5Btt_news%5D=37229&tx_ttnews%5BbackPid%5D=484&no_cache=1)].

<sup>29</sup> President of Russia, *Statement in connection with the situation concerning the NATO countries' missile defence system in Europe*, 23.11.2011 [<http://eng.news.kremlin.ru/transcripts/3115>]. See also, RIA Novosti, *U.S., NATO have some 1,000 interceptor missiles – Rogozin*, 20.1.2012 [<http://en.rian.ru/world/20120120/170856516.html>].

<sup>30</sup> President of Russia, *Statement in connection with the situation concerning the NATO countries' missile defence system in Europe*, 23.11.2011 [<http://eng.news.kremlin.ru/transcripts/3115>].

President Medvedev returned to this speech on 20 March 2012, reaffirming Russia's policy.<sup>31</sup> Several Russian news media, citing news agency Interfax, reported on 25 January 2012 that preparations for the deployment of Iskander missiles in the Kaliningrad enclave have begun. According to Russian government newspaper *Rossiyskaya Gazeta*, the staff of the unit to be formed has already been designated by the General Staff and the first batch of missile complexes would be deployed in the second half of 2012.<sup>32</sup> The 152nd Guards Missile Brigade at Chernyakhovsk is the obvious choice for Iskander deployment.<sup>33</sup> This brigade is still equipped with the ageing short-range Tochka-U missiles, which are being phased out. Russia's foreign minister, Sergei Lavrov, let it be understood at the security conference in Munich in early February 2012 that the Russian decision to deploy Iskander missiles in Kaliningrad is dependent upon the US and NATO decision to go forward as planned: '[I]f everything goes ahead with missile defense as is planned in Washington and Brussels, then we would have to take measures.'<sup>34</sup>

<sup>31</sup> President of Russia, *Expanded meeting of the Defence Ministry Board*, 20.3.2012 [<http://eng.news.kremlin.ru/transcripts/3562>]. See also RIA Novosti, *Russia Repeats Iskander Deployment Threat*, 24.4.2012 [<http://www.en.rian.ru/world/20120424/173017483.html>].

<sup>32</sup> Юрий Гаврилов, *Ответ "Искандера"*, *Российская Газета*, 26.1.2012 [<http://www.rg.ru/2012/01/25/iskander-site.html>]. See also RT Newline, *Russia starts deploying Iskander missiles in Kaliningrad region*, 25.1.2012 [<http://rt.com/news/line/2012-01-25/#id25499>].

<sup>33</sup> Mikhail Barabanov, *Iskander the Great*, editorial, *Moscow Defense Brief*, No. 4, 2008 [<http://mdb.cast.ru/mdb/4-2008/>]. As for the Tochka-U missiles with the 152nd Guards Missile Brigade, see Warfare.ru, *Western Military District – OSC West* [<http://warfare.ru/?linkid=2225&catid=321>], (accessed on 25.1.2012).

<sup>34</sup> NTI Global Security Newswire, *NATO undeterred by Russian concerns on European missile shield*, 6 February 2012 [<http://www.nti.org>

An important question is why Russia was so adamant in keeping the issue of pulling out of the INF Treaty on the table in 2004–2008. If the dispute on missile defence remains unsolved, it is only a matter of time before the INF Treaty is again taken up. Russian leaders are fully aware that the Iskander issue is already controversial in view of the treaty, and that making full use of the missile's technical potential would be a clear breach of the agreement. The particular connection of the Iskander system (including its cruise-missile version, the Iskander-K) with the INF problem is substantiated by the fact that no other missile projects possibly belonging to this sphere have been referred to in public.

### **Military-operative and technical evaluation of the Iskander missile systems**

Definitions of tactical vs. non-strategic dual-use weapons are often ambiguous. It may, however, be useful here to refer to the Russian MFA definition, which distinguishes between non-strategic nuclear forces in the following manner:<sup>35</sup>

- Non-strategic nuclear weapons include all nuclear weapons which do not fall into the class of strategic nuclear weapons, that is, weapons with less than 5,500 km ranges, to include

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[/gsn/article/nato-undeterred-russian-concerns-missile-shield/](#)].

<sup>35</sup> Vladimir Rybachenkov, 'Nuclear Strategy of Russia,' Counsellor, Ministry of Foreign Affairs of the Russian Federation, *Lecture at the NATO School*, Oberammergau, 1.3.2001. See also Gunnar Arbman and Charles Thornton, *Russia's tactical nuclear weapons, part I: Background and policy issues*, FOI-R-- 1057-- SE, 11/2003,11 and Eva Dahlberg, Martin Goliath, and Mårten Stenmark, *Några tekniska aspekter på ryska taktiska kärnvapen i Östersjöområdet*, FOI-R-- 3255-- SE, 12/2011,13–14.

Tactical and Operational nuclear weapons.

- Tactical nuclear weapons are a class of nuclear weapons designed to engage objects in the tactical depth of enemy deployment (up to 300 kilometres) with the purpose of accomplishing a tactical mission. Under certain conditions, tactical nuclear weapons may be involved in the accomplishment of operational and strategic missions;
- Operational nuclear weapons are a class of nuclear weapons designed to engage objects in the operational depth of the enemy deployment (up to 600 kilometres) with the purpose of accomplishing an operational mission. Under certain conditions operational nuclear weapons may be involved in the accomplishment of strategic missions and, in exceptional cases, in the accomplishment of tactical missions.

Operational and tactical nuclear weapons are in service with the general-purpose forces. The technical assessment in this report primarily deals with the ballistic-missile system 9K720 Iskander-M, designed for the Russian Armed Forces, and touches upon the cruise-missile model Iskander-K, which uses the same Iskander launcher.<sup>36</sup> The shorter-range Iskander-E

<sup>36</sup> This technical evaluation is based mostly on the following sources: Duncan Lennox (ed.), *Iskander (SS-26 'Stone'/9M720/9M723 Tender)*, Jane's Strategic Weapons Systems, posted on 24.8.2011, and Mikhail Barabanov, *Iskander the Great*, editorial, Moscow Defense Brief, No. 4, 2008 [<http://mdb.cast.ru/mdb/4-2008/>].

model, intended for export, will receive less scrutiny.

When the Oka missile (9K714, OTR-23, SS-23 Spider) had to be 'sacrificed' under the INF Treaty, the missile's manufacturer in Kolomna, the machine-building design bureau (KBM) began looking for substitute activity for its production facility. The Sfera space-launch vehicle project for small satellites, with its design based on the Oka, did not prosper, but the engine developed in the project could be utilised in the development of a new ballistic missile.

The new missile was named Iskander after the Persian-language name of Alexander the Great. Testing of the missile began in October 1995, and the missile was reported ready for serial production already the following year. This estimate proved unrealistic.

It is somewhat unclear how the early versions of the missile evolved in the 1990s and whether they were ever brought into service. It appears that one of the first (9M720) had performance figures similar to the one meant for export – i.e., the Iskander-E (9M723E).<sup>37</sup> Improvement of the Iskander missile system has been an ongoing process.<sup>38</sup> The present, rather small inventory of missiles may, therefore, repre-

<sup>37</sup> This technical evaluation is based mostly on the following sources: Duncan Lennox (ed.), *Iskander (SS-26 'Stone'/9M720/9M723 Tender)*, Jane's Strategic Weapons Systems, posted on 24.8.2011, and Mikhail Barabanov, *Iskander the Great*, editorial, Moscow Defense Brief, No. 4, 2008 [<http://mdb.cast.ru/mdb/4-2008/>]. See also the very informative Military Russia database. Military Russia - ОТЕЧЕСТВЕННАЯ ВОЕННАЯ ТЕХНИКА (после 1945г.), 9K720 Искандер – SS-26 Stone, 28.12.2011 [<http://military.tomsk.ru/blog/topic-185.html>].

<sup>38</sup> Ярослав Вяткин, *Новые «Искандеры» передают горячий привет Польше и Грузии* [‘New “Iskander” conveys warm greetings to Poland and Georgia’], Аргументы Недели, 19.10.2011 [<http://www.argumenti.ru/army/n311/131376>].

sent a fairly broad range of performance capabilities. Perhaps the first public mention of series production of missile engines came only in February 2009.<sup>39</sup>

It is now openly admitted that the Iskander is actually a modernised version of the Okatactical missile system.<sup>40</sup> The Oka was one of the most successful Soviet operational-tactical missile projects. The system was autonomous, it used a self-propelled platform with amphibious capability, and its small dimensions meant that Il-76 transport aircraft could deliver it anywhere.

The Iskander is, naturally, a weapons system of an entirely different capability than the old SS-21 Tochka missiles, which entered service in the 1970s and whose range is 120 kilometres.<sup>41</sup> However, the Iskander is said to be superior to the SS-23 missile too in all respects.<sup>42</sup> One clear dif-

ference was that the Iskander launcher can carry two missiles whereas the SS-23 launcher only had room for one. An Iskander launcher is capable of launching both missiles within approximately one minute. This kind of firepower affords significant tactical advantages in practical combat situations: a target's destruction can be ensured by firing both missiles at the same target.

In August 2011, it was reported that six operational-tactical Iskander systems had been completed in 2010 and that, in total, 120 more missile systems would be procured as part of the rearmament programme extending to 2020.<sup>43</sup> This is enough for 10 missile brigades (as noted above, a missile brigade at full strength has 12 launchers). In April 2011, it was reported that there were 75 missiles operational and 30 launchers in service.<sup>44</sup>

Prime Minister Medvedev visited the Kolomna Machine-Building Bureau (KBM) in July 2012, which produces Iskander-M missile systems.

“This is a unique plant and it's clear that it has been in its business for a long time. But

<sup>39</sup> RIA Novosti, *Russia boosts production of engines for Iskander-M missiles*, 6.2.2009 [<http://en.rian.ru/russia/20090206/120017916.html>].

<sup>40</sup> Ольга Божьева, *Возрождение ракетного комплекса*, Московский комсомолец, 8.9.2011 [<http://www.mk.ru/politics/article/2011/09/07/621622-vozhrozhdenie-raketnogo-kompleksa.html>]. For an English translation, see *Revival of the missile system*, Defense & Security, No. 246 (12.9. 2011) [<http://dlib.eastview.com/browse/doc/25964145>].

<sup>41</sup> Oleg Artyukov, *Why does Russia need Iskander systems*, Pravda.ru, 20.10.2011 [[http://English.pravda.ru/russia/politics/20-10-2011/119390-russia\\_iskander-0/](http://English.pravda.ru/russia/politics/20-10-2011/119390-russia_iskander-0/)]. ‘Iskander outstrips the predecessor on all indices such as the shooting accuracy and the range of fire, the weight, the ammunition state, the speed of movement and others’, Col. Andrei Bobrun, spokesman for the Western Military District, is quoted as saying.

<sup>42</sup> Wikileaks Global Intelligence Files, [*STRATFOR Eurasia*] [*Fwd:INSIGHT - RUSSIA Iskander Missile*], [[http://wikileaks.org/gifiles/docs/1739377\\_-eurasia-fwd-insight-russia-iskander-missile-.html](http://wikileaks.org/gifiles/docs/1739377_-eurasia-fwd-insight-russia-iskander-missile-.html)]. The mail, written by researcher Lauren Goodrich and building on information given by an inside Russian source stated: “The Iskandar is of great use to Russia and much focus. It has been highly successful both technologically and strategi-

cally. They consider the Iskander the most effective and deadly nonstrategic (and even perhaps strategic) ballistic missile in existence. It is better than the Oka, which worried the US so much because of its accuracy. But the Iskander is considered so much better. INF wiped out the Oka, but the Iskander falls underneath the INF-for now. The Oka was/is to replace the Elbrus, Tochka and Tochka-U and now the Iskandar replaces them both, but with a new and more modern highly accurate propellant of a short-range ballistic missile with a range of 500 km”.

<sup>43</sup> RIA Novosti, *Russian army to receive 120 Iskander tactical missile systems*, 2.8.2011 [[http://en.rian.ru/mlitary\\_news/20110802/165508090.html](http://en.rian.ru/mlitary_news/20110802/165508090.html)]. See also *Iskander (SS-26 'Stone'/9M720/9M723Tender)*, Jane's Strategic Weapon Systems, posted on 24.8.2011.

<sup>44</sup> Duncan Lennox (ed.), *Iskander (SS-26 'Stone'/9M720/9M723 Tender)*, Jane's Strategic Weapons Systems, posted on 24.8.2011.

[...] one can see that it has recently been re-tooled; [...]. The missile system itself, [...] is being improved, new types of missiles are being built for it, and the system's combat and performance characteristics are being expanded. In short, the Iskander-M is clearly among the most effective weapons in its class and we consider it to be much better than its foreign analogues. It should form the core of the Land Forces' missile group."<sup>45</sup>

Medvedev's remarks in Kolomna and investments made to enhance missile production significantly indicate that the procurement plans have become more realistic.

In October 2011, it was reported that the first missile brigade fully equipped with Iskander systems (the 26th Missile Brigade) was in operational readiness at Luga, in Russia's Western Military District.<sup>46</sup> The brigade was at full strength, according to an announcement by the Russian Ministry of Defence on 20 October 2011.

<sup>45</sup> Russian Prime Minister Dmitry Medvedev's comment on 23 July 2012 [<http://government.ru/eng/docs/19764/>]. See also RIA Novosti, *Medvedev Calls for Faster Rearmament*, 24 July 2012 [[http://en.rian.ru/military\\_news/20120723/174740545.html](http://en.rian.ru/military_news/20120723/174740545.html)].

<sup>46</sup> David C. Isby, *Russia tests artillery rockets during major exercise*, Jane's Missiles & Rockets, posted on 1.11.2011; Министерство обороны Российской Федерации, *На полигоне, расположенном на территории Ленинградской области, началось тактическое учение ракетного соединения Западного военного округа*, 20.10.2011 [<http://structure.mil.ru/structure/okruga/west/news/more.htm?id=10745977@egNews>]; Lyudmila Aleksandrova, *Iskander complexes may prove Russia's response to US missile defense in Europe*, ITAR-TASS, 20.10.2011 [<http://www.itar-tass.com/en/c39/252346.html>]; Andrei Garavski, *«Искандер» на западных рубежах* [“Iskander” at the Western borders], *Krasnaya Zvezda*, 21.10.2011 [[www.redstar.ru/2011/10/21\\_10/1\\_04.html](http://www.redstar.ru/2011/10/21_10/1_04.html)]; and Oleg Artyukov, *Why does Russia need Iskander systems*, *Pravda.ru*, 20.10.2011 [[http://english.pravda.ru/russia/politics/20-10-2011/119390-russia\\_iskander-0/](http://english.pravda.ru/russia/politics/20-10-2011/119390-russia_iskander-0/)].

The 630th Training Missile Battalion performed Iskander missile firings at the Kapustin Yar missile test range in early November 2011 for the purpose of testing a new terminal guidance system to improve accuracy significantly.<sup>47</sup> ‘The guided missile is homed ‘by photo’ [and] compares the actual view to a pre-loaded digital image of the target,’ according to a spokesperson for the General Staff. The technology is similar to the US Digital Scene-Mapping Area Correlator (DSMAC) employed by US cruise missiles before the era of GPS targeting.

The new Russian terminal guidance device helped to improve the accuracy of the Iskander missile twofold, to within five metres.<sup>48</sup> The versions deployed so far have a circular error probable (CEP) of 10 metres. The improved accuracy makes the Iskander more efficient against various targets. With such pinpoint accuracy, a warhead weighing 500 kilos means assured destruction of almost any enemy target, including bunkers and buried targets. The list of objects whose destruction could be guaranteed is significantly expanding.<sup>49</sup>

<sup>47</sup> Ярослав Вяткин, *Новые «Искандеры» передают горячий привет Польше и Грузии* [‘New “Iskander” conveys warm greetings to Poland and Georgia’], *Аргументы Недели*, 19.10.2011 [<http://www.argumenti.ru/army/n311/131376>]; see also *Известия*, *«Искандер» научили взрывать метро по фотографии*, 13.11.2011 [<http://izvestia.com/news/506652>] and *Russia Today*, *‘Fly-by-photo’ Iskander missile test-fired*, 15.11.2011 [<http://rt.com/news/iskander-missile-photo-test-361/>].

<sup>48</sup> Duncan Lennox (ed.), *Iskander (SS-26 ‘Stone’/9M720/9M723 Tender)*, Jane's Strategic Weapons Systems, posted on 24.8.2011. The Iskander-M CEP has an accuracy of 2–5 metres, according to Jane's.

<sup>49</sup> *Известия*, *«Искандер» научили взрывать метро по фотографии*, 13.11.2011 [<http://izvestia.com/news/506652>] and *Russia Today*, *‘Fly-by-photo’ Iskander missile test-fired*, 15.11.2011 [<http://rt.com/news/iskander-missile-photo-test-361/>].

According to Izvestia, citing a General Staff source, the Luga missile brigade will be the first unit to get these new scene-matching precision missiles, beginning in 2012.

Other terminal guidance methods are being developed alongside optical terminal guidance. The objective is to be able to feed target information to the missile in real time via data link and target acquisition to Unmanned Aerial Vehicles (UAV).<sup>50</sup> Good results can probably be achieved already in the next few years with the Glonass satellite navigation system. It is probably only a matter of time before the same five-metre CEP can be achieved against fixed targets, and maybe even some moving targets.<sup>51</sup> Since the flight time of the missile to a target at a range of 500 km is only around six minutes, it is eminently suitable for surprise strikes against various vital enemy targets.<sup>52</sup>

There is a versatile selection of warheads available for the missile. They include 480 kg and 700 kg conventional warheads, a high-yield fuel-air warhead, several cluster munitions or submunition dispenser warheads (which are detonated at a height of approximately one kilometre

above the target) an EMP warhead, and – semi-officially – a nuclear warhead.<sup>53</sup>

Public information on the Iskander-M is slightly contradictory. The weight of the Iskander-E is stated to be 3,800 kg; that of the missile stage (engine included) comes to 3,320 kg, since the weight of the largest warhead approved for export is the above-mentioned 480 kg.<sup>54</sup> The missile stage of the model M is assumed to be identical to that of the model E. The basic warhead of the Russian Armed Forces Iskander-M model has been stated to weigh 700 kg. According to one Russian defence source, the maximum weight of the Iskander-M would, however, be no less than 4,615 kg, which

<sup>50</sup> RIA Novosti, *Russia starts tests of target designer for Iskander missiles*, 28.1.2009 [<http://en.rian.ru/russia/20090128/119844577.html>].

<sup>51</sup> Naturally, this also applies to future cruise-missile versions of the Iskander.

<sup>52</sup> Andrei Garavski, «Искандер» на западных рубежах [“Iskander” at the Western borders’], *KrasnayaZvezda*, 21.10.2011 [[http://www.redstar.ru/2011/10/21\\_10/1\\_04.html](http://www.redstar.ru/2011/10/21_10/1_04.html)]. An excerpt translates as: ‘The mobile Iskander missile-artillery system is designed for use in precision strikes against ground-based targets such as command posts, large force concentrations, firing positions, air and missile defence facilities, and helicopters and aircraft at airfields. The Iskander missiles can be transported by all available transport means, including aircraft. This weapons system has high tactical manoeuvrability, owing to its terrain-worthy transport vehicle’.

<sup>53</sup> Sergei Balmasov, *Russia shows Iskander missiles to NATO*, *Pravda.ru*, 17 December 2010 [<http://english.pravda.ru/russia/politics/17-12-2010/116249-iskander-0/>]. See also RIA Novosti, *Russian army to receive 120 Iskander tactical missile systems*, 2 August 2011 [[http://en.rian.ru/mlitary\\_news/20110802/165508090.html](http://en.rian.ru/mlitary_news/20110802/165508090.html)] and RIA Novosti, *Russia to deploy Iskander missiles in all military districts*, 14.10.2010 [[http://en.rian.ru/mlitary\\_news/20101014/160955507.html](http://en.rian.ru/mlitary_news/20101014/160955507.html)]. A possible nuclear warhead is the 372 kg warhead for the Oka missile (SS-23 Spider): Military Russia, *9K714 Oka – SS-23 Spider* [<http://militaryrussia.ru/blog/topic-183.html>].

<sup>54</sup> According to the MTCR (Missile Technology Control Regime) agreement, the export of all devices with a range of more than 300 km or a warhead weighing more than 500 kg is banned. It seems that no official announcement has been made on how the Iskander-E missile's speed will be limited such that the 300 km range limit would not be broken. It is possible that the model E is equipped with thrust termination which is automatically triggered as the missile approaches the allowed speed limit. Another possibility is that the export model is, in fact, an early version of the missile that uses lower-energy-grade fuel. Ярослав Вяткин, *Новые «Искандеры» передают горячий привет Польше и Грузии* [‘New “Iskander” conveys warm greetings to Poland and Georgia’], *Аргументы Недели*, 19.10.2011 [<http://www.argumenti.ru/army/n311/131376>].

could imply a heavy penetrating warhead weighing about 1,300 kg.<sup>55</sup>

There is some speculation about the design of the missile. One authoritative source describes the Iskander-M as a 'short-range, road-mobile, two-stage, solid-propellant single warhead missile'.<sup>56</sup> This is most probably not the case.<sup>57</sup> The missile flies in one piece for its entire trajectory. Terminal guidance is achieved through vanes.

The acknowledged Russian defence-industry magazine *Moscow Defense Brief* writes that a single-stage, solid-propellant Soyuz NPO missile engine powers the missile. Thrust at take-off is classified, but there are several useful flight videos available, which may be used to assess the missile's initial acceleration.<sup>58</sup> A crude estimate is 4g, which indicates that thrust is approximately 20 tonnes (200 kN) at take-off.

In practice, no missile is subject to aerodynamic drag at altitudes above 50 kilometres and, hence, aerodynamic steering is not possible at these altitudes. The missile follows a ballistic trajectory in this phase of the flight. In a number of operational missions, the Iskander missile is,

however, powerful enough to use a lower quasi-ballistic trajectory, staying at altitudes below 50 kilometres while remaining within the allowed maximum range of 500 kilometres stipulated by the INF Treaty.

The missile is claimed to be capable of performing violent manoeuvres in the terminal stage of flight, which would greatly complicate the enemy's chances of destroying the missile with anti-ballistic missiles. A low trajectory also affords the tactical advantage of the missile remaining in radar shadow for considerably longer than it would on a higher, so-called minimum-energy trajectory optimised for range. This shortens the reaction times of the defence.

According to official information, the Iskander-M missile's engine burns for 25 seconds and the missile reaches the terminal speed of 2.1 km/s at an altitude of 12–15 kilometres, presumably with a 700 kg warhead.<sup>59</sup> The speed of the missile at burn-out is the crucially important single parameter, unambiguously determining the maximum range of the missile. For this reason alone, it is prudent to estimate the burn-out speed from physical-technical principles.

Russian missile technology is well-known for its high standard. It can safely be assumed that the Iskander, representing new technology, is technically at least comparable to the known US solid-propellant missiles (e.g., the Minuteman III) or Space Shuttle solid rocket boosters, which represent 1970s technology. According to Israeli missile designer Uzi Rubin, Space Shuttle solid rocket booster performance values and weight ratio make for an excellent compari-

<sup>55</sup>Military Russia - ОТЕЧЕСТВЕННАЯ ВОЕННАЯ ТЕХНИКА (после 1945г.), 9К720 Искандер – SS-26 Stone, 28.12.2011 [<http://military.tomsk.ru/blog/topic-185.html>].

<sup>56</sup>Duncan Lennox (ed.), *Iskander (SS-26 'Stone')/9M720/9M723 Tender*, Jane's Strategic Weapons Systems, posted on 24.8.2011.

<sup>57</sup> Experienced Israeli missile engineer Uzi Rubin regards the Iskander-M to be a single-stage missile, without any hesitation. Private communication, August 2010. See also the Military Russia database. Military Russia - ОТЕЧЕСТВЕННАЯ ВОЕННАЯ ТЕХНИКА (после 1945г.), 9К720 Искандер – SS-26 Stone, 28.12.2011 [<http://military.tomsk.ru/blog/topic-185.html>].

<sup>58</sup> YouTube, *Iskander SS-26 (Искандер-Э)*, uploaded 30.5. 2009 [[http://www.youtube.com/watch?v=kPyIMhDy\\_bs&feature=related](http://www.youtube.com/watch?v=kPyIMhDy_bs&feature=related)]; see also YouTube, *Iskander SRBM*, uploaded 14.7.2009 [<http://www.youtube.com/watch?v=8EkJWtbHgFE&feature=related>].

<sup>59</sup> When the stated launch weight of the missile is 4,020 kg and the missile stage weighs 3,320 kg, the difference is the weight of the warhead, 700 kg.

son when one is evaluating the performance of the Iskander missile.<sup>60</sup>

The burn-out velocity achieved by a missile is determined by the propellant's exhaust-gas discharge speed and the propellant's weight as a percentage of the missile's total weight. Missiles and launch vehicles usually use an ammonium per chlorate composite propellant. The velocity reached by a rocket or missile is directly proportional to the speed at which the combustion gases flow from the combustion chamber. In the case of Space Shuttle solid rocket boosters, the gas exhaust speed is 2.4–2.65 km/s.<sup>61</sup>

Although the United States have been ahead of the Soviet Union and Russia in solid propellant missile technology, Russia has made marked advances.<sup>62</sup> That is why the performance values given above for the Iskander missile raise questions. The propellant (gas exhaust speed below 2.3 km/s) would be comparable only to the US Navy's vintage Polaris A1 missile of more than half a century ago or Iran's new Sejil missile

today.<sup>63</sup> This is not credible. The mass-fraction of the propellant with regard to the entire missile-stage weight is the other factor affecting a missile's burnout velocity. The higher the propellant/weight ratio, the more effective the missile/rocket. The fuel in a Space Shuttle solid rocket booster accounts for approximately 85 per cent of the total weight, which is a typical figure for other missiles as well, such as the Minuteman III and some stages of Trident missiles. This weight ratio is probably quite representative for the Iskander missile also.

In our most conservative calculation<sup>64</sup> it is assumed that the energy-efficiency of the Iskander missile propellant is only at a level comparable to the Iranian Sejil missile. In this case, combustion-gas flow speed at sea level is 2.25 km/s, which makes for an average of 2.37 km/s for the entire boost phase. The basic Iskander-M warhead (700 kg) was chosen as the warhead. The missile's maximum range stayed within the parameters of the INF Treaty only in this extreme case. The result was slightly more than 450 kilometres.

<sup>60</sup> Uzi Rubin, private communication, 19–20.8.2010.

<sup>61</sup> NASA, *Solid rocket boosters* (NASA Facts, SRB Stats box at [[http://www.nasa.gov/returntoflight/system/system\\_SRB.html](http://www.nasa.gov/returntoflight/system/system_SRB.html)]). See also Wikipedia, *Space Shuttle solid propellant booster*, version of 9.9.2010 [[http://en.wikipedia.org/wiki/Space\\_Shuttle\\_Solid\\_Rocket\\_Booster](http://en.wikipedia.org/wiki/Space_Shuttle_Solid_Rocket_Booster)]. The lower figure has been obtained at sea level, where atmospheric pressure resists the combustion gases' flow from the combustion chamber. The higher figure is valid above the atmosphere – i.e., in a near vacuum.

<sup>62</sup> The strategic Topol-M and RS-24 Yars missiles are modern, solid-propellant missiles. A prerequisite for the graceful hull design of the new Borei-class submarines, as with Western missile submarines, is a sufficiently powerful propellant for the Bulava. This is the only way to keep the Bulava's length reasonable without a reduction in range. Western naval ballistic missiles have typically been 10–13 metres in length. The Bulava's length is probably 12–13 metres.

<sup>63</sup> J.D. Hunley, *The development of propulsion technology for U.S. space-launch vehicles, 1926–1991*, Texas A&M University Press, USA, 2007,241 (ISBN 13: 978-1-58544-582-2) and International Institute for Strategic Studies (IISS), *Iran's ballistic missile capabilities – a net assessment*, IISS Strategic Dossier, London, 2010,57.

<sup>64</sup> The results are based on the application of US MIT physicist Dr Geoffrey Forden's code for calculating missile trajectories (Geoffrey Forden, *GUI Missile Flyout: A general program for simulating ballistic missiles*, Science and Global Security, Vol. 15 (2007), 133–146), on one hand, and on my own back-up calculations, in which physically sensible assumptions were made as to the shape of the missile trajectory and development of engine thrust, on the other. I have striven to take the effect of Earth's gravity and, especially, air resistance into account as realistically as possible. The writer thanks Eero Tamminen, D.Sc. (Tech.), and missile engineer Uzi Rubin for their extremely valuable assistance.



In the case of a realistic propellant (cf. Space Shuttle solid rocket boosters), when the average combustion-gas flow speed would be 2.50 km/s, the missile would already have a range of approximately 520 km – i.e., be over the INF limit. When a lighter, 480 kg conventional warhead, or a nuclear warhead weighing around 400 kg (the SS-23 nuclear warhead weighed 372 kg), was used in the calculations, a range of at least 600 kilometres was the result with ‘poor’ propellant, and approximately 750 kilometres (with a nuclear warhead) was found with realistic propellant values. This makes the results compatible with unofficial US estimates, according to which the Iskander's range is approximately 700 km.<sup>65</sup>

The solid propellant of the SRMU (Solid Rocket Motor Upgrade) engines of the Titan IV B launch vehicle, developed by the United States in the early 1990s, is over 10 per cent more effective than Space Shuttle solid rocket booster propellant.<sup>66</sup> It is likely that the propellant of new Russian strategic missiles such as the Topol-M and the Bulava is at least near this technical level. With a new propellant, the next possible development model of the Iskander, which might be called the Iskander-U, could well reach a range of 1,000 kilometres.

The former commander of Russia's Artillery and Rocket Forces, Colonel General Vladimir Zaritsky, openly admitted in an interview with *Nezavisimaja Gazeta* in November 2007 that the Iskander missile has considerably more potential than has been announced and that its range can also be increased if the political decision to pull

<sup>65</sup> This information was communicated to me by knowledgeable sources in 2010.

<sup>66</sup> The combustion-gas flow speed of the Titan IV B's SRMU engines is 2.8 km/s at sea level. *Titan IV*, Wikipedia [[http://en.wikipedia.org/wiki/Titan\\_IV](http://en.wikipedia.org/wiki/Titan_IV)]. See also *Titan IVB – specifications*, Space and Tech [[http://www.spaceandtech.com/spacedata/elvs/titan4b\\_specs.shtml](http://www.spaceandtech.com/spacedata/elvs/titan4b_specs.shtml)].

out of the INF Treaty is made.<sup>67</sup> According to the magazine's experts, the range can be extended to 1,000 kilometres without changes to the launcher.

In a combat situation, operational and tactical factors may make it advantageous to launch an Iskander missile at a low trajectory. In such a case, the range may remain within the permissible 500 kilometres. Achieving a certain range on a low trajectory requires considerably more speed of a missile than does achieving the same range on a minimum-energy trajectory.<sup>68</sup> In addition, air resistance affects speed on a low trajectory more than it would on a higher, minimum-energy one. These kinds of operational decisions are not, however, valid measures of compliance with INF Treaty criteria.

The Iskander-M undoubtedly has the potential to fly well beyond the allowed maximum range, but that doesn't yet imply Russia violating the INF Treaty. So far, there are no confirmed reports that the Iskander-M would have been tested at ranges beyond 500 kilometres. For the time being, this decides the matter from a legal standpoint.

One might also raise the question of whether a Russian military commander would have confidence in a weapon that has not been tested to its full potential, if the military-operational situation at hand demanded missile employment at maximum range.<sup>69</sup> Testing of updated versions of the

<sup>67</sup> Viktor Myasnikov, *Full reverse*, Defense & Security, No. 131 (23.11.2007) [<http://dlib.eastview.com/browse/doc/12998773>].

<sup>68</sup> The matter can easily be understood if one considers the different methods of using artillery. Indirect fire has a far greater range than does direct fire. Firing angle is a crucially important parameter.

<sup>69</sup> Uzi Rubin in private communication of 17.5.2011: “Good confidence can be achieved by testing to less than maximum range, provided that the missile goes through all the flight stages, its trajectory shaping is similar to a full range shaping,

Iskander-M missile complex started in October 2011. Special precautions are taken to deny others from observing the tests. The missile launches are performed in the early hours in almost complete darkness at a time when there are no U.S. satellites overhead.<sup>70</sup>

The Iskander system's development plan also includes a cruise-missile version, the Iskander-K, launched from the same launcher, which was still in the development stage in 2011. The system will have 4-6 launch tubes per launcher. An Iskander-K equipped with a Club-K cruise missile was successfully launched in May 2007. It hit its target 360 kilometres away. If other proven missiles of the R-500 family were used instead, the range could be several times longer<sup>71</sup>. The Russian Air Force's strategic cruise missiles (Kh-55) and the Navy's Granat (SS-N-21) cruise missiles, whose range is 2,600 kilometres, belong to this family.<sup>72</sup> The ground-launched RK-55

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the flight structural and thermal loads are reasonably close to the maximum ones, and that the missile is fully instrumented with stress and thermal sensors whose information is fully recoverable from telemetry. In that case, the engineers can extrapolate from the flight data to the expected full range parameters and judge the margins of safety at full range. This, however, is the engineering answer. The military mind works differently, and more often than not the military would refuse to accept any performance parameter that has not been proved in test”.

<sup>70</sup> Ярослав Вяткин, *Новые «Искандеры» передают горячий привет Польше и Грузии* [‘New “Iskander” conveys warm greetings to Poland and Georgia’], Аргументы Недели, 19.10.2011 (<http://www.argumenti.ru/army/n311/131376>). See also Дмитрий Фадеев, “Искандер-М”. Запуск обновлённого комплекса (‘Iskander-M. Launch date set’), TVZVEZDA.ru, 11.10.2011 [<http://www.youtube.com/watch?v=llf5fwOTYoM>].

<sup>71</sup> Ibid. See also *Iskander-K*, Military Russia [<http://military.tomsk.ru/blog/topic-304.html>].

<sup>72</sup> Stratfor researcher Lauren Goodrich wrote the following interesting comment in a email in November 2009: “Now the developers of the Iskander

Relief (SSC-4) cruise missile eliminated with the implementation of the INF Treaty was in a similar performance category.

### **Use of the Iskander missile in the Russo-Georgian War**

In the Russo-Georgian War of August 2008, Russia used tactical ballistic missiles operationally. The older SS-21 Tochka missiles had already been used in the wars in Chechnya, but this war afforded the first possibility to test the new Iskander system in a real combat environment. This indeed was done, although Russia has not officially admitted to using Iskander missiles in Georgia.<sup>73</sup> Deputy Chief of the General Staff, Col. Gen. Anatoli Nogovitsyn strongly denied the use of tactical ballistic missiles in the Georgian conflict:

“I unequivocally dismiss media rumours [that] the Iskander and Tochka-U launchers were used for attacks against targets in Georgia,” he said. ‘Let me say once again, the Iskander launcher is not a weapon organic to the 58th army of the North Caucasus Military District. As for Tochka-U, it proved unneces-

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system are toying with further development of its warfighting capabilities, including the integration of the high-precision R-500 subsonic cruise missile. The R-500 is a more conventional version of the old Soviet 3M10 long-range cruise missile with a range of 2600 km, which was put on the Russian nuclear attack subs. These [RK-55 Relief CMs, this author’s observation] were eliminated also under INF - for now. This testing will be wrapped up by the end of 2009, since it has been successful thus far. After that it is a political decision in whether to put it into service, though 6 missiles with the R-500s are already ready to be implemented.” Wikileaks Global Intelligence Files, [STRATFOR Eurasia] [Fwd: INSIGHT - RUSSIA - Iskander Missile], [[http://wikileaks.org/gifiles/docs/1739377\\_-eurasia-fwd-insight-russia-iskander-missile-.html](http://wikileaks.org/gifiles/docs/1739377_-eurasia-fwd-insight-russia-iskander-missile-.html)].

<sup>73</sup> Mikhail Barabanov, *Iskander the Great*, editorial, Moscow Defense Brief, No. 4, 2008 [<http://mdb.cast.ru/mdb/4-2008/>].

sary, because other attack means available were quite enough to hit Georgian targets in the conflict zone.”<sup>74</sup>

The denial of operational use of the Iskander missile in Georgia later evolved into endorsement of the capability of the missile system. Voice of Russia reported on 23 November 2011:

“Russian officials have admitted to using the Iskander missile against Georgia, and official reports testify to the high effectiveness of the Iskander missiles, as one of the most devastating and accurate weapons in the Russian arsenal.”<sup>75</sup>

According to *Moscow Defense Brief* magazine, the 630th Training Missile Battalion of the 60th Combat Training Center belonging to the Artillery and Rocket Forces of the North Caucasus Military District, equipped with the Iskander missile systems, launched several Iskander missiles equipped with conventional warheads and cluster munitions at targets in Georgia. The strike against the Georgian Separate Tank Battalion base in Gori is said to have been quite successful, with 28 tanks destroyed.<sup>76</sup> These numbers have not been independently confirmed.

In addition to the above, the strike against the Baku–Supsa oil pipeline on 12 August 2008, which apparently was unsuc-

cessful, should be mentioned.<sup>77</sup> The pipeline was also repeatedly a target of the Russian Air Force. Missile strikes against Georgian air bases were nevertheless effective.<sup>78</sup>

The surprise missile strike against the Gori city centre on 12 August 2008 received especially great international attention.<sup>79</sup> The city was almost completely evacuated, and most of those present were journalists reporting on the war, not Georgian soldiers or other military targets.<sup>80</sup> The strike killed more than 10 people, including a cameraman with the Dutch television company RTL.

Russian Armed Forces Iskander missiles equipped with cluster munitions were used in the strike. According to German missile expert Robert Schmucker, recovered missile fragments indicate at least 2–3 missiles having been fired.<sup>81</sup> Approximately

<sup>77</sup> Government of Georgia, *Russian invasion of Georgia: Russian SS-21 and SS-26 missiles used against Georgia*, 17.11.2008 [http://georgiaupdate.gov.ge/doc/10006919/Iskander%2017.11.pdf].

<sup>78</sup> Uzi Rubin, personal communication 19-20.8.10.

<sup>79</sup> YouTube, *Russian SS-26 'ISKANDER' killed Stan Storimans & Georgians (2008)* [http://www.youtube.com/watch?v=W33sormX3jc] This video is taken from RTL reporter Jeroen Akkermans's programme *RTL Nieuws Special: ONDERZOEK IN GORI:DE DOOD VAN STAN STORIMANS*, 12.8.2009. [http://www.rtl.nl/components/actueel/rtnieuws/miMedia/208632/208633.public.27801717.RTL\_Nieuws\_Special\_Onderzoek\_In\_Gori\_-\_De\_Dood\_Van\_Stan\_Storimans\_s1\_a1.xml].

<sup>80</sup> Georgian army units had retreated from Gori in a state of near-panic the previous evening. There were no other Georgian soldiers in Gori than a token number overseeing the evacuation. The pictures by Akkermans and Storimans speak for themselves (see YouTube, *Russian SS-26 'ISKANDER' killed Stan Storimans & 12 Georgians No3*. [www.youtube.com/watch?v=PanUNlZyCw8])

<sup>81</sup> *RTL Nieuws Special: ONDERZOEK IN GORI: DE DOOD VAN STAN STORIMANS*, 12.8.2009. [http://www.rtl.nl/components/actueel/rtnieuws/miMedia/208632/208633.public.27801717.RTL\_Nieuws\_Special\_Onderzoek\_In\_Gori\_-

<sup>74</sup> BBC Monitoring International Reports (ITAR-TASS news agency, Moscow, 26.8. 2008), *Russia denies using Iskander, Tochka-U missiles against Georgia*, 26.8.2008 [http://www.accessmylibrary.com/article-1G1-188169914/russia-denies-using-iskander.html].

<sup>75</sup> Andrei Kislyakov, *We all have bombs*, Rysslands röst (Voice of Russia), 23.11.2011 [http://english.ruvr.ru/radio\_broadcast/36564197/60966381.html].

<sup>76</sup> Ibid, see also note 73.

20 cluster munitions, in total, exploded around Gori's market place. These were propelled by a type of rocket that is apparently found only in Russia's military arsenal.<sup>82</sup> A research commission set up by Dutch Minister of Foreign Affairs Maxime Verhagen came to this conclusion in October 2008.

“The missile strike left behind quite intact and recognisable missile fragments with legible markings as undeniable evidence. This is characteristic of missiles carrying cluster munitions.”<sup>83</sup>

## Conclusions

Russian defence planning attaches both an effective offensive conventional role as well as an important nuclear deterrent role for the Iskander missile system in various parts of Russia's vast territory. Tactical ballistic missiles and cruise missiles excellently complement strike and ground attack air forces.<sup>84</sup> This is one reason why

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[De\_Dood\_Van\_Stan\_Storimans\_s1\_a1.xml]. The news special was presented by RTL reporter Jeroen Akkermans, a colleague of the cameraman killed in the strike.

<sup>82</sup> Permanent Mission of the Kingdom of the Netherlands to the United Nations, *Dutch cameraman was killed by Russian cluster bomb*, 21.10.2008 [<http://www.netherlandsmission.org/article.asp?articleref=AR00000462EN>], [<http://www.netherlandsmission.org/listing.asp?level=1&categoryvalue=newevents>]. See also *Report of the Storimans investigative mission*, The Hague, 20.10.2008 [<http://www.minbuza.nl/dsresource?objectid=buzabeheer:32226&type=pdf>].

<sup>83</sup> *ibid.* 81.

<sup>84</sup> Recent wars have shown convincingly that only prohibitively expensive stealth aircraft can penetrate heavily defended enemy airspace without suffering more than token losses. Long-range stand-off weapons are needed to defeat the air defence; only then can a more traditional bombing campaign be undertaken with impunity, using free-fall ‘dumb’ gravity bombs or laser-guided weapons.

Russian leaders long sought an understanding with the United States for pulling out of the INF Treaty.

Russia's experience of suspending the Conventional Forces in Europe Treaty (CFE) in 2007 is, however, encouraging as the Western reaction has remained so unimpressive that the suspension can be continued without noticeable repercussions.<sup>85</sup> Russia may interpret the latter to mean that the INF Treaty too is, rather irrelevant in the view of the United States. For the time being Russia seems to have changed policy and the INF Treaty issue no longer is such a high profile issue as it was a few years ago. It does not seem to limit the implementation of Russia's Iskander deployment plans in any meaningful way. Western indifference is conspicuous.<sup>86</sup>

The operational deployment of Iskander systems in Finland's neighbourhood is a serious matter. It is a clear signal of the growing military importance of Russia's western direction. The missile system's role as a dual-purpose weapon – Luga has an obvious capacity for storing nuclear warheads – speaks of Russia's ability to use the weapons system as political leverage. Russian pressure on European states committed to the United States and NATO's missile defence plans is a good example of this.

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<sup>85</sup> RIA Novosti, *Russia's CFE treaty moratorium to remain in place – defence minister*, 17.9.2010 [<http://en.rian.ru/russia/20100917/160620094.html>].

<sup>86</sup> US Colonel (Retd) Sam Gardiner thinks it unlikely that the West would, at this time, have the political will to raise the Iskander issue. The matter does not evoke interest, even in military circles. ‘I raised the Iskander range as an issue in the seminars I did for the air forces of the region in both Stockholm and Tallinn, as well as the USAF headquarters in Germany. As for the reactions, I could have been talking about the price of oranges on the Asian market,’ he said in private communication on 6.9.2010.

“If we place Iskander missiles in the Kola Peninsula, they would cover a significant part of the Scandinavian Peninsula, including a large area of Norway. If we place them in the Leningrad and Kaliningrad regions, Iskander units also cover half the territory of Poland,” *Pravda* wrote in December 2010.<sup>87</sup>

The economic significance of Russia’s northwestern area is clearly rising. In northern waters there are large natural resources. The northern sea routes seem to be taking on a larger role. The competition for influence in the arctic areas seems to be growing.

“Russia views the Arctic in very different terms from all other littoral and nearby states, and takes any “foreign” interest in the area as an indication of hostile intent which may require a securitized response”, two eminent British analysts wrote already in 2007.<sup>88</sup>

Professor Stephen J. Blank (U.S. Army War College Strategic Studies Institute) underlines that it is no longer political rhetoric, but actual policy when Iskander missiles are deployed in the neighborhood of Finland:

“Recent deployments of the SS-26 Iskander missile (that comes in both nuclear and conventional formats) in the [former] Leningrad Military District where it could threaten Finland and the Baltic States suggest not just a desire to deter NATO, but also the continuing desire to intimidate Russian neighbors. Should Russia divine a threat in Europe, it reserves the right to place these missiles in Kaliningrad

<sup>87</sup> Sergei Balmasov, *Russia shows Iskander missiles to NATO*, *Pravda.ru*, 17.12.2010 [<http://english.pravda.ru/russia/politics/17-12-2010/116249-iskander-0/>].

<sup>88</sup> Dr. Mark A. Smith and Keir Giles, *Russia and the Arctic: The Last Dash North*, UK Defence Academy, September 2007, [[http://conflictstudies.academia.edu/KeirGiles/Papers/966105/Russia\\_and\\_the\\_Arctic\\_the\\_Last\\_Dash\\_North\\_](http://conflictstudies.academia.edu/KeirGiles/Papers/966105/Russia_and_the_Arctic_the_Last_Dash_North_)].

from where it could threaten Poland and even Germany as well.<sup>89</sup>”

Russia’s defence minister Anatoli Serdyukov acknowledged the military build-up near Russia’s western borders during Finnish defence minister Stefan Wallin’s visit in Moscow on 14 February 2012. Mr. Serdyukov, however, pointed out that the missiles were not aimed at Finland, but were deployed there for other reasons.

Different versions of the conventional Iskander missiles would be suitable weapons in strategic assault operations of the kind that the President of Russia’s prestigious Academy of War Sciences, Army General Makhmut Gareev envisions. These fast and versatile weapons are extremely hard to intercept, and they could play an important military role in our neighbouring territories, including the crippling of our nation’s military defence capability for a sufficient time during the critical early stages of a strategic assault attack.<sup>90</sup> In this context, it is interesting to note that use of special operations forces trained for reconnaissance and subversion missions in the deep rear of the enemy territory is also contemplated as an integral part of such strike operations.<sup>91</sup>

<sup>89</sup> Blank, Stephen J.: “Russia and nuclear weapons”, in Blank, Stephen J. (ed.): *Russian Nuclear Weapons: Past, Present, and Future*, Strategic Studies Institute, U.S. Army War College, 11/2011, 331.

<sup>90</sup> Министерство обороны Российской Федерации, *На полигоне, расположенном на территории Ленинградской области, началось тактическое учение ракетного соединения Западного военного округа*, 20.10.2011 [<http://structure.mil.ru/structure/okruga/west/news/more.htm?id=10745977@egNews>] and Andrei Garavski, *«Искандер» на западных рубежах* [“Iskander” at the Western borders’], *Krasnaya Zvezda*, 21.10.2011 [[http://www.redstar.ru/2011/10/21\\_10/1\\_04.html](http://www.redstar.ru/2011/10/21_10/1_04.html)].

<sup>91</sup> Ярослав Вяткин, *Что Россия может противопоставить ЕвроПРО*, *Аргументы Недели*, No. 48 (289), 7.12.2011

Uzi Rubin has addressed the important question of missile threat from Israel's perspective. He points out the general trend of rapidly declining cost of increased ballistic missile accuracy. What can be envisioned is an improvement of accuracy of several orders of magnitude when rather unsophisticated low-accuracy missiles are upgraded. In the Iranian case a hundred-fold improvement would give Iran the ability to hit key Israeli economic infrastructure and administrative targets in the future.

"I'm asking my military friends how they feel about waging war without electricity."<sup>92</sup>

If the accuracy of Iranian missiles improves further, which according to Rubin is "bound to happen," Iran will be able to carry out pinpoint attacks on Israel's air bases, which are concentrated in just a few places. Here it is worth keeping in mind, that Russia is many decades ahead of Iran in missile technology.

The harsh political rhetoric has also produced rather critical responses. Alexander Konovalov wrote in *Ogonek* in December 2011:<sup>93</sup>

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[<http://www.argumenti.ru/army/n318/142451>], or Yaroslav Vyatkin, *What can Russia do to oppose the European antimissile defense*, Defense & Security, No. 285 (13.12. 2011). A unit from the 98<sup>th</sup> Guards Airborne Division in Ivanovo, some 400 kilometres north-east of Moscow, trained in Luga in February/March 2012. See Janne Yläjoki, *Kaukopartioretkellä Lugassa (On a long-range ranger patrol trip to Luga)* Keskiuomalainen, 1.3.2012.

<sup>92</sup> Gareth Porter, *Israel Shields Public from Risks of War with Iran*, Antiwar.com, 29.3.2012 [<http://original.antiwar.com/porter/2012/03/29/israel-shields-public-from-risks-of-war-with-iran/>].

<sup>93</sup> Александр Коновалов, *Пустой пакет*, Огонёк, No. 50 (5209), (19.12.2011) [<http://www.kommersant.ru/doc/1836761>], or Alexander Konovalov, *Empty package*, *Ogonek*, No. 50 (19–25.12. 2011), translated in Defense & Security, No. 289(23.12.2011) [<http://dlib.eastview.com/browse/doc/26406985>].

"President Medvedev never before spoke about deployment of the strike armaments systems providing for 'fire destruction of the European component of the antimissile defense'. Incidentally, deployment of missile systems Iskander in Kaliningrad Region for this purpose is a step as pointless as provocative. [...] The proposed option of response measures is dangerous not by itself but because it provokes development of events in accordance with an extremely dangerous scenario. A map of Europe and the area of destruction provided by Iskander missile from Kaliningrad Region were shown in one of the television reports dedicated to the statement of the President. It was not very impressive. Afterwards, the journalist said that it was necessary only to increase power of the engine of Iskander a little and its radius would grow to 2,000 kilometers. A pink circle on the map covered the entire continent and the journalist full of enthusiasm concluded, "Then we will have entire Europe in our sights.""

Whereas it is pardonable for a young journalist not to know the framework of international obligations binding Russia now, does the President need to give political statements that actually mean breaking of the treaty on shorter and medium range missiles? Withdrawal from the new Strategic Arms Reduction Treaty (New START) and the INF Treaty may indeed be asymmetric means of response to the European missile shield plans.<sup>94</sup> Russia still attaches great importance to its nuclear weapons and is particularly unwilling to engage in negotiations about reductions in tactical nuclear weapons. Dr Alexander Pikayev, a well-known expert on nuclear weapons, wrote in

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<sup>94</sup> Ярослав Вяткин, *Что Россия может противопоставить ЕвроПРО*, Аргументы Недели, No. 48 (289), 7 December 2011 [<http://www.argumenti.ru/army/n318/142451>], translated as Yaroslav Vyatkin, *What can Russia do to oppose the European antimissile defense*, Defense & Security, No. 285 (13.12.2011).

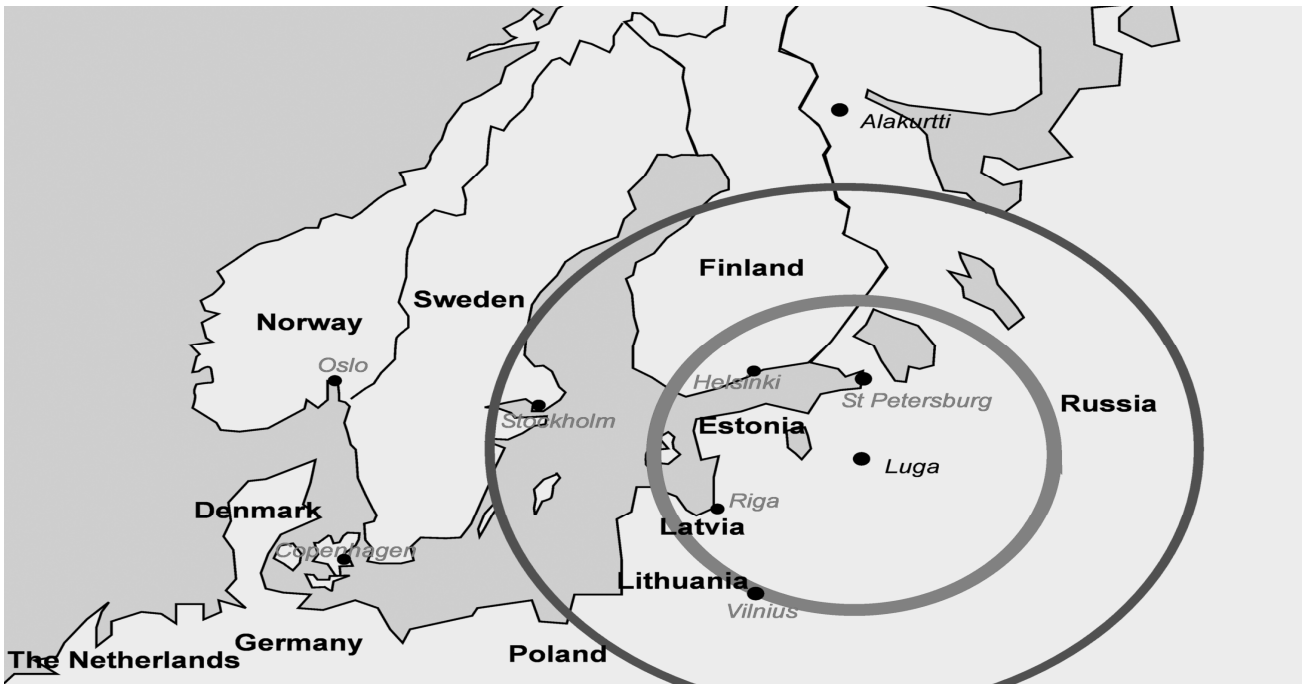


Image: 2. Iskander-M missile range from the 26<sup>th</sup> Missile Brigade based in Luga.

the Moscow Carnegie Institute report in 2009 as follows:

“The issue of Tactical Nuclear Weapons in Europe became more acute after the Baltic States joined NATO. The buffer dividing Russia from NATO vanished, the Kaliningrad Oblast was surrounded by NATO member states’ territory, and the Baltic States are only a short distance from Moscow, and even closer to St Petersburg. The small depth of defense, very short flight time for missiles and attack aviation if deployed in Latvia and Estonia, and the sizable overall imbalance in NATO’s favour in conventional weapons and armed forces have inevitably increased Russian interest in NSNW’s [non-strategic nuclear weapons] as a means of neutralizing the West’s numerical, geo-strategic and operational superiority.”<sup>95</sup>

The issue of tactical nuclear warheads in Kaliningrad was debated in the begin-

<sup>95</sup> Alexander Pikayev, *Nonstrategic nuclear weapons*, in Alexei Arbatov and Vladimir Dvorkin (eds.), *Nuclear Proliferation: New Technologies, Weapons, Treaties*, Carnegie Moscow Center, 2009, 123 [http://www.carnegie.ru/publications/?fa=35773].

ning of this century. Hans M. Kristensen (Director of the Nuclear Information Project, Federation of American Scientists) has recently disclosed photographs which indicate many major features of a Russian central nuclear storage depot being readied in Kaliningrad.<sup>96</sup> The Global Zero NATO–Russia Commission’s report prepared for the 48th Munich Security Conference in February 2012 strongly encouraged ‘the United States and Russia to negotiate the removal of all of their tactical nuclear weapons from operational combat bases in Europe to national storage facilities on their national territories as part of comprehensive bilateral talks on deep reductions in their stockpiles of tactical and strategic nuclear weapons’.<sup>97</sup> Unfortunately, the prospects

<sup>96</sup> Hans M. Kristensen, *Non-Strategic Nuclear Weapons*, Federation of American Scientists, Special Report No. 3, 5/2012, 74.

<sup>97</sup> *Removing U.S. and Russian tactical nuclear weapons from European combat bases*, The Global Zero NATO–Russia Commission Report, prepared for the 48th Munich Security Conference, 2/2012 [http://www.globalzero.org/en/nato-russia-commission-report] and [http://dl.dropbox.com/u/6395109/GZ%20NATO-Russia%20Commission

for realisation of this ambitious proposal in the foreseeable future are not very encouraging.

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%20Report%20-%20EN.pdf]. See also Ambassador Richard Burt, *Speech at the 48th Munich Security Conference*, 4.2.2012 [<http://www.securityconference.de/Richard-Burt.842+M52087573ab0.0.html>].



## APPENDIX

Appendix to quote: 18:

One of Dr Kozin's presentation's transparencies, titled 'BASIC NEGATIVE FEATURES OF THE US BMD IN EUROPE. Stated roughly the following:

1. It will add a formidable element to the US presence in Europe and, globally, increase the US armed forces' strategic component, thus dramatically moving strategic reconfiguration in favour of Washington.
2. It will be bolted onto the NATO TBMD and SBMD systems.
3. It will not operate independently from the rest of the US continental strategic BMD (Alaska and California) or 'old' US assets in Europe.
4. As soon as it is in place, it could well be expanded and upgraded, and never be dismantled: the number of missiles could be quickly increased, with conversion to nuclear-tipped war-heads.
5. The third site will not be limited by two European states, and Georgia plus 14 more states might join.
6. The system will be linked with space-based assets; militarising of space would be inevitable (see US National Space Policy, 31 August 2006, Section 5)

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