II. Russian nuclear forces

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As of January 2014 Russia maintained an arsenal of approximately 4300 nuclear warheads assigned to operational forces. About 2300 of these are strategic warheads, including 1600 that are deployed on ballistic missiles and at bomber bases, and 700 bomber and submarine warheads that are kept in storage. Russia also possessed approximately 2000 non-strategic (tactical) nuclear warheads. A further 3700 warheads were retired or awaiting dismantlement, for a total inventory of roughly 8000 warheads (see table 6.3).

Russia met the ceiling of 1550 deployed warheads mandated by the 2010 Russian–US Treaty on Measures for the Further Reduction and Limitation of Strategic Offensive Arms (New START) in 2012, six years earlier than envisaged by the treaty.[1] As of 1 September 2013, Russia was counted as deploying a total of 1400 deployed warheads attributed to 473 treaty-accountable strategic launchers, including intercontinental ballistic missiles (ICBMs), submarine-launched ballistic missile (SLBMs) and heavy bombers.[2] This represented a decrease of 99 deployed warheads and 18 accountable launchers since 1 September 2012.[3]

The reduction of Russian strategic forces is due to the gradual retirement of all Soviet-era missiles, which are being replaced by modern systems, albeit at less than a one-for-one basis. As this continues over the next decade, the overall size of Russia's strategic force will probably fall further, even without a follow-on arms reduction treaty. However, Russia's strategic modernization is not motivated entirely by the need to replace old systems—other motives include maintaining rough overall parity with the United States, improving weapon survivability and efficiency, and national prestige.

Missile production has increased in order to facilitate the transition to a post-Soviet strategic arsenal. In February 2012 the Russian Prime Minister, Vladimir Putin (now president), stated that the Russian military would receive 'more than 400 advanced ground and sea-based intercontinental ballistic missiles' over the coming decade, or an average of 40 missiles per

[1] For a summary and other details of New START see annex A, section III, in this volume.

[2] US Department of State, 'New START Treaty aggregate numbers of strategic offensive arms', Fact Sheet, 1 Oct. 2013, <http://www.state.gov/t/avc/rls/215000.htm>. Under New START, each heavy bomber is counted as carrying only 1 warhead, even though the aircraft can carry larger payloads of nuclear-armed cruise missiles or nuclear gravity bombs.

[3] Russia continued to abstain from publicly releasing the full unclassified data exchanged under New START, including a breakdown of deployed and non-deployed missiles and bombers at individual bases as well as the warheads attributed to them.

Table 6.3. Russian nuclear forces, January 2014

Type/ Russian designation (NATO designation)	No. deployed	Year first deployed	Range (km)[a]	Warhead loading	No. of warheads (deployed/ assigned)[b]
Strategic offensive forces					**~1 600/2 300**[c]
Bombers	*60/72*[d]				*60/810*[e]
Tu-95MS6 (Bear-H6)	24/29	1981	6 500–10 500	6 x AS-15A ALCMs, bombs	24/174
Tu-95MS16 (Bear-H16)	25/30	1981	6 500–10 500	16 x AS-15A ALCMs, bombs	25/480
Tu-160 (Blackjack)	11/13	1987	10 500–13 200	12 x AS-15B ALCMs or AS-16 SRAMs, bombs	11/156
ICBMs	*304*				*967/967*
RS-20V (SS-18 Satan)	46[e]	1992	11 000–15 000	10 x 500–800 kt	460/460[f]
RS-18 (SS-19 Stiletto)	30	1980	10 000	6 x 400 kt	180/180
RS-12M Topol (SS-25 Sickle)	117	1985	10 500	1 x 800 kt	117/117
RS-12M2 Topol-M (SS-27)	60	1997	10 500	1 x 800 kt	60/60
RS-12M1 Topol-M (SS-27)	18	2006	10 500	1 x (800 kt)	18/18
RS-24 (SS-27 Mod 2)	33	2010	10 500	4 x (100 kt)	132/132
RS-24 (SS-27 Mod 2/silo)	–	(2014)	10 500	4 x (100 kt)	–/–
SLBMs	*144*				*416/528*[g]
RSM-50 Volna (SS-N-18 M1 Stingray)	48	1978	6 500	3 x 50 kt	96/144
RSM-54 Sineva (SS-N-23 M1)	96	1986/2007	9 000	4 x 100 kt	320/384
RSM-56 Bulava (SS-NX-32)	(48)	(2015)	>8 050	4 x (100 kt)	–/(192)
Non-strategic forces					**–/(~2 000)**[h]
ABM, air/coastal defence[i]	*~1 100*				*–/(~425)*
53T6 (SH-08, Gazelle)	68	1986	30	1 x 10 kt	–/(68)
S-300 (SA-10/12/20)	1 000	1980	..	1 x low kt	–/(~340)
SSC-1B (Sepal)	34	1973	500	1 x 350	–/(~17)
Air force weapons[j]	*430*				*–/(~730)*
Tu-22M3 (Backfire-C)	150	1974	..	3 x ASM, bombs	–/(~450)
Su-24M/M2 (Fencer-D)	260	1974	..	2 x bombs	–/(~260)
Su-34 (Fullback)	20	2006	..	2 x bombs	–/(~20)
Army weapons	*170*				*–/(~170)*
Tochka (SS-21 Scarab)	140	1981	120	(1 x 10 kt)	–/(~140)
Iskander (SS-26 Stone)	30	2005	500	(1 x 10 kt)	–/(~30)
Navy weapons					*–/(~700)*
Submarines/surface ships/air	SLCM, ASW, SAM, depth bombs, torpedoes[k]				
Total deployed/assigned warheads					**~1 600/4 300**
Retired awaiting dismantlement					~3 700
Total inventory					**~8 000**

. . = not available or not applicable; ( ) = uncertain figure; ABM = anti-ballistic missiles; ALCM = air-launched cruise missile; ASM = air-to-surface missile; ASW = Anti-submarine warfare; ICBM = intercontinental ballistic missile; kt = kiloton; NATO = North Atlantic Treaty Organization; SAM = surface-to-air missile; SLBM = submarine-launched ballistic missile; SLCM = sea-launched cruise missile; SRAM = short-range attack missile.

[a] Aircraft range is for illustrative purposes only; actual mission range will vary according to flight profile and weapon loading.

[b] In this column, the first number is the estimated number of deployed warheads attributed to the bomber type by the New START treaty, and the second number is the estimated number of warheads assigned to the delivery system.

[c] The number deployed is the estimated count under New START for deployed warheads on ballistic missiles plus *c*. 200 bomber weapons that are thought to be present at bomber bases but not counted by the treaty. The number assigned—in the second column—is the total number of warheads estimated to be assigned to the particular delivery system. This includes the 700 strategic warheads that are estimated to be in reserve for SSBNs and bombers. The table does not count so-called phantom aircraft—bombers that are not assigned a nuclear mission but still carry electronic equipment that makes them accountable under the treaty.

[d] The first number is the number of bombers estimated to be counted under New START. The second number is the total number of bombers in the inventory.

[e] Of the 810 weapons that estimated to be assigned to long-range bombers, only 300 are thought to be present at the bomber bases. The remaining weapons are thought to be stored at central storage facilities.

[f] This figure assumes 46 missiles in 7 regiments. It is possible that an 8th regiment is still operational, in which case the number of RS-20Vs would be 52, with 520 warheads.

[g] Two or three of the SSBNs are in overhaul at any given time and do not carry their assigned nuclear missiles and warheads.

[h] All non-strategic nuclear warheads are in storage, according to the Russian Government, and are not counted in the total deployed warheads.

[i] The A-135 ABM system around Moscow is being upgraded. The S-300 system is thought to have some nuclear capability, but there is uncertainty about which and how many of the different interceptors (SA-10 Grumble, SA-12 Gargoyle, SA-12A Gladiator, SA-12B Giant) have nuclear capability.

[j] These figures assume that only half of land-based strike aircraft have nuclear missions.

[k] Surface ships are not thought to be assigned nuclear torpedoes.

Sources: Russian Ministry of Defence press releases; US Department of State, START Treaty Memoranda of Understanding, 1990–July 2009; New START aggregate data releases, various years; US Air Force, National Air and Space Intelligence Center (NASIC), *Ballistic and Cruise Missile Threat* (NASIC: Wright-Patterson Air Force Base, OH, May 2013); BBC Monitoring; Russians news media; Russian Strategic Nuclear Forces, <http://www.russianforces.org/>; International Institute for Strategic Studies, *The Military Balance* (Routledge: London, various years); Cochran, T. B. et al., *Nuclear Weapons Databook*, vol. 4, *Soviet Nuclear Weapons* (Harper & Row: New York, 1989); *Jane's Strategic Weapon Systems*, various issues; *Proceedings*, US Naval Institute, various issues; 'Nuclear notebook', *Bulletin of the Atomic Scientists*, various issues; and author's estimates.

year.[4] Most of that is production of SLBMs and replacement of test-launch missiles.

The Russian Government has pledged firm financial and organizational support for nuclear modernization, but the effort competes with funding for the modernization of Russia's general military, which remains dominated by Soviet-era equipment. Russian news media in 2012 reported that Russia planned to spend an average of 34 billion roubles ($1 billion) per year in 2013–15 on nuclear weapons.[5] According to the Defence Committee of the Duma (the lower house of the Russian Parliament), Russia will spend 46 billion roubles ($1.4 billion) on nuclear weapon systems in 2016, up from 29 billion roubles ($888 million) in 2013.[6] It is unclear what is included in these figures, but they constitute only a fraction of the roughly $23 billion that the USA spends each year on maintaining its nuclear arsenal.[7]

Strategic bombers

Russia's Long-range Aviation Command includes approximately 13 Tu-160 (Blackjack), 30 Tu-95MS16 and 29 Tu-95MS6 (Bear) bombers. The maximum loading on these bombers is about 810 nuclear weapons, of which approximately 200 may be stored at the two strategic bomber bases. The Tu-160s and about 15 of the Tu-95s are based at the Engels Air Base near Saratov in western Russia. The remaining Tu-95s are based at the Ukrainka Air Base near Belogorsk in eastern Russia.

Each Tu-160 can carry up to 12 AS-15B Kent (Kh-55) long-range cruise missiles. The Tu-95MS16 can carry up to 16 AS-15A long-range cruise missiles, and the Tu-96MS6 can carry up to 6 AS-15As. There is some uncertainty about whether the bombers are still equipped to carry nuclear gravity bombs.

Modernization of the ageing Tu-160 and Tu-95MS bombers is well under way, with several improved bombers already deployed. Only 'a few tens' of the 59 remaining Tu-95MS aircraft will be modernized, and the rest will be retired, while 'at least 10' Tu-160s will be modernized by 2020.[8] Apart from

[4] Putin, V., [Being strong: national security guarantees for Russia], *Russiiskaya Gazeta*, 20 Feb. 2012, English translation <http://rt.com/politics/official-word/strong-putin-military-russia-711/>.

[5] 'Russia to spend 100 billion on nuclear weapons', *Pravda*, 18 Oct. 2012, <http://english.pravda.ru/news/russia/18-10-2012/122499-russia_nuclear_weapons-0/>.

[6] 'Russia to up nuclear weapons spending by 50% by 2016', RIA Novosti, 8 Oct. 2013, <http://en.ria.ru/military_news/20131008/184004336/RussiatoUpNuclearWeaponsSpending50by2016.html>. On the Russian military budget, modernization plans and implementation challenges see Perlo-Freeman, S., 'Russian military expenditure, reform and restructuring', *SIPRI Yearbook 2012*.

[7] US Congressional Budget Office, *Projected Costs of U.S. Nuclear Forces, 2014 to 2023* (US Congress: Washington, DC, Dec. 2013), p. 2.

[8] Mikhailov, A., [Strategic bomber 'Bear' is left in service], *Izvestiya*, 20 Sep. 2012 (in Russian); and 'Russia to upgrade over 10 Tu-160 bombers by 2020', RIA Novosti, 7 Feb. 2012, <http://en.rian.ru/mlitary_news/20120207/171200584.html>.

upgrading ageing equipment, the modernization of the Tu-160 adds conventional weapon capability.

Development of a next-generation bomber known as PAK-DA has begun, with the contract awarded to the Tupolev company in February 2014.[9] The new subsonic wing-shaped bomber is scheduled to begin replacing Tu-160 and Tu-95 bombers from the mid-2020s.

Since 2004, Russia has reactivated a training programme to deploy bombers on long-range patrols and occasionally to bases in other countries. Russian Tu-95s regularly fly missions into the Norwegian Sea and the Atlantic Ocean, the Sea of Japan, and the western and eastern Pacific Ocean. In October 2013, two Tu-160s flew from Engels Air Base, north of the Kola Peninsula to the Caribbean and landed at Maiquetia airfield in Venezuela before flying on to Nicaragua.[10]

Land-based ballistic missiles

As of January 2014 Russia's Strategic Rocket Forces (SRF)—the branch of the armed forces that controls Russia's ICBMs—consisted of 12 missile divisions grouped into three armies and deploying a total of 304 ICBMs of six different types and variations. The ICBM force carries nearly 1000 warheads, almost two-thirds of Russia's deployed strategic warheads.

The ICBM force is undergoing rapid transformation due to the gradual retirement of Soviet-era missiles and the introduction of newer (but fewer) ICBMs. By 2016, the RS-20V (designated SS-18 by NATO), RS-18 (SS-19) and RS-12M Topol (SS-25) missiles will make up less than half of the ICBM force and by 2024 they will be gone. Taking into account current plans announced by the Russian military, the ICBM force could potentially decline to approximately 280 missiles over the next decade. To keep rough parity with the larger US ICBM force (planned at 400 missiles under New START—see section I), the Russian military is prioritizing the deployment of multiple warheads on its new ICBMs. By the early 2020s, the ratio of silo and road-mobile missiles would stay roughly the same but with mobile missiles with multiple independently targetable re-entry vehicles (MIRV) carrying a greater portion of the ICBM warheads (51 per cent versus 28 per cent today). Before 2010, all Russian road-mobile missiles were single-warhead weapons.

The liquid-fuel, silo-based RS-20V is armed with 10 warheads, carrying roughly half of the warheads on the ICBM force. Roughly 46 missiles remain, down from 108 a decade ago, deployed at two missile fields: 28 missiles in four regiments at Uzhur in Krasnoyarsk Krai, and 18 missiles in

[9] 'Tupolev to develop Russia's next-generation long-range bomber', Interfax-AVN, 13 Feb. 2014, Translation from Russian, BBC Monitoring.

[10] Isby, D. C., 'Blackjacks return to Venezuela', *Air International*, Dec. 2013, p. 13.

three regiments at Dombarovsky in Orenburg Oblast.[11] The Commander of the SRF, Colonel General Sergei Karakaev, stated in December 2012 that the service life of the RS-18 would be extended to 2019 and the RS-20V to 2022.[12]

Approximately 30 of the liquid-fuel, silo-based RS-18s remain. Each missile carries an estimated six warheads for a total of 180 warheads. Down from 130 missiles a decade ago, the last RS-18 is scheduled to be withdrawn from service by 2019. Of the 30 remaining RS-18s, an estimated 20 are deployed at Kozelsk in Kaluga Oblast, and perhaps 10 with the 60th Missile Division at Tatishchevo in Saratov Oblast.

The third Soviet-era ICBM, the solid-fuel road-mobile RS-12M Topol, is also being rapidly reduced. Down from 315 missiles a decade ago, there are now approximately 117 RS-12Ms left. The missile is scheduled to be retired by 2021.[13] Several intermediate-range test-launches of the RS-12M in recent years may have been related to the development of a new ICBM payload, possibly designed to evade ballistic missile defence systems.

The solid-fuel single-warhead RS-12 Topol-M (SS-27 Mod 1) has been deployed in both road-mobile (RS-12M1) and silo-based (RS-12M2) versions. Deployment of the RS-12M2 started at Tatishchevo in 1997, a deployment that was completed in 2012 after 60 missiles were installed. Deployment of the RS-12M1 followed in 2007–10 at Teykovo, north-east of Moscow.

ICBM warhead payloads could not be changed under the 1991 Treaty on the Reduction and Limitation of Strategic Offensive Arms (START), but when it expired in 2009 Russia began deployment of the RS-24 Yars (SS-27 Mod 2), a MIRVed variant of the Topol-M (SS-27 Mod 1).[14] Deployment of the road-mobile version of the RS-24 began at Teykovo in 2010 and introduction is currently under way at Novosibirsk and Tagil, where the first RS-24s went on 'experimental combat duty' in December 2013.[15]

Deployment of the first silo-based RS-24s has begun, with the 28th Guard Missile Division at Kozelsk. Preparation began in 2012 and instalment of the first regiment with 10 missiles began in early 2014.[16] It is not yet

[11] It is possible that a 4th regiment at Dombarovsky is still active, in which case 52 RS-20Vs with 520 warheads are deployed.

[12] 'Russia's Voyevoda ICBM to remain in service for another decade—commander', Interfax-AVN, 15 Dec. 2012, Translation from Russian, BBC Monitoring International Reports.

[13] [SRF will be armed with Soviet ballistic missiles until 2021], Novosti-Kosmonavtiki, 17 Dec. 2013, <http://novosti-kosmonavtiki.ru/news/14702/> (in Russian).

[14] For a summary and other details of START see annex A, section III, in this volume.

[15] 15 mobile RS-24 were placed on 'experimental combat duty' by the end of Dec. 2013 (effective 25 Dec.), including 1 full regiment (9 launchers) at Novosibirsk and 1 partial regiment (6 launchers) at Tagil. [SRF commander: missile forces in an intensive process of rearming], ITAR-TASS, 18 Dec. 2013, <http://itar-tass.com/politika/841474> (in Russian).

[16] 'Russian Strategic Missile troops gear up for new ICBMs by 2018–2020', Interfax, 28 Mar. 2014, Translation from Russian, BBC Monitoring.

known how many RS-24s will be installed at Kozelsk but at least 30 seems likely.

Russia has started development of a third modification of the Topol-M, known as the RS-26 (a working name). Similarly to the Topol, the RS-26 has been test launched at both intercontinental and shorter ranges. According to Karakaev, the RS-26 is a road-mobile 'prototype intercontinental ballistic missile based on Yars and Topol-M', but significantly lighter (about 80 tonnes, whereas the RS-24 weighs about 120 tonnes) to improve manoeuvrability during field deployments.[17] According to Karakaev, 'Its cross-country capability will be better, its sizes will be smaller, it will have greater survivability and it should have a smaller camouflaging case'.

Development of a new 'heavy' ICBM has begun. Known as Sarmat, the new liquid-fuel, silo-based, MIRVed missile is intended as a replacement for the RS-20V. Development was authorized in 2012, and deployment of the 100-tonne missile is intended to begin around 2020. The Sarmat will first be deployed at Dombarovsky and possibly later also at Uzhur.

The Russian missile industry is also working on a concept for a rail-mobile missile with MIRV that would be lighter and shorter than the RT-23 (SS-24) that was retired in 2005. No decision has been made on whether to develop and deploy a rail-mobile missile.

Ballistic missile submarines and sea-launched ballistic missiles

As of January 2014 the Russian Navy operated a total of nine nuclear-armed nuclear-powered ballistic missile submarines (SSBNs). Three additional new SSBNs are in various stages of completion and one older SSBN is used for SLBM test-launches.

Three Project 667BDR Kalmar (designated Delta III class by NATO) submarines, each carrying 16 RSM-50 Volna (SS-N-18 M1) SLBMs, are assigned to the Pacific Fleet. The liquid-fuel RSM-50 is armed with 3 MIRVs.

The current backbone of the Russian SSBN fleet is made up of 6 Project 667BDRM Delfin (Delta IV class) submarines assigned to the Northern Fleet, each carrying 16 RSM-54 Sineva (SS-N-23 M1) SLBMs. Each liquid-fuel RSM-54 carries 4 MIRVs. The Sineva replaced the original RSM-54 (SS-N-23 Skiff) between 2007 and 2012, and a third modification of the missile, known as Layner, is now being introduced. Extensive rumours have circulated about the development of an increased payload with up to as many as 10 smaller warheads.[18] Development of such a large warhead load-

[17] 'Russia designing "new" rail-mobile ICBM system, troops getting new missiles', Interfax, 18 Dec. 2013, Translation from Russian, Open Source Center.

[18] 'Layner devised for monetary savings', *Izvestia*, 17 Feb. 2012, Translation from Russian, Open Source Center.

ing would, if deployed, bring Russia's strategic forces above the warhead limit set by New START. Others suggest the modification is 'modest' and the payload change may be more about improving the missile's capability to penetrate missile defence systems.[19]

To replace the Soviet-era SSBNs, Russia is building eight Borei class SSBNs. The first Borei submarine, K-535 *Yury Dolgoruky*, was delivered to the Northern Fleet in January 2013. The second boat, K-550 *Alexander Nevsky*, followed in December 2013, while the third, *Vladimir Monomakh*, is undergoing sea trials. The first Borei will be assigned to the Northern Fleet while the next two boats will be assigned to the Pacific Fleet, where they will replace the last of the old Kalmar SSBNs. The fourth and subsequent hulls of the Borei class will be of an improved design known as Project 955A. Construction of the first improved Borei began in July 2012.

Technical problems with its solid-fuel RSM-56 Bulava-30 (SS-N-32) SLBM have delayed operational service of the Borei class indefinitely. Development has been hampered by technical difficulties: approximately half of the test-launches have failed. After the latest failure in 2013, two additional launches were scheduled for late 2014.[20] Each Borei SSBN is equipped with 16 launch tubes for the Bulava, each of which is estimated to carry 4 MIRVs. Unconfirmed and contradictory rumours claim that each of the improved Borei class SSBNs will be equipped with 20 missiles.

Non-strategic nuclear weapons

Considerable uncertainty exists about the size, composition and location of Russia's non-strategic nuclear weapon inventory. The estimate made here is that there are approximately 2000 warheads available to Russian forces, with many more retired and awaiting dismantlement (see table 6.3). This estimate is based on previous estimates of the Soviet non-strategic warhead arsenal, information released in connection with the 1991–92 Soviet/Russian and US Presidential Nuclear Initiatives (PNIs) and statements by Russian officials on the progress in non-strategic weapon reductions under the PNIs, as well as analysis of the Russian order of battle and of a nominal delivery platform warhead loading.[21] The estimate is consistent with a statement made in November 2011 by the US Department of Defense that

[19] See e.g. 'Russian navy takes into service Layner ICBM', Interfax, 2 Apr. 2014, Translation from Russian, BBC Monitoring.

[20] For an overview of Bulava flight tests see Podvig, P., 'Bulava missile test history', Russian Strategic Nuclear Forces, 7 Sep. 2013, <http://russianforces.org/navy/slbms/bulava.shtml>.

[21] For more information see Kristensen, H. M., *Non-Strategic Nuclear Weapons*, Federation of American Scientists (FAS) Special Report no. 3 (FAS: Washington, DC, May 2012), pp. 51–65. See also Kristensen, H. M., *Trimming Nuclear Excess: Options for Further Reductions of U.S. and Russian Nuclear Forces*, Federation of Atomic Scientists (FAS) Special Report no. 5 (FAS: Washington, DC, Dec. 2012), pp. 26–27.

unclassified estimates set the Russian inventory at approximately 2000–4000 non-strategic nuclear weapons.[22]

Most of the Russian non-strategic nuclear arsenal consists of weapon systems developed and fielded during the Soviet era, and many may be retired over the next decade. Nonetheless, unlike most other nuclear-armed states, Russia continues to attribute importance to non-strategic nuclear weapons, partly as military compensation for inferior conventional forces. As a result, modernization of several non-strategic nuclear weapon systems is under way.

The modernization includes the Iskander-M (SS-26) SRBM, which is replacing the Tochka (SS-21) SRBM in 10 missile brigades. Deployment started in 2004 and is currently under way in 5 brigades, primarily in the western military districts. Rumours that the Iskander-M has been deployed to the Kaliningrad Oblast are inaccurate.[23] Instead, the first deployment of the Iskander-M in the Western Military District is under way with the 26th Missile Brigade near Luga, south of St Petersburg.[24]

Non-strategic nuclear aircraft modernizations include upgrading the old Tu-22M3 (Backfire) intermediate-range bomber, upgrading the Su-24M (Fencer-D) fighter-bomber and introduction of the new Su-34 (Fullback) fighter-bomber. The Su-34, which will eventually replace the Su-24M, is already being deployed in western military districts and participates in military exercises and operations.

A new Project 885M Yasen class (Graney) attack submarine is under construction, with the first boat, K-560 *Severodvinsk*, undergoing sea trials. At least 6 Yasen boats are planned by 2020. The Yasen is thought to be equipped with a new long-range sea-launched cruise missile, the Kalibr (SS-N-30), which may be nuclear capable. Modernization of existing nuclear-capable attack submarines is also under way, including Project 945 (Sierra), Project 949A (Oscar II) and Project 971 (Akula).

[22] Miller, J., Principal Deputy Under Secretary of Defense for Policy, Statement before the US House of Representatives, Armed Services Committee, 2 Nov. 2011, <http://armedservices.house.gov/index.cfm/2011/11/the-current-status-and-future-direction-for-u-s-nuclear-weapons-policy-and-posture>, p. 2; and Kile, S. N. et al., 'Russian nuclear forces', *SIPRI Yearbook 2012*, p. 321.

Another study, published in 2012, suggests that the number of Russian 'operationally assigned' non-strategic nuclear warheads may be as low as *c.* 1000, with the total stockpile being *c.* 1900. This study assumes that non-strategic nuclear warheads are assigned not to individual delivery vehicles but to nuclear-capable military units, which have a fixed number of nuclear warheads assigned to them. Sutyagin, I., *Atomic Accounting: A New Estimate of Russia's Non-Strategic Nuclear Forces*, Occasional Paper (Royal United Services Institute: London, Nov. 2012), pp. 2–3.

[23] For claim and rebuttal of rumour about Iskander-M missiles in Kaliningrad see Solms-Laubach, F., 'Putin stationiert Raketen für Atomprengköpfe' [Putin deploys missiles for nuclear warheads], *Bild*, 14 Dec. 2013; 'Putin says no Iskanders deployed in Kaliningrad', RIA Novosti, 19 Dec. 2013, <http://en.ria.ru/military_news/20131219/185723285/Putin-Says-No-Iskanders-Deployed-in-Kaliningrad.html>.

[24] 'Troops in Western Russia to get Iskander-M missiles in 2014', Interfax, 14 Jan. 2014, Translation from Russian, BBC Monitoring.

Widespread rumours over the past several years have asserted that Russia has violated the 1987 Soviet–US Treaty on the Elimination of Intermediate-Range and Shorter-Range Missiles (INF Treaty) by testing a new cruise missile, possibly the R-500, to a range banned by the treaty.[25] The US Government has confirmed that it has 'concerns about Russian compliance with the INF Treaty' and is 'not going to drop the issue until our concerns have been addressed'.[26]

[25] E.g. Gordon, M. R., 'U.S. says Russia tested missile, despite treaty', *New York Times*, 29 Jan. 2014. For a summary and other details of the INF Treaty see annex A, section III, in this volume.

[26] Friedt, A. E., Acting Assistant Secretary, US Department of State, Bureau of Arms Control, Verification and Compliance, 'U.S.–Russian nuclear arms control negotiations: Ukraine and beyond', Testimony before US House of Representatives, Foreign Affairs Committee Joint Subcommittee, 29 Apr. 2014, <http://www.state.gov/t/avc/rls/2014/225530.htm>.