II. Russian nuclear forces

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As of January 2012 Russia maintained an arsenal of approximately 1800 deployed nuclear warheads, all of which were either placed on long-range strategic missiles or located on bases with operational forces (see table 7.3). This represents a decrease from the figure published in *SIPRI Yearbook 2011* and reflects a recalculation based on New START aggregate data and adjustment of the bomber weapon count. In addition, Russia possessed a sizable stockpile of non-deployed nuclear warheads, consisting of approximately 2000 non-strategic (tactical) nuclear warheads held in storage, and another 5500 warheads that were retired and awaiting dismantlement.

In 2011 Russia and the United States completed two exchanges of data on the numbers, locations and technical characteristics of their strategic nuclear forces that are subject to New START.[1] As of 1 September 2011, Russia deployed a total of 1566 warheads attributed to 516 treaty-accountable strategic launchers—intercontinental ballistic missiles (ICBMs), submarine-launched ballistic missiles (SLBMs) and heavy bombers.[2] This meant that Russia was already close to meeting the New START ceiling of 1550 deployed warheads that is to be achieved by the 2018 deadline for implementing the treaty. Russia has refused to publicly release 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.

The modest arms reductions mandated by New START codified existing trends in Russian strategic forces. These forces have continued to decline as Soviet-era missiles and bombers have reached the end of their service lives. Because of technical and financial constraints, Russia has not introduced new or modernized delivery systems at nearly the same rate as it has retired the older systems.

The force reductions have been accompanied by a doctrinal shift away from the Soviet requirement of 'nuclear parity' with all potential adversaries towards a posture of minimal deterrence vis-à-vis the USA. Russia's national security strategy, approved in 2009, states that Russia will

[1] On New START's provisions see chapter 8, section I, and annex A in this volume.

[2] See chapter 8, section I, table 8.2, in this volume. 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. US State Department, Bureau of Arms Control, Verification and Compliance, 'New START Treaty aggregate numbers of strategic offensive arms', Fact sheet, 25 Oct. 2011, <http://www.state.gov/t/avc/rls/176096.htm>.

Table 7.3. Russian nuclear forces, January 2012

Type/Russian designation (NATO designation)	No. deployed	Year first deployed	Range (km)[a]	Warhead loading	No. of warheads[b]
Strategic offensive forces					**~1 510/2 430**
Bombers	*72*				*72/820*[c]
Tu-95MS6 (Bear-H6)	28	1981	6 500–10 500	6 x AS-15A ALCMs, bombs	28/168
Tu-95MS16 (Bear-H16)	31	1981	6 500–10 500	16 x AS-15A ALCMs, bombs	31/496
Tu-160 (Blackjack)	13	1987	10 500–13 200	12 x AS-15B ALCMs or AS-16 SRAMs, bombs	13/156
ICBMs	*322*				*1 087*
RS-20V (SS-18 Satan)	50	1992	11 000–15 000	10 x 500–800 kt	500
RS-18 (SS-19 Stiletto)	48	1980	10 000	6 x 400 kt	288
RS-12M Topol (SS-25 Sickle)	135	1985	10 500	1 x 800 kt	135
RS-12M2 Topol-M (SS-27)	56	1997	10 500	1 x 800 kt	56
RS-12M1 Topol-M (SS-27)	18	2006	10 500	1 x (800 kt)	18
RS-24 Yars (SS-27 Mod 2)	15	2010	10 500	6 x (100? kt)	90
SLBMs	*144*				*352/528*[d]
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)	(32)	(2011)	>8 050	6 x (100? kt)	(192)
Non-strategic forces					**(~2 000)***
ABM, air/coastal defence[e]	*~1 100*				*(~425)**
53T6 (SH-08, Gazelle)	68	1986	30	1 x 10 kt	(68)*
S-300/S-400 (SA-10/12/20/21)	1 000	1980	..	1 x low kt	(~340)*
SSC-1B (Sepal)	34	1973	500	1 x 350	(~17)*
Air force weapons[f]	*430*				*(~730)**
Tu-22M3 (Backfire-C)	150	1974	..	3 x ASM, bombs	(~450)*
Su-24M/M2 (Fencer-D)	264	1974	..	2 x bombs	
Su-34 (Fullback)	16	2006	..	2 x bombs	
Army weapons[g]	*164*				*(~164)**
SS-21 Tochka (Scarab)	150	1981	120	(1 x 10 kt)	(~150)*
SS-26 Iskander (Stone)	24	2005	500	(1 x 10 kt)	(~24)*
Navy weapons SLCM, ASW, SAM, depth bombers, torpedoes[h]					*(~700)**
Total deployed/assigned warheads					**~1 800/4 430**[i]

.. = 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.

* According to the Russian Government, all non-strategic nuclear warheads are in storage, and are therefore not counted in the total number of deployed warheads. In addition to the 2000 warheads available for non-strategic nuclear-capable forces listed in the table, another 2000 warheads are estimated to have been retired and awaiting dismantlement.

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

[b] For strategic warhead estimates with two figures, the number on the left is the estimated count under New START for deployed warheads, while the number on the right is the total number of warheads estimated to be assigned to the delivery system. The table does not count so-called phantom aircraft, bombers that are not assigned a nuclear mission but still carry electronic equipment that make them accountable under the treaty.

[c] Of the 820 weapons that are 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.

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

[e] The 51T6 (SH-11 Gorgon) is no longer operational. The S-300P (SA-10 Grumble, SA-12 Gargoyle), S-300V (SA-12A Gladiator, SA-12B Giant) and S-400 (SA-21 Growler) may have some capability against some ballistic missiles. Only about one-third of the 1000 deployed air-defence launchers are counted as having nuclear capability.

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

[g] According to NATO's International Military Staff, the Russian 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 SIPDIS, USNATO546, 23 Nov. 2009, <http://www.aftenposten.no/spesial/wikileaksdokumenter/article4028273.ece>.

[h] Surface ships are not believed to have been assigned nuclear torpedoes.

[i] The left-hand number is the number of warheads estimated to be counted by New START plus *c*. 300 bomber weapons that are thought to be present at bomber bases. Another 700 strategic warheads are estimated to be in reserve for SSBNs and bombers, and *c*. 2000 non-strategic warheads are thought to be in central storage. In addition, *c*. 5500 retired warheads are thought to be in queue for dismantlement for a total inventory of *c*. 10 000 warheads.

Sources: Russian Ministry of Defence press releases; US Department of State, START Treaty Memoranda of Understanding, 1990–July 2009; 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.

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 'minimally sufficient' (*garantirovanno dostatochnyi*) deterrence under current arms control limitations but need quali-

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

tative improvements to enhance their survivability for an assured second-strike capability and their ability to penetrate missile defences.[4]

Russia's strategic force modernization plans have prioritized the deployment of a new road-mobile ICBM and the development of a new silo-based heavy ICBM. Russia is also pressing ahead with the introduction into service of a new generation of strategic submarines and SLBMs, as well as the overhaul of its long-range bomber force.

Strategic bombers

Russia's Long-range Aviation Command includes 13 Tu-160, 31 Tu-95MS16 and 28 Tu-95MS6 bombers. In 2011 the command conducted 50 strategic bomber patrols, continuing the practice that was suspended in 1992 and resumed in 2007.[5] In order to maintain the pace of long-range patrols, Russia has initiated a programme to upgrade and extend the service life of its ageing heavy bomber force. However, Russia's strategic aviation units have reportedly experienced problems with overhaul and maintenance, which have precluded any increase in patrol activity. A shortage of aerial refuelling aircraft (Il-78), necessary for long-range missions, has also been reported.[6]

In 2011 the Tupolev Design Bureau continued to develop the new strategic bomber, known as the PAK DA (Advanced Aviation Complex for Long-Range Aviation). The current plans include building the first PAK DA prototype by 2020, and the aircraft is expected to enter service by 2030.[7]

Land-based ballistic missiles

As of January 2012 Russia's Strategic Rocket Forces (SRF) consisted of three missile armies, with 12 missile divisions, deploying a total of 322 ICBMs of different types.[8] The RS-20V (SS-18) and RS-18 (SS-19) liquid-fuelled, silo-based ICBMs date from the Soviet era and are expected

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

[5] President of Russia, 'Press statement and responses to media questions following the Peace Mission 2007 counterterrorism exercises and the Shanghai Cooperation Organisation Summit', 17 Aug. 2007, <http://archive.kremlin.ru/eng/speeches/2007/08/17/2033_type82915_141812.shtml>; and [Long-range aviation day is celebrated by the Air Force], ITAR-TASS, 23 Dec. 2011, <http://www.itar-tass.com/c9/304603.html>.

[6] Stukalin, A., 'Bears and Blackjacks are back: what's next?', *Moscow Defense Brief*, no. 4 (22), 2010.

[7] [Long-range aviation day is celebrated by the Air Force], ITAR-TASS, 23 Dec. 2011, <http://www.itar-tass.com/c9/304603.html>.

[8] [RVSN will keep three armies and 12 divisions until 2016], RIA Novosti, 6 May 2011, <http://ria.ru/defense_safety/20110506/371480435.html>.

to be taken out of service around 2020.[9] On 27 December 2011 an RS-18 was launched from the Baikonur space launch facility in Kazakhstan as part of a programme to extend the missiles' service life three times longer than originally planned.[10] In 2011 the Ministry of Defence announced that it had selected the Makeyev Design Bureau—traditionally a developer of SLBMs—to begin design and development work on a new silo-based heavy ICBM to replace the RS-20V and the RS-18.[11]

The solid-fuelled, road-mobile RS-12M Topol (SS-25) ICBM is undergoing a service-life extension programme. Based on the results of two test launches conducted in 2011, the SRF announced that the RS-12M missile would remain on combat duty until 2019. In 2011 two test launches were conducted as part of the service-life extension programme. Based on the results of the tests, the SRF announced that the service life of the RS-12M missile would be extended until 2019.[12] One of the tests, on 3 September 2011, involved trials of a 'prospective combat payload', which some experts interpreted as referring to missile defence penetration aids.[13]

The RS-12 Topol-M (SS-27) has been developed in both road-mobile (RS-12M1) and silo-based (RS-12M2) versions.[14] In 2010 the SRF abandoned production of the RS-12M1 in favour of a MIRVed variant, the RS-24 (SS-27 Mod 2), which can carry up to three warheads. The deployment of the first regiment, consisting of nine RS-24s, was completed in August 2011.[15] Another six RS-24 missiles were deployed in December 2011.[16]

Ballistic missile submarines and sea-launched ballistic missiles

As of January 2012 the Russian Navy operated a total of 10 nuclear-powered ballistic missile submarines (SSBNs), six of which were operation-

[9] Isby, D. C., 'Russia to develop new heavy ICBM', *Jane's Missiles and Rockets*, vol. 15, no. 5 (May 2011), p. 16.

[10] Russian Ministry of Defence, Information and Public Relations Service, [The RS-18 ICBM launched from Baikonur], 27 Dec. 2011, <http://www.function.mil.ru/news_page/country/more.htm?id=10865745@egNews>; and 'RS-18 ICBM to serve three times the planned operational life', *Jane's Missiles and Rockets*, vol. 15, no. 10 (Oct. 2011), p. 6.

[11] Litovkin, V., [The military is waiting for the 5th generation missiles], *Izvestiya*, 13 May 2011; and Kovalenko, D., [Against the BMD], *Vzglyad*, 16 Dec. 2011.

[12] Russian Ministry of Defence, Information and Public Relations Service, [A successful test launch of the RS-12M 'Topol' missile was conducted from Plesetsk], 2 Sep. 2011, <http://www.structure.mil.ru/structure/forces/strategic_rocket/news/more.htm?id=10679038@egNews>; and 'Topol ballistic missiles may stay in service until 2019', RIA Novosti, 28 Oct. 2011, <http://en.rian.ru/mlitary_news/20111028/168206957.html>.

[13] 'Old Topol is tested with a new warhead', Russian Strategic Nuclear Forces Blog, 3 Sep. 2011, <http://russianforces.org/blog/2011/09/old_topol_is_tested_with_a_new.shtml>.

[14] Lennox, D. (ed.), *Jane's Strategic Weapon Systems* (IHS Global Limited: Coulsdon, 2011), p. 175.

[15] Richardson, D., 'Russia places first RS-24 Yars ICBM unit on combat alert', *Jane's Missiles and Rockets*, vol. 15, no. 10 (Oct. 2011), p. 6.

[16] Russian Ministry of Defence, Information and Public Relations Service, [Two more divisions will be equipped with the state-of-the-art 'Yars' missile complex], 19 Dec. 2011, <http://www.structure.mil.ru/structure/forces/strategic_rocket/news/more.htm?id=10854015@egNews>.

ally deployed. Three Delta III class (Project 667BDR Kalmar) submarines, each carrying 16 RSM-50 SLBMs, were assigned to the Pacific Fleet, and six Delta IV class (Project 667BDRM Delfin) submarines, each carrying 16 RSM-54 SLBMs, were assigned to the Northern Fleet. On 29 December 2011, one of the Delta IV Class SSBNs, the K-84 *Ekaterinburg*, caught fire in its floating dry dock during maintenance. The fire damage was not expected to be repaired before mid-2014.[17] As of January 2012, two other Delta IV class submarines were undergoing overhauls. In addition, one Typhoon class (Project 941 Akula) submarine was being kept for use as a test platform.[18]

Successful launches of the new R-29RMU2.1 'Liner' SLBM, a variant of the RSM-54 Sineva (SS-N-23 Skiff) SLBM, were conducted on 20 May by K-84 *Ekaterinburg* and on 29 September 2011 by K-114 *Tula*. The new missile reportedly can carry up to 10 warheads of different yields as well as missile defence countermeasures.[19]

Russia is pressing ahead with the introduction into service of a new class of SSBN, the Project 955 Borei. The lead boat in the class, the *Yurii Dolgorukii*, successfully finished sea trials in December 2011 and is expected to enter service in 2012. The second boat in the class, the *Aleksandr Nevskii*, will continue its trials in 2012.[20]

Each of the Borei class submarines will carry 16 SLBMs of a new type, the three-stage, solid-fuelled RSM-56 Bulava. Serious technical problems related to the poor quality of missile components led to an administrative reorganization of the Bulava's development programme in 2009–10. In 2011 the Russian Navy conducted four successful flight tests of the Bulava, including a salvo launch in the White Sea of two missiles on 23 December 2011.[21] After the successful salvo launch, the Bulava missile was officially approved for service with the Russian Navy.[22]

[17] There were conflicting reports about whether the submarine's reactors had been shut down and its ballistic missiles removed prior to the fire. Safronov-Jr., I., [The "Ekaterinburg" submarine is promised to be back in service by 2014], *Kommersant*, 13 Jan. 2012, <http://www.kommersant.ru/doc-y/1849693>.

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

[19] 'Liner SLBM explained', Russian Strategic Nuclear Forces Blog, 4 Oct. 2011, <http://russianforces.org/blog/2011/10/liner_slbm_explained.shtml>; and Richardson, D., 'Liner SLBM completes its trials programme', *Jane's Missiles and Rockets*, vol. 15, no. 12 (Dec. 2011), p. 5.

[20] [The 'Yurii Dolgorukii' submarine is about to enter service with the Russian strategic nuclear Navy], ARMS-TASS, 11 Jan. 2012, <http://www.arms-tass.su/?page=article&aid=102458&cid=44>.

[21] 'Yuri Dolgoruky launches its first Bulava missile', *Jane's Missiles and Rockets*, vol. 15, no. 8 (Aug. 2011), p. 9; 'Russians practice submerged salvo launch of Bulava missile from *Yuri Dolgoruky*', *Jane's Missiles and Rockets*, vol. 16, no. 1 (Jan. 2012), p. 3; and Kramnik, I., 'Russia completes Bulava missile testing', Voice of Russia, 29 Dec. 2011, <http://english.ruvr.ru/2011/12/ 29/63127625.html>.

[22] 'Bulava missile completes flight tests, ready to deploy', RIA Novosti, 27 Dec. 2011, <http://en.rian.ru/mlitary_news/20111227/170516131.html>.

Non-strategic nuclear weapons

There is considerable uncertainty about the size and location of Russia's non-strategic nuclear inventory, which continues to be characterized by a high degree of secrecy and a lack of transparency. Estimates about the size of the Soviet inventory of non-strategic nuclear weapons in 1991 ranged from approximately 15 000 to 21 700.[23] Since the end of the cold war, Russia has significantly reduced its inventory of non-strategic nuclear weapons.[24] In November 2011 a senior US Department of Defense official testified before the US Congress that Russia possessed approximately 2000–4000 non-strategic nuclear weapons.[25] This number is somewhat lower than the '3000–5000 plus' range given during a NATO briefing on the USA's 2010 Nuclear Posture Review in September 2009.[26]

Based on an analysis of Russia's remaining nuclear-capable naval, air force and air defence delivery systems and their nominal warhead capacity, it is estimated here that Russia has available approximately 2000 non-strategic nuclear warheads for these systems.[27] Another 2000 warheads are estimated to have been retired and awaiting dismantlement.

[23] For an estimated range see Norris, R. S. and Arkin, W. M., 'Nuclear notebook: estimated Soviet nuclear stockpile (July 1991)', *Bulletin of the Atomic Scientists*, vol. 47, no. 6 (July/Aug. 1991), p. 48; and Arbatov, A., 'Deep cuts and de-alerting: a Russian perspective', ed. H. A. Feiveson, *The Nuclear Turning Point: A Blueprint for Deep Cuts and De-Alerting of Nuclear Weapons* (Brookings Institution Press: Washington, DC, 1999), p. 320.

[24] The Russian Government declared in 2010 that it had reduced the number of non-strategic nuclear weapons by approximately 75% since 1991. See 2010 NPT Review Conference, Delegation of the Russian Federation, 'Practical steps of the Russian Federation in the field of nuclear disarmament', Statement, New York, 3–28 May 2010, p. 8.

[25] 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.

[26] Kile, S. N. et al., 'World nuclear forces', *SIPRI Yearbook 2011*, p. 334; and US Mission to NATO, 'PDUSDP Miller consults with allies on Nuclear Posture Review', Cable to US State Department, no. 09USNATO378, 4 Sep. 2009, <http://wikileaks.org/cable/2009/09/09USNATO378.html>.

[27] Kristensen, H. M., *Non-Strategic Nuclear Weapons*, Federation of American Scientists (FAS) Special Report no. 3 (FAS: Washington, DC, May 2012), p. 52.