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Russian nuclear forces

VITALY FEDCHENKO, HANS M. KRISTENSEN AND PHILIP SCHELL



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II. Russian nuclear forces

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As of January 2013 Russia maintained an arsenal of approximately 4500 nuclear warheads assigned to operational forces. About 2500 of these are strategic warheads, including 1800 that are deployed on ballistic missiles and at bomber bases, and 700 that are kept in storage. Russia also possessed approximately 2000 non-strategic (tactical) nuclear warheads. A further 4000 warheads were retired or awaiting dismantlement, for a total inventory of roughly 8500 warheads (see table 6.3).

In 2012 Russia and the United States completed two biannual exchanges of data on numbers, locations and technical characteristics of their strategic nuclear forces subject to New START. As of 1 September 2012, Russia was counted as deploying a total of 1499 warheads attributed to 491 treaty-accountable strategic launchers, including intercontinental ballistic missiles (ICBMs), submarine-launched ballistic missile (SLBMs) and heavy bombers.¹ This represented a decrease of 67 deployed warheads and 25 accountable launchers since 1 September 2011.² Russia thus met the New START ceiling of 1550 deployed warheads in 2012, six years earlier than envisaged by the treaty.

The arms reductions mandated by New START codified existing trends in Russian strategic forces. Russia has continued to retire Soviet-era missiles (RS-20V, RS-18 and RS-12M) that have reached the end of their service lives. At the same time, Russia has been introducing new mobile ICBMs and SLBMs, albeit at a slower rate than it has been retiring the older systems.

The Russian National Security Strategy, approved in 2009, states that Russia will maintain parity with the USA's offensive strategic weapons in the most cost-effective way.³ According to senior military experts, Russia's strategic nuclear forces can guarantee minimum deterrence under the existing arms control limitations, but in order to assure a future second-strike capability, Russia needs to improve both survivability of its missiles

¹ US State Department, Bureau of Arms Control, Verification and Compliance, 'New START Treaty aggregate numbers of strategic offensive arms', Fact Sheet, 30 Nov. 2012, <<http://www.state.gov/t/avc/rls/201216.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.

² 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.

³ [National security strategy of the Russian Federation for the period until 2020], Russian Presidential Decree no. 537, 12 May 2009, <<http://www.scrf.gov.ru/documents/99.html>>.

Table 6.3. Russian nuclear forces, January 2013

Type/ Russian designation (NATO designation)	No. deployed	Year first deployed	Range (km) ^a	Warhead loading	No. of warheads (deployed/ assigned) ^b
Strategic offensive forces					-1 800/-2 500^c
<i>Bombers</i>	72				60/810 ^d
Tu-95MS6 (Bear-H6)	29	1981	6 500– 10 500	6 x AS-15A ALCMs, bombs	24/174
Tu-95MS16 (Bear-H16)	30	1981	6 500– 10 500	16 x AS-15A ALCMs, bombs	25/480
Tu-160 (Blackjack)	13	1987	10 500– 13 200	12 x AS-15B ALCMs or AS-16 SRAMs, bombs	11/156
<i>ICBMs</i>	326				1 050/1 050
RS-20V (SS-18 Satan)	55	1992	11 000– 15 000	10 x 500–800 kt	550/550
RS-18 (SS-19 Stiletto)	35	1980	10 000	6 x 400 kt	210/210
RS-12M Topol (SS-25 Sickle)	140	1985	10 500	1 x 800 kt	140/140
RS-12M2 Topol-M (SS-27, silo)	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 Yars, mobile (SS-27 Mod 2)	18	2010	10 500	(4) x (100 kt)	72/72
RS-24 Yars, silo (SS-27 Mod 2)	–	2013	10 500	(4) x (100 kt)	–/–
<i>SLBMs</i>	160				448/624 ^e
RSM-50 Volna (SS-N-18 M1 Stingray)	48	1978	6 500	3 x 50 kt	96/144
RSM-54 Sineva (SS-N-23 Skiff)	96	1986/ 2007	9 000	4 x 100 kt	256/384
RSM-56 Bulava (SS-NX-32)	16	2013	>8 050	6 x (100 kt)	96/96
Non-strategic forces					–/(–2 000)^f
<i>ABM, air/coastal defence^g</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)
<i>Air force weapons^h</i>	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)
<i>Army weaponsⁱ</i>	170				–/(–170)
OTR-21 Tochka (SS-21 Scarab)	140	1981	120	(1 x 10 kt)	–/(–140)
Iskander (SS-26 Stone)	30	2005	500	(1 x 10 kt)	–/(–30)
<i>Navy weapons</i>					–/(–700)
Submarines/surface ships/air			SLCM, ASW, SAM, depth bombs, torpedoes ^j		
Total deployed/assigned warheads					–1 800/4 500
Retired awaiting dismantlement					~4 000
Total inventory					~8 500

. . = 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; 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 warheads deployed to each delivery system, and the second number is the estimated number of warheads assigned to the delivery system.

^c This first total includes warheads estimated to be counted by New START plus approximately 300 bomber weapons that are thought to be present at bomber bases. Unlike the New START Treaty, it also includes full SSBN loads. A further 700 strategic warheads are estimated to be in reserve for SSBNs and bombers.

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

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

^f According to the Russian Government, all non-strategic nuclear warheads are in storage, and so they are not counted in the total deployed warheads. In addition to the 2000 warheads available for non-strategic nuclear-capable forces listed here, another 2000–3000 warheads are estimated to have been retired and awaiting dismantlement.

^g The 51T6 (SH-11 Gorgon) is no longer operational. 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, SA-21 Growler) have nuclear capability. Some air-defence missiles may have a limited capability against some ballistic missiles. Only c. one-third of the 1000 deployed air-defence launchers are counted as having nuclear capability.

^h These figures assume that only half of Russia's land-based strike aircraft have nuclear missions.

ⁱ According to the North Atlantic Treaty Organization (NATO) International Military Staff, Russia's Zapad and Ladoga exercises held in Aug.–Sep. 2009 included 'missile launches, some of which may have simulated the use of tactical nuclear weapons'. Daalder, I., US Ambassador to NATO, 'NATO–Russia: NAC discusses Russian military exercises', Cable to US State Department no. USNATO546, 23 Nov. 2009, <<http://wikileaks.org/cable/2009/11/09USNATO546.html>>.

^j 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, and New START aggregate data releases, 2012; US Air Force, National Air and Space Intelligence Center (NASIC), *Ballistic and Cruise Missile Threat* (NASIC: Wright-Patterson Air Force Base, OH, June 2009); World News Connection, National Technical Information Service (NTIS), US Department of Commerce, various issues; Russian news media; Russian Strategic Nuclear Forces, <<http://www.russianforces.org/>>; International Institute for Strategic Studies, *The Military Balance 2010* (Routledge: London, 2010); 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 authors' estimates.

and their ability to evade missile defences.⁴ Russia is working towards the former goal by introducing more survivable systems such as road-mobile ICBMs and new-generation nuclear-powered ballistic missile submarines (SSBNs) and SLBMs. To reach the latter goal, it is testing ICBM payloads designed to penetrate missile defences and developing a new heavy ICBM. The Russian Government pledged firm financial and organizational support to these programmes on a number of occasions in 2012. It reportedly spent 27.4 billion roubles (\$933 million) on nuclear armaments in 2012 and plans to spend 29.3 billion roubles (\$998 million) in 2013, 33.3 billion roubles (\$1134 million) in 2014 and 38.6 billion roubles (\$1314 million) in 2015.⁵

Strategic bombers

Russia's Long-range Aviation Command includes 13 Tu-160, 30 Tu-95MS16 and 29 Tu-95MS6 bombers. The maximum loading on these bombers is about 810 nuclear weapons, of which 200–300 may be stored at the bomber bases.⁶ In 2012 the command conducted 'over 35' strategic bomber sorties, continuing the routine practice that was resumed in 2007 after having been suspended in 1992.⁷ On 19 October 2012, the bombers successfully launched four cruise missiles as part of what appears to have been a larger military exercise. All missiles reached Pemboi testing ground, Komi Republic, and one was shot down by a Pantsyr'-S mobile air defence system.⁸

Russia continues its efforts to upgrade and extend the service life of its ageing Tu-95MS bombers. The Russian Ministry of Defence announced in September 2012 that the modernization of the bombers' electronic equipment would begin in 2013. This would allow the Tu-95MS to remain in service until the new strategic bomber, known as the PAK DA (from the Russian abbreviation of advanced aviation complex for long-range aviation), enters service, which is not expected before 2025. Only 'a few tens' of the 59 remaining Tu-95MS aircraft will be modernized, and the rest will

⁴ Umnov, S., [Russia's SNF: building up ballistic missile defence penetration capacities], *Voenno-Promyshlennyyi Kur'er*, 8–14 Mar. 2006; and Esin, V., [The United States: in pursuit of a global missile defence], *Voenno-Promyshlennyyi Kur'er*, 25–31 Aug. 2010.

⁵ [Russia plans to spend more than 100 billion roubles on nuclear weapons by 2015], RIA Novosti, 17 Oct. 2012, <http://ria.ru/atomtec_news/20121017/903330028.html>; Putin, V., 'Being strong', *Foreign Policy*, 21 Feb. 2012; and President of Russia, [Meeting concerning implementation of the state arms procurement programme in the area of nuclear deterrence], 26 July 2012, <<http://kremlin.ru/news/16058>>. On total Russian military expenditure see chapter 3, section III, in this volume.

⁶ 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).

⁷ Russian Ministry of Defence, [Long-range aviation patrols became routine], 2 Jan. 2012, <http://function.mil.ru/news_page/world/more.htm?id=11569911@egNews>.

⁸ 'Bombers launch cruise missiles in a strategic forces exercise', Russian Strategic Nuclear Forces, 19 Oct. 2012, <http://russianforces.org/blog/2012/10/bombers_launch_cruise_missiles.shtml>.

be retired.⁹ Russia is also modernizing its Tu-160 bombers and Il-78 refuelling aircraft.¹⁰

Land-based ballistic missiles

As of January 2013 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 326 ICBMs of different types. The RS-20V (designated SS-18 by NATO) and RS-18 (SS-19) liquid-fuelled, silo-based ICBMs, which date from the Soviet era, are expected to be gradually phased-out by 2020 and the RS-18 replaced by a new liquid-propellant missile currently under development.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 The solid-fuelled road-mobile RS-12M Topol (SS-25) is also planned to be retired by 2019; meanwhile it is undergoing a life-extension programme. During 2012, the programme included test-launches on 7 June (which also tested missile defence countermeasures) and 19 October.¹³

The solid-fuel RS-12M Topol-M (SS-27 Mod 1) has been developed in both road-mobile (RS-12M1) and silo-based (RS-12M2) versions.¹⁴ In 2010 the SRF abandoned further procurement of the RS-12M1 in favour of the mobile version of the RS-24 Yars (SS-27 Mod 2), which is a variant of the RS-12M1 with multiple independently targetable re-entry vehicles (MIRV); deployment began in 2011. By the end of 2012 the SRF had 18 operational RS-24 missiles, all of which were deployed with the 54th Guards Missile Division (GMD), based in Teykovo District, Ivanovo Oblast.¹⁵ Preparations began to replace the RS-12Ms of the 29th GMD at Irkutsk and the 39th GMD at Novosibirsk with the mobile version of the RS-24.¹⁶ In 2012 the decision was taken to also stop procurement of the RS-12M2; the last

⁹ Mikhailov, A., [Strategic bomber 'Bear' is left in service], *Izvestiya*, 20 Sep. 2012.

¹⁰ [First flying prototype of the PAK DA is planned for 2017], *Vzglyad*, 23 Dec. 2012, <<http://vz.ru/news/2012/12/23/613368.html>>.

¹¹ Isby, D. C., 'Russian exercise highlights SRF modernization plans', *Jane's Missiles and Rockets*, vol. 16, no. 12 (Dec. 2012), p. 4.

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

¹³ 'Test of Topol from Kapustin Yar', 7 June 2012, Russian Strategic Nuclear Forces, <http://russianforces.org/blog/2012/06/test_of_topol_from_kapustin_ya.shtml>; and Isby (note 11).

¹⁴ Lennox, D. (ed.), *Jane's Strategic Weapon Systems*, no. 54 (IHS Global Limited: Coulsdon, 2011), p. 175.

¹⁵ 'Topol-M and RS-24 Yars deployment plans', 14 Dec. 2012, Russian Strategic Nuclear Forces, <http://russianforces.org/blog/2012/12/topol-m_and_rs-24_yars_deploym.shtml>.

¹⁶ Russian Ministry of Defence, [Two more missile divisions will be re-equipped with the new missile system 'Yars'], 19 Dec. 2011, <http://function.mil.ru/news_page/country/more.htm?id=10854015@egNews>.

four missiles of this kind were put into service with the 60th Missile Division at Tatischevo Airbase, Saratov Oblast. Preparations began in 2012 to equip the 28th GMD, based at Kozelsk, Kaluga Oblast, with the silo version of the RS-24, which will replace the RS-18.¹⁷ From 2013, all new silo-based ICBMs will be RS-24s.¹⁸

On 23 May and 24 October 2012 the SRF was reported to have launched two new mobile ICBMs of an unspecified type, although they were probably RS-24s with modified payloads.¹⁹

Ballistic missile submarines and sea-launched ballistic missiles

As of January 2013 the Russian Navy operated a total of 10 SSBNs: 7 with the Northern Fleet and 3 with the Pacific Fleet.

Three Project 667BDR Kalmar (designated Delta III class by NATO) submarines, each carrying 16 RSM-50 Volna (SS-N-18 M1) SLBMs, were assigned to the Pacific Fleet. One of them, the K-433 *Svyatoy Georgiy Pobedonosets*, successfully test-launched an RSM-50 SLBM on 19 October 2012.²⁰ Six Project 667BDRM Delfin (Delta IV class) submarines, each carrying 16 RSM-54 Sineva (SS-N-23) SLBMs, were assigned to the Northern Fleet. One of them, the K-84 *Ekaterinburg*, was damaged in December 2011 and is not expected to be back in service until 2014.²¹

On 10 January 2013 Russia's first Project 955 Borei SSBN, the K-535 *Yuri Dolgoruky*, entered service with the Northern Fleet. The second submarine of this class, the K-550 *Alexander Nevsky*, is still undergoing sea trials, while the third, *Vladimir Monomakh*, was launched on 30 December 2012.²² The construction of the *Knyaz Vladimir*, the first SSBN of an upgraded Project 955A Borei class, began in July 2012.²³ Russia plans to build a total of eight Borei SSBNs, equipped with RSM-56 Bulava (SS-NX-32) SLBMs, to replace the existing Kalmar and Delfin SSBNs.

¹⁷ [Fifth generation missile complex is being deployed in Kaluga region], TV Zvezda, 12 July 2012, <<http://tvzvezda.ru/news/forces/content/201207122252-8xqt.htm>>.

¹⁸ Isby, D. C., 'Silo-based Yars ICBMs to enter service', *Jane's Missiles and Rockets*, vol. 17, no. 1 (Jan. 2013), p. 6.

¹⁹ Safronov, I., ['Bulava' surfaced in Plesetsk], *Kommersant*, 24 May 2012; and 'New ICBM tested in Kapustin Yar', Russian Strategic Nuclear Forces, 24 Oct. 2012, <http://russianforces.org/blog/2012/10/new_icbm_tested_in_kapustin_ya.shtml>.

²⁰ 'Russia successfully tests ballistic missiles', Russia Today, 30 Oct. 2012, <<http://rt.com/news/bulava-sineva-topol-launch/>>.

²¹ Kile, S. N. et al., 'Russian nuclear forces', *SIPRI Yearbook 2012*, p. 320.

²² 'Russia to lay down two improved Borei class subs in 2013', RIA Novosti, 14 Jan. 2013, <http://en.ria.ru/military_news/20130114/178766923/Russia_to_Lay_Down_Two_Improved_Borei_Class_Subs_in_2013.html>.

²³ 'Putin attends nuclear sub ceremony', RIA Novosti, 30 July 2012, <http://en.rian.ru/military_news/20120730/174865317.html>.

In addition, one Project 941 Akula (Typhoon class) submarine has been converted for use as a test platform. It is not considered part of the armed SSBN force.²⁴

Non-strategic nuclear weapons

There is considerable uncertainty about the size and location of Russia's non-strategic nuclear inventory. The estimate made here is that there are approximately 2000 warheads available to Russian forces with another 2000 retired and awaiting dismantlement (see table 6.3). This estimate is based on previous estimates of the Soviet non-strategic warheads arsenal, information released in connection with the 1991–92 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.²⁵ The estimate is consistent with a statement made in November 2011 by the US Department of Defense that unclassified estimates set the Russian inventory at approximately 2000–4000 non-strategic nuclear weapons.²⁶

Another study published in 2012 suggests that the number of Russian 'operationally assigned' non-strategic nuclear warheads may be as low as approximately 1000, with the total stockpile being about 1900.²⁷ 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.

²⁴ 'Russia set to keep Typhoon class nuclear subs until 2019—Navy', RIA Novosti, 7 May 2010, <http://en.rian.ru/military_news/20100507/158917310.html>.

²⁵ 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 (note 6), pp. 26–27.

²⁶ 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 (note 21), p. 321.

²⁷ 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.