A New START Model for Transparency in Nuclear Disarmament

Individual Country Reports

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A NEW START MODEL FOR TRANSPARENCY IN NUCLEAR DISARMAMENT

INDIVIDUAL COUNTRY REPORTS

This supplement to the UNIDIR study A New START Model for Transparency in Nuclear Disarmament[1] contains data exchange documents for all Nuclear Non-Proliferation Treaty nuclear-weapon states that are modelled after the reports submitted by the Russian Federation and the United States as part of their New START obligations. [2] These model reports demonstrate the feasibility of applying the New START-type data exchange mechanism to nuclear arsenals of other states and illustrate advantages of this kind of reporting. In the New START framework, these documents provide detailed information on the composition of the strategic forces and the supporting infrastructure that helps the Russian Federation and the United States to monitor compliance with the treaty and conduct verification and inspection activities. In the multilateral context, data exchange would play a role of an important confidence-building tool and open a possibility of closer cooperation among nuclear-weapon states in moving towards coordinated reductions of their nuclear arsenals.

The format of the data exchange documents is described in the protocol to the treaty. The treaty also specifies that the reports should be submitted every six months after the treaty enters into force. The information exchanged by the parties is considered confidential and cannot be released to the public without mutual consent.[3] There are two exceptions to the consent rule—each party has the right to release to the public the aggregate numbers of strategic arms, and the detailed data related to its own strategic forces.[4] The parties normally release the aggregate numbers some time after the official exchange takes place.[5] The United States also has released unclassified versions of three of the four data exchange reports that it has submitted to the Russian Federation so far.[6] Some information—geographic coordinates, unique identifiers, and site diagrams of facilities—was withheld from the public release as required by the treaty,[7] while other data, such as the number of deployed warheads associated with intercontinental ballistic missile (ICBM) bases or submarine bases, was removed during the declassification process.

The model data exchange documents presented in this supplement comply with the requirements of the New START protocol to the maximum extent possible and use the United States reports as an example. They also include geographic coordinates of the facilities that could be identified by using

1 Tamara Patton, Pavel Podvig, and Phillip Schell, *A New START Model for Transparency in Nuclear Disarmament*, UNIDIR, 2013.

2 New START refers to the Treaty between the United States of America and the Russian Federation on Measures for the Further Reduction and Limitation of Strategic Offensive Arms.

3 New START, art. VII.5.

4 New START, arts. VII.5 and VII.7.

5 By the end of 2012, there had been four data exchanges, reflecting the status of strategic forces as of 5 February 2011 (the date the treaty entered into force), 1 September 2011, 1 March 2012, and 1 September 2012. For the most recent data exchange, see US Department of State, Bureau of Arms Control, Verification and Compliance, "New START Treaty aggregate numbers of strategic offensive arms", 3 October 2012, www.state.gov/t/avc/rls/198582.htm/.

6 These reports can be requested from the Bureau of Arms Control, Verification and Compliance of the US Department of State.

7 New START, art. VII.6.

open satellite imagery to demonstrate that most of the location data that would be included in the treaty report is already available in the public domain.

Each model report, which can be found in the annexes, consists of nine sections that correspond to different categories of data. The first section describes general provisions and agreements that apply to the exchange information. The model reports follow the convention established in this section that uses the mark "---" to denote entries that are not applicable, and the mark "***" to denote that the data will be provided when available. The treaty requires that geographic coordinates of facilities should be rounded to the nearest minute, as long as this allows locations to be distinguished. In the model data exchange documents presented here all coordinates are given with higher accuracy to facilitate their identification on maps.

The next four sections of the exchange reports contain the aggregate numbers of strategic arms and detailed information about ICBM, submarine, and air bases, deployed warheads, non-deployed ICBMs, submarine-launched ballistic missiles (SLBMs), and heavy bombers. A separate section describes space launch facilities. One section of the report contains technical data on the ICBMs and SLBMs that are covered by the treaty. The next section describes distinguishing features of bombers that are equipped for nuclear arms. The final section of the data exchange document mostly contains information that is relevant for inspection activities. This section is not included in the model documents presented in this supplement, but the states could submit this information if they decide to open their facilities for inspection.

CHINA

Overview and aggregate numbers

Based on a variety of governmental and non-governmental sources, it is estimated that as of 2012 China maintained a total stockpile of about 240 nuclear warheads, of which about 180 warheads were assigned to various operational delivery systems—land-based ballistic missiles and nuclear-configured aircraft. All warheads, however, are kept in storage, as it is widely believed that in peacetime China stores its nuclear warheads in storage facilities separate from their delivery vehicles and not ready for immediate launch.[8] In addition to the warheads that are assigned to operational systems, some are held in reserve in anticipation of future deployment of existing or new systems; some are probably held as spares.

For the purposes of reporting under the New START standard, only about 60 of China's nuclear capable land-based ballistic missiles would qualify as deployed delivery systems that would be counted against the respective New START limit. These include 20 DF-5A missiles and about 40 missiles of the DF-31 and DF-31A types, all of which have a range of over 5,500km and therefore would be considered ICBMs under the New START definition. China has been developing SLBMs, but as of the date of the report, 1 September 2012, none of these missiles were believed to be deployed. Also, none of China's nuclear-capable aircraft would fall under the New START definition of a heavy bomber, so they would not be accounted for in the New START-type report.

The number of warheads on deployed ICBMs, deployed SLBMs, and nuclear warheads counted for deployed heavy bombers would be reported as zero. This is because, although China's land-based ICBMs are considered deployed, it is widely believed that, in peacetime, China stores its nuclear ICBM warheads in storage facilities separate from their delivery vehicles. Reportedly, individual warheads are only uploaded in very rare cases for technical assessments.[9] Since the navy's SLBMs are not considered deployed, the warheads that could be assigned to them would not be counted in this category. As there are no aircraft that would be considered heavy bombers under New START, the number of deployed warheads associated with bombers is zero as well.

The total number of deployed and non-deployed launchers of ICBMs and SLBMs, and heavy bombers would include the 60 deployed ICBMs, an estimated 10 ICBM launchers that are used for training and testing, and the 39 SLBM launchers on ballistic missile submarines (three of them are launchers that are used for testing). No aircraft would be counted against the New START limit.

ICBMs

Based on the New START definition of an ICBM as a land-based ballistic missile with a range in excess of 5,500 km, only three types of China's ballistic missiles are counted under the treaty: the silo-based DF-5A (range 13,000km), the road-mobile DF-31 (range 7,400km), and the DF-31A (range 11,200km). All other Chinese land-based, nuclear-capable ballistic missiles fall below the 5,500km threshold and are not counted. These include the DF-3A (range 3,100km), the DF-4 (5,500km), and

8 See e.g. Hui Z., "China", in R. Acheson (ed.), *Assuring Destruction Forever: Nuclear Weapon Modernization Around the World*, Reaching Critical Will, 2012, p. 17; Li B., "Tracking Chinese strategic mobile missiles", *Science and Global Security*, vol. 15, no. 1, 2007, p. 11.

9 See e.g. Hui Z., "China", in R. Acheson (ed.), *Assuring Destruction Forever: Nuclear Weapon Modernization Around the World*, Reaching Critical Will, 2012, p. 17; Li B., "Tracking Chinese strategic mobile missiles", *Science and Global Security*, vol. 15, no. 1, 2007, p. 11.

the DF-21/21A (ranges 2,100km and 2,500km) ballistic missiles.[10] There are inconsistent estimates on the range of the DF-4, which is currently being replaced by the DF-31.[11] Given that the DF-4 is also one of China's oldest ballistic missiles, we assume that its range is at the lower end of the estimates, so it is not counted as an ICBM for the model report. Any new types of missiles that might be in development would not be counted for New START purposes and would be classified as prototypes, defined as an ICBM or SLBM of a new type, no more than 20 missiles of which have been launched, and no launchers of missiles of which have been deployed.[12]

The DF-5A (CSS-4 Mod 2) is a liquid-fuelled, three-stage, silo-based ICBM. Reportedly, the missile was first deployed in 1981. A civil derivative of the DF-5A, the Long March-2C, or CZ-2C, is used for space launch applications.[13] The solid-fuelled, three-stage, road-mobile DF-31 (CSS-10 Mod 1) and DF-31A (CSS-10 Mod 2) are believed to have entered into service in 2006 and 2007 respectively.[14] New START defines a silo launcher of ICBMs as an ICBM launcher in a silo structure located in the ground. The term mobile launcher of ICBMs means an erector–launcher mechanism for launching ICBMs and the self-propelled device on which it is mounted. Accordingly, the DF-5A is classified as a silo-based ICBM and the DF-31/31A as road-mobile.

New START counts an ICBM as deployed when it is contained in or on a deployed launcher of ICBMs, which is not an ICBM test or training launcher and is not located at a space launch facility. Although the operational status of China's ICBMs is not officially confirmed, from an operational point of view it would be reasonable to assume that the Second Artillery of the People's Liberation Army, China's strategic missile force, keeps its ICBMs contained within their respective launchers. As a result, all of China's 60 ICBMs are considered as deployed for the model report. Furthermore, the United States Department of Defense estimates a corresponding number of launchers for each ICBM.[15] This is an important point, as it suggests that there are no empty ICBM launchers.

There have been claims that China could hide significant numbers of additional ballistic missiles and warheads in clandestine underground facilities.[16] However, based on the United States Department of Defense estimate of a corresponding number of launchers and ICBMs, it could be assumed that there are no empty silos and mobile launchers to be used to launch any non-deployed missiles that some believe China might have. Any additional launchers would have to be declared and counted under New START. The number of non-deployed ICBMs, (defined as an ICBM not contained in a deployed launcher of ICBMs or on a deployed launcher of ICBMs) is not included in the

10 Although China has its own system for defining missile ranges, the United States Department of Defense definitions are used here—short range: less than 1,100km; medium range: 1,100–2,750km; intermediate range: 2,750–5,500km; and intercontinental range: more than 5,500km.

11 In 2010, the United States Department of Defense listed the DF-4 with a range of 5,400+ km, and the Federation of American Scientists and the Stockholm International Peace Research Institute specified a range of 5,500km. Older Federation of American Scientists sources indicated a range of 4,500–7,000km, Sean O'Connor, author of the "IMINT & Analysis" website (http://geimint.blogspot.com/) estimates 4,760km.

12 There are claims that China might have tested what is believed to be a new type of ICBM referred to as DF-41; see B. Gertz, "Ready to launch", *Washington Free Beacon*, 21 August 2012, http://freebeacon.com/ready-to-launch/.

13 D. Lennox (ed.), *Jane's Strategic Weapon Systems*, no. 54, 2011, p. 19.

14 Ibid., p. 29.

15 US Department of Defense, *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2012*, 2012, p. 29.

16 B. Stephens, "How many nukes does China have?", *Wall Street Journal*, 24 October 2011; V. Yesin, "Tretiy posle SShA i Rossii [The third after the Unites States and Russia]", *Voenno-Promyshlennyi Kurier,* vol. 17, 2 May 2012, http://vpk-news.ru/articles/8838/.

aggregate numbers reported under New START (article II.1a sets a limit of 700 on deployed missiles and bombers, while article II.1b, which deals with non-deployed systems, limits only launchers). However, in a detailed biannual data exchange, parties report all their non-deployed missiles. So, if China would submit information in the format of a detailed New START data exchange, it would have to report on the number of its non-deployed ICBMs.

The New START reporting structure of ICBM bases distinguishes between ICBM bases for silo launchers of ICBMs and ICBM bases for mobile launchers of ICBMs. Since China has silo-based as well as mobile-based missiles, it would have to report both types of facilities.

An ICBM base for silo launchers of ICBMs refers to an area in which one or more groups of silo launchers of ICBMs and one associated maintenance facility are located. Each ICBM base for silo launchers of ICBMs oversees a number of silo launcher groups. An ICBM base for mobile launchers of ICBMs refers to an area in which one or more basing areas and one associated maintenance facility are located. The term basing area means an area within an ICBM base for mobile launchers of ICBMs, in which deployed mobile launchers of ICBMs are based and in which fixed structures for mobile launchers of ICBMs are located. A fixed structure for mobile launchers of ICBMs is defined as a unique structure, within a basing area, designed to contain mobile launchers of ICBMs.

In the case of China, fixed structures for mobile launchers of ICBMs appear to be high-bay garages that contain mobile ICBM launchers. The term itself, which appeared in the START treaty in 1991, originally referred to the missile shelters with retractable roofs that were deployed by the Soviet Union for its SS-25 missiles. New START does not make a distinction between the types of garages.

The information available on deployment structure and basing patterns of China's nuclear forces is limited and the estimated locations and descriptions can only be drawn from a limited number of sources. The Second Artillery appears to have organized its missile units into six geographically dispersed bases and one central storage facility. Each missile base appears to operate within a broad geographic area and oversees numerous subordinate missile brigades. These brigades maintain one or more garrisons, which in turn support launch battalions that deploy China's ICBMs. The launch battalions appear to be geographically spread out from their respective brigade garrisons.[17] In terms of New START, "bases" appear to be equivalent to ICBM bases for silo launchers of ICBMs and ICBM bases for mobile launchers of ICBMs respectively. The Second Artillery's missile brigades, operating China's silo-based and mobile ICBMs, appear to be analogous to what the New START treaty refers to as launcher groups for silo launchers and basing areas for mobile launchers. This assumes that brigades do not have their own maintenance facilities, as defined by New START. If that would be the case, each brigade would be considered an ICBM base. The structure of China's ICBM bases appears to have an additional category—launch battalions, associated with each missile brigade—which the New START treaty does not account for.[18]

The Second Artillery's ICBMs are believed to be assigned to four out of its six bases—53 Base, 54 Base, 55 Base, and 56 Base. 54 Base and 55 Base reportedly operate both silo-based and road-mobile ICBMs, while 53 Base and 56 Base operate only road-mobile ICBMs. As a result, the Chinese missile base structure of deploying both silo-based and mobile ICBMs at the same "base"

17 M.A. Stokes, *China's Nuclear Warhead Storage and Handling System*, Project 2049 Institute, 2010, p. 7; Li B., "Tracking Chinese strategic mobile missiles", *Science and Global Security*, vol. 15, no. 1, 2007, p. 4.

18 Russian mobile ICBM regiments also have battalions; for example, an ICBM base in Teykovo has 36 missiles in four basing areas (referred to as deployment areas in START) and one maintenance facility. Each basing area has nine fixed structures. ICBMs based at one basing area are organized in three battalions with three missiles each.

does not fit in the New START categories of separating ICBM bases for silo and mobile launchers for ICBMs. It is possible that maintenance facilities for DF-5 and DF-31 are different—in this case these sites would be counted as separate ICBM bases in treaty terms. However, maintenance facilities have not been clearly identified.

In the Chinese case, available information on the Second Artillery's basing structure is scarce. Main bases, missile brigades, and launch battalions appear to be located relatively far away from each other. In New START there is no specific limit on the size of the basing area, whether it is a silo group or a mobile ICBM base. Also, there is no limit on the size of the area where mobile ICBMs can go on patrol. A base should be understood more as an organizational concept—like a missile division—and its size is limited only by practicality of having one maintenance facility at the base; one would not have a maintenance facility too far from actual deployment areas. One significant identifying feature of garrisons appears to be open parade grounds and a distinct arrangement of buildings around them. High-bay garages could serve as a fixed structure for mobile launchers of ICBMs. In some cases is it possible to identify what could be prepared launch sites, which the Second Artillery appears to maintain for launching its mobile ICBMs. It is unclear, however, whether China's mobile ICBMs can only be launched from prepared launch pads. These locations give some information about the possible basing areas of China's mobile ICBMs. However, only a limited number of what appear to be DF-5A silos and high-bay garages suggesting the presence of mobile launchers of ICBMs can be identified at this time.[19]

Based on open-source literature, it is not possible to determine the exact number of deployed mobile and silo-based ICBMs associated with each individual base and respective missile brigade, but we assume that the estimated maximum of 60 deployed ICBMs are evenly distributed among the identified main bases and missile brigades.[20]

ICBM bases for silo launchers of ICBMs[21]

Luoyang

The ICBM base located in Luoyang, Henan province, is referred to as 54 Base. With its headquarters located in Luoyang, the base is believed to consist of six missile brigades, which operate the silo-based DF-5A and mobile DF-31 as well as the DF-4 ballistic missile, which is not counted under New START. The main maintenance facility is believed to be located within the 54 Base headquarters. Under this category, only the brigades with silo launchers of ICBMs are included.

There are two silo-based ICBM basing areas in the Luoyang missile base—Lushi, also known as 801 Brigade, and 804 Brigade in Luoning. Both brigades reportedly operate silo-based DF-5A. Based

19 The authenticity of these locations remains uncertain as China reportedly constructed a large number of decoy silos. However, the decoys appear to be incapable of launching a missile. Otherwise they would have to be counted as non-deployed launchers; see Federation of American Scientists, "DF-5", 28 July 2000, www.fas.org/nuke/guide/china/icbm/df-5.htm/.

20 Gen. Viktor Yesin, a former Chief of Staff of the Russian Strategic Rocket Forces, estimates 6 DF-5A and 12 DF-31 launchers at 54 Base, 12 DF-5A launchers at 55 Base, and 18 DF-31A launchers at 56 Base, comprising a total number of 48 ICBMs. See V. Yesin, "Tretiy posle SShA i Rossii [The third after the Unites States and Russia]", *Voenno-Promyshlennyi Kurier,* vol. 17, 2 May 2012, http://vpk-news.ru/articles/8838/.

21 The following sections are largely based on Nuclear Transparency, http://nucleartransparency.fas.org/; S. O'Connor, "PLA Second Artillery Corps", Air Power Australia, technical report APA-TR-2009-1204, April 2012, www.ausairpower.net/APA-PLA-Second-Artillery-Corps.html/; S. O'Connor, "PLA ballistic missiles," Australia Air Power, technical report APA-TR-2010-0802, April 2012, www.ausairpower.net/APA-PLA-Ballistic-Missiles.html/; S. O'Connor, "The PLA's Second Artillery Corps", *I&A*, vol. 1, no. 1, 2011; Sinodefence, http://sinodefence.com/; and GlobalSecurity.org, www.globalsecurity.org/.

on a scenario where China's approximately 60 ICBMs are evenly distributed among the Second Artillery's main bases, we assume that the total number of deployed silo launchers and ICBMs at the Luoyang base is 10. However, only three silo complexes could be identified on Google Earth—two silos of the Lushi basing area and one of the Luoning basing area. The remaining locations are unknown.

As is the case with all ICBMs, no deployed warheads would be reported at this base. It is unknown whether non-deployed ICBMs are located at 54 Base's maintenance facility. For the purpose of this supplement, it is indicated that this information would be provided at a later point in time. The facility is reported to contain a training silo launcher, which would be reported as a non-deployed ICBM launcher, so the total number of launchers at the Luoyang base is assumed to be 11.

Huaihua

The missile base near Huaihua, Hunan province, also referred to as 55 Base, oversees four missile brigades, but only three brigades appear to deploy ICBMs that would be counted under New START. Apart from the DF-5A and DF-31A, 55 Base reportedly also operates a DH-10 ground-launched cruise missile brigade. The main maintenance facility is believed to be located within 55 Base headquarters in Huaihua.

Only two brigades that operate the silo-based DF-5A would be reported in this section—803 Brigade in the Jingzhou basing area and 814 Brigade in the Huitong basing area. The 803 and 814 Brigades are located in close proximity and may share the same garrison and support facilities. However, there is also a possibility that what appear to be garrison facilities could be a secondary garrison, forward deployed from 803 Brigade. Three possible silo locations of the 803 Brigade and one possible silo of the 814 brigade could be identified on Google Earth.

According to our scenario of an even distribution of China's ICBMs, we assume that a total of 10 deployed DF-5A and silo launchers are associated with the Huaihua base. Information on possible non-deployed ICBMs at the maintenance facility would be provided later. The maintenance facility is assumed to contain one training silo, which would be counted as a non-deployed ICBM launcher, so the base includes a total of 11 silo launchers, deployed and non-deployed.

ICBM bases for mobile launchers of ICBMs

Kunming

The mobile ICBM base located near Kunming, Sichuan province, is generally referred to as 53 Base. It is believed that the base consists of six missile brigades. The main maintenance facility is assumed to be located within 53 Base headquarters in Kunming.

Only one brigade appears to operate ICBMs and would be reported under New START. This is the basing area near Yuxi, which appears to be under construction. It remains unclear which specific brigade will be deployed in this basing area. In the 2010 image available on Google Earth, the facility appears nearly complete, including two high-bay garages with road access at either end, which suggest the deployment of DF-31/31A. Given the uncertainty with the operational status of the base, we assume that no ICBMs or mobile launchers were deployed there in September 2012. Also, no non-deployed ICBMs or launchers at the maintenance facility are reported at this point.

Luoyang

54 Base located in Luoyang operates both silo-based and mobile missiles. It would therefore have to be reported as two separate ICBM bases, even though it is organizationally a single unit. Two basing areas with mobile launchers of ICBMs would be included in this section—Nanyang, which

is associated with 813 Brigade, and Xixia, where it remains unclear which brigade is deployed in this basing area.

813 Brigade in Nanyang was reported to be the first operational DF-31 road-mobile ICBM unit of the Second Artillery. The exact number of deployed DF-31 and deployed mobile launchers there is unknown; however, at least two fixed structures for mobile launchers of ICBMs can be identified within the Nanyang garrison. Approximately 20km north of the primary garrison, what appear to be additional fixed structures for mobile launchers supporting launch positions in the surrounding area can be identified. Two launch sites reside in the complex, with additional positions located in the outlying area.

There is some uncertainty regarding possible launch sites identified near Xixia. It was believed that the site once served 813 Brigade at Nanyang; however, it may also support a separate DF-31 or DF-31A missile brigade. Garrison facilities have not been reliably identified, but what appear to be prepared launch sites for road-mobile ballistic missiles can be found on commercial satellite imagery.

We assume that the mobile ICBM brigades of the Luoyang base include 10 deployed DF-31 and/or DF-31A. The total number of mobile ICBM launchers at the base is taken to be 10. No deployed warheads would be reported at the base.

Huaihua

As 54 base, 55 base located in Huaihua also operates silo-based and mobile ICBMs. It would therefore have to be reported as two separate ICBM bases, even though it is organizationally the same. This section includes the only basing area for mobile launchers of ICBMs near Shaoyang. 805 Brigade, which is deployed there, was originally believed to be located in Tongdao as a DF-4 unit. The brigade appears to be undergoing conversion to the road-mobile DF-31A and relocation to a garrison identified in Shaoyang, approximately 200km northeast of Tongdao.

Two possible fixed structures for mobile ICBM launchers can be identified; however, the exact number of deployed DF-31A and deployed mobile launchers of ICBMs remains uncertain. For the purposes of the model report, we assume that there are 10 DF-31A missiles and their launchers deployed at this basing area. No deployed warheads would be reported in Huaihua. No information is available on possible non-deployed ICBMs located at the maintenance facility. It is therefore indicated that this information will be provided at a later point.

Xining

The mobile ICBM base reported to be located in Xining, Qinghai province, is generally referred to as 56 Base. The exact location of 56 Base headquarters, however, is unclear. Two possible garrison facilities can be identified in the north-western and the south-eastern part of Xining. It is believed that the base consists of eight missile brigades. The location of the main maintenance facility cannot be reliably identified. In the model report it is assumed to be located within 56 Base headquarters in Xining.

Three brigades appear to operate ICBMs and would be reported under New START: 809 Brigade in Datong, 812 Brigade in Tianshui, and an unidentified brigade at the basing area in Delingha.

Satellite imagery dating 6 June 2011 shows six DF-31/31A launchers lined up on the parade ground at the 809 Brigade base in Datong. The brigade has been thought to be equipped with the DF-21, but might be under conversion to the longer range DF-31/31A. It is unclear if the launchers are permanently based in the area or temporarily deployed from another brigade, possibly 812 Brigade

located approximately 500km to the south-east.[22] Satellite imagery suggests four fixed structures for mobile launchers of ICBMs.

812 Brigade in the Tianshui basing area is believed to operate the DF-31A. Three possible fixed structures for mobile launchers of ICBMs can be identified. A secondary garrison appears to be located approximately 40km south together with two possible launch sites.

A large launch complex is located at Delingha. Reportedly, the site once hosted 812 Brigade as a DF-4 unit, before it was equipped with the DF-31A and relocated to Tianshui. Some sources refer to the complex as a training unit. While this may be the case, it is included in the model report as it is far more expansive than what appear to be China's other ballistic missile training complexes. However it remains uncertain whether the facilities are employed for training purposes or operational deployment. It is currently not possible to determine which type of ballistic missiles might be stationed at the Delingha complex. Reports have, however, indicated the likelihood of a DF-31/31A presence.

There is some uncertainty regarding a complex identified at Haiyan. Some sources list the Haiyan complex as a training site associated with 56 Base. The complex reportedly once served as a DF-3 training site and now likely supports DF-21 training. Recent satellite imagery, however, shows two DF-31 or DF-31A launchers and support vehicles at the facility. It remains unclear whether the facility might be under conversion to the DF-31/31A and if the launchers are deployed or located at the facility for training purposes. Given the recently observed presence of the DF-31/31A, the facility is reported as an operational launch battalion in the model report, possibly associated with 812 Brigade at Tianshui.[23]

Overall, the mobile missile base in Xining is assumed to have 20 deployed ICBMs. None of the missiles are believed to have deployed nuclear warheads. The base is also assumed to have one training launcher. Information on non-deployed ICBMs will be provided at a later point.

Production facilities for ICBMs

The development and production of ballistic missiles in China involves a number of facilities throughout the country. All facilities are subordinate to either the China Aerospace Science and Industry Corporation (CASIC) or the China Aerospace Science and Technology Corporation (CASC). CASC appears to be responsible for the production of space launch vehicles and ICBMs, with CASIC focusing on short- and medium-range ballistic missiles and cruise missiles. Several of these facilities would be classified as ICBM production facilities under the New START definition.[24] It is difficult to reliably identify all facilities that are involved in ICBM production. The model data exchange report includes information on three of them—at Nanyuan, Northern Beijing, and Chengdu.

22 H. Kristensen, "Chinese mobile ICBMs seen in central China", FAS Strategic Security Blog, 1 March 2012, www.fas.org/blog/ssp/2012/03/df-31deployment.php/.

23 H. Kristensen, "Increasing nuclear transparency: using satellite imagery and Freedom of Information Act to monitor Chinese and Russian nuclear forces", presentation at the conference Increasing Nuclear Transparency: Using Satellite Imagery and Computers to Monitor Nuclear Forces and Proliferators, Washington, DC, 7 June 2012.

24 New START defines a production facility for ICBMs or SLBMs as a facility at which:
(i) ICBMs or SLBMs that are maintained, stored, and transported as assembled missiles in their launch canisters, are assembled, including the joining of all stages of such missiles and the loading of such missiles into launch canisters.
(ii) ICBMs or SLBMs that are maintained, stored, and transported as assembled missiles without launch canisters, are assembled, including the joining of two or more stages.
(iii) First stages of ICBMs or SLBMs that are maintained, stored, and transported in stages are assembled.

Nanyuan

The Nanyuan facility is reported as the 221st Factory of the CASC First Academy. It is located south of Beijing, adjacent to the Beijing-Nanyuan airfield. The facility is believed to be associated with the production of the DF-31/31A as well as liquid-fuelled space launch vehicles and other ballistic missiles.

Northern Beijing

Final assembly and incorporation of volatile engine components may take place at what appears to be a missile assembly and trans-shipment facility, located north of Beijing. This facility is equipped with rail facilities that could function for missile trans-shipment.

Chengdu

The Sichuan Aerospace Industry Corporation, also known as Sichuan Academy of Aerospace Technology, produces components and sub-assemblies for space and missile systems. It is believed to be the Seventh Academy (062 Base) division of CASIC, which is associated with the DF-5 and DF-5A.[25] The production facilities of the corporation appear to be located near Chengdu, Luzhou, Wanyuan, and Chongqing. For the purposes of the model report, it is assumed that the ICBM production facility is located near Chengdu, Sichuan province.

Production facilities for mobile launchers of ICBMs

New START defines a production facility for mobile launchers of ICBMs as a facility at which the erector–launcher mechanism of a mobile launcher of ICBMs is mounted on the self-propelled device. Reportedly, China's mobile launchers of ICBMs are produced in three factories and may also be produced at the Nanyuan facility. Although these facilities can be identified, it is unclear where the erector–launcher mechanism of a mobile launcher is mounted on the self-propelled device. In the model report it is assumed that the only production facility that produces mobile ICBM launchers is the Wanshan Special Vehicle Factory (also known as CASIC Ninth Academy) located in Xiaogan city, Hubei province. The factory, a subordinate to China Sanjiang Space Group located in Yinbin, Hubei province, is believed to produce the erector–launchers for the DF-31/31A .[26]

Storage facilities for ICBMs

New START defines a storage facility for ICBMs or SLBMs as a specified facility, outside an ICBM base, a submarine base, a test range, or a space launch facility, for the storage of ICBMs or SLBMs. It is not known if China operates dedicated ICBM storage facilities outside of ICBM bases.

Storage facilities for mobile launchers of ICBMs

A storage facility for mobile launchers of ICBMs is defined in New START as a specified facility, outside an ICBM base, a test range, or a space launch facility, for the storage of mobile launchers of ICBMs. There is no evidence of designated storage facilities for mobile launchers of ICBMs in China outside of the main missile bases.

25 "DongFeng 5 (CSS-4) intercontinental ballistic missile", Sinodefence, 15 February 2009, www.sinodefence.com/strategic/missile/df5.asp/.

26 J. Lewis, "More on DPRK TELs", Arms Control Wonk, 24 April 2012, http://lewis.armscontrolwonk.com/archive/5162/more-on-dprk-tels/.

Repair facilities for ICBMs

Under New START, a repair facility for ICBMs or SLBMs is defined as a specified facility, outside an ICBM base or a submarine base, for the repair or maintenance of ICBMs or SLBMs. There is no evidence of designated repair facilities for ICBMs in China outside of the main missile bases.

Repair facilities for mobile launchers of ICBMs

A repair facility for mobile launchers of ICBMs is defined in New START as a specified facility, outside an ICBM base, for the repair or maintenance of mobile launchers of ICBMs. There is no evidence of designated repair facilities for mobile launchers of ICBMs in China outside of the main missile bases.

Test ranges

New START defines a test range as a designated land area, other than an ICBM base, from which launches of ICBMs or SLBMs are conducted. China appears to have two primary ICBM test facilities: the Taiyuan Space Launch Centre in Shanxi province (also often referred to as Wuzhai Space and Missile Test Centre) and the Jiuquan/Shuangchengzi Space Launch Centre in Inner Mongolia. Both facilities contain what seem to be multiple launch positions and support facilities indicating large-scale development programmes. The Taiyuan test facility appears to be primarily used for ICBM tests, whereas the Shaungchengzi complex is believed to focus on short-, medium-, and intermediate-range ballistic missile tests. Nevertheless, any type of missile could be launched from either location. New START would consider both as test ranges, since they have been used for ICBM tests in the past. Silos that were used for ICBM and SLBM tests would be counted as non-deployed launchers under New START. However, as information on the number of test silos is scarce, only an incomplete number of structures that appear to be silos for missile tests can be identified.

Taiyuan

The Taiyuan Space Launch Centre is the Second Artillery's primary ICBM test facility. Reportedly, the JL-1 and JL-2 SLBMs were also tested from this facility. It is the only test facility that operates what appears to be a DF-5 silo test launcher. This silo would be accounted for as a non-deployed launcher. Press reports have also referred to the Taiyuan complex for DF-31 and DF-31A test launches.[27] Additional facilities and associated launch pads north of the main complex have been identified as potential DF-31 and DF-31A test areas. No mobile test launchers could be reliably identified at the site; however, since Taiyuan is China's primary ICBM test facility, two mobile test launchers are included in the model report. It is also assumed that no non-deployed missiles are stored at the test range, although a small number of ICBMs could be stored at Taiyuan. Information about launchers and non-deployed missiles may be added later.

Shuangchengzi

The Shuangchengzi missile test site is believed to have supported early DF-5 test launches, conducted from launch pads that are thought to be inactive since the mid-1990s. Launch pads would not be reported under New START, so it is assumed that no test launchers at Shuangchengzi would be included in a New START-type report. Today, the primary focus of the Shuangchengzi test site is believed to be short-, medium-, and intermediate-range ballistic missile tests, as well as space launches.

27 J. Lewis, "Taiyuan Space Launch Center", Arms Control Wonk, 10 September 2006, http://lewis.armscontrolwonk.com/archive/1193/taiyuan-space-launch-center/.

Training facilities

New START defines a training facility as a specified facility, outside an ICBM base or a submarine base, at which personnel are trained to use, operate, or maintain ICBMs or SLBMs and their launchers. Four training facilities appear to be associated with the Second Artillery's ICBM programme to provide theoretical and field training for missile units. Most of the Second Artillery's training facilities appear as garrisons and reside close to operational brigade facilities associated with individual missile bases. However, although training facilities are located within the geographical basing area of an associated main base, the facilities appear to be separate and distinct from the base headquarters and other associated garrisons and could technically be reported under New START. One of the identified training facilities appears to be located within the Luoyang 54 Base headquarters and therefore would not be reported under New START.

Dongkou

The Dongkou training complex is believed to be associated with 55 Base. Open-source satellite imagery suggests a DF-5A training silo within the complex. New construction between 2006 and 2009, however, resulted in the training silo being removed or moved indoors. This possibly relates to the introduction of the DF-31A to 55 Base. Still, the model report includes a training DF-5A silo in Dongkou. Also, it is assumed that the facility has at least one DF-5A training missile.

Kangzhuang

The Kangzhuang training facility is located within the 51 Base basing area. Reportedly, the Second Artillery conducted initial crew familiarization training on the DF-31 erector–launcher in the early 1990s. One training DF-31/31A mobile launcher and one training missile is included in the model report as located at Kangzhuang.

Xian

The Second Artillery Engineering College at Xian is under the auspices of the Second Artillery, and is the primary body for theoretical and technical education and training.[28] The model report assumes that one training DF-31/31A mobile launcher and one training missile are located there.

Linyi

The training facility at Linyi includes a training range for mobile ICBM launchers and transporters as well as several training launch sites.

Conversion and elimination facilities for ICBMs

New START defines a conversion or elimination facility for ICBMs or SLBMs as a specified facility for the elimination of ICBMs, SLBMs, and launch canisters. No conversion and elimination facilities for ICBMs have been identified in China to date.

Conversion and elimination facilities for mobile launchers of ICBMs

New START defines a conversion or elimination facility for mobile launchers of ICBMs as a specified facility for the conversion or elimination of mobile launchers of ICBMs. No conversion and elimination facilities for mobile launchers of ICBMs have been identified in China to date.

28 Han Z. and Zhang C., "Second Artillery Engineering College creates 100-plus generals," *PLA Daily*, 20 October 2009.

SLBMs

China's sea-based nuclear force consists of the JL-1 and JL-2 SLBM associated the navy's single Xia-class (Type 092) and the second generation Jin-class (Type 094) nuclear-powered ballistic missile submarine (SSBN), respectively. The JL-1 and JL-2 would be classified as SLBMs for the purposes of New START reporting as they have a range of more than 600km and have been installed or launched from a submarine.

According to the New START definition of a deployed SLBM as an SLBM that is contained in a deployed launcher of SLBMs, China's SLBMs are not considered deployed, although there is some uncertainty. The Xia-class SSBN is equipped to be armed with 12 JL-1, the sea-based derivative of the DF-21. The submarine was launched in April 1981 but never conducted a deterrent patrol and is thought not to be fully operational, despite several refits. The JL-1 is believed to have a range of about 1,770km and became operational in 1986. In the past, JL-1 were reportedly loaded into the SSBN's launch tubes and subsequently fired for testing and also for training purposes.[29] However, it is not clear whether JL-1 are currently installed on the submarine. Therefore, these SLBM launchers are not counted as deployed.

The status of the successor SSBN, the Jin class, is unknown. According to the United States Department of Defense, two submarines are in operational service. One submarines is believed to be associated with the North Sea Fleet with its homeport in Jiangezhuang near Qingdao, and the other with the South Sea Fleet with its homeport in Yulin on Hainan Island. [30] A third boat appears to be under construction, but its exact status is unknown.[31] Each Jin-class SSBN will be armed with China's next generation SLBM, the JL-2, which is estimated to have a range of about 7,400 km. Development of the missile has encountered several setbacks during development due to technical difficulties, so the JL-2 is still believed to be in the development stage. However, it would not be considered a prototype under New START as it has been tested more than 20 times. Jin-class SSBNs have reportedly been equipped with JL-2 for test firing and training. According to unconfirmed reports, what could be part of a series of final JL-2 flight tests conducted from Jin-class SSBNs occurred in January and August 2012.[32] In a draft of its annual report to the United States Congress, the United States–China Economic and Security Review Commission said in 2012 that the combination of Jin-class SSBNs and JL-2 could become fully operational within two years.[33] The United States Department of Defense reiterated this assessment.[34] Nevertheless, the JL-2 is not yet believed to be ready for mass manufacturing and deployment and it is assumed that the Jin-class SSBNs' launch tubes are empty.

29 Federation of American Scientists, "JL-1 [CSS-N-3] ", 10 June 1998, www.fas.org/nuke/guide/china/slbm/jl-1.htm/.

30 Wu R., "Survivability of China's sea-based nuclear forces", *Science and Global Security*, vol. 19, no. 2, 2011, pp. 94–96.

31 US Department of Defense, *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2012*, 2012, p. 24; H. Kristensen, "Chinese Jin-SSBNs getting ready?", FAS Strategic Security Blog, 2 June 2011, www.fas.org/blog/ssp/2011/06/jin2011.php/.

32 J.M. Cole, "MND closely monitoring Chinese missile tests", *Taipei Times*, 10 January 2012.

33 United States–China Economic and Security Review Commission, *2012 Report to Congress*, 2012, p. 7.

34 US Department of Defense, *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2012*, 2012, p. 24.

Submarine bases

New START defines a submarine base as a facility at which ballistic missile submarines are based, and at which shore-based support for such submarines, which may include the assembly, loading, maintenance, and storage of SLBMs, is provided.

The navy operates two main submarine bases, the Jianggezhuang submarine base associated with the North Sea Fleet, and the Yulin submarine base on Hainan Island, associated with the South Sea Fleet. In addition, the Xiaopingdao submarine base is the navy's designated submarine and SLBM test complex.

Jianggezhuang

Jianggezhuang is located near the homeport of the North Sea Fleet in Qingdao. It was the first SSBN facility in China and currently serves as the homeport for the Xia-class SSBN and allegedly one Jin-class SSBN.

The most significant feature of the base is what appears to be an underground submarine facility located in the south-eastern end of the bay. The size and layout of the underground facility are unknown, but the entrances give some indications. In addition to the submarine pool itself, the facility might house storage facilities for JL-1, storage facilities for nuclear warheads, and various personnel facilities. Moreover, rail tracks appear to connect the facility to outside buildings. Although the underground facility is a possible storage and service site for the *Xia*'s nuclear JL-1, the submarine apparently can also load the missiles at pier side. Several images available on the internet show the loading of JL-1 into the *Xia*.[35]

A model New START report would include the one Xia-class submarine with 12 non-deployed JL-1 launchers and one Jin-class submarine with 12 non-deployed JL-2 launchers. It is also assumed that there are 12 non-deployed JL-1 stored at the base.

Xiaopingdao

Xiaopingdao serves as logistics base for submarines and also as an test complex associated with the JL-1 and JL-2. Xiaopingdao is home to the navy's sole Golf-class submarine, employed as an SLBM test launch platform. Given that submarine is a testing platform, its launchers are counted as non-deployed. The submarine is believed to support JL-2 trials for the Jin-lass SSBN. In the past, JL-1 tests were also conducted from this boat. However, this facility would be reported as a submarine base and not as a test range under New START. The treaty defines the term test range as a designated *land area*, other than an ICBM base, from which launches of ICBMs or SLBMs are conducted.

Two different Jin-class SSBNs have been identified at this facility on numerous occasions. The latest publicly available satellite imagery (dating 3 March 2011) displays two Jin-class SSBNs at the Xiaopingdao base. However, it is likely that this could be temporary testing and/or training ground for the two boats, and not their permanent base.

A model New START report would include one Golf-class submarine with three non-deployed JL-2 launchers. It is assumed that no non-deployed JL-2 are stored at the base.

Yulin

Yulin is the naval base of the South Fleet and the latest naval facility to be associated with the SSBN fleet. In December 2007 images appeared of a Jin-class SSBN docked at the Yulin facility. Currently, Yulin appears to be the second SSBN homeport in China, with a single Jin-class boat in residence.

35 H. Kristensen, "China's nuclear missile submarine base", The Nuclear Information Project, 16 February 2006, www.nukestrat.com/china/subcave.htm/.

The Yulin submarine base has a number of significant features. A degaussing facility is located to the south of the primary complex. Three docks provide port facilities for a pair of submarines each. A large support complex is located adjacent to the docks. Various hardened complexes exist at Yulin. What appears to be a hardened submarine cave entrance is located south of the primary docks. The above-ground infrastructure surrounding the entrance suggests the presence of a large underground complex.

A model New START report would include one Jin-class submarine with 12 non-deployed JL-2 launchers. It is assumed that no non-deployed JL-2 are stored at the Yulin base.

SLBM loading facilities

Under New START, the term SLBM loading facility means a shore-based facility, outside a submarine base, where SLBMs are loaded onto or unloaded from ballistic missile submarines. There is no evidence of designated SLBM loading facilities in China outside of its three main SSBN bases. Furthermore, all three identified bases seem to possess significant underground facilities where loading would most likely occur.

Production facilities for SLBMs

There is some uncertainty in determining the entity responsible for producing and assembling China's SLBMs. The JL-1 and JL-2 are derivatives of the DF-21 and the DF-31 respectively. It is therefore assumed for the model report that China's SLBMs are thus produced and assembled at the Nanyuan missile factory in southern Beijing.

Production facilities for ballistic missile submarines

The primary submarine production facility is the Bohai shipyard of the China Shipbuilding Industry Corporation, which was established in 1954. It is located in Huludao, Liaoning province. The first submarine to be commissioned from this yard in 1987 was the Xia-class SSBN. It has been reported that the *Xia*'s replacement, the Jin-class SSBN, is also being constructed at the Huludao shipyard.[36]

Storage facilities for SLBMs

The New START treaty defines a storage facility for ICBMs or SLBMs as a specified facility, outside an ICBM base, a submarine base, a test range, or a space launch facility, for the storage of ICBMs or SLBMs. There is no evidence of designated SLBM storage facilities in China outside of its three main SSBN bases. Furthermore, all three identified bases seem to possess significant underground facilities where storage would most likely take place.

Repair facilities for SLBMs

Under New START, a repair facility for ICBMs or SLBMs is defined as a specified facility, outside an ICBM base or a submarine base, for the repair or maintenance of ICBMs or SLBMs. There is no evidence of designated SLBM repair facilities in China outside of its three main SSBN bases. Furthermore, all three identified bases seem to possess significant underground facilities where repair and maintenance activities would most likely take place.

Test ranges

The JL-1 and JL-2 were tested at the Taiyuan Space Launch Centre, which is also used as an ICBM test range and space launch facility.

36 "Submarine shipbuilding", GlobalSecurity.org, 11 July 2011, www.globalsecurity.org/military/world/china/newcon-ss.htm/; H. Kristensen, "Two more Chinese SSBNs spotted", FAS Strategic Security Blog, 4 October 2007, www.fas.org/blog/ssp/2007/10/two_more_chinese_ssbns_spotted.php/.

Conversion and elimination facilities for SLBMs

New Start defines a conversion or elimination facility for ICBMs or SLBMs as a specified facility for the elimination of ICBMs, SLBMs, and launch canisters. No conversion and elimination facilities for SLBMs have been identified in China to date.

Conversion and elimination facilities for SLBM launchers

No specific conversion and elimination facilities for SLBM launchers have been identified in China to date. It is assumed for the model report that this task is performed at the Bohai shipyard, which is the production facility for ballistic missile submarines.

Heavy bombers

The air force is believed to maintain a small number of gravity bombs to be delivered by the H-6 medium-range bomber and possibly a more modern combat aircraft.[37] The H-6 is estimated to have a range of 3,100km and would not be classified as a heavy bomber under New START, which defines a heavy bomber as a bomber of a type, any one of which satisfies either of the following criteria: its range is greater than 8,000km, or it is equipped for long-range nuclear air-launched cruise missiles (ALCMs). The Chinese air force might deploy a more modern combat aircraft equipped to carry nuclear armaments in the future. It can be assumed, however, that no aircraft of this class will have a range of greater than the 8,000km required for New START reporting purposes. China is believed to be developing an air-launched derivative of the DH-10 cruise missile with a range of more than 1,500km, possibly for delivery by an upgraded version of the H-6 aircraft. New START defines a long-range ALCM as an ALCM with a range in excess of 600km. Although the DH-10 fulfils the range requirement, there are conflicting reports by the United States about whether the DH-10 has nuclear capability. In any event, as of 2013, no aircraft is equipped for long-range nuclear ALCMs. Accordingly, the H-6 and the DH-10 are not counted as a heavy bomber and long-range nuclear ALCM, respectively.

Space launch facilities

In addition to the Taiyuan (Wuzhai) and Jiuquan/Shuangchengzi space launch centre, two additional space launch facilities—the Wenchang and Xichang satellite launch centre—do not appear to be associated with China's ICBM or SLBM programmes.

ICBM and SLBM technical data

New START requires reporting on technical data of ICBMs and SLBMs in its detailed exchange. These include categories such as type of missile, dimensions, and other data. They are listed in the corresponding section of the model data exchange document (see annex A).[38]

37 United States National Security Council, *Report to Congress on Status of China, India and Pakistan Nuclear and Ballistic Missile Programs*, 28 July 1993.

38 The primary sources of information are D. Lennox (ed.), *Jane's Strategic Weapon Systems*, no. 54, 2011; and Li B., "Tracking Chinese strategic mobile missiles", *Science and Global Security*, vol. 15, no. 1, 2007.

FRANCE

Overview and aggregate numbers

France's nuclear force is comprised of sea- and air-based components. The sea-based component consists of four Triomphant-class SSBNs: *Le Terrible* (2010), *Le Vigilant* (2004), *Le Téméraire* (1999), and *Le Triomphant* (1997).[39] Each submarine is equipped to carry up to 16 SLBMs. The fleet is currently undergoing conversion from the M45 SLBM to the newer M51, with improvements in range and accuracy. The fleet should complete the retrofit process by 2018.[40] Both the M45 and M51 can carry up to six TN75 warheads. An improved version of the M51, the M51.2, is designed to carry a new nuclear warhead with a selectable yield of up to 150kt, and this will replace the M51.1 after 2015.[41]

The air-based component consists of two land-based (Mirage 2000N and Rafale F3) and one sea-based (Rafale MK3) nuclear-capable combat aircraft. The Mirage 2000N is currently scheduled to be replaced by the Rafale in 2018. All these aircraft are equipped with the ASMP-A, a medium-range air-to-surface missile, which is armed with a thermonuclear warhead that is reported to have a selectable yield of 20, 90, or 300kt. In the future, the ASMP-A will be fitted with the new warhead used on the M51.2 from around 2015.[42]

Under New START definitions, only France's sea-based nuclear component would be counted, as the ranges of the nuclear capable aircraft and ALCMs fall below the thresholds for reporting. Therefore, in calculating the aggregate numbers for France, only details associated with the Triomphant-class submarines are considered.

Three of France's four SSBNs are considered deployed under New START definitions (that is, they have missiles loaded into their launch tubes). With the exception of *Le Vigilant*, which was in overhaul at the time of the September 2012 data exchange, all submarines most likely had missiles installed in their launchers. Since each Triomphant-class submarine has 16 launch tubes, France would report 48 deployed SLBMs. Both the M45 and M51 SLBMs are capable of carrying up to six warheads. The exact number of warheads deployed on these SLBMs is not known, so maximum numbers are accounted for in the model report. These factors contribute to aggregate numbers of 48 deployed SLBMs, 288 deployed warheads, and 64 deployed and non-deployed launchers of SLBMs.

ICBMs

France has never operated any nuclear ICBMs. In the past, France deployed nuclear-capable medium- and short-range ballistic missiles, but after the Cold War, France significantly scaled back its nuclear arsenal. In 1996, a review of France's nuclear posture was conducted as part of a wider defence review, which called for the nuclear forces to be consolidated on fewer platforms and for

39 S. Kile et al., "World nuclear forces", in *SIPRI Yearbook 2011. Armaments, Disarmament and International Security*, Stockholm International Peace Research Institute, 2011, p. 339.

40 See French Senate, *Avis presente au nom de la commission des affaires étrangères, de la défense et des forces armées sur le projet de loi de finances pour 2013, adopté par l'Assemblée nationale, tome VIII—Défense : équipement des forces*, 22 November 2012, p. 37, www.senat.fr/rap/a12-150-8/a12-150-81.pdf/.

41 D. Lennox (ed.), *Jane's Strategic Weapon Systems*, no. 54, 2011, p. 51.

42 Ibid., p. 50.

a new generation of nuclear weapons to be developed. During this process, the land-based ballistic missiles were withdrawn from service in 1996–1997.[43]

SLBMs

France currently possesses two SLBMs, the M45 and the M51. The M51 has two versions, the M51.1 and the newer M51.2, which is expected to be commissioned on *Le Triomphant* around 2015 after the submarine's retrofit and overhaul.[44]

With a range of approximately 6,000km, the M45, which entered service in 1997, would be counted under New START when loaded onto a submarine.[45] The M51.1 has increased range and accuracy compared to the M45.[46] With a range of more than 6,000km, this missile would be counted under New START as an ICBM.[47] The missile was first deployed on *Le Terrible* when it entered operational service in September 2010. The initial version of the missile, the M51.1, carries up to six TN75 nuclear warheads, and was developed and produced by the Direction des applications militaires of the Commissariat à l'energie atomique.[48] The upgraded version, the M51.2, will be outfitted with a new warhead (see above).[49] The M51.2 is planned to debut on *Le Triomphant* around 2015.[50]

As of 1 September 2012, only *Le Terrible* was outfitted with the M51.1. On that date, *Le Vigilant* was still in the process of conversion from the M45 to the M51.1, completing overhaul in October 2012.[51] Accordingly, in a New START-type report providing data as of September 2012, *Le Vigilant* would still be counted as a submarine with M45 launchers. On that date, *Le Triomphant* and Le *Téméraire* still carried the M45, though *Le Triomphant* is expected to begin its conversion to the M51.2 in 2013.[52] *Le Téméraire* will be retrofitted for the M51 in the next decade.[53]

French SSBNs reportedly unload their missiles at l'Île Longue before undergoing major overhaul at Brest.[54] Therefore, in the model report, the launchers and missiles of an SSBN are considered to be separated and therefore non-deployed during a scheduled overhaul.

43 See C. Taylor, *French Nuclear Deterrent*, UK House of Commons document SN/IA/4079, 30 June 2010.

44 French Senate, *Avis presenté au nom de la commission des affaires étrangères, de la défense et des forces armées sur le projet de loi de finances pour 2013, adopté par l'Assemblée nationale, tome VIII—Défense : équipement des forces*, 22 November 2012, www.senat.fr/rap/a12-150-8/a12-150-81.pdf/.

45 Astrium, "M45", www.astrium.eads.net/en/programme/m-45.html.

46 R.S. Norris and H.M. Kristensen, "French nuclear forces, 2008", *Bulletin of Atomic Scientists*, vol. 64, no. 4, 2008.

47 Ibid.

48 G. de Briganti, "M51 missile nears first test launch; will equip final SSBN in 2010", *defense-aerospace.com*, 25 September 2006.

49 French Senate, *Projet de loi de finances pour 2012 : Défense : équipement des forces*, 17 November 2011, chp. II, § I.B.2.

50 French Senate, *Avis presenté au nom de la commission des affaires étrangères, de la défense et des forces armées sur le projet de loi de finances pour 2013, adopté par l'Assemblée nationale, tome VIII—Défense : équipement des forces*, 22 November 2012, www.senat.fr/rap/a12-150-8/a12-150-81.pdf/.

51 French Ministry of Defence, "La base opérationnelle de l'Île Longue, à quoi ça sert ? Comment ça marche ?", 29 December 2010, www.defense.gouv.fr/marine/dossiers/l-ile-longue/la-base-operationnelle-de-l-ile-longue/; and "Le SNLE Le Vigilant retrouve l'Île Longue", *Mer et Marine*, 22 October 2012, www.meretmarine.com/fr/content/le-snle-le-vigilant-retrouve-lile-longue/.

52 S. Kile et al., "World nuclear forces", in *SIPRI Yearbook 2011. Armaments, Disarmament and International Security*, Stockholm International Peace Research Institute, 2011, p. 339.

53 "Le SNLE Le Vigilant retrouve l'Île Longue", *Mer et Marine*, 22 October 2012, www.meretmarine.com/fr/content/le-snle-le-vigilant-retrouve-lile-longue/.

54 "L'Île Longue submarine base, France", *naval-technology.com*, www.naval-technology.com/projects/

As of 1 September 2012, *Le Vigilant* was undergoing overhaul and conversion to the M51.1, and therefore its associated missiles and launchers were counted as non-deployed. As *Le Terrible* already carried the M51.1, only the missiles of *Le Triomphant* and *Le Téméraire* would be counted as deployed M45. With 16 missiles per submarine and a maximum capacity of six warheads per missile, this equates to 96 deployed warheads on the 32 deployed M45. Also, the 16 M51.1 on *Le Terrible* would be counted under New START. Each of these missiles is capable of carrying up to six warheads, leading to a maximum capacity of 96 deployed warheads on this submarine.

Uncertainty in these numbers stems from France's patrol and storage procedures. One or two SSBNs are normally on station in designated patrol areas at any given time. When each submarine returns from patrol, it undergoes a maintenance period in one of two dry docks located at the northern tip of l'Île Longue base.[55] During this time, depending on the level of maintenance required, the missiles could be stored at l'Île Longue, which includes a facility with what appears to be 24 vertical missile storage silos. [56] Despite this possibility of missiles being unloaded for minor maintenance procedures, for the purposes of the model report, it is assumed that the SLBMs remain on the submarine unless it is scheduled for major overhaul.

Submarine bases

New START defines a submarine base as a facility at which ballistic missile submarines, as well as submarines that had been previously equipped with SLBM launchers but after conversion are incapable of launching SLBMs, are based, and at which shore-based support for such submarines, which may include the assembly, loading, maintenance, and storage of SLBMs, is provided. By this definition, France possesses one naval base that would be counted under New START: l'Île Longue submarine base. It is located in Brest and serves as the main base to the French SSBN fleet.

L'Île Longue Strategic Submarine Base

L'Île Longue Strategic Submarine Base in Brest is dedicated to the SSBN fleet and reportedly consists of three zones. At the north end of the base peninsula, the "yellow zone" includes the harbour and installations to support the SSBNs. The submarines can be docked here in two roofed 200m-long dry docks, with entrances facing east. The reactor workshop is located between these two basins, and all maintenance of the nuclear reactor cores are carried out in this workshop. With this process, the parts of the nuclear reactor are separated and inspected, and the fuel can be stored in a 170m-long pool. The "red zone" in the middle of the base peninsula consists of bunkers for the assembly, storage, and maintenance of missiles and nuclear warheads. Twenty-four possible missile storage tubes can be seen toward the middle of the peninsula. At the south end of the base, the "blue zone" houses security installations, recreational facilities, and barracks.[57]

All four of France's SSBNs are based at l'Île Longue. On 1 September 2012, these submarines included *Le Terrible* (equipped with the M51.1), *Le Vigilant* (M45), *Le Triomphant* (M45), and *Le Téméraire* (M45), equating to 48 M45 launchers and 16 M51 launchers. All are counted as deployed with the exception of the 16 missiles and launchers associated with *Le Vigilant*, which was in overhaul on 1 September 2012.

lilelonguesubmarineb/.

55 French Ministry of Defence, "La base opérationnelle de l'Île Longue, à quoi ça sert ? Comment ça marche ?", 29 December 2010, www.defense.gouv.fr/marine/dossiers/l-ile-longue/la-base-operationnelle-de-l-ile-longue/.

56 R.S. Norris and H.M. Kristensen, "French nuclear forces, 2008", *Bulletin of Atomic Scientists*, vol. 64, no. 4, 2008.

57 "L'Île Longue submarine base, France", *naval-technology.com*, www.naval-technology.com/projects/lilelonguesubmarineb/.

Since France reportedly only puts one or two submarines on active patrol at any given time, these numbers represent the maximum possible missile and launcher deployments. When a submarine returns from patrol, standard procedure is for it to undergo a 40-day maintenance period in one of the two dry docks at l'Île Longue. There is a possibility of the missiles being unloaded for this period, in which case they would be counted as non-deployed. It also remains possible that missiles are put in storage when a submarine is not on active patrol. Nevertheless, it is assumed in the model report that SLBMs remain on the submarine during minor maintenance procedures and are only offloaded when it goes in for major overhaul. These missiles are apparently stored at the base.[58] The model report assumes that on 1 September 2012 the 16 M45 missiles associated with *Le Vigilant* (which was in overhaul at the time) would be counted as non-deployed missiles at l'Île Longue.

France also operates the Brest Naval Base, which serves as the port of call for maintenance of French naval forces including the SSBN fleet, nuclear attack submarines, and aircraft carriers. The Brest Naval Base would not be counted as a submarine base under New START, as it is not the home port of any SSBN.

Submarine loading facilities

New START defines an SLBM loading facility as a shore based facility, outside a submarine base, where SLBMs are loaded onto or unloaded from ballistic missile submarines. Based on this definition, there are no such facilities in France. France reportedly stores and loads its missiles from its main SSBN base at l'Île Longue, suggesting that France does not have any specialized loading facilities outside of this base. [59] Therefore, no facilities would be counted in this category under New START.

Production facilities for SLBMs

Annex Guenvénez

A production facility for SLBMs is defined in New START as a facility at which SLBMs that are maintained, stored, and transported as assembled missiles in their launch canisters, are assembled, including the joining of all stages of such missiles and the loading of such missiles into launch canisters, and as a facility at which SLBMs that are maintained, stored, and transported as assembled missiles without launch canisters, are assembled, including the joining of two or more stages, and as where first stages of ICBMs or SLBMs that are maintained, stored, and transported in stages are assembled.

This definition implies that only the facility where final assembly occurs should be counted under the treaty, and subcontractors' facilities in charge of making various components should not be counted. According to the French Navy, final missile assembly occurs at Annex Guenvénez, a complex supported by EADS Astrium staff located a few kilometres south of l'Île Longue naval base. Missile stages are manufactured by EADS Astrium in the Bordeaux region and then transported to the Annex Guenvénez where they are completed. This process includes final thermal protection measures, introduction of electric actuators, orientation of the nozzles, and installation of electronic control boxes and pyrotechnic separation stages. When each stage is completed, it is tested through digital simulations before final assembly. Once assembled, the missile is then transported by road from Guenvénez to l'Île Longue.[60] At present, there could possibly be some non-deployed M51.1

58 Ibid.

59 R.S. Norris and H.M. Kristensen, "French nuclear forces, 2008", *Bulletin of Atomic Scientists*, vol. 64, no. 4, 2008.

60 French Ministry of Defence, "La base opérationnelle de l'Île Longue, à quoi ça sert ? Comment ça marche ?", 29 December 2010, www.defense.gouv.fr/marine/dossiers/l-ile-longue/la-base-operationnelle-de-l-ile-longue/.

at this site as preparations are made to arm *Le Vigilant*. However, as this cannot be confirmed, the model report does not identify any non-deployed missiles at this location.

Production facilities for ballistic missile submarines

Direction des constructions navales services, Cherbourg Shipyard

Direction des constructions navales services (DCNS), a state-owned company governed by private law, produced France's current Triomphant-class SSBNs, most recently completing *Le Terrible*, which was admitted to active duty in September 2010.[61] As both designer and integrator of SSBNs ever since France decided to acquire an independent nuclear deterrence capability, DCNS has been a major contributor to the French Navy.[62] Though DCNS has multiple locations throughout France, its submarine operations are centred at its Cherbourg site.

Storage facilities for SLBMs

A storage facility for SLBMs is defined by New START as a specified facility, outside an ICBM base, a submarine base, a test range, or a space launch facility, for the storage of ICBMs or SLBMs. There are no reported SLBM storage facilities outside of l'Île Longue. Therefore, there are no facilities to report under this category.

Repair facilities for SLBMs

New START defines a repair facility for SLBMs as a specified facility, outside an ICBM base or a submarine base, for the repair or maintenance of SLBMs. There are no reported SLBM repair facilities outside of l'Île Longue. Therefore, there are no facilities to report under this category.

Test ranges

DGA Essais de missiles

New START defines a test range as a designated land area, other than an ICBM base, from which launches of ICBMs or SLBMs are conducted. Testing of the M51 occurs at the DGA Essais de missiles at Biscarrosse, located south of Bordeaux, in south-western France, operated by the Direction générale de l'armement, Centre d'essais de lancement de missiles.[63]

At this site, there is a comprehensive test infrastructure that includes a submersible rig for ejection trials of inert missiles (located at Toulon, on the Mediterranean coast), firing installations to test missile propulsion stages, a ground launch rig, and a 100m-deep circular pool into which a special rig, comprising a missile tube and accessories, is submerged for underwater launch tests.[64]

Due to the fact that tests can be conducted from devices surrounded by land, this facility would have to be reported under New START. In contrast, if SLBM tests were only conducted at sea as in the case of the United States and the United Kingdom, then no facilities would have to be reported under this category. In addition, land-based pools and rigs at Biscarrosse would need to be reported in the data exchange as test launchers given that they can be classified as SLBM launchers based on

61 French Senate, *Projet de loi de finances pour 2012 : Défense : équipement des forces*, 17 November 2011, chp. II, § I.B.

62 DCNS, "Le Terrible—pushing the limits of technology", http://en.dcnsgroup.com/naval/products/snle-le-terrible/.

63 French Ministry of Defence, "Missile M51 : succès du troisième vol expérimental", 28 June 2010, www.defense.gouv.fr/dga/actualite-dga/2008/missile-m51-succes-du-troisieme-vol-experimental/.

64 G. de Briganti, "M51 missile nears first test launch; will equip final SSBN in 2010", *defense-aerospace.com*, 25 September 2006.

the New START definition of a device intended or used to contain, prepare for launch, and launch an SLBM. It is uncertain how many of these devices are located at this site.

Conversion and elimination facilities for SLBMs

A conversion or elimination facility is defined in New START as a specified facility for the elimination of ICBMs, SLBMs, and launch canisters. Although it is uncertain, it appears that missiles may be dismantled at l'Île Longue along with warheads that are also dismantled there.[65] If this is the case, no facilities would be reported in this category. Another possibility is that SLBMs would be dismantled where they are produced in Aquitane, although it is not clear if this is the case.

Conversion and elimination facilities for SLBM launchers

An SLBM launcher conversion and elimination facility is defined in New START as a specified facility for the conversion or elimination of SLBM launchers. All operations for SSBN dismantlement reportedly take place at the military port of Cherbourg.[66] Presumably, this would also include SLBM launcher dismantlement. Because this facility would already be declared in the data exchange as an SSBN production facility, it would not need to be reported under this category.

Heavy bombers

France's nuclear-armed aircraft would not be counted under New START due to their range being under the reporting threshold. Under New START, a heavy bomber means a bomber that possesses a range greater than 8,000km, or a bomber that can launch ALCMs with a range in excess of 600km.

France's land-based aircraft, the Mirage 2000N and the Rafale F3, possess a range of 2,750km and 2,000km, respectively. Its carrier-based aircraft, the Rafale MK3, has a range of 2,000km.[67] As all ranges fall under the 8,000km threshold, these aircraft would not be counted under New START.

Additionally, the ALCMs arming these planes also fall below the 600km range threshold. The ASMP, designed for the Mirage 2000N and Rafale, is estimated to have a range of 300km, and the ASMP-A, designed for the Rafale F3, has a range of 500km.[68] Therefore, these missiles and their associated aircraft would not be counted under New START.

Space launch facilities

France's main space launch facility is the Centre spatial Guyanais. Located in French Guiana, this facility is shared by the French space agency CNES, the European Space Agency, and the commercial company Arianespace. The facility focuses on activities surrounding the Soyuz, Vega, and Ariane 5 launchers.[69]

65 French National Assembly, *Rapport d'information déposé en application de l'article 145 du règlement par la Commission de la défense nationale et des forces armées sur la fin de vie des équipements militaires*, information report no. 3251, 16 March 2011, p. 12.

66 French Ministry of Defence, "Le démantèlement des bâtiments à propulsion nucléaire", 11 July 2010, www.defense.gouv.fr/dga/equipement/dissuasion/le-demantelement-des-batiments-a-propulsion-nucleaire/.

67 S. Kile et al., "World nuclear forces", in *SIPRI Yearbook 2011. Armaments, Disarmament and International Security*, Stockholm International Peace Research Institute, 2011, p. 326.

68 R.S. Norris and H.M. Kristensen, "French nuclear forces, 2008", *Bulletin of Atomic Scientists*, vol. 64, no. 4, 2008.

69 Centre spatial Guyanais, "Vega, un lanceur européen", www.cnes-csg.fr/web/CNES-CSG-fr/10024-vega-un-lanceur-europeen.php/.

New START defines a space launch facility as a specified facility from which objects are delivered into the upper atmosphere or space using ICBMs or SLBMs. Given the definitions of an ICBM and SLBM, no French facility would be reported under this category. France's activities at the site focus on launches of the Ariane rocket series, which is reportedly based on the S-2 missile. The latter missile had an intermediate range of about 3,000km,[70] falling short of the 5,500km range threshold under New START.[71]

ICBM and SLBM technical data

New START requires reporting on technical data of ICBMs and SLBMs in its detailed exchange. These include categories such as type of missile, dimensions, and other data. They are listed in the corresponding section of the model data exchange document (see annex B).[72]

70 Encyclopedia Britannica, "S-2", www.britannica.com/EBchecked/topic/514655/S-2.

71 Federation of American Scientists, "Intercontinental ballistic missiles", 25 October 1998, www.fas.org/nuke/intro/missile/icbm.htm/.

72 The primary sources of the information is D. Lennox (ed.), *Jane's Strategic Weapon Systems*, no. 54, 2011.

RUSSIAN FEDERATION

Overview and aggregate numbers

As a party to the New START treaty, the Russian Federation submits detailed data about its strategic forces to the United States on a biannual basis. However, unlike the United States, the Russian Federation has not released an unclassified version of its submissions, so the information available publicly is limited to the aggregate numbers of deployed delivery systems and warheads and to the total number of deployed and non-deployed launchers. Given the size of the Russian strategic arsenal, this complicates the analysis of the composition of the force. However, most of the information relevant to New START has been disclosed during the exchanges under the START treaty, which was in force until December 2009. The last START data exchange reflected the status of the Russian strategic forces as of 1 July 2009. This information, along with other publicly available data, allows the reconstruction of the key elements of the full New START exchange document.

The Russian strategic forces include all three elements of the nuclear triad—ICBMs, SLBMs, and heavy bombers. According to the published New START aggregate data, as of 1 September 2012 the Russian Federation had 491 deployed delivery systems and 1,499 deployed warheads in its strategic arsenal. The Russian Federation also declared that it had 884 deployed and non-deployed launchers.

The data submitted by the Russian Federation as part of the New START exchange does not take into account its non-strategic systems. It is estimated that the Russian Federation has about 2,000 nuclear warheads that are assigned to delivery systems that are not covered by New START. Additionally, about 5,500 warheads are believed to be awaiting dismantlement.[73] However, these warheads have been consolidated at more than a dozen centralized storage facilities across the country, so they are not operationally deployed. Indeed, the only Russian delivery systems that carry nuclear warheads are ICBMs and SLBMs.[74] This means that the New START data provides a good picture of the number of deployed nuclear warheads in the Russian nuclear force.

ICBMs

Under New START, the Russian Federation declared five types of land-based ballistic missiles that are considered ICBMs under the treaty—RS-12M (also known as SS-25 or Topol), RS-12M2 (SS-27 or Topol-M), RS-18 (SS-19 or UR-100NUTTH), RS-20 (SS-18 or R-36M2), and RS-24 (Yars). All these missiles have a range of greater than 5,500 km.

Most of the missiles of the SS-18, SS-19, and SS-25 types were deployed during the 1980s; the first SS-19 were adopted for service in 1979, and deployment of SS-18 and SS-25 began later and continued until 1992. Life extension programmes will allow the Russian Federation to keep some of the SS-19 and SS-25 in service until 2019. SS-18 will be able to remain in service until 2020.[75]

73 H.M. Kristensen and R.S. Norris, "Russian nuclear forces, 2012", *Bulletin of the Atomic Scientists*, vol. 68, no. 2, 2012.

74 This conclusion is based on a series of interviews with directors of the 12th Main Directorate, which operates nuclear storage facilities; see "Poryadok v yadernykh chastyakh [Order in nuclear units]", *Krasnaya zvezda*, 5 September 2006, http://old.redstar.ru/2006/09/05_09/1_02.html/; "Dezhurstvo u yadernoy knopki [On duty at the nuclear button]", *Rossiyskaya gazeta*, 4 September 2007, www.rg.ru/2007/09/04/orujie.html/; and "Garanty yadernogo shchita [Guarantors of the nuclear shield]", *Krasnaya zvezda*, 3 September 2012, www.redstar.ru/index.php/component/k2/item/4428-garantyi-yadernogo-schita/.

75 "Old missiles to get extension of service life", *RussianForces.org*, 14 December 2012, http://russianforces.

SS-27 is relatively new—the first missiles of this type entered service in 1997. In 2010, the Russian Federation began deployment of the RS-24, which is believed to be a multiple-warhead version of SS-27.

The Russian Federation is developing new ICBMs that will replace the currently deployed ones as they reach the end of their service lives. At least two ICBMs are under development—a "medium class" solid-propellant missile that will continue the SS-27/RS-24 line, and a larger liquid-fuel missile that is intended to replace the SS-18.[76] Flight tests of the solid-propellant missile began in 2011, but with only three tests completed so far, the missile is considered a prototype under the treaty, so the Russian Federation does not have to include it in data exchange reports. Development of the new liquid-fuel ICBM has not yet reached the stage of flight tests.

SS-18 and SS-19 are silo-based missiles, and SS-25 are mobile ICBMs that are deployed on road-mobile launchers. SS-27 are deployed in silos as well as on road-mobile launchers. The RS-24 is currently being deployed on road-mobile launchers, but it will be deployed in silos as well. Accordingly, the Russian Federation has to report two types of ICBM bases—for silo launchers of ICBMs and for mobile launchers of ICBMs.

All ICBMs are operated by the Strategic Rocket Forces, which is a separate branch of the armed forces, subordinated directly to the General Staff. The main structural units of the Strategic Rocket Forces are three missile armies—the 31st Missile Army (with headquarters in Orenburg), the 27th Guards Missile Army (Vladimir), and the 33rd Guards Missile Army (Omsk). Each includes several divisions that correspond to missile bases as defined in the treaty—a division includes a maintenance facility (known as Technical Rocket Base) and a number of missile regiments, which are either groups of silo launchers or basing areas for mobile launchers.

ICBM bases for silo launchers of ICBMs

Dombarovskiy

Dombarovskiy (also known as Yasnyy) is the base of the 13th Missile Division of the 31st Missile Army that operates the SS-18 (RS-20, R-36M2). The division headquarters are located in the city of Komarovskiy, which is adjacent to the city of Yasnyy of the Orenburg region, near the border with Kazakhstan.

In 2009, at the time of the last START data exchange, the Russian Federation declared 52 deployed silos and 31 deployed ICBMs in Dombarovskiy. The number of silos corresponds to eight groups of silo launchers—one with 10 silos and seven with six silos each (an additional two six-silo launch groups were liquidated in the 1990s). As of early 2013, only six missile regiments—designated Dombarovskiy-1, -3, -4, -5, and -8—were active. One more regiment, Dombarovskiy-2, apparently has been converted to a unit that supports the space-launch facility for Dnepr launchers (a converted SS-18/R-36MUTTH). The command centre of this regiment, Dombarovskiy-2-5, was converted to a launch facility; accordingly, the other five silos of this group most likely do not contain deployed missiles. The missile regiments that serviced silo groups Dombarovskiy-7 and -10 have been disbanded, but their silos have not been eliminated according to the START or New START procedures, so they are counted as non-deployed ICBM silo launchers.

org/blog/2012/12/old_missiles_to_get_extension.shtml/.

76 "Na strazhe strategicheskoy stabilnosti [Guarding strategic stability]", *Natsionalnaya oborona*, no. 12, December 2012, www.nationaldefense.ru/includes/periodics/armedforces/2011/1212/14507836/detail.shtml/.

In its New START reports, the Russian Federation most likely declares Dombarovskiy as an ICBM base with 30 deployed ICBM launchers and 30 deployed ICBMs of the RS-20 (SS-18, R-36M2) type. The converted silo of the Dombarovskiy-2 group would not be reported as deployed, as it would only contain a missile during a relatively brief time of preparation for launch. Since the most recent Dnepr launch from Dombarovskiy took place on 17 August 2011 and no launches have been conducted since then, as of 1 September 2012 the silo did not contain a missile.[77] The SS-18 deployed in Dombarovskiy are normally deployed with a full load of 10 warheads, so the ICBMs deployed at this base carry 300 nuclear warheads.

The maintenance facility that services the missile division deployed in Dombarovskiy is located approximately 4km to the west of Yasnyy. It includes a training silo that would have to be declared as a non-deployed ICBM launcher, bringing the total number of launchers in Dombarovskiy to 53. The maintenance facility also includes ICBM storage—earlier START data exchanges suggest that there are two non-deployed ICBMs stored there.

Uzhur

Uzhur is the base of the 62nd Missile Division of the 33rd Guards Missile Army. The division currently operates the SS-18 (RS-20, R-36M2). The division headquarters are located in Solnechnyy, a military town directly to the south of Uzhur in Krasnoyarsk krai.

In the 2009 START data exchange, the Russian Federation declared 52 silo launchers and 28 ICBMs deployed at the Uzhur missile base. This corresponds to eight silo launcher groups—one with 10 silos and seven with six silos each (an additional two six-silo launch groups were liquidated in the 1990s). However, the 62nd Missile Division includes only four active missile regiments—Uzhur-1, -2, -5, and -6—with 28 missile silos.

Five of the 10 original regiments of the division have been disbanded and two launch groups—Uzhur-3 and -4—have been eliminated. Silos of the five launch groups—Uzhur-7, -8, -9, and -10—have not been eliminated, even though they have been decommissioned. These silos would be reported as non-deployed ICBM launchers in a New START data exchange (note that for the numbers for these launch groups in the model report may not correspond to the actual regiment numbers). This means that the total number of ICBM launchers, deployed and non-deployed, in Uzhur is 52.

The exact number of deployed silos and ICBMs in Uzhur is not known. The New START aggregate data suggest that the Russian Federation may have a total of 50 deployed ICBMs of the SS-18 type. Assuming that 30 missiles are deployed in Dombarovskiy, the division at Uzhur has 20 deployed ICBMs. Since each deployed SS-18 carries 10 nuclear warheads, the Russian Federation would report 200 deployed nuclear warheads associated with the Uzhur base.

The maintenance facility of the Uzhur division is located approximately 5km to the west of division headquarters. The training silo that is located there would be counted as a non-deployed ICBM launcher, so the total number of launchers at Uzhur is 53. The maintenance facility also includes an ICBM storage area, but the START data exchanges indicate that normally no non-deployed ICBMs are stored there.

77 Kosmotras, “Successful launch of Dnepr launch vehicle performed on 17 August 2011”, 17 August 2011, http://kosmotras.ru/en/news/110/.

Kozel'sk

The missile base in Kozel'sk is the base of the 28th Missile Division of the 27th Guards Missile Army. The division maintains and operates the SS-19 (RS-18, UR-100NUTTH). The division headquarters are located in the military city Kozel'sk-5, about 10km south of Kozel'sk, Kaluga region.

The division originally had 60 missile silos in six missile regiments with 10 silos each. The silos of one of the groups, Kozel'sk-6, were dismantled in 2007, leaving 50 intact silos that would be counted as either deployed or non-deployed ICBM launchers. As of early 2013, only three missile regiments were in active service—Kozel'sk-1, -2, and -4. The SS-19 missiles of these regiments are being withdrawn from service to be replaced by the newer silo-based RS-24. In the model report it is assumed that in September 2012 all missiles were removed from the silos of the Kozel'sk-1 launch group and 20 missiles of the Kozel'sk-2 and -4 regiments were still in their silos. These 20 silos and missiles would be counted as deployed for the purposes of New START reporting. However, since the missiles are being withdrawn from service, they apparently had their warhead sections removed, so no deployed warheads would be reported at the Kozel'sk division.

The division maintenance facility has one training silo, which would be reported as a non-deployed ICBM launcher. START data exchange reports indicate that normally there are two non-deployed ICBMs stored at the maintenance facility. Overall, it is assumed that as of 1 September 2012 the division in Kozel'sk had 20 deployed ICBMs in 20 deployed ICBM launchers and a total of 51 ICBM launchers, deployed or non-deployed. No deployed warheads would be reported there.

Tatishchevo

The 60th Missile Division of the 27th Guards Missile Army based in Tatishchevo operates two types of silo-based missiles—the SS-19 (RS-18, UR-100NUTTH) and Topol-M (RS-12M variant 2 for silo launchers, SS-27). The missile base is located approximately 5km to the south-west of the city of Tatishchevo, Saratov oblast.

The division infrastructure includes 12 launcher groups of 10 silo launchers each. Only 10 of these groups are currently in service, corresponding to 10 missile regiments. Two groups—Tatishchevo-1 and -10—have been deactivated and the regiments that serviced them disbanded. However, the 20 silos of these regiments have not been eliminated in accordance with the New START provisions, so they would count against the limit of total ICBM launchers. Six of the 10 active missile regiments—corresponding the Tatishchevo-2, -3, -4, -5, -6, and -8 launcher groups—operate Topol-M. The other four active regiments operate SS-19.

Deployment of the Topol-M in the Tatishchevo-2 regiment, the last one to receive ICBMs of this type, was completed only at the end of 2012, so as of 1 September 2012 the regiment had only eight ICBMs installed in silos. Therefore, the total number of deployed Topol-M in Tatishchevo would be 58. All 40 SS-19, deployed in silos of the Tatishchevo-7, -8, -11, and -12 launcher groups, would be considered deployed as of 1 September 2012.

Public satellite imagery allows the identification of the two deactivated launcher groups—Tatishchevo-1 and -10—but there is some uncertainty as to which of the groups on the map should be associated with which number. The same is true for other launcher groups—although those that contain Topol-M can be identified with some accuracy, the designations of the launcher groups in the model data report may not correspond to the actual missile regiment numbers.

The Topol-M deployed in Tatishchevo carry a single nuclear warhead. The SS-19 carry six warheads each. Accordingly, the Russian Federation would report 298 nuclear warheads as deployed at the base.

The maintenance facility of the Tatishchevo base has one training silo launcher that would be counted as a non-deployed launcher of the SS-19. The storage facility there probably contained no Topol-M, as they would be installed in silos as they were received at the base. The START reporting record suggests that normally there are four SS-19 in storage.

In sum, in its New START report as of 1 September 2012, the Russian Federation most likely declared that the Tatishchevo missile base had 98 deployed ICBMs (58 Topol-M and 40 SS-19), 298 warheads on deployed ICBMs (58 Topol-M and 240 SS-19), and a total of 121 ICBM launchers, deployed and non-deployed.

ICBM bases for mobile launchers of ICBMs

Teykovo

The 54th Missile Division of the 27th Guards Missile Army has its headquarters in the military city Teykovo-6, in the north-western part of Teykovo, Ivanovo oblast. The division currently operates two types of missiles—road-mobile Topol-M (R-12M variant 2 for road-mobile launcher, SS-27) and RS-24.

The division consists of four regiments deployed at four missile bases. Each regiment normally operates nine missiles. Teykovo-1 and -2 regiments operate Topol-M, Teykovo-3 and -4 operate RS-24. As of 1 September 2012, the Teykovo-4 regiment was incomplete and had only six deployed RS-24.[78] However, since the missiles most likely were already in Teykovo, the model report assumes that in the New START data exchange the Russian Federation reported 18 ICBMs of the RS-24 type as deployed there.

Topol-M is a single-warhead missile, so there are 18 nuclear warheads associated with missiles of this type. RS-24 is believed to carry six warheads. Accordingly, in September 2012 Russia would declare 90 warheads on RS-24 deployed in Teykovo.

The maintenance facility of the division is located about 5km north of Teykovo city. It does not appear to store non-deployed launchers or missiles, so the total number of launchers at the missile base was 33.

Yoshkar-Ola, Nizhniy Tagil, Irkutsk, Barnaul, Vypolzovo, Novosibirsk

Six divisions of the Strategic Rocket Forces currently operate road-mobile SS-25 missiles or have had their SS-25 withdrawn as part of the conversion process that will equip them with the RS-24. These are the divisions deployed at the missile bases known as Yoshkar-Ola, Nizhniy Tagil, Irkutsk, Barnaul, Vypolzovo, and Novosibirsk. Normally, these divisions consist of two to four missile regiments with nine missiles each. Each regiment corresponds to a basing area that includes garages for launchers and support vehicles as well as "fixed structures for mobile launchers of ICBMs".

Although most active basing areas of SS-25 missiles can be identified with some accuracy using satellite imagery and other open source information, basing area numbers may not correspond to the actual numbers included in the data exchange report.

Yoshkar-Ola is a designation for the 7th Missile Division of the 27th Missile Army headquartered in Rechnoy military city, about 10km south-east of Yoshkar-Ola, Mari El Republic. The division includes three missile regiments with nine SS-25 each. No missiles or missile launchers are deployed at the maintenance facility, which is located close to Rechnoy.

78 Russian Ministry of Defense, "V RVSN zavershilos' perevooruzheniye Tetykovskogo soyedineniya [The Rocket Forces completed re-armament in Teykovo]", 20 September 2012, http://function.mil.ru/news_page/country/more.htm?id=11368246@egNews/.

The Nizhniy Tagil missile base is the 42nd Missile Division of the 31st Missile Army with headquarters in Svobodnyy military city, about 25km north-east from Nizhniy Tagil, Sverdlovsk oblast. As of September 2012, the division includes three active missile regiments with nine SS-25 each. The maintenance facility is located in Svobodnyy; no missiles are assumed to be stored there.

The 7th Missile Division in Vypolzovo is headquartered in the military city of Ozernyy, near Vypolzovo, Tver oblast. The division includes two missile regiments with nine SS-25 each. The maintenance facility is about 3km to the west of Ozernyy.

The Irkutsk missile base is the base of the 29th Missile Division with headquarters in the Zelenyy district of Irkutsk. The division includes three active missile regiments. In June 2012 the Strategic Rocket Forces began withdrawal of the SS-25, so that they could be replaced by new missiles of the RS-24 type.[79] As a result, as of September 2012, only the Irkutsk-2 regiment had the full complement of nine SS-25. There were no missiles in Irkutsk-1 regiment and Irkutsk-3 regiment was reported incomplete. The model report assumes that while the regiments are still active, their missiles have been withdrawn from service, so no deployed ICBMs would be reported in Irkutsk.

The Barnaul missile base is home of the 23rd Missile Division of the 33rd Guards Missile Army. The division headquarters and the maintenance facility are located in the Sibirsky-2 military town, about 25km north from Barnaul, Altai region. The division includes four active regiments that operate Topol and SS-25. As each regiment includes nine ICBMs, there are 36 deployed mobile ICBMs and 36 deployed ICBM warheads that would be declared at Barnaul. No non-deployed ICBMs or ICBM launchers appear to be stored at the base maintenance facility.

The 39th Missile Division of the 33rd Guards Missile Army, known in New START as Novosibirsk missile base, has its headquarters in the Gvardeyskiy district of Pashino, near Novosibirsk. The division includes three active missile regiments—Novosibirsk-12, -13, and -21. As of September 2012, Novosibirsk-12, was in the process of being converted to RS-24, so it is known that no ICBMs or ICBM launchers were deployed there. The other two regiments with nine missiles each appeared to be operational. However, the model report assumes that no deployed Topol/SS-25 would be reported there. The maintenance facility, located about 15km north of Pashino, does not appear to contain non-deployed ICBMs or ICBM launchers.

Production facilities for ICBMs

Votkinsk Machine Building Plant

The Votkinsk Plant is the only manufacturer of solid-propellant ICBMs and SLBMs in the country. It produces Topol-M and Yars as well as Bulava SLBMs and short-range ballistic missiles. The plant is located in Votkinsk, Udmurtia.

M.V. Khrunichev Machine Building Plant

The Khrunichev Plant in Moscow has been involved in production of several types of ICBMs. Production ceased in the early 1980s, when the Soviet Union completed deployment of the SS-19—the last intercontinental missile produced by the Khrunichev Plant. However, the plant remains involved in servicing ICBMs of this type; it is also involved in the conversion programme that uses the SS-19 as a space launcher. Accordingly, it has been reported in START data exchanges as an ICBM production facility and most likely retained this status in the New START data exchanges as well.

79 D. Andreyev, "Perevooruzheniye strategicheskogo masshtaba [Rearmament on a strategic scale]", *Krasnaya zvezda*, 1 June 2012.

Production facilities for mobile launchers of ICBMs

The only facility that produces mobile launchers for ICBMs is the Barrikady plant, located in Volgograd. The plant produces mobile transporter launchers for Topol-M and RS-24.

Storage facilities for ICBMs

The Russian Federation has four ICBM storage facilities that appear to be operational—Surovatikha, Piban'shur, Khrizolitovyy, and Znamenka. In its START declarations the Russian Federation also listed an ICBM storage facility at Plesetsk, which probably serves as an interim storage location for ICBM-derived space launchers or for ICBMs used in tests. Surovatikha (Dalneye Konstantinovo-5), located about 60km north of Nizniy Novgorod, mostly stores SS-25. Khrisolitovyy (Ural'skyy), about 30km north-east of Yekaterinburg, stores SS-25, SS-19, and SS-18. Piban'shur, about 100km north of Votkinsk, Udmurtia, has a small number of SS-19—apparently the ones that are being eliminated. Znamenka, about 30km north of Tambov, is an arsenal of the Space Forces that appears to be a storage facility for ICBM-derived space launchers.

Storage facilities for mobile launchers of ICBMs

The only storage facility for mobile launchers that the Russian Federation declared under START was Piban'shur, co-located with the Piban'shur ICBM storage facility. As of 2009, 43 mobile launchers were stored there. We assume that in September 2012 there were about 70 mobile launchers in storage at Piban'shur. These launchers would be counted as non-deployed ICBM launchers.

Repair facilities for ICBMs

In its START declarations, the Russian Federation did not list any ICBM repair facilities. It is assumed that no such facilities are reported under New START as well.

Repair facilities for mobile launchers of ICBMs

In its START declarations, the Russian Federation did not list any repair facilities for mobile launchers of ICBMs. It is assumed that no such facilities have been reported under New START.

Test ranges

There are two main ICBM test ranges located in the Russian Federation—Plesetsk and Kapustin Yar in Arkhangelsk oblast. Both test sites are used to launch road-mobile missiles—SS-25, Topol-M, Yars, and a prototype of a new road-mobile solid-propellant ICBM.

The Plesetsk test range has a number of silo launchers that were used for testing various ICBMs in the past. However, most of these sites have been eliminated, so in its 2009 START declaration the Russian Federation listed four test silos located in Plesetsk—22-7 for the SS-24, and M1-1, M1-2, and M1-3 for the Topol-M. The 22-7 silo appears to have been eliminated by 2009, so only three silo launchers would be listed in Plesetsk. The exact location of these silos could not be determined reliably—the most likely positions are listed in the data exchange document as Plesetsk-1, -2, and -3. The test range also has a launch site used for tests of mobile missiles.

The range in Kapustin Yar is used for test launches of mobile missiles, such SS-25 as well as the new solid-propellant ICBM that is still considered to be a prototype.[80] ICBM launches from this site usually involve testing of new warheads as the missiles are launched towards the Sary-Shagan test

80 "Rocket Forces launch plans for 2013", *RussianForces.org*, 14 December 2012, http://russianforces.org/blog/2012/12/rocket_forces_launch_plans_for_2.shtml/; "Na poligone Kapustin Yar proshli ispytaniya novoy ballisticheskoy rakety [New ballistic missile has been tested in Kapustin Yar]", *Zvezda TV*, 25 October 2012, http://tvzvezda.ru/news/forces/content/201210251016-yr4a.htm/.

site, where a number of radars are deployed. There are no ICBM silo launchers in Kapustin Yar that would have to be reported in New START.

Test launches of SS-19 and SS-18 liquid-fuel missiles are conducted from the Baykonur test site in Kazakhstan. When the START treaty was in force, silo launchers deployed there were reported in Kazakhstan's reports. In 2009, Kazakhstan reported six test silo launchers deployed in Leninsk, as the Baykonur site was designated in START—two silos used for SS-19 and four for SS-18. The Russian Federation reportedly pulled out its military units from Baykonur, so these silos may no longer be functional.[81] The last ICBM test launch from Baykonur took place in December 2011, although the Russian Federation may continue to use the site for space launches, including those that use converted ICBMs.[82] Accordingly, it is likely that in the New START report Baykonur is not listed as an ICBM test range, although it would be included in the report as a space launch site.

One of the silos of the Dombarovskiy missile base has been converted to a launch facility of the Dnepr launch system, which is a converted SS-18. These launches are considered to be flight tests of the SS-18. However, under the terms of New START, an active missile division would not be considered a test range.

Training facilities

There are two facilities that have to be reported under New START—the Serpukhov Military Institute of the Strategic Rocket Forces and the Balabanovo Training Centre of the Strategic Rocket Forces Academy. In 2009, the Russian Federation declared eight SS-25 training launchers and three training SS-25 missiles at Serpukhov, and one training SS-25 launcher with one SS-25 missile and an SS-19 launcher with a training missile at the Balabanovo Centre. Another training facility reported under START—the Rostov Branch of the Strategic Rocket Forces Academy—was disbanded in 2011 and therefore would not be included in the New START data exchange report.

Conversion or elimination facilities for ICBMs

In its START declarations, the Russian Federation listed two ICBM conversion and elimination facilities, at the Votkinsk Plant and in Bershet'. The Bershet' facility, however, was handling the SS-24, which have been eliminated and therefore are not reported under New START.

Conversion or elimination facilities for mobile launchers of ICBMs

The Piban'shur storage facility has also been declared as a conversion and elimination facility under START. It is assumes that this facility is declared under New START as well.

SLBMs

The Russian Federation's ballistic missile submarine fleet includes four types of submarines and four types of SLBMs that are accounted for under New START—the RSM-50, RSM-52, RSM-54, and RSM-56. However, only two types of SLBMs are currently operationally deployed. RSM-50, also known as SS-N-18 or R-29R, is deployed on three submarines of the Project 667BDR/Delta III class. Each submarine can carry 16 missiles of this type and each missile carries three warheads. RSM-54 (SS-N-23, R-29RM) are deployed on six submarines of the Project 667BDRM/Delta IV class. Each

81 "Voyennye struktury Rossii pokinut Baykonur k nachalu 2012 goda [Russian military units will leave Baykonur by the beginning of 2012]", *Tengrinews.kz*, 12 December 2011, http://tengrinews.kz/kazakhstan_news/voennyie-strukturyi-rossii-pokinut-baykonur-k-nachalu-2012-goda-203667/.

82 Russian Ministry of Defense, "S kosmodroma Baykonur proveden pusk mezhkontinentalnoy ballisticheskoy rakety RS-18 [RS-18 intercontinental ballistic missile launched from Baykonur]", 27 December 2011, http://function.mil.ru/news_page/country/more.htm?id=10865745@egNews/.

submarine has 16 launch tubes. Missiles of this type currently carry four warheads, although a modification with 10 warheads might be deployed in the future.[83]

RSM-52 (SS-N-20, R-39) has been withdrawn from service. However, two of the Project 941/Typhoon submarines that carried missiles of this type have not been liquidated yet, so their launchers count against the treaty limit of deployed and non-deployed launchers. The third Project 941-class submarine has been converted to a testing platform for the RSM-56. All 20 launch tubes on this submarine are counted as non-deployed SLBM launchers.

RSM-56, also known as Bulava, is a new missile that will be deployed on Project 955 Borey submarines. Two submarines of this class, with 16 launchers each, have entered service so far. Their launchers, however, will not be counted as deployed until they contain an SLBM. Since neither of the two submarines has been accepted for service, no RSM-56 are counted as deployed.

Submarine bases

Nerpich'ya

The Nerpich'ya (Zapadnaya Litsa) Inlet near Zaozersk at the Kola Peninsula is a base port of a number of submarine units of the Northern Fleet. One of these units, the 18th Submarine Division, included submarines of the Project 941 class, also known as Typhoon. The division was disbanded in 2004 and its submarines were transferred the Sevmash Plant in Severodvinsk. Nevertheless, the Russian Federation continued to report Nerpich'ya as a submarine base in its START data exchange. We assume that it continues this practice in New START reports.

As of September 2012, the Russian Federation had three submarines of the Project 941/Typhoon class—*Arkhangel'sk*, *Severstal*, and *Dmitry Donskoy*. *Arkhangel'sk* and *Severstal* can carry 20 SS-N-20/R-39 each (each missile can carry 10 warheads). However, these missiles have been withdrawn from service and the submarines are awaiting elimination. As of 1 September 2012, the 40 launchers on these two submarines would be counted as non-deployed SS-N-20 launchers.

The *Dmitry Donskoy* is also located in Severodvinsk. This submarine has been converted for test launches of the RSM-56, so all its 20 launchers would be counted as non-deployed launchers of the RSM-56.

Yagel'naya

Yagel'naya Bay near Gadzhiyevo in the Kola Peninsula is the base of the 31st Submarine Division of the Northern Fleet. The division currently includes six Project 667BDRM/Delta IV-class submarines, each capable of carrying 16 R-29RM/SS-N-23 with four warheads.

As of 1 September 2012, four submarines—*Tula*, *Bryansk*, *Novomoskovsk*, and *Karelia*—had missiles on board. The other two submarines—*Verkhoturie*, and *Ekaterinburg*—were in overhaul, so their launchers were counted as non-deployed. The missiles assigned to these submarines are likely to be stored at the base storage facility.

Gadzhiyevo is also a base for the new submarines of the Project 955 Borey class. Two submarines are currently undergoing sea trials—*Yuriy Dologrukiy*, and *Alexander Nevskiy*. Each submarine has 16 launchers for the RSM-56. Neither submarine has missiles on board, but their launchers would be counted as non-deployed SLBM launchers. Until they are formally commissioned, these submarines are located in Severodvinsk, although for the purposes of the treaty they are listed as based in Yagel'naya.

83 "Liner SLBM explained", *RussianForces.org*, 4 October 2011, http://russianforces.org/blog/2011/10/liner_slbm_explained.shtml/.

Rybachiy

Rybachiy is the treaty name of the Pacific Fleet submarine base in Vilyuchinsk, located near Petropavlovsk-Kamchatskiy on the Kamchatka Peninsula. One of the units based there, the 25th Submarine Division, currently includes three Project 667BDR/Delta III-class submarines—*Ryazan'*, *Podol'sk*, and *Svyatoy Georgiy Pobedonosets*. Each submarine can carry 16 R-29/RSM-50 with three warheads. The submarines of the Project 667BDR class are expected to be withdrawn from service, but as of September 2012 all three submarines were believed to be operational.

SLBM loading facilities

In its START data exchange reports, the Russian Federation declared two SLBM loading facilities, at the Okol'naya Inlet in Severomorsk, and in Severodvinsk. Okol'naya is the main arsenal of the Northern Fleet, so it apparently has SLBM loading facilities. The Severodvinsk loading facility is adjacent to the Sevmash plant. Submarine bases appear to have their own loading facilities as well, which would not be reported under New START as separate loading facilities.

Production facilities for SLBMs

Krasnoyarsk Machine Building Plant

The Machine Building Plant in Krasnoyarsk produces the R-29RM. However, the Russian Federation is planning to produce a new liquid-fuel missile there, so it may be reported as an ICBM production facility.[84]

Votkinsk Machine Building Plant

The Votkinsk Plant in Votkinsk, Udmurtia, is the only manufacturer of solid-propellant ICBMs and SLBMs. It produces Topol-M and Yars, as well as Bulava and short-range ballistic missiles.

Production facilities for ballistic missile submarines

The Russian Federation has not declared any production facilities in its START data exchange reports, even though Project 955 submarines were under construction when the treaty was in force. Since both START and New START have identical definitions of a production facility for ballistic missile submarines, this means that no such facilities would be reported under New START.

Storage facilities for SLBMs

Russia reported three SLBM storage facilities in its START declarations—Okol'naya, Revda, and Nenoksa. Okol'naya is a large munitions depot of the Northern Fleet near Severomorsk. Revda is another navy arsenal, located on the Kola Peninsula. In the past, it was used to store liquid-fuel SLBMs, but in the last START data exchange no missiles were reported to be stored there. The facility may still be reported under New START. Nenoksa is a storage facility associated with the 45th Naval Test Range, located on the coast of the White Sea about 30km west of Severodvinsk. The site was used to store solid-propellant SS-N-20, but as of 2009 no missiles were reported in storage there. Nevertheless, this storage facility may have to be reported under New START, so it is included in the model data exchange document.

Repair facilities for SLBMs

New START defines a repair facility for SLBMs as a specified facility, outside an ICBM base or a submarine base, for the repair or maintenance of SLBMs. In its START declarations, the Russian

84 "Armya zhdet pyatogo pokoleniya raket [The military is awaiting fifth-generation missiles]", *Izvestia*, 13 May 2011, http://izvestia.ru/news/374754/.

Federation listed Severodvinsk in this category, although it is not clear what facility in Severodvinsk could perform these functions. In the model report it is assumed that the repair facility is associated with the SLBM loading facility in Severodvinsk.

Test ranges

The only SLBM test range that the Russian Federation listed in its START declarations was Nenoksa—the 45th Naval Test Range located near Severodvinsk. The range was used to conduct flight tests of the SS-N-20/R-39. Although this missile has been withdrawn from service, it is still listed as active under New START, so the test range may have to be reported in New START declarations. The newly developed Bulava has not been tested from a test range on land.[85]

Conversion and elimination facilities for SLBMs

The Pashino facility near Novosibirsk is the site of the 118th Naval Arsenal. The facility was used to store liquid-fuel SLBMs, but at the time of the last START data exchange in 2009 no missiles were stored there. Since the Russian Federation may use the facility in the future, it is assumed that it is listed in the New START declaration.

Conversion or elimination facilities for SLBM launchers

There are four shipbuilding and ship repair plants that are involved in elimination of submarines. Two are located in Severodvinsk—the Zvezdochka Plant (listed as Sever Production Combine in START) and Northern Machine Building Enterprise (Sevmash). Two other facilities—the Zvezda Far Eastern Plant in Bol'shoy Kamen', Primorskiy krai near Vladivostok, and Kamchatka Maritime Plant at Vilyuchinsk, across the bay from the Rybachiy submarine base in Kamchatka—service ships of the Pacific Fleet.

Heavy bombers

The Russian Federation has two types of bombers that are listed as heavy bombers under New START—Tu-160 Blackjack and Tu-95MS Bear. These bombers have a range of more than 8,000km, and they are also equipped to carry nuclear long-range ALCMs. The bombers are based at two bases—Engel's near Saratov and Ukrainka in the Far East. In the last START data exchange in 2009, the Russian Federation declared 13 deployed Tu-160 and 63 deployed Tu-95MS. Since then, some aircraft have been withdrawn from service and others were transferred out of the operational force for repair or modernization. As a result, it is estimated that in September 2012 the Russian Federation had 67 bombers that were counted as deployed—11 Tu-160 and 56 Tu-95MS.

These aircraft could carry about 800 nuclear weapons, but the actual number of weapons assigned to them is probably much lower—about 200.[86] In any event, the New START counting rules count each heavy bomber as carrying a single deployed warhead. This means that for the purposes of the New START data exchange, the Russian Federation reports 67 deployed heavy bombers and 67 deployed warheads. The total number of heavy bombers, which would include non-deployed as well as deployed aircraft, is about 80.

85 However, pop-up tests of the Bulava were carried out at the test range of the Design Bureau of Special Machine-Building near St. Petersburg; "More details on the Bulava test program", *RussianForces.org*, February 4, 2009, http://russianforces.org/blog/2009/02/more_details_on_the_bulava_tes.shtml/.

86 H.M. Kristensen and R.S. Norris, "Russian nuclear forces, 2012", *Bulletin of the Atomic Scientists*, vol. 68, no. 2, 2012.

Airbases

Ukrainka

Ukrainka is the 6952nd Air Base of the Long Range Aviation Command, located in the Amur oblast in the Far East. In the 2009 START data exchange, the Russian Federation declared 40 bombers as based at Ukrainka. We estimate that as of September 2012, 36 bombers were still deployed at this base. Under START, the Russian Federation reported two types of Tu-95MS—Tu-95MS-6 and Tu-95MS-16, capable of carrying six and 16 ALCMs, respectively. However, under New START each bomber is counted as carrying a single deployed warhead.

Engel's

Engel's is the 6950th Air Base of the Long Range Aviation Command, located near Saratov. The division operates Tu-160 and Tu-95MS that are counted under New START as well as Tu-22M3 medium-range bombers that are not covered by the treaty. In 2009, the Russian Federation declared 13 Tu-160 and 18 Tu-95MS as deployed at Engel's. The exact number of bombers that remain in service is not publicly known, but it could be estimated that in September 2012 there were 11 Tu-160 and 16 Tu-95MS based at Engel's.

Ryazan'

Ryazan' airbase is the base of the 43rd Combat Use and Pilot Training Centre in Dyagilevo, near Ryazan'. Even though it is not an operational base, it would have to be reported as an airbase for the purposes of the treaty. In 2009, the Russian Federation declared five Tu-95MS deployed there. However, at least one of these bombers has been transferred elsewhere, so in its September 2012 declaration the Russian Federation would have reported four Tu-95MS based at Ryazan'.

Production facilities for heavy bombers

The only aviation plant that continues production of bombers is Kazan' Aircraft Production Combine, which is producing the Tu-160. The plant also carries out modernization of the aircraft. No bombers are believed to be currently deployed there.

Storage facilities for heavy bombers

The Russian Federation reported no storage facilities for heavy bombers in its START declarations, so it is likely that no facilities of this kind would be reported under New START.

Repair facilities for heavy bombers

In its START declarations, the Russian Federation listed the 360th Aircraft Repair Plant in Ryazan' as a repair facility for heavy bombers. This facility would be reported under New START as well. No aircraft would be reported as located at this base.

Heavy bomber flight test centres

The Zhukovskiy Flight Test Centre that the Russian Federation declared in its START data exchange is the Gromov Flight Research Institute located in Zhukovskiy near Moscow. In 2009 the Russian Federation listed seven Tu-160 and five Tu-95MS test aircraft at the centre. The model report assumes that these numbers have not changed.

Conversion or elimination facilities for heavy bombers

In the START data exchange, the Russian Federation declared the Engel's base as a conversion or elimination facility for heavy bombers. However, it was declared as a facility that services older

Bear G bombers that have been eliminated. Since these bombers would not be counted under New START, no conversion facilities would have been listed in the data exchange.

Space launch facilities

START and New START define a space launch facility as a specified facility from which objects are delivered into the upper atmosphere or space using ICBMs or SLBMs. In its START declarations the Russian Federation listed four space launch facilities—Plesetsk, Baykonur, Svobodnyy, and Nenoksa.

Plesetsk is the main space launch site and has extensive infrastructure for conducting space launches and ICBM flight tests. Part of the site is declared as an ICBM test range. In 2009, the Russian Federation declared three non-deployed ICBM launchers there—a soft launcher for the Rockot space launcher, which is a converted SS-19, a soft launcher of the Start-1 space launcher, which is a converted SS-25, and one mobile launcher of the SS-25. The first two of these launchers would be reported under New START as well.

Baykonur is the space launch site located in Kazakhstan. It was included in Kazakhstan's START declaration (as Leninsk-1), which listed two "launchers that have contained or launched an ICBM or SLBM". These would be declared as non-deployed launchers under New START. However,

it appears that the Russian Federation may not include Baykonur space launch range in its New START declaration.

Svobodnyy is the treaty name of the Vostochnyy space launch site that is being built in Amur oblast in the Far East. The site, which was earlier used as an ICBM base, had been used for launches of the Start-1 launcher.

Nenoksa is the 45th Naval Test Range located near Severodvinsk. It was used for flight tests of the SS-N-20 in the past—the launcher that was used for this test was listed in the Russian Federation's START declaration. The site has not yet been used for space launches, but it appears that the Russian Federation has plans to use Nenoksa for launches of scientific sounding rockets.

ICBM and SLBM technical data

The technical data for all ICBMs, SLBMs, and heavy bombers has been supplied by the Russian Federation in its START data exchange (see annex C). The only exception is the RS-24, which was listed as a prototype under START. However, this missile is a multiple-warhead version of Topol-M, so its technical characteristics are assumed to be identical.

UNITED KINGDOM

Overview and aggregate numbers

The United Kingdom possesses a solely sea-based nuclear force consisting of four SSBNs. The Vanguard-class SSBNs—*Vanguard*, *Victorious*, *Vigilant*, and *Vengeance*—serve the United Kingdom's nuclear strategy of "continuous at-sea deterrence" with one submarine remaining on deterrent patrol at all times.[87] The submarines are each capable of carrying up to 16 Trident II D5 ballistic missiles. The United Kingdom has purchased rights to 58 of these missiles from the United States through the Polaris Sales Agreement.[88] Given that the United Kingdom 's SLBMs are all Trident II D5s manufactured in the United States, the United Kingdom's missiles are already covered by a number of New START provisions.[89]

The United Kingdom does not have an ICBM or heavy bomber component to its nuclear arsenal, so New START would cover the submarine force alone. On 1 September 2012, only two of the United Kingdom's four SSBNs had missiles on board. As the United Kingdom apparently operates its SSBNs at a reduced missile loading, active submarines are assessed to carry 12 SLBMs each. Also, the United Kingdom is currently in the process of reducing the number of warheads on its active SSBNs from 48 to 40. As of 2011, at least one was reported to carry up to the reduced maximum of 40 nuclear warheads.[90] This results in aggregate numbers of 24 deployed SLBMs, 88 deployed warheads, and 64 deployed and non-deployed launchers.

ICBMs

Since the United Kingdom does not possess any land-based intercontinental ballistic missiles, it would have nothing to report in this section of the New START data exchange.

SLBMs

The United Kingdom's only SLBM is the Trident II D5. The missile is already counted under New START as an existing element of the United States' force given its demonstrated range between 6,500 and 12,000km.[91] The United States shares its SLBMs with the United Kingdom through a "mingled assets" arrangement as part of the 1963 Polaris Sales Agreement (amended in 1982).[92]

87 Royal Navy, "Vanguard class", www.royalnavy.mod.uk/The-Fleet/Submarines/Ballistic-Submarines/Vanguard-Class/.

88 The Polaris Sales Agreement between the United States and the United Kingdom was concluded in 1963 to allow the United Kingdom to acquire the Polaris SLBM. It was amended in 1980 to facilitate purchase of the Trident I (C4) and again in 1982 to authorize the purchase of the Trident II (D5). Ten of these missiles were expended in flight tests. The most recent test launch took place on 23 October 2012; see Lockheed Martin, "Lockheed Martin-built Trident II D5 missile achieves 143 successful test flights", October 2012, www.lockheedmartin.com/us/news/preSS-releases/2012/october/1031-SS-trident.html/.

89 Specifically, the New START protocol specifies that notification must be provided on the transfer of SLBMs to or from a third state (See part IV, § II.7 of the protocol).

90 UK House of Commons, "Written ministerial statements", 29 June 2011, www.publications.parliament.uk/pa/cm201011/cmhansrd/cm110629/wmstext/110629m0001.htm/.

91 New START, art. III.8b(ii).

92 Adm. Terry Benedict, US Navy, Director, Strategic Systems Command, presentation to the National Defense Industrial Association, Air Force Association, and Reserve Officers Association Capitol Hill Breakfast Forum, 20 July 2012, unofficial transcript available at www.afa.org/HBS/transcripts/2012/7-20-2012%20Admiral%20Terry%20Benedict.pdf/.

The pool of shared missiles is stored at the Strategic Weapons Facility Atlantic in Kings Bay, Georgia, in the United States. The United Kingdom and United States programmes are linked not only by the completed missiles, but also by the components of the missiles. For instance, a missile can reside on a United Kingdom submarine for a number of years, come back to the United States, be disassembled, certified in its individual pieces, go into inventory, and when those pieces are required, they are built up into the next missile.[93]

Although each Vanguard-class SSBN is capable of carrying up to 16 missiles, the United Kingdom apparently operates its submarines at a reduced load. In 2010, the government announced that it would implement measures to reduce the number of operational missiles on each submarine from 12 to eight, indicating that the currently deployed submarines carry no more than 12 missiles on board.[94]

New START defines a deployed SLBM as an SLBM contained in a deployed launcher of SLBMs. On 1 September 2012, only two of the United Kingdom's submarines would have been considered deployed. On that date, one submarine, *Vengeance*, was in overhaul. Given that it is common practice for missiles to be offloaded before a submarine undergoes long-term maintenance or overhaul, the launchers and missiles are considered to be separated and therefore non-deployed during this time. Another submarine, *Vigilant*, which completed its overhaul earlier in 2012, was undergoing preparation for deployment that ended with a live test fire on 23 October 2012.[95] Given this timing, *Vigilant* most likely did not have missiles on board on 1 September 2012. The other two submarines most likely had missiles loaded in their launch tubes, so it could be assumed that the United Kingdom would report 24 deployed SLBMs as of 1 September 2012.[96]

Beyond these factors, it is important to consider that missiles could also be offloaded during less intensive, routine maintenance, in which case the missiles and their associated launchers would then be considered non-deployed. However, as such procedures are difficult to identify without an established notification system such as in New START, only the missiles and launchers of submarines in overhaul are considered non-deployed in the report.

The life cycle of a Trident missile in the United Kingdom system would support this notion. At the beginning of a new cycle, Vanguard-class submarines travel to Kings Bay in the United States where Trident missiles are randomly selected from the stockpile for loading.[97] The submarines then go to the Royal Naval Armaments Depot at Coulport near Faslane in Scotland where the missiles are fitted with warheads that are designed and manufactured in the United Kingdom. Presumably,

93 Ibid.

94 United Kingdom, *Securing Britain in an Age of Uncertainty: The Strategic Defence and Security Review*, 2010, p. 5. The parliamentary record suggests that submarines normally carry fewer than 16 missiles; see UK House of Commons, under "nuclear submarines", 19 December 2006, www.publications.parliament.uk/pa/cm200607/cmhansrd/cm061219/text/61219w0038.htm/; and UK House of Commons, under "HMS Vigilant", 1 December 1997, www.publications.parliament.uk/pa/cm199798/cmhansrd/vo971201/text/71201w08.htm/. The authors are grateful to Nick Ritchie for providing references to the UK parliamentary record.

95 UK House of Commons, "Written answers to questions", 19 November 2012, www.publications.parliament.uk/pa/cm201213/cmhansrd/cm121119/text/121119w0001.htm/. The preparation process is known as a Demonstration and Shakedown Operation (DASO).

96 It is also possible that the number of missiles on one of the active submarines was reduced to 10. However, in the absence of official data to confirm that, the model report assumes that both active submarines carry 12 missiles.

97 UK Ministry of Defence, and UK Foreign and Commonwealth Office, *The Future of the United Kingdom's Nuclear Deterrent: The Current System*, fact sheet 4, www.nti.org/media/pdfs/29_9.pdf?_=1317842725/.

these missiles and warheads would remain on the submarine until it undergoes its midlife overhaul and refuel, at which point it would return to the United States to unload its missiles for routine maintenance.[98] The submarine would then return to the United Kingdom to complete its overhaul without any missiles on board.

An additional issue of note regarding the missile-sharing arrangement is its implications for unique identification numbers. While there are no missiles that are specifically designated for the United Kingdom, given that the United States has to report all non-deployed missiles and notify the Russian Federation of any transfer of SLBMs to the United Kingdom, it is worth noting that the Russian Federation would eventually know the exact number of missiles in United Kingdom custody at any given moment. This demonstrates that there is already a certain level of transparency beyond the US–Russian bilateral context.

Given that the United Kingdom is in the process of reducing warhead numbers across its fleet there is some uncertainty about the number of deployed warheads. In 2010, the government declared that each submarine is equipped with no more than 48 warheads and made a commitment to reduce this number in the future.[99] In 2011, the Minister of Defence announced that "at least one of the Vanguard-class ballistic missile submarines now carries a maximum of 40 nuclear warheads".[100] This would most likely be in reference to either *Vanguard* or *Victorious*, both of which had completed their scheduled overhauls by that time. Therefore, with one of these submarines carrying a maximum of 48 warheads and one carrying a maximum of 40, this would amount to 88 deployed warheads as of 1 September 2012.

Submarine bases

Clyde

New START defines a submarine base as a facility at which ballistic missile submarines are based, and at which shore-based support for such submarines, which may include the assembly, loading, maintenance, and storage of SLBMs, is provided. By this definition only Her Majesty's Naval Base (HMNB) Clyde in Scotland, which currently serves as the main base for the United Kingdom's SSBN fleet, would be counted under New START as a submarine base.

HMNB Clyde provides a base port to the ships and submarines of the Faslane Flotilla and supports dozens of other visiting vessels every year. The Vanguard-class SSBNs' main berthing docks are located at the northern end of the base in Faslane Bay, which is surrounded by a visible floating barrier. Also within this barrier is a large floating dry dock, which could be used to house and repair submarines that are between deterrent patrols and are not undergoing a midlife refuel at HMNB Devonport.[101]

Towards the southern end of the base, there are several docks adjacent to the coastline used to support attack submarines, the Astute-class and the Trafalgar-class, which are conventionally armed and reportedly accompany the Vanguard-class SSBNs when on deterrent patrol.[102]

98 US SSBNs follow the practice of unloading their SLBMs before going into overhaul; see: US Department of State, Bureau of Verification, Compliance, and Implementation, "Deployed and non-deployed launchers", 2 August 2010, www.state.gov/t/avc/rls/145556.htm/.

99 Cabinet Office of the United Kingdom, "Trident value for money review", fact sheet 10, https://update.cabinetoffice.gov.uk/sites/default/files/resources/Factsheet10-Trident-Value-for-Money-Review.pdf/.

100 UK House of Commons, "Written ministerial statements", 29 June 2011, www.publications.parliament.uk/pa/cm201011/cmhansrd/cm110629/wmstext/110629m0001.htm/.

101 Trident Ploughshares, *Tri-denting It Handbook*, 3rd ed., 2001, p. 84, http://theopenunderground.de/@pdf/war/waffen/tiHandbook.pdf/.

102 Ibid., p. 80.

HMNB Clyde also includes the Royal Armaments Depot at Coulport located west of the main facilities in Faslane Bay. Coulport currently undertakes the storage, processing, maintenance, and issue of key elements of the Trident missile system, as well as warhead storage and loading.[103] Coulport currently possesses a special jetty that is used to mate nuclear warheads to the Trident missiles.[104] It also consists of warhead and missile bunkers visibly embedded in the nearby hillside.[105]

As HMNB Clyde serves as the base port for all of the Vanguard SSBNs, all of the forces comprising the United Kingdom's aggregate numbers would be reported under this base.

SLBM loading facilities

New START defines an SLBM loading facility as a shore-based facility, outside a submarine base, where SLBMs are loaded onto or unloaded from ballistic missile submarines. Based on this definition, there are no such facilities in the United Kingdom. Some occasional loading and offloading may occur at Coulport for light maintenance, but since this facility is considered part of HMNB Clyde, it would not be reported separately.

Production facilities for SLBMs

The Trident II D5 is produced by Lockheed Martin at multiple locations in the United States.[106] As these facilities are not located in the United Kingdom, they would not be reported under a New START-type report.

Production facilities for ballistic missile submarines

BAE Systems Maritime

All four of the Vanguard-class SSBNs were manufactured at the building yard at Barrow-in-Furness, Cumbria, owned by BAE Systems (formerly by Vickers Shipbuilding), and the operational and refit and support site at Devonport, Plymouth, owed by DML (a consortium of which 51 per cent is owned by the US firm Halliburton). These facilities reportedly support all stages of an SSBN's life, from concept design through to operation, maintenance, and disposal.[107] Barrow is the only licensed site in the United Kingdom for the construction, testing, and commissioning of nuclear-powered submarines. Barrow is also currently involved in the design and construction of a successor to the Vanguard class.[108]

Storage facilities for SLBMs

A storage facility for SLBMs is defined by New START as a specified facility, outside an ICBM base, a submarine base, a test range, or a space launch facility, for the storage of ICBMs or SLBMs. There are no designated SLBM storage facilities in the United Kingdom outside of possible occasional storage at HMNB Clyde. The United Kingdom chose to utilize the missile pool with the United

103 Royal Navy, "Naval bases", www.royalnavy.mod.uk/The-Fleet/Naval-Bases/.
104 UK Parliament, "The referendum on separation for Scotland", 5 October 2012, www.publications.parliament.uk/pa/cm201213/cmselect/cmscotaf/writev/ref/m7.htm/.
105 Trident Ploughshares, *Tri-denting It Handbook*, 3rd ed., 2001, p. 85, http://theopenunderground.de/@pdf/war/waffen/tiHandbook.pdf/.
106 Lockheed Martin, *Strategic Weapons Facility Atlantic: Supporting the Trident Submarine Fleet*, 2009, p. 6.
107 UK House of Commons Defence Committee, *The Future of the UK's Strategic Nuclear Deterrent: the Strategic Context, Eighth Report of Session 2005–06*, 20 June 2006, p. 24.
108 UK House of Commons Defence Committee, *The Future of the UK's Strategic Nuclear Deterrent: the Manufacturing and Skills Base, Fourth Report of Session 2006–07*, 12 December 2006, p. 9.

States at Kings Bay rather than store and support the missiles domestically due to cost-efficiency concerns.[109]

However, the United Kingdom has 16 bunkers at Coulport for storing Trident missiles and, according to the government, can load and offload missiles as required.[110] Trident missiles can also be removed from SSBNs at Faslane.[111] Nevertheless, as both Coulport and Faslane are considered a part of HMNB Clyde, these areas would not be counted under New START. It should be noted, though, that if the United Kingdom were to store any missiles at Clyde, such missiles and their associated launchers would need to be reported as non-deployed under the HMNB Clyde base listing.

Repair facilities for SLBMs

The United Kingdom does not possess a designated repair facility for SLBMs, defined in New START as a specified facility, outside an ICBM base or a submarine base, for the repair or maintenance of SLBMs. The Royal Armaments Depot at Coulport is responsible for the maintenance, as well as storage, processing, and issue of key elements of the Trident missile system.[112] However, as this facility is a part of HMNB Clyde, it would not be reported separately.

Test ranges

The United Kingdom does not have a test range, which is defined in New START as a designated land area, other than an ICBM base, from which launches of ICBMs or SLBMs are conducted. The United Kingdom conducts test fires directly from Vanguard SSBNs off the coast of Florida in the United States at the Eastern Test Range after retrieving missiles from Kings Bay in Georgia.[113] On completion of sea trials, the Vanguard SSBNs undertake their Demonstration and Shakedown Operations (DASO) in the United States, which culminate in the test firing of a Trident II D5.[114]

Conversion and elimination facilities for SLBMs

The United Kingdom does not possess a conversion or elimination facility for the Trident II D5. This has to do with the nature of the Polaris Sales Agreement in that the United Kingdom does not buy Trident missiles from the United States, rather they only buy the right to use the missile, and any disassembly or conversion processes must take place in the United States.[115]

Conversion and elimination facilities for SLBM launchers

New START defines a conversion or elimination facility for SLBM launchers as a specified facility for the conversion or elimination of SLBM launchers. The United Kingdom does not have any facilities

109 UK House of Commons Defence Committee, *The Future of the UK's Strategic Nuclear Deterrent: the Strategic Context, Eighth Report of Session 2005–06*, 20 June 2006, p. 24.

110 UK House of Commons, under "Faslane", 18 December 2006, www.publications.parliament.uk/pa/cm200607/cmhansrd/cm061218/text/61218w0008.htm/.

111 See UK House of Commons Defence Committee, *The Progress of the Trident Programme*, publication HC 549, 1993, p. 17.

112 Royal Navy, "RNAD Coulport", www.royalnavy.mod.uk/The-Fleet/Naval-Bases/Clyde/RNAD-Coulport/.

113 US Navy, Strategic Systems Programs, "Polaris-Poseidon-Trident, the British Strategic Systems programs", www.ssp.navy.mil/about/history_facts_5.shtml/; Federation of American Scientists, "Trident-II D-5", 4 December 2006, www.fas.org/nuke/guide/uk/slbm/d-5.htm/.

114 Royal Navy, "HMS Vigilant", www.royalnavy.mod.uk/The-Fleet/Submarines/Ballistic-Submarines/Vanguard-Class/HMS-Vigilant.

115 Adm. Terry Benedict, US Navy, Director, Strategic Systems Command, presentation to the National Defense Industrial Association, Air Force Association, and Reserve Officers Association Capitol Hill Breakfast Forum, 20 July 2012, unofficial transcript available at www.afa.org/HBS/transcripts/2012/7-20-2012%20Admiral%20Terry%20Benedict.pdf/.

that are "specified" for conversion or elimination of SLBM launchers. Currently, when a submarine leaves service, it is stored afloat and regularly maintained to preserve it in a safe condition. As of 2011, there were a total of 17 submarines being stored in this way, the oldest of which is the *Dreadnought*, which left service 30 years ago.[116]

Submarines are currently stored at HMNB Devonport or Rosyth Royal Dockyard. The four decommissioned Resolution-class SSBNs that carried the Polaris SLBM are stored at Rosyth. However, the Ministry of Defence has recently stated that all submarines leaving service in the future will be stored at Devonport to await dismantling, and that no further submarines will be stored at Rosyth.[117]

HMNB Devonport is also where all of the Vanguard SSBNs undergo their midlife overhaul and refuel. *Vigilant* left Devonport in 2011, and as of March 2012, *Vengeance* had begun its overhaul and refuel.[118]

Heavy bombers

The United Kingdom does not possess heavy bombers as defined by New START. In the past, the United Kingdom operated nuclear-armed bombers such as the V-bombers (Valiant, Victor and Vulcan) from 1956.[119] However, none of these systems would have been counted as heavy bombers under New START due to insufficient range.[120] The United Kingdom's nuclear-armed air-launched weapons were withdrawn from service at the end of the Cold War.

Space launch facilities

New START defines a space launch facility as a specified facility from which objects are delivered into the upper atmosphere or space using ICBMs or SLBMs. Given the definitions of an ICBM and SLBM, no facilities would be reported under this category.

ICBM and SLBM technical data

New START requires reporting on technical data of ICBMs and SLBMs in its detailed exchange (see annex D). These include categories such as type of missile, dimensions, and other data. The United States data exchange already includes technical data for the Trident II D5 SLBM.

116 UK Ministry of Defence and DE&S Submarines, *Submarine Dismantling Project (SDP). Consultation Document*, 28 October 2011, p. 10.

117 Ibid., p. 19.

118 UK Ministry of Defence, "£350m upgrade for HMS Vengeance", 26 March 2012, www.gov.uk/government/news/350m-upgrade-for-hms-vengeance--2/.

119 UK Ministry of Defence, and UK Foreign and Commonwealth Office, *The Future of the United Kingdom's Nuclear Deterrent: The History of the UK's Nuclear Weapons Programme*, fact sheet 5, www.mod.uk/NR/rdonlyres/BF640257-5A51-4355-B3A4-3DBAABAE52E7/0/Cm6994_Factsheet5.pdf/.

120 For more information on ranges, see Federation of American Scientists, "Vulcan", www.fas.org/nuke/guide/uk/bomber/vulcan.htm/; Federation of American Scientists, "Victor", www.fas.org/nuke/guide/uk/bomber/victor.htm/; Federation of American Scientists, "Valiant", www.fas.org/nuke/guide/uk/bomber/valiant.htm/.

UNITED STATES

Overview and aggregate numbers

In addition to publishing the US and Russian aggregate numbers of deployed delivery systems and warheads and the total number of launchers, the United States has made public unclassified versions of its biannual reports.[121] These documents contain a detailed account of the status of the US strategic nuclear forces.

The New START data exchange reports serve as an important transparency tool as they provide information about the largest part of the US operational nuclear force. Overall, about 2,000 nuclear warheads are assigned to strategic delivery systems, while the only non-strategic weapons that would be considered deployed are the approximately 200 bombs in Europe.[122] As long as the United States maintains its strategic arsenal at New START levels, non-strategic weapons would not significantly distort the picture of the US nuclear posture. The case of reserve warheads is more complicated. The United States maintains the capability to add to its operationally deployed arsenal about 2,800 warheads currently kept in active reserve. Although New START does not explicitly limit this capability, reporting under the treaty provides the information that makes it possible to accurately estimate it and take it into account.

In the most recent New START data exchange, the United States declared 806 deployed ICBMs, SLBMs, and heavy bombers, and 1,722 accountable deployed warheads. The report also listed the total of 1,034 deployed and non-deployed launchers.

ICBMs

For the ICBM component of its strategic nuclear force, the United States reports the status of two types of missiles—Minuteman III and Peacekeeper (MX). However, only the Minuteman III is currently deployed. The nominal US ICBM force consists of 450 missiles of this type deployed in silos at three missile bases. At the date of the most recent data exchange (1 September 2012), one ICBM was removed from its silo, probably for maintenance, so the number of deployed ICBMs was reported as 449.

The unclassified version of the New START data exchange released by the United States does not contain information about the number of warheads on individual ICBMs. It is known that most US ICBMs carry a single warhead and the total number of deployed ICBM warheads is estimated to be 500.[123]

In addition to the 449 launchers that contained deployed ICBMs, the United States declared 108 non-deployed launchers. These include the one silo from which a missile was temporarily removed, 100 intact silos that were used to deploy Minuteman III and MX in the past, and seven test launchers.

121 Information removed from the documents during the declassification process includes the coordinates of listed facilities, unique identification numbers of delivery systems and launchers, and the number of deployed warheads (other than the aggregate number); see US Department of State, Bureau of Arms Control, Verification and Compliance, "New START Treaty aggregate numbers of strategic offensive arms", 20 November 2012, www.state.gov/t/avc/newstart/c39906.htm/. The complete unclassified data for the United States is available upon request from the Bureau of Arms Control, Verification and Compliance.

122 H.M. Kristensen and R.S. Norris, "U.S. nuclear forces, 2012", *Bulletin of the Atomic Scientists*, vol. 68, no. 3, 2012, p. 86.

123 Ibid.

The total number of ICBM launchers is therefore 557. The data exchange also reported that the United States has 321 non-deployed ICBMs (263 Minuteman III and 58 MX) that are located at ICBM bases as well as at storage, repair, and production facilities.

ICBM bases for silo launchers of ICBMs

Under New START, a base for silo launchers of ICBMs is defined as an area in which one or more groups of silo launchers of ICBMs and one associated maintenance facility are located. As of 1 September 2012, the United States reported 449 deployed silo-launchers of ICBMs. These are dispersed among three air force bases: Warren Air Force Base, Malmstrom Air Force Base, and Minot Air Force Base.

F.E. Warren Missile Complex

The 90th Missile Wing is the host wing at F.E. Warren Air Force Base. Under this wing, the 90th Operations Group has command and control of 150 Minuteman III missiles and 15 Missile Alert Facilities. The 150 missiles are deployed over a 9,600mi^2 area of eastern Wyoming, western Nebraska, and northern Colorado.[124]

The 90th Operations Group includes the 319th, 320th and 321st Missile Squadrons.[125] Each squadron is responsible for five Missile Alert Facilities and 50 Minuteman III.[126] ICBMs are further divided into 10 missiles per silo launcher group (each consisting of 10 silos) as can be seen in the New START data exchange.

In the 1 September 2012 New START data exchange, the United States reported 149 deployed Minuteman III launchers at this complex, with each launcher containing one of the 149 deployed ICBMs. One silo is reported as non-deployed, while its associated missile is presumably located at the base's maintenance facility. As two Minuteman III are reported under the maintenance facility, the extra missile is assumed to be a typically non-deployed missile undergoing routine maintenance.

New START data also reflects 50 non-deployed MX silo launchers. In 1988, 50 MX were brought on alert in modified Minuteman III missile silos. The missiles were deactivated 19 September 2005.[127]

Malmstrom Missile Complex

Malmstrom Air Force Base supports the 341st Missile Wing. Under this wing, the 341st Operations Group oversees 15 Missile Alert Facilities and 150 Minuteman III.[128] These missiles are spread across a 13,800mi^2 area, making Malmstrom Missile Complex the largest in the United States. The entire missile complex is located within the state of Montana.

The 341st Operations Group is comprised of three missile squadrons: the 10th, 12th, and 490th. Each squadron is responsible for five Missile Alert Facilities and 50 Minuteman III.[129] ICBMs are further divided into 10 missiles per silo launcher group (with 10 silos per group) as can be seen in the New START data exchange.

As of 1 September 2012, this complex was reported to hold 150 deployed Minuteman III in 150 launchers. The United States also reported 50 non-deployed Minuteman III launchers. One

124 F.E Warren Air Force Base, "Units", www.warren.af.mil/units/index.asp/.
125 Ibid.
126 US Air Force, "90th Missile Wing", www.warren.af.mil/library/factsheets/factsheet_print.asp?fsID=15991&page=1/.
127 Ibid.
128 Malmstrom Air Force Base, "341st Operations Group", 30 July 2010, www.malmstrom.af.mil/library/factsheets/factsheet.asp?id=4677/.
129 Ibid.

Minuteman III is reported under the base's associated maintenance facility, and this is presumably a non-deployed missile undergoing routine maintenance.

Minot Missile Complex

Minot Air Force Base supports the 91st Missile Wing. The 91st Operations Group is comprised of three missile squadrons: the 740th, 741st, and 742nd.[130] The silo launchers are arranged across an 8,500mi^2 area in the northern half of North Dakota, with the most northerly silo located less than 4km from the Canadian border. Each of the three missile squadrons oversees five Missile Alert Facilities and five silo launcher groups containing 10 Minuteman III silos each.

In the 1 September 2012 New START data exchange, the United States reported 150 deployed Minuteman III in 150 deployed launchers. There is also one non-deployed Minuteman III reported under the associated maintenance facility.

Production facilities for ICBMs

ATK Launch Systems

The United States' only production facility for both ICBMs and SLBMs is ATK Launch Systems in Corinne, Utah. The company, founded in 1929, manufactures solid rocket motor systems for space, defence, and commercial applications. It also offers propulsion systems for both commercial and military programmes. ATK is responsible for refurbishing all three solid-propellant stages of the Minuteman III. A refurbishment programme began in 1998, and ATK highlights that plans are in place for the missile to continue in its deterrent role through 2020.[131] The company was formerly known as ATK Thiokol; it changed its name to ATK Launch Systems in May 2006.

Storage facilities for ICBMs

Under New START, storage facilities must be reported if they are located outside of a reported base. There are two such facilities in the United States: Camp Navajo in Arizona, and the Oasis Complex in Utah.

Camp Navajo

Camp Navajo is a Department of Defense facility that is operated by the Arizona National Guard. The facility covers 114km^2 in central Arizona.[132] It stores ICBM and SLBM components that are subject to New START inspections.[133] As of 1 September 2012, the site held 129 Minuteman III.

Oasis Complex

The Oasis Complex in Utah stores SLBMs as well as ICBMs. The Utah Test and Training Range is located 50mi west of Hill Air Force Base, and is managed as a division of the base. The Oasis Compound and its adjacent missile storage area are located on the north-eastern portion of the range, which is a primary test site for strategic weapons systems, and is used for testing ICBM rocket motors. The Oasis Complex is also the site where missile motors are destroyed under the START I treaty.[134] As of 1 September 2012, this site held 71 Minuteman III.

130 Minot Air Force Base, "91st Operations Group", 8 November 2010, www.minot.af.mil/library/factsheets/factsheet.asp?id=3884/.
131 ATK, "Minuteman III", www.atk.com/products-services/minuteman-iii/.
132 Camp Navajo, "Camp Navajo Training Site", www.campnavajo.com/index.php?which_page=ts_intro/.
133 US Army, "The U.S. Army Camp Navajo's role in the New START Treaty (NST)", 25 April 2011, www.smdc.army.mil/2008/NST/ACInfoPprCampNavajoNSTv3.pdf/.
134 Hill Air Force Base, "Air Force Nuclear Weapons Center, Intercontinental Ballistic Missile Systems Directorate", 15 March 2012, www.hill.af.mil/library/factsheets/factsheet.asp?id=19289/.

Storage facilities for mobile launchers of ICBMs

The United States does not report any storage facilities under this category as it does not possess any mobile launchers of ICBMs.

Repair facilities for ICBMs

Hill Air Force Base

The only ICBM repair facility in the United States located outside of an ICBM base is Hill Air Force Base. This base is an Air Force Materiel Command base located in northern Utah. Its host organization is the 75th Air Base Wing, which provides support for many organizations, the largest being the Ogden Air Logistics Complex, which provides engineering and logistics management for the Minuteman III. [135] Historically, as the Logistics System Program Manager for the entire ICBM force, the Ogden Air Logistics Center at Hill Air Force Base had a close working relationship with all ICBM systems, including the Minuteman family.[136] This facility also supports the MX; it was assigned the logistics system management for the MX in September 1975 and still manages the logistics today.[137] As of 1 September 2012, Hill Air Force Base held 54 Minutemen III and 58 MX.

Repair facilities for mobile launchers of ICBMs

The United States does not report any repair facilities under this category, as it does not possess any mobile launchers of ICBMs.

Test ranges

Vandenberg Air Force Base

Vandenberg Air Force Base is the only test range in the United States, following the New START definition of a designated land area, other than an ICBM base, from which launches of ICBMs or SLBMs are conducted. Here, the 30th Space Wing is charged with supporting ICBM flight tests. The wing conducts ICBM force development evaluation through operations at the Western Range, a geographic region consisting of instrumentation sites along the California coast and extending downrange to Hawaii.[138] In addition, the wing supports space launch operations.

As of 1 September 2012, Vandenberg held six test launchers of Minuteman III and one test launcher of MX. It also held three non-deployed Minuteman III.

Training facilities

The United States does not report any facilities under this category.

Conversion or elimination facilities for ICBMs

The United States does not report any facilities under this category. The United States is presumably carrying out elimination activities at facilities that are declared in other categories.

135 Hill Air Force Base, "Hill AFB", www.hill.af.mil/units/index.asp/.
136 Hill Air Force Base, "'Minuteman III' ICBM", 1 October 2007, www.hill.af.mil/library/factsheets/factsheet.asp?id=5720/.
137 Hill Air Force Base, "'Peacekeeper' ICBM", 19 October 2010, www.hill.af.mil/library/factsheets/factsheet.asp?id=5762/.
138 Vandenberg Air Force Base, "14th Air Force", 1 November 2012, www.vandenberg.af.mil/library/factsheets/factsheet.asp?id=4684/.

Conversion or elimination facilities for mobile launchers of ICBMs

The United States does not report any storage facilities under this category, as it does not possess any mobile launchers of ICBMs.

SLBMs

The submarine fleet includes 14 ballistic missile submarines of the Ohio class that are deployed at two bases. Six submarines are based in the Atlantic and eight in the Pacific. Each submarine is equipped to carry 24 Trident II ballistic missiles, which is the only type of SLBM declared under New START as operational.

The United States expects to have up to two submarines in long-term refuelling overhaul at any given time, so their missiles are removed from launch tubes, and these missiles and launchers are not considered deployed for the purposes of the treaty.[139] As of September 2012, the United States reported 239 deployed SLBMs, which indicates that more than two submarines had at least some of their missiles removed at that time.

The unclassified version of the New START report does not provide information about the number of warheads on SLBMs. It is believed that deployed Trident II carry four to five warheads, so on the date of the report the United States had approximately 1,100 deployed SLBM warheads.

According to the New START report, the United States does not have any SLBM launchers for tests or training, so the 336 launchers on 14 submarines give the total number of SLBM launchers. The data exchange also reported that the United States has 180 non-deployed SLBMs. This number includes SLBMs that were removed from submarines undergoing overhaul as well as reserve SLBMs that are stored at submarine bases and production facilities. It is worth noting that the United Kingdom has access to the pool of non-deployed Trident II, so the total number of these missiles in US custody changes from one report to another.

Submarine bases

The United States' ballistic missile submarine force is based at two bases on opposite sides of the country: the Strategic Weapons Facility Atlantic at Kings Bay, Georgia, and the Strategic Weapons Facility Pacific at Silverdale, Washington.

The sea-based component of the nuclear force consists of 14 Ohio-class SSBNs, each carrying up to 24 Trident II D5. In order to implement New START, the United States reportedly plans to reduce this number to 20 launchers and missiles per submarine by disabling and sealing off four launch tubes per submarine.[140] As of 1 September 2012, this reduction in launchers has not yet begun. All 336 launchers of the 14 submarines are still counted under the aggregate number of launchers.

Strategic Weapons Facility Atlantic

The Strategic Weapons Facility Atlantic consists of 24 buildings. The facilities include administration buildings, supply warehouses, a calibration laboratory, processing buildings (including two missile assembly buildings), two vertical missile packaging buildings (where the Trident II D5 is made ready for delivery to the submarine), inspection buildings, and explosive handling wharves.[141] Construction of this complex began in 1985 and was completed in 1994.

139 US Department of State, Bureau of Verification, Compliance, and Implementation, "Deployed and non-deployed launchers", 2 August 2010, www.state.gov/t/avc/rls/145556.htm/.

140 R. O'Rourke, *Navy Ohio Replacement (SSBN[X]) Ballistic Missile Submarine Program: Background and Issues for Congress*, US Congressional Research Service, 10 December 2012, p. 19.

141 Naval Submarine Base Kings Bay, "Strategic Weapons Facility, Atlantic", www.cnic.navy.mil/kingsbay/

Six ballistic missile submarines are listed as stationed at this base: the *Alaska*, *Maryland*, *Rhode Island*, *Tennessee*, *West Virginia*, and *Wyoming*. As of 1 September 2012, the United States reported 103 deployed SLBMs and 103 deployed launchers of SLBMs. If we assume that active submarines are carrying the full load of 24 missiles, this means that four of the submarines based here were carrying a full load on that date, and one submarine was in the process of loading or unloading its missiles. This assessment fits with the reported 41 non-deployed launchers. With 24 missiles per submarine, one submarine carried no missiles on 1 September 2012, and the submarine in the process of loading or unloading carried only seven missiles.

The Ohio-class submarines reportedly spend 70 days at sea followed by 25 days in dock for overhaul. The United States expects to have up to two submarines in overhaul at any given time. During overhaul, the missiles are removed from the launchers and counted as non-deployed.[142]

The United States also reports 107 non-deployed SLBMs at this base. This number is significantly greater than the number of non-deployed launchers given that the base is charged with assembling the Trident II D5 and processing missile guidance and launcher subsystem components for the entire arsenal.[143]

Strategic Weapons Facility Pacific

The Strategic Weapons Facility Pacific is a part of the Naval Base Kitsap Bangor Annex, located on the Hood Canal adjacent to the Olympic Peninsula in western Washington. The base also comprises a number of additional shore facilities for the submarines and their crews.[144] The base provides assembly, storage, checkout, onload, and offload of missiles. It also provides technical engineering services for guidance, missile, and launcher support equipment.[145]

Naval Base Kitsap was created in 2004 by merging the former Naval Station Bremerton with Naval Submarine Base Bangor.[146] The primary berthing facilities at Bangor consist of four separate pier complexes: "KB" Docks, Delta Pier, Marginal Pier, and Explosives Handling Wharf. SSBNs berth at Marginal Pier South and at Delta Pier North and South. They also use the Explosives Handling Wharf and the drydock on Delta Pier.[147]

Eight SSBNs are listed as stationed here: the *Alabama*, *Henry M. Jackson*, *Kentucky*, *Louisiana*, *Maine*, *Nebraska*, *Nevada*, and *Pennsylvania*. On 1 September 2012, 136 launchers were declared as deployed and 56 as non-deployed. Assuming that active submarines carry a full load of 24 missiles, this would indicate that five submarines carried a full load, two submarines carried no missiles, and one submarine was in the process of unloading or loading its missiles.

About/TenantCommands/StrategicWeaponsFacilityAtlantic/index.htm/.

142 US Department of State, Bureau of Verification, Compliance, and Implementation, "Deployed and non-deployed launchers", 2 August 2010, www.state.gov/t/avc/rls/145556.htm/.

143 Naval Submarine Base Kings Bay, "Strategic Weapons Facility, Atlantic", www.cnic.navy.mil/kingsbay/About/TenantCommands/StrategicWeaponsFacilityAtlantic/index.htm/.

144 Lockheed Martin, *Strategic Weapons Facility Atlantic: Supporting the Trident Submarine Fleet*, 2009, p. 5.

145 US Navy, Strategic Systems Programs, " About SSP", www.ssp.navy.mil/about/locations.shtml/.

146 Lockheed Martin, *Strategic Weapons Facility Atlantic: Supporting the Trident Submarine Fleet*, 2009 , p. 5.

147 US Naval Research Laboratory Marine Meteorology Division, "Puget Sound ports and harbors of interest to the U.S. Navy", www.nrlmry.navy.mil/~cannon/puget_sound/text/ports.htm/.

SLBM loading facilities

The United States does not have separate loading facilities outside of its reported ballistic missile submarine bases, and therefore has nothing to report under this category.

Production facilities for SLBMs

ATK Launch Systems

ATK manufactures solid-propulsion boost motor systems for all three stages of the Trident II under a contract from primary contractor Lockheed Martin Space Systems. ATK has long produced solid-propulsion systems for submarine-launched missiles, beginning with the Polaris in the 1950s.[148] As of 1 September 2012, five non-deployed Trident were reported at this facility. These were first stage motors. The Strategic Weapons Facility Atlantic at Kings Bay, Georgia is responsible for the final assembly of the missile.[149]

Production facilities for ballistic missile submarines

New START defines a production facility for ballistic missile submarines as a facility at which construction of ballistic missile submarines is performed. As there are currently no ballistic missile submarines being constructed, the United States does not list any facilities under this category.

The Ohio-class SSBNs were built by General Dynamics Electric Boat, established in 1899. Primary operations are the shipyard in Groton, Connecticut, the automated hull-fabrication and outfitting facility in Quonset Point, Rhode Island, and an engineering building in New London, Connecticut.[150]

Electric Boat received the contracts for the design and development of the Ohio-class SSBN in 1972, and the first submarine was launched in 1979. Although the United States now maintains a fleet of 14 of these submarines, the original fleet consisted of 18. In 2003, Electric Boat began converting some of the Ohio-class SSBNs into multi-mission submarines optimized for covert strike and special operations support. In 2007, Electric Boat re-delivered *Georgia*, completing the conversion of four Ohio-class SSBNs to an enhanced conventional strike platform that can accommodate large numbers of special forces.[151]

Storage facilities for SLBMs

Oasis Complex

On occasion, the Oasis Complex in Utah stores SLBMs. However, on 1 September 2012, the site held no SLBMs.

Repair facilities for SLBMs

The United States does not report any facilities under this category.

Test ranges

Although Vandenberg Air Force Base is reported as a test range for ICBMs, the United States does not report any facilities under this category for SLBMs, since the tests of these missiles are conducted at sea.

148 ATK, "Trident II", www.atk.com/products-services/trident-ii/.
149 Naval Submarine Base Kings Bay, "Strategic Weapons Facility, Atlantic", www.cnic.navy.mil/kingsbay/About/TenantCommands/StrategicWeaponsFacilityAtlantic/index.htm/.
150 General Dynamics Electric Boat, "EB history", www.gdeb.com/about/history/.
151 Ibid.

Conversion and elimination facilities for SLBMs

The United States does not report any facilities under this category. The United States is presumably carrying out elimination activities at facilities that are declared in other categories.

Conversion or elimination facilities for SLBM launchers

The United States does not report any facilities under this category.

Heavy bombers

At the time of signature of New START, the United States declared four types of heavy bombers—the B-52G, B-52H, B-1B, and B-2A. However, only B-52H and B-2A can carry nuclear weapons. The B-1B has been converted to non-nuclear missions, so they no longer appear in the New START balance. The conversion was performed soon after New START entered into force according to a procedure specified in the treaty.[152] The B-52G is no longer operational; the aircraft are located at a storage facility, where they are being eliminated. Until this process is completed, the B-52G will be accounted for under New START.

In its New START data submission the United States declared that as of 1 September 2012 it had 118 deployed heavy bombers (30 B-52G, 78 B-52H, and 10 B-2A). According to the treaty rules, these bombers are counted as carrying a single weapon each. The actual number of nuclear weapons that are assigned to them is somewhat higher, with estimates suggesting that the bomber force could carry about 300 weapons.[153] In addition to the 118 deployed bombers, the United States declared 23 non-deployed bombers, which are located at production and repair facilities or are used for tests.

Airbases

Under New START, the term deployed heavy bomber means a heavy bomber equipped for nuclear armaments, other than a test heavy bomber or a heavy bomber located at a repair facility or at a production facility. There are three heavy bomber bases reported by the United States: Whiteman Air Force Base in Missouri, Barksdale Air Force Base in Louisiana, and Minot Air Force Base in North Dakota.

Whiteman Air Force Base

Whiteman Air Force Base is located approximately 70mi southeast of Kansas City, Missouri. The host unit at this base is the 509th Bomb Wing, one of two units that operate the B-2A. Also located at Whiteman is the 131st Bomb Wing, an Air National Guard unit that flies the B-2A alongside the 509th.[154]

As of 1st September 2012, the United States reported that all 10 of its deployed B-2A were based as well as located at Whiteman Air Force Base. The United States also reported nine non-deployed B-2A based there. According to the treaty's definition of non-deployed heavy bombers, these would have to be located at either a repair facility or production facility. Accordingly, six of the nine were reported as located at the repair facility associated with Whiteman Air Force Base, and three were reported as located at the Northrop Plant in Palmdale, California.

152 US Department of State, Bureau of Arms Control, Verification and Compliance, "New START Treaty implementation update", 17 May 2012, www.state.gov/t/avc/rls/183335.htm/.

153 H.M. Kristensen and R.S. Norris, "U.S. nuclear forces, 2012", *Bulletin of the Atomic Scientists*, vol. 68, no. 3, 2012, p. 86.

154 Whiteman Air Force Base, "509th Bomb Wing", www.whiteman.af.mil/units/509thbombwing/index.asp/.

Barksdale Air Force Base

Barksdale Air Force Base is located in Bossier Parish, in the northwest corner of Louisiana. This base is headquarters for the 2nd Bomb Wing, with three squadrons of B-52H—the 11th Bomb Squadron, which is the training squadron, the 20th, and the 96th.[155]

As of 1 September 2012, Barksdale Air Force Base held only B-52H. On that date, though 41 deployed B-52H were reported as based there, only 40 were reported as located there. The one deployed B-52H located off base could be among the reported deployed B-52H at the storage facility of Davis-Monthan Air Force Base in Arizona, or located at another base or unknown site.

The United States also reported seven non-deployed B-52H as based at this site. By definition, these would have to be among the non-deployed B-52H reported under the Boeing Plant repair facility in Wichita, Kansas, or the Tinker Air Force Base repair facility in Oklahoma.

Minot Air Force Base

Minot Air Force Base is located in Ward County, North Dakota, 13mi north of the city of Minot. The host wing at the base is the 5th Bomb Wing. The 5th Operations Group provides the aircrews to fly the wing's B-52H. The group is comprised of the 23rd Bomb Squadron, 69th Bomb Squadron, and the 5th Operations Support Squadron.[156]

As of 1 September 2012, 37 deployed B-52H were reported as based at Minot, though only 18 were located there. Some of the remaining 19 deployed B-52H could be among those reported as in storage at Davis-Monthan Air Force Base, and some could be located at other unknown locations.

The United States also reported four non-deployed B-52H under this base. These would have to be located either at the Boeing Plant repair facility in Wichita, Kansas, or the Tinker Air Force Base repair facility in Oklahoma.

Minot Air Force Base also still serves as the base for the older B-52G. As of 1 September 2012, 30 deployed B-52G were reported as based there, though all 30 are reported as located in storage at Davis-Monthan Air Force Base in Arizona, where they are prepared for dismantlement.

Production facilities for heavy bombers

The only reported heavy bomber production facility is the Northrop Plant in Palmdale, California. Northrop Grumman's B-2 final assembly and modification facility is located there. The facility is part of the larger Air Force Plant 42, located within the Antelope Valley of the Mojave Desert, approximately 80mi north of Los Angeles. The site includes multiple high-bay buildings and airfield access with flyaway capability.[157] As of 1 September 2012, there were three B-2A reported as located at this facility.

The B-52G and B-52H were produced by Boeing. As these are no longer in production, no additional production facilities are reported.

155 Barksdale Air Force Base, "2d Bomb Wing", 16 August 2010, www.barksdale.af.mil/library/factsheets/factsheet.asp?id=16244/.

156 Minot Air Force Base, "Guardians of the Upper Realm", www.minot.af.mil/units/5thbombwingunits/index.asp/.

157 California State Military Museum, "Air Force Plant 42, Palmdale", www.militarymuseum.org/AFPlant42.html/.

Storage facilities for heavy bombers

Davis-Monthan Air Force Base

Davis-Monthan Air Force Base is located within the city limits, and approximately 5mi south-east of downtown, of Tucson, Arizona. The base supports the 309th Aerospace Maintenance and Regeneration Group. This facility has grown to include more than 4,400 aircraft and 13 aerospace vehicles from the Air Force, Navy, Marine Corps, Army, Coast Guard, and several federal agencies including NASA.[158]

As of 1 September 2012, all of the United States' deployed B-52G were reported as located at this site. In addition, 13 deployed B-52H were located here.

Repair facilities for heavy bombers

Boeing Plant, Palmdale, California

The Boeing Plant in Palmdale, California, provides support for both the B-2 and B-52. The facility is associated with Edwards Air Force Base, where Boeing serves as a contractor.[159] As of 1 September 2012, no heavy bombers were reported under this site.

Boeing Plant, Wichita, Kansas

The Boeing Plant in Wichita, Kansas, provides support for the B-52.[160] As of 1 September 2012, two non-deployed B-52H were reported under this site. Boeing will reportedly close this plant by the end of 2013 in order to deal with defence spending cutbacks.[161] The work will reportedly be sent to other plants in three other states.

Tinker Air Force Base

The Oklahoma City Air Logistics Complex at Tinker Air Force Base provides support for the B-52. The 76th Aircraft Maintenance Group directs, manages, and accomplishes maintenance, repair, modification, overhaul, functional check flights, and reclamation of several aircraft, including the B-52.[162] As of 1 September 2012, nine non-deployed B-52H were reported under this site.

Whiteman Air Force Base

Whiteman Air Force Base in Missouri provides support for the B-2. As of 1 September 2012, six non-deployed B-2A were reported in the "repair facilities" section.

Heavy bomber flight test centres

Edwards Air Force Base

Edwards Air Force Base in Palmdale, California, is counted under New START as a heavy bomber test flight centre. The 412th Test Wing is the host wing at Edwards Air Force Base. It plans, conducts, analyses, and reports on all flight and ground testing of aircraft, weapons systems, software and components, as well as modelling and simulation for the Air Force.[163]

158 Davis-Monthan Air Force Base, "309 AMARG", www.dm.af.mil/units/amarc.asp/.
159 D. Arkell, "Wings of change", *Boeing Frontiers*, vol. 6, no. 5, 2007, p. 15, www.boeing.com/news/frontiers/archive/2007/september/sep07frontiers.pdf/.
160 Ibid.
161 R. Hegeman, "Boeing to close historic Wichita plant by end of 2013". *USA Today*, 4 January 2012.
162 Tinker Air Force Base, "Oklahoma City Air Logistics Complex", 28 August 2012, www.tinker.af.mil/library/factsheets/factsheet.asp?id=8552/.
163 Edwards Air Force Base, "Home of the 412th Test Wing", www.edwards.af.mil/units/index.asp/.

As of 1 September 2012, all three of the United States' test heavy bombers (one B-2A and two B-52H) were reported under this location.

Conversion or elimination facilities for heavy bombers

Davis-Monthan Air Force Base

The 309th Aerospace Maintenance and Regeneration Group at Davis-Monthan Air Force Base in Arizona is charged with conversion and elimination of heavy bombers. On 1 September 2012, no aircraft were reported at the conversion/elimination facility at this site.

Space launch facilities

New START defines a space launch facility as a specified facility from which objects are delivered into the upper atmosphere or space using ICBMs or SLBMs. The United States reports three such facilities: the Kodiak Launch Facility in Alaska, Vandenberg Space Launch Complex in California, and Wallops Flight Facility in Virginia.

Kodiak Launch Facility

The Kodiak Launch Complex is a commercial rocket launch facility for suborbital and orbital space launch vehicles owned and operated by the Alaska Aerospace Development Corporation. The complex is designed for Castor 120-based solid-propellant launch vehicles up to Athena III, and can also accommodate launch vehicles using Minuteman II stages. Castor 120 is a derivative of the first-stage of the MX.[164] The first stage motors of this ICBM have to be reported in New START as non-deployed ICBMs. The United States reports no non-deployed ICBMs located at the Kodiak launch facility in September 2012.

Vandenberg Space Launch Complex

The Vandenberg Space Launch Complex is located within Vandenberg Air Force Base. This base is headquarters for the 30th Space Wing. The 30th manages Department of Defense space and missile testing, and the placing of satellites into polar orbit from the west coast using expendable boosters (Delta II, Pegasus, Taurus, Minotaur, Atlas V, and Delta IV). Wing personnel also support the Minuteman III Intercontinental Ballistic Missile Force Development Evaluation programme.[165]

As of 1 September 2012, the United States reported no non-deployed ICBMs located at the Vandenberg Space Launch Complex.

Wallops Flight Facility

The Wallops Flight Facility, located in Virginia, was established in 1945 by NASA's predecessor, the National Advisory Committee for Aeronautics.[166] The Wallops facility supports a wide range sounding rockets as well as suborbital and orbital launch vehicles, including Minuteman- and MX-derived models. Today, the facility includes six launch pads, facilities for launch control and assembly buildings that support the preparation and launching of suborbital and orbital launch systems, as well as range instrumentation to launch, track, acquire data, and recover payloads.[167]

164 "Kodiak", www.astronautix.com/sites/kodiak.htm/.
165 Vandenberg Air Force Base, "Units", www.vandenberg.af.mil/units/index.asp/.
166 National Aeronautics and Space Administration, "Wallops Flight Facility", www.nasa.gov/centers/wallops/about/index.html/.
167 "Wallops Island", www.astronautix.com/sites/walsland.htm/.

On 1 September 2012, the United States reported no non-deployed ICBMs located at the Wallops Flight Facility.

ICBM and SLBM technical data

The United States made public all technical data required by New START (see annex E).[168]

168 The 1 September 2012 data exchange is available at www.fas.org/programs/ssp/nukes/armscontrol/NewSTART_USnumbers090112.pdf/.

MODEL DATA EXCHANGE REPORTS

ANNEX A. CHINA

Data as of: 01 September 2012

CATEGORIES OF DATA PERTAINING TO STRATEGIC OFFENSIVE ARMS

Section II. Aggregate Numbers

	P. R. China
Deployed ICBMs, Deployed SLBMs, and Deployed Heavy Bombers	60
Warheads on Deployed ICBMs, on Deployed SLBMs, and Nuclear Warheads Counted for Deployed Heavy Bombers	0
Deployed and Non-deployed Launchers of ICBMs, Deployed and Non-deployed Launchers of SLBMs, and Deployed and Non-deployed Heavy Bombers	109

Section III. ICBMs, ICBM Launchers, and Warheads on Deployed ICBMs

P. R. China

	ICBM Type or Variant of a Type			
	DF-5A	DF-31	DF-31A	Total
Deployed ICBMs	20	20	20	60

Warheads on Deployed ICBMs	0	0	0	0
Non-deployed ICBMs	***	***	***	***
Deployed and Non-deployed Launchers of ICBMs	25	25	***	70
Deployed Launchers of ICBMs	20	20	20	60
Non-deployed Launchers of ICBMs	5	5	***	10
Test Launchers	1	2	***	3

ICBM Base for Silo Launchers of ICBMs

Name/Location: Luoyang (54 Base)
Coordinates: 34°32′41.89″N 112°08′55.39″E

	ICBM Type or Variant of a Type
	DF-5A
Deployed ICBMs	10
Warheads on Deployed ICBMs	0
Deployed Silo Launchers of ICBMs	10
Non-deployed Silo Launchers of ICBMs	1

Silo Launcher Group: Lushi (801 Brigade)

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
801-1	34°12′00.15″N 111° 0′29.04″E		DF-5A
802-2	33°55′47.50″N 111° 2′36.11″E		DF-5A
***	***		DF-5A

Silo Launcher Group: Luoning (804 Brigade)

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
804-1	34°17′5.93″N 111°37′36.39″E		DF-5A
***	***		DF-5A

Maintenance Facility

Name/Location: Luoyang (54 Base)
Coordinates: 34°32′41.89″N 112° 8′55.39″E

	ICBM Type or Variant of a Type
	DF-5A
Non-deployed ICBMs	***
Silo Training Launchers	1

ICBM Base for Silo Launchers of ICBMs

Name/Location: Huaihua (55 Base)
Coordinates: 27°32′10.16″N 109°59′10.89″E

	ICBM Type or Variant of a Type
	DF-5A
Deployed ICBMs	10
Warheads on Deployed ICBMs	0

Deployed Silo Launchers of ICBMs 10

Non-deployed Silo Launchers of ICBMs 1

Silo Launcher Group: Jingzhou (803 Brigade)

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
803-1	26°25′51.62″N 109°27′42.13″E		DF-5A
803-2	26°26′24.93″N 109°33′47.48″E		DF-5A
803-3	26°33′41.49″N 109°50′41.36″E		DF-5A
***	***		DF-5A

Silo Launcher Group: Huitong (814 Brigade)

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
814-1	26°56′52.79″N 109°42′37.21″E		DF-5A
***	***		DF-5A

Maintenance Facility

Name/Location: Huaihua (55 Base)
Coordinates: 27°32′10.16″N 109°59′10.89″E

ICBM Type or Variant of a Type
DF-5A

Non-deployed ICBMs ***

Silo Training Launchers 1

ICBM Base for Mobile Launchers of ICBMs

Name/Location: Kunming (53 Base Mobile)
Coordinates: 24°59′41.68″N 102°50′5.73″E

	ICBM Type or Variant of a Type
	DF-31/A
Deployed ICBMs	0
Warheads on Deployed ICBMs	0
Deployed Mobile Launchers of ICBMs	0

Basing area: Yuxi
Coordinates: 24°21′41.61″N 102°29′40.51″E

	ICBM Type or Variant of a Type
	DF-31/A
Deployed ICBMs	0
Deployed Mobile Launchers of ICBMs	0
Fixed Structures for Mobile Launchers of ICBMs	2

Maintenance Facility

Name/Location: Kunming (53 Base Mobile)
Coordinates: 24°59′41.68″N, 102°50′5.73″E

	ICBM Type or Variant of a Type
	DF-31/A
Non-deployed ICBMs	0
Non-deployed Mobile Launchers of ICBMs	0

ICBM Base for Mobile Launchers of ICBMs

Name/Location: Luoyang (54 Base Mobile)
Coordinates: 34°32′38.81″N 112° 8′52.40″E

	ICBM Type or Variant of a Type
	DF-31/A
Deployed ICBMs	10
Warheads on Deployed ICBMs	0
Deployed Mobile Launchers of ICBMs	10

Basing area: Nanyang (813 Brigade Mobile)
Coordinates: 33° 00′44.95″N 112°24′52.76″E

	ICBM Type or Variant of a Type
	DF-31
Deployed ICBMs	***

Deployed Mobile Launchers of ICBMs	***
Fixed Structures for Mobile Launchers of ICBMs	3

Basing area: Xixia
Coordinates: 33°17′36.87″N 111°52′50.50″E

	ICBM Type or Variant of a Type
	DF-31/A
Deployed ICBMs	***
Deployed Mobile Launchers of ICBMs	***
Fixed Structures for Mobile Launchers of ICBMs	***

Maintenance Facility

Name/Location: Luoyang (54 Base Mobile)
Coordinates: 34°32′38.81″N 112° 8′52.40″E

	ICBM Type or Variant of a Type
	DF-31
Non-deployed ICBMs	***
Non-deployed Mobile Launchers of ICBMs	0

ICBM Base for Mobile Launchers of ICBMs

Name/Location:	Huaihua (55 Base Mobile)
Coordinates:	27°32′10.51″N 109°59′4.66″E

	ICBM Type or Variant of a Type
	DF-31
Deployed ICBMs	10
Warheads on Deployed ICBMs	0
Deployed Mobile Launchers of ICBMs	10

Basing area:	Shaoyang (805 Brigade)
Coordinates:	27°15′13.26″N 111°23′14.38″E

	ICBM Type or Variant of a Type
	DF-31A
Deployed ICBMs	10
Deployed Mobile Launchers of ICBMs	10
Fixed Structures for Mobile Launchers of ICBMs	2

Maintenance Facility

Name/Location:	Huaihua (55 Base Mobile)
Coordinates:	27°32′10.51″N 109°59′4.66″

	ICBM Type or Variant of a Type
	DF-31A
Non-deployed ICBMs	***
Non-deployed Mobile Launchers of ICBMs	0

ICBM Base for Mobile Launchers of ICBMs

Name/Location: Xining (56 Base Mobile)
Coordinates: 36°39′39.43″N 101°41′3.84″E or 36°35′59.67″N 101°47′14.17″E

	ICBM Type or Variant of a Type
	DF-31/A
Deployed ICBMs	20
Warheads on Deployed ICBMs	0
Deployed Mobile Launchers of ICBMs	20

Basing area: Datong (809 Brigade)
Coordinates: 36°56′55.01″N 101°39′58.56″E

	ICBM Type or Variant of a Type
	DF-31/A
Deployed ICBMs	6

Deployed Mobile Launchers of ICBMs	6
Fixed Structures for Mobile Launchers of ICBMs	4

Basing area: Tianshui (812 Brigade Mobile)
Coordinates: 34°31′48.14″N 105°54′35.23″E

	ICBM Type or Variant of a Type
	DF-31A
Deployed ICBMs	***
Deployed Mobile Launchers of ICBMs	***
Fixed Structures for Mobile Launchers of ICBMs	3

Basing area: Delingha
Coordinates: 37°21′36.21″N 97°21′42.98″E

	ICBM Type or Variant of a Type
	DF-31/A
Deployed ICBMs	***
Deployed Mobile Launchers of ICBMs	***
Fixed Structures for Mobile Launchers of ICBMs	***

Basing area: Haiyan
Coordinates: 36°49′30.86″N, 101° 6′13.29″E

	ICBM Type or Variant of a Type
	DF-31/A
Deployed ICBMs	***
Deployed Mobile Launchers of ICBMs	***
Fixed Structures for Mobile Launchers of ICBMs	***

Maintenance Facility

Name/Location: 56 Base Mobile, Xining
Coordinates: 36°37′39.41″N 101°44′57.48″E

	ICBM Type or Variant of a Type
	DF-31/A
Non-deployed ICBMs	***
Non-deployed Mobile Launchers of ICBMs	1

ICBM Loading Facilities

***

Production Facilities for ICBMs

Name/Location:	221th Factory, Nanyuan
Coordinates:	39°47′56.17″N 116°24′4.76″E

	ICBM Type or Variant of a Type
	DF-31/A
Non-deployed ICBMs	***

Name/Location:	Northern Beijing
Coordinates:	40°18′28.57″N 116°31′20.21″E

	ICBM Type or Variant of a Type	
	DF-5/A	DF-31/A
Non-deployed ICBMs	***	***

Name/Location:	Chengdu
Coordinates:	30°33′34.12″N 104°15′19.84″E

	ICBM Type or Variant of a Type
	DF-5/A
Non-deployed ICBMs	***

Production Facilities for Mobile Launchers of ICBMs

Name/Location:	Wanshan Special Vehicle Factory
Coordinates:	30°55′44.20″N 113°56′6.70″E

	ICBM Type or Variant of a Type
	DF-31/A
Non-deployed Mobiles Launchers of ICBMs (Returned)	***

Storage Facilities for ICBMs

Name/Location: ***
Coordinates: ***

	ICBM Type or Variant of a Type	
	DF-5/A	DF-31/A
Non-deployed ICBMs	***	***

Storage Facilities for Mobile Launchers of ICBMs

Name/Location: ***
Coordinates: ***

	ICBM Type or Variant of a Type
	DF-31/A
Non-deployed Mobile Launchers of ICBMs	***

Repair Facilities for ICBMs

Repair Facilities for Mobile Launchers of ICBMs

Test Ranges

Name/Location: Taiyuan
Coordinates: 38°50′58.30″N 111°36′33.82″E

	ICBM Type or Variant of a Type	
	DF-5A	DF-31/A
Non-deployed ICBMs	***	***
Test Launchers	1	2

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
Taiyuan-1	38°52′40.55″N 111°35′33.12″E		DF-5/A

Name/Location: Shuangchengzi
Coordinates: 41°15′57.01″N 100°20′38.98″E

	ICBM Type or Variant of a Type
	DF-5/A
Non-deployed ICBMs	0
Test Launchers	0

Training Facilities

Name/Location: Dongkou
Coordinates: 27° 1′54.82″N 110°32′29.85″E

	ICBM Type or Variant of a Type
	DF-5A
Non-deployed Mobiles Launchers of ICBMs	0
Silo Training Launchers	1

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
Dongkou-1	27° 2′3.56″N 110°32′26.94″		DF-5A

Name/Location: Kangzhuang
Coordinates: 40°18′4.66″N 115°41′2.14″E

	ICBM Type or Variant of a Type
	DF-31/A
Non-deployed Mobiles Launchers of ICBMs	1
Silo Training Launchers	0

Name/Location: Xian
Coordinates: 34°18′51.03″N 109° 7′22.41″E

	ICBM Type or Variant of a Type	
	DF-5A	DF-31/A
Non-deployed Mobiles Launchers of ICBMs	0	1

Silo Training Launchers	1	0

Name/Location: Linyi
Coordinates: 35° 9′36.67″N 110°47′50.18″E

	ICBM Type or Variant of a Type
	DF-31/A
Non-deployed Mobiles Launchers of ICBMs	0
Silo Training Launchers	0

Conversion or Elimination Facilities for ICBMs

Conversion or Elimination Facilities for Mobile Launchers of ICBMs

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Section IV. SLBMs, SLBM Launchers, and Warheads on Deployed SLBMs

P. R. China

	SLBM Type or Variant of a Type		
	JL-1	JL-2	Total
Deployed SLBMs	0	0	0
Warheads on Deployed SLBMs	0	0	0
Non-deployed SLBM s	***	***	***
Deployed and Non-deployed Launchers of SLBMs	12	27	39
Deployed Launchers of SLBMs	0	0	0
Non-deployed Launchers of SLBMs	12	27	39
Test Launchers	0	3	3

Submarine Base

Name/Location: Jianggezhuang
Coordinates: 36°06′56.50″N 120°34′32.76″E

	SLBM Type or Variant of a Type	
	JL-1	JL-2
Deployed SLBMs	0	0
Warheads on Deployed SLBMs	0	0
Non-deployed SLBMs	***	***

Deployed Launchers of SLBMs	0	0
Non-deployed Launchers of SLBMs	12	12

Ballistic Missile Submarines Based at this Submarine Base

	Number of Submarines/Aggregate Number of Launchers by SLBM Type	
	JL-1	JL-2
Submarine Type		
Type 092/Xia-Class	1/12	
Submarine Name:		
092		
Submarine Type		
Type 094/Jin-Class		1/12
Submarine Name:		
094-1		

Submarine Base

Name/Location: Xiaopingdao
Coordinates: 38° 49′10.41″N 121°29′29.31″E

	SLBM Type or Variant of a Type
	JL-2
Deployed SLBMs	0
Warheads on Deployed SLBMs	0
Non-deployed SLBMs	***

Deployed Launchers of SLBMs	0
Non-deployed Launchers of SLBMs	3

Ballistic Missile Submarines Based at this Submarine Base

	Number of Submarines/Aggregate Number of Launchers by SLBM Type
	JL-2
Submarine Type	
Type 031/Golf-Class	1/3

Submarine Name:

031

Submarine Base

Name/Location: Yulin
Coordinates: 18°12′30.72″N 109°41′4.89″E

	SLBM Type or Variant of a Type
	JL-2
Deployed SLBMs	0
Warheads on Deployed SLBMs	0
Non-deployed SLBMs	***
Deployed Launchers of SLBMs	0
Non-deployed Launchers of SLBMs	12

Ballistic Missile Submarines Based at this Submarine Base

	Number of Submarines/Aggregate Number of Launchers by SLBM Type
	JL-2
Submarine Type	
Type 094/Jin-Class	1/12

Submarine Name:

094-2

SLBM Loading Facilities

Production Facilities for SLBMs

Name/Location: 221th Factory, Nanyuan
Coordinates: 39°47′56.17″N 116°24′4.76″E

	SLBM Type or Variant of a Type
	JL-2
Non-deployed SLBMs	***

Production Facilities for Ballistic Missile Submarines

Name/Location: Bohai Shipbuilding Heavy Industry Co.
Coordinates: 40°42′46.24″N 121° 0′8.32″E

	SLBM Type or Variant of a Type	
	JL-1	JL-2
Non-deployed Launchers of SLBMs	***	***

Storage Facilities for SLBMs

Repair Facilities for SLBMs

Test Ranges

Name/Location: Taiyuan
Coordinates: 38°50′58.30″N 111°36′33.82″E

	SLBM Type or Variant of a Type	
	JL-1	JL-2
Non-deployed SLBMs	***	***
Test Launchers	0	0

Conversion or Elimination Facilities for SLBMs

Conversion or Elimination Facilities for SLBM Launchers

Name/Location: Bohai Shipbuilding Heavy Industry Co.
Coordinates: 40°42′46.24″N 121° 0′8.32″E

	SLBM Type or Variant of a Type	
	JL-1	JL-2
Non-deployed Launchers of SLBMs	***	***

Section V. Heavy Bombers and Nuclear Warheads Counted for Deployed Heavy Bombers

P. R. China

Section VI. Space Launch Facilities

P. R. China

Section VII. ICBM and SLBM Technical Data

Classification A:

Assembled ICBMs or SLBMs in Launch Canisters

Classification B:

Assembled ICBMs or SLBMs Without Launch Canisters

Classification C:

ICBMs or SLBMs Maintained, Stored, and Transported in Stages

P. R. China

(a) Intercontinental Ballistic Missiles

	ICBM Type or Variant of a Type		
	DF-5A	DF-31	DF-31A
Missile			
Classification	A	A	A
Number of Stages	2	3	3
Length of Assembled Missile Without Front Section (m)	31.5	***	14.9

Maximum Diameter of Missile Airframe (Without Stabilizers, Raceways, Lug Guides, or Other Protruding Elements) (m)	3.35	***	2.0
Total Length of a Missile as a Unit With Launch Canister			
With Front Section (m)	36	14.3	18.7
Without Front Section (m)	***	***	***
Length of Launch Canister Body (m)	***	15.4	***
Diameter of Launch Canister Body (Without Protruding Elements) (m)	***	2.2	***
Missile Stages			
First Stage			
Length (m)	20.5	4.4	6
Length of First Stage Without Nozzle Attached (m)	***	***	***
Diameter (m)	3.35	2.0	2.0
Type of Propellant (Liq/Sol)	Liq	Sol	Sol

Second Stage			
Diameter (m)	3.35	2.0	2.0
Type of Propellant (Liq/Sol)	Liq	Sol	Sol
Third Stage			
Diameter (m)	---	1.5	1.5
Type of Propellant (Liq/Sol)	---	Sol	Sol
Size Criteria for Conducting Inspections			
97% of the Length of Launch Canister Body (m)	***	***	***
97% of the Diameter of Launch Canister Body (Without Protruding Elements) (m)	***	***	***
97% of the Length of First Stage (m)	***	***	***
97% of the Diameter of First Stage (m)	***	***	***

Mobile Launchers of ICBMs

	Type or Version of a Type
	DF-31/A
Mobile Launcher of ICBMs (In Transport Position, Without Missile)	
Length (m)	18
Height (m)	3.1
Width (m)	2.5
Size Criteria for Conducting Inspections	
97% of the Length (m)	***
97% of the Height (m)	***
97% of the Width (m)	***

External and Functional Differences Between Training Models of Missiles and ICBMs of Corresponding Types

For Training Models of DF-5A Types of Missiles:

***

For Training Models of DF-31 Types of Missiles:

***

For Training Models of DF-31A Types of Missiles:

***

(b) Submarine-Launched Ballistic Missiles

	SLBM Type or Variant of a Type	
	JL-1	JL-2
Missile		
Classification	C	***
Number of Stages	2	3
Length of Assembled Missile Without Front Section (m)	***	***
Maximum Diameter of Missile Airframe (Without Stabilizers, Raceways, Lug Guides, or Other Protruding Elements) (m)	1.4	1.8–2.0
Total Length of a Missile as a Unit With Launch Canister		
With Front Section (m)	10.7	13.0 or 13.6
Without Front Section (m)	***	***
Length of Launch Canister Body (m)	***	***
Diameter of Launch Canister Body (Without Protruding Elements) (m)	***	***

Missile Stages		
First Stage		
Length (m)	***	***
Length of First Stage Without Nozzle Attached (m)	***	***
Diameter (m)	1.4	1.8–2.0
Type of Propellant (Liq/Sol)	Sol	Sol
Second Stage		
Diameter (m)	***	1.8–2.0
Type of Propellant (Liq/Sol)	Sol	Sol
Third Stage		
Diameter (m)	***	***
Type of Propellant (Liq/Sol)	***	Sol
Size Criteria for Conducting Inspections		
97% of the Length of Launch Canister Body (m)	***	***

97% of the Diameter of Launch Canister Body (Without Protruding Elements) (m)	***	***
97% of the Length of First Stage (m)	***	***
97% of the Diameter of First Stage (m)	***	***

External and Functional Differences Between Training Models of Missiles and SLBMs of Corresponding Types

For Training Models of JL-1 Types of Missiles:

***

For Training Models of JL-2 Types of Missiles:

***

Section VIII. Heavy Bomber Distinguishing Features

P. R. China

(a) Heavy Bombers Equipped for Nuclear Armaments

(b) Heavy Bombers Equipped for Non-nuclear Armaments

Section IX. Other Data Required by the Treaty

2. To each Party, ICBMs, SLBMs, submarines, heavy bombers, inspection airplanes, and, where applicable, variants referred to in the Treaty, are known as follows:

P. R. China

	[In the Host Country]	[Other Designation]
ICBMs:	DF-5A	CSS-4 Mod 2
	DF-31	CSS-10 Mod 1
	DF-31A	CSS-10 Mod 2
SLBMs:	JL-1	CSS-N-3
	JL-2	CSS-NX-14
Submarines:	Type 092	Xia-Class
	Type 094	Jin-Class
	Type 031	Golf-Class

ANNEX B. FRANCE

Data as of: 01 September 2012

CATEGORIES OF DATA PERTAINING TO STRATEGIC OFFENSIVE ARMS

Section II. Aggregate Numbers

	France
Deployed ICBMs, Deployed SLBMs, and Deployed Heavy Bombers	48
Warheads on Deployed ICBMs, on Deployed SLBMs, and Nuclear Warheads Counted for Deployed Heavy Bombers	288
Deployed and Non-deployed Launchers of ICBMs, Deployed and Non-deployed Launchers of SLBMs, and Deployed and Non-deployed Heavy Bombers	64

Section III. ICBMs, ICBM Launchers, and Warheads on Deployed ICBMs

France

Section IV. SLBMs, SLBM Launchers, and Warheads on Deployed SLBMs

France

	SLBM Type or Variant of a Type		
	M45	M51.1	Total
Deployed SLBMs	32	16	48
Warheads on Deployed SLBMs	192	96	288
Non-deployed SLBM s	16	0	16
Deployed and Non-deployed Launchers of SLBMs	48	16	64
Deployed Launchers of SLBMs	32	16	48
Non-deployed Launchers of SLBMs	16	0	16
Test Launchers	0	0	0

Submarine Base

Name/Location: Île Longue Strategic Submarine Base
Coordinates: 48°18′3.99″N 4°30′42.27″W

	SLBM Type or Variant of a Type	
	M45	M51.1
Deployed SLBMs	32	16
Warheads on Deployed SLBMs	192	96

Non-deployed SLBMs	16	0
Deployed Launchers of SLBMs	32	16
Non-deployed Launchers of SLBMs	16	0

Ballistic Missile Submarines Based at this Submarine Base

	Number of Submarines/Aggregate Number of Launchers by SLBM Type	
	M45	M51.1
Submarine Type		
Le Triomphant	3/48	1/16

Submarine Name:

Le Téméraire
Le Triomphant
Le Vigilant
Le Terrible

SLBM Loading Facilities

Production Facilities for SLBMs

Name/Location: Annex Guenvénez
Coordinates: 48°15'42.89"N 4°31'3.25"W

	SLBM Type or Variant of a Type	
	M45	M51.1
Non-deployed SLBMs	0	0

Production Facilities for Ballistic Missile Submarines

Name/Location: Cherbourg Shipyard
Coordinates: 49°38′53.62″N 1°38′18.58″W

	SLBM Type or Variant of a Type	
	M45	M51.1
Non-deployed Launchers of SLBMs	0	0

Storage Facilities for SLBMs

Repair Facilities for SLBMs

Test Ranges

Name/Location: DGA Essaisde missiles
Coordinates: 44°20′40.98″N 1°15′17.14″W

	SLBM Type or Variant of a Type	
	M45	M51.1
Non-deployed SLBMs	0	0
Test Launchers	0	***

Conversion or Elimination Facilities for SLBMs

Conversion or Elimination Facilities for SLBM Launchers

Section V. Heavy Bombers and Nuclear Warheads Counted for Deployed Heavy Bombers

France

Section VI. Space Launch Facilities

France

Section VII. ICBM and SLBM Technical Data

Classification A:

Assembled ICBMs or SLBMs in Launch Canisters

Classification B:

Assembled ICBMs or SLBMs Without Launch Canisters

Classification C:

ICBMs or SLBMs Maintained, Stored, and Transported in Stages

France

(a) Intercontinental Ballistic Missiles

(b) Submarine-Launched Ballistic Missiles

	SLBM Type or Variant of a Type	
	M45	M51.1
Missile		
Classification	A	A
Number of Stages	3	3

Length of Assembled Missile Without Front Section (m)	***	***
Maximum Diameter of Missile Airframe (Without Stabilizers, Raceways, Lug Guides, or Other Protruding Elements) (m)	1.93	2.35
Total Length of a Missile as a Unit With Launch Canister		
With Front Section (m)	11.05	13
Without Front Section (m)	***	***
Length of Launch Canister Body (m)	***	***
Diameter of Launch Canister Body (Without Protruding Elements) (m)	***	***
Missile Stages		
First Stage		
Length (m)	***	***
Length of First Stage Without Nozzle Attached (m)	***	***
Diameter (m)	1.93	2.35

Type of Propellant (Liq/Sol)	Sol	Sol
Second Stage		
Diameter (m)	1.93	2.35
Type of Propellant (Liq/Sol)	Sol	Sol
Third Stage		
Diameter (m)	***	***
Type of Propellant (Liq/Sol)	Sol	Sol
Size Criteria for Conducting Inspections		
97% of the Length of Launch Canister Body (m)	***	***
97% of the Diameter of Launch Canister Body (Without Protruding Elements) (m)	***	***
97% of the Length of First Stage (m)	***	***
97% of the Diameter of First Stage (m)	***	***

External and Functional Differences Between Training Models of Missiles and SLBMs of Corresponding Types

For Training Models of M45 Types of Missiles:

***

For Training Models of M51.1 Types of Missiles:

***

Section VIII. Heavy Bomber Distinguishing Features

France

(a) Heavy Bombers Equipped for Nuclear Armaments

(b) Heavy Bombers Equipped for Non-nuclear Armaments

ANNEX C. RUSSIAN FEDERATION

Data as of: 01 September 2012

CATEGORIES OF DATA PERTAINING TO STRATEGIC OFFENSIVE ARMS

Section II. Aggregate Numbers

	Russian Federation
Deployed ICBMs, Deployed SLBMs, and Deployed Heavy Bombers	491
Warheads on Deployed ICBMs, on Deployed SLBMs, and Nuclear Warheads Counted for Deployed Heavy Bombers	1,499
Deployed and Non-deployed Launchers of ICBMs, Deployed and Non-deployed Launchers of SLBMs, and Deployed and Non-deployed Heavy Bombers	884

Section III. ICBMs, ICBM Launchers, and Warheads on Deployed ICBMs

Russian Federation

	ICBM Type or Variant of a Type			
	RS-12M	RS-12M2 for silo launchers	RS-12M2 for mobile launchers	RS-18
Deployed ICBMs	108	58	18	60

Warheads on Deployed ICBMs	108	58	18	240
Non-deployed ICBMs	***	***	***	***
Deployed and Non-deployed Launchers of ICBMs	***	62	18	115
Deployed Launchers of ICBMs	108	58	18	60
Non-deployed Launchers of ICBMs	***	4	0	55
Test Launchers	0	2	0	2

	ICBM Type or Variant of a Type		
	RS-20	RS-24	Total
Deployed ICBMs	50	18	312
Warheads on Deployed ICBMs	500	108	1,032
Non-deployed ICBMs	***	***	***
Deployed and Non-deployed Launchers of ICBMs	106	19	560
Deployed Launchers of ICBMs	50	18	312
Non-deployed Launchers of ICBMs	56	1	248
Test Launchers	0	1	5

ICBM Base for Silo Launchers of ICBMs

Name/Location: Dombarovskiy
Coordinates: 51°01′27.29″N 59°47′58.11″E

	ICBM Type or Variant of a Type
	RS-20
Deployed ICBMs	30
Warheads on Deployed ICBMs	300
Deployed Silo Launchers of ICBMs	30
Non-deployed Silo Launchers of ICBMs	23

Silo Launcher Group: Dombarovskiy-1

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
1-1	51°03′55.91″N 59°41′37.66″E		RS-20
1-2	51°01′51.05″N 59°41′24.52″E		RS-20
1-3	50°58′21.55″N 59°33′03.91″E		RS-20
1-4	51°01′13.65″N 59°34′14.23″E		RS-20
1-5	51°04′11.31″N 59°29′02.24″E		RS-20
1-6	51°09′12.00″N 59°31′29.00″E		RS-20
1-7	51°11′33.00″N 59°38′07.00″E		RS-20
1-8	51°08′51.00″N 59°35′50.00″E		RS-20
1-9	51°06′08.95″N 59°34′38.25″E		RS-20
1-10	51°06′54.40″N 59°38′06.52″E		RS-20

Silo Launcher Group: Dombarovskiy-2

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
2-1	51°09′17.74″N 59°44′54.59″E		RS-20
2-2	51°12′25.20″N 59°51′00.02″E		RS-20
2-3	51°10′06.26″N 59°58′03.42″E		RS-20
2-4	51°05′50.44″N 60°05′14.79″E		RS-20
2-5 Yasnyy	51°05′36.53″N 59°50′40.52″E		RS-20
2-6	51°02′12.40″N 59°57′32.35″E		RS-20

Silo Launcher Group: Dombarovskiy-3

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
3-1	50°40′54.36″N 59°47′33.00″E		RS-20
3-2	50°39′31.38″N 59°39′21.20″E		RS-20
3-3	50°58′21.55″N 59°33′03.91″E		RS-20
3-4	50°50′15.46″N 59°35′42.29″E		RS-20
3-5	50°45′24.19″N 59°35′55.57″E		RS-20
3-6	50°46′34.09″N 59°46′29.74″E		RS-20

Silo Launcher Group: Dombarovskiy-4

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
4-1	50°59′38.94″N 60°23′23.62″E		RS-20
4-2	51°12′00.57″N 60°15′17.70″E		RS-20
4-3	51°11′05.92″N 60°23′20.82″E		RS-20
4-4	51°05′49.44″N 60°21′20.95″E		RS-20
4-5	51°03′48.49″N 60°12′45.17″E		RS-20
4-6	50°58′22.03″N 60°14′33.36″E		RS-20

Silo Launcher Group: Dombarovskiy-5

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
5-1	51°15′32.79″N 60°27′41.35″E		RS-20
5-2	51°22′45.34″N 60°22′21.12″E		RS-20
5-3	51°14′54.04″N 60°08′30.92″E		RS-20
5-4	51°20′19.11″N 60°09′44.09″E		RS-20
5-5	51°16′16.05″N 60°17′55.67″E		RS-20
5-6	51°20′48.45″N 60°28′21.66″E		RS-20

Silo Launcher Group: Dombarovskiy-7

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
7-1	51°31′43.64″N 59°48′04.17″E		RS-20
7-2	51°36′04.12″N 59°55′35.80″E		RS-20
7-3	51°35′20.29″N 60°04′58.05″E		RS-20
7-4	51°30′11.82″N 60°10′41.27″E		RS-20
7-5	51°31′20.82″N 59°58′22.75″E		RS-20
7-6	51°25′29.23″N 60°06′38.48″E		RS-20

Silo Launcher Group: Dombarovskiy-8

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
8-1	51°18′06.37″N 60°43′43.45″E		RS-20
8-2	51°15′53.50″N 60°51′32.17″E		RS-20
8-3	51°12′06.80″N 60°45′55.52″E		RS-20
8-4	51°08′46.90″N 60°40′34.22″E		RS-20
8-5	51°14′27.87″N 60°36′25.09″E		RS-20
8-6	51°09′35.88″N 60°33′32.16″E		RS-20

Silo Launcher Group: Dombarovskiy-10

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
10-1	50°59′09.66″N 60°39′01.92″E		RS-20
10-2	50°53′18.57″N 60°41′57.49″E		RS-20
10-3	50°52′39.83″N 60°31′30.27″E		RS-20
10-4	51°03′14.94″N 60°29′35.42″E		RS-20
10-5	50°57′37.20″N 60°31′44.27″E		RS-20
10-6	51°04′14.39″N 60°37′28.73″E		RS-20

Maintenance Facility

Name/Location: Dombarovskiy
Coordinates: 51°01′27.29″N 59°47′58.11″E

	ICBM Type or Variant of a Type
	RS-20
Non-deployed ICBMs	2
Silo Training Launchers	1

ICBM Base for Silo Launchers of ICBMs

Name/Location: Uzhur
Coordinates: 55°16′05.74″N 89°44′50.15″E

	ICBM Type or Variant of a Type
	RS-20
Deployed ICBMs	20
Warheads on Deployed ICBMs	200
Deployed Silo Launchers of ICBMs	20
Non-deployed Silo Launchers of ICBMs	33

Silo Launcher Group: Uzhur-1

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
1-1	55°19′53.85″N 89°43′58.97″E		RS-20
1-2	55°17′14.09″N 89°38′47.02″E		RS-20
1-3	55°19′15.00″N 89°33′55.00″E		RS-20
1-4	55°16′57.00″N 89°26′49.00″E		RS-20
1-5	55°13′04.92″N 89°33′49.44″E		RS-20
1-6	55°24′28.18″N 89°39′54.94″E		RS-20
1-7	55°23′55.00″N 89°47′07.00″E		RS-20
1-8	55°19′46.24″N 89°38′10.02″E		RS-20
1-9	55°14′52.00″N 89°40′39.00″E		RS-20
1-10	55°16′18.76″N 89°34′41.98″E		RS-20

Silo Launcher Group: Uzhur-2

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
2-1	55°06′49.00″N 89°38′05.00″E		RS-20
2-2	55°12′01.00″N 89°42′24.00″E		RS-20
2-3	55°04′56.00″N 89°48′56.00″E		RS-20
2-4	55°01′29.00″N 89°34′16.00″E		RS-20
2-5	55°02′05.00″N 89°43′43.00″E		RS-20
2-6	54°57′00.00″N 89°40′60.00″E		RS-20

Silo Launcher Group: Uzhur-5

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
5-1	55°19′17.00″N 89°57′34.00″E		RS-20
5-2	55°14′53.97″N 89°55′02.08″E		RS-20
5-3	55°10′01.00″N 89°54′23.00″E		RS-20
5-4	55°20′12.00″N 90°05′43.00″E		RS-20
5-5	55°15′20.30″N 90°04′38.39″E		RS-20
5-6	55°11′10.49″N 90°08′17.63″E		RS-20

Silo Launcher Group: Uzhur-6

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
6-1	55°21′06.00″N 90°16′19.00″E		RS-20
6-2	55°05′14.00″N 90°19′30.00″E		RS-20
6-3	55°12′21.00″N 90°15′10.00″E		RS-20
6-4	55°21′55.00″N 90°26′52.00″E		RS-20
6-5	55°16′40.00″N 90°24′40.00″E		RS-20
6-6	55°10′52.00″N 90°25′24.00″E		RS-20

Silo Launcher Group: Uzhur-7

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
7-1	55°16′58.00″N 90°35′46.00″E		RS-20
7-2	55°11′54.00″N 90°35′31.00″E		RS-20
7-3	55°15′08.00″N 90°45′49.00″E		RS-20
7-4	55°16′09.00″N 90°54′43.00″E		RS-20
7-5	55°21′25.00″N 90°53′32.00″E		RS-20
7-6	55°21′42.00″N 90°44′31.00″E		RS-20

Silo Launcher Group: Uzhur-8

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
8-1	55°26′48.64″N 89°29′21.43″E		RS-20
8-2	55°28′56.00″N 89°35′45.00″E		RS-20
8-3	55°34′09.71″N 89°31′00.88″E		RS-20
8-4	55°34′17.00″N 89°20′19.00″E		RS-20
8-5	55°38′18.00″N 89°26′01.00″E		RS-20
8-6	55°30′53.00″N 89°24′25.00″E		RS-20

Silo Launcher Group: Uzhur-9

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
9-1	55°34′55.00″N 89°56′28.00″E		RS-20
9-2	55°29′05.00″N 89°43′55.00″E		RS-20
9-3	55°32′51.00″N 89°48′40.00″E		RS-20
9-4	55°38′01.00″N 89°49′30.00″E		RS-20
9-5	55°39′37.00″N 89°57′15.00″E		RS-20
9-6	55°37′10.00″N 89°41′06.00″E		RS-20

Silo Launcher Group: Uzhur-10

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
10-1	55°29′57.00″N 90°18′12.00″E		RS-20
10-2	55°35′12.00″N 90°13′39.00″E		RS-20
10-3	55°34′45.00″N 90°21′41.00″E		RS-20
10-4	55°26′17.00″N 90°18′05.00″E		RS-20
10-5	55°27′29.00″N 90°25′01.00″E		RS-20
10-6	55°30′21.00″N 90°24′41.00″E		RS-20

Maintenance Facility

Name/Location: Uzhur
Coordinates: 55°16′05.74″N 89°44′50.15″E

	ICBM Type or Variant of a Type
	RS-20
Non-deployed ICBMs	0
Silo Training Launchers	1

ICBM Base for Silo Launchers of ICBMs

Name/Location: Kozel'sk
Coordinates: 53°56'37.77"N 35°46'10.36"E

	ICBM Type or Variant of a Type
	RS-18
Deployed ICBMs	20
Warheads on Deployed ICBMs	0
Deployed Silo Launchers of ICBMs	20
Non-deployed Silo Launchers of ICBMs	31

Silo Launcher Group: Kozel'sk-1

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
1-1	53°47'52.00"N 35°48'21.00"E		RS-18
1-2	53°48'38.00"N 35°53'20.00"E		RS-18
1-3	53°43'59.00"N 35°39'27.00"E		RS-18
1-4	53°46'35.00"N 35°41'39.00"E		RS-18
1-5	53°53'05.00"N 35°43'36.00"E		RS-18
1-6	53°51'30.00"N 35°47'41.00"E		RS-18
1-7	53°49'37.00"N 35°42'01.00"E		RS-18
1-8	53°40'56.00"N 35°46'41.00"E		RS-18
1-9	53°44'58.00"N 35°53'49.00"E		RS-18
1-10	53°44'43.00"N 35°48'22.00"E		RS-18

Silo Launcher Group: Kozel'sk-2

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
2-1	54°01'41.00"N 35°27'36.00"E		RS-18
2-2	54°04'48.00"N 35°29'05.00"E		RS-18
2-3	53°56'19.00"N 35°22'28.00"E		RS-18
2-4	53°59'36.00"N 35°20'37.00"E		RS-18
2-5	54°01'07.00"N 35°32'18.00"E		RS-18
2-6	53°57'48.00"N 35°27'52.00"E		RS-18
2-7	53°56'41.00"N 35°34'28.00"E		RS-18

2-8	54°02′43.00″N 35°40′34.00″E		RS-18
2-9	53°59′45.00″N 35°38′36.00″E		RS-18
2-10	54°02′48.00″N 35°19′46.00″E		RS-18

Silo Launcher Group: Kozel′sk-3

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
3-1	53°53′55.00″N 35°52′45.00″E		RS-18
3-2	53°51′28.00″N 35°55′05.00″E		RS-18
3-3	53°52′17.00″N 35°59′42.00″E		RS-18
3-4	53°54′53.00″N 35°48′13.00″E		RS-18
3-5	53°57′08.00″N 35°52′04.00″E		RS-18
3-6	53°58′03.00″N 35°59′21.00″E		RS-18
3-7	54°01′10.00″N 36°01′11.00″E		RS-18
3-8	53°55′12.00″N 36°04′05.00″E		RS-18
3-9	53°59′58.00″N 35°54′55.00″E		RS-18
3-10	54°02′43.00″N 35°54′45.00″E		RS-18

Silo Launcher Group: Kozel′sk-4

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
4-1	53°47′52.00″N 35°48′21.00″E		RS-18
4-2	53°48′38.00″N 35°53′20.00″E		RS-18
4-3	53°43′59.00″N 35°39′27.00″E		RS-18
4-4	53°46′35.00″N 35°41′39.00″E		RS-18
4-5	53°53′05.00″N 35°43′36.00″E		RS-18
4-6	53°51′30.00″N 35°47′41.00″E		RS-18
4-7	53°49′37.00″N 35°42′01.00″E		RS-18
4-8	53°40′56.00″N 35°46′41.00″E		RS-18
4-9	53°44′58.00″N 35°53′49.00″E		RS-18
4-10	53°44′43.00″N 35°48′22.00″E		RS-18

Silo Launcher Group: Kozel′sk-5

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
5-1	53°45′53.00″N 35°29′25.00″E		RS-18
5-2	53°47′37.00″N 35°36′43.00″E		RS-18
5-3	53°44′37.00″N 35°34′13.00″E		RS-18
5-4	53°40′60.00″N 35°29′38.00″E		RS-18
5-5	53°42′02.00″N 35°24′33.00″E		RS-18
5-6	53°48′20.00″N 35°31′54.00″E		RS-18
5-7	53°50′41.00″N 35°27′33.00″E		RS-18
5-8	53°45′43.00″N 35°21′16.00″E		RS-18
5-9	53°54′08.00″N 35°30′09.00″E		RS-18
5-10	53°51′50.00″N 35°35′16.00″E		RS-18

Maintenance Facility

Name/Location: Kozel'sk
Coordinates: 53°56'37.77"N 35°46'10.36"E

	ICBM Type or Variant of a Type
	RS-18
Non-deployed ICBMs	2
Silo Training Launchers	1

ICBM Base for Silo Launchers of ICBMs

Name/Location: Tatishchevo
Coordinates: 51°41'54.91"N 45°32'24.78"E

	ICBM Type or Variant of a Type	
	RS-18	RS-12M2 for silo launchers
Deployed ICBMs	40	58
Warheads on Deployed ICBMs	240	58
Deployed Silo Launchers of ICBMs	40	58
Non-deployed Silo Launchers of ICBMs	21	2

Silo Launcher Group: Tatishchevo-1

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
1-1	51°33′26.00″N 45°18′33.00″E		RS-18
1-2	51°32′13.00″N 45°07′09.00″E		RS-18
1-3	51°26′51.00″N 45°16′15.00″E		RS-18
1-4	51°28′60.00″N 45°09′49.00″E		RS-18
1-5	51°29′46.00″N 45°15′37.00″E		RS-18
1-6	51°27′55.05″N 45°21′48.53″E		RS-18
1-7	51°32′49.00″N 45°13′10.00″E		RS-18
1-8	51°25′03.00″N 45°10′11.00″E		RS-18
1-9	51°28′56.00″N 45°04′24.00″E		RS-18
1-10	51°25′47.00″N 45°04′20.00″E		RS-18

Silo Launcher Group: Tatishchevo-2

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
2-1	51°42′53.00″N 45°13′40.00″E		RS-12M2
2-2	51°39′48.00″N 45°14′44.00″E		RS-12M2
2-3	51°40′51.00″N 45°19′39.00″E		RS-12M2
2-4	51°45′25.00″N 45°16′45.00″E		RS-12M2
2-5	51°45′33.00″N 45°11′28.00″E		RS-12M2
2-6	51°43′14.81″N 45°07′52.40″E		RS-12M2
2-7	51°46′31.01″N 45°06′17.27″E		RS-12M2
2-8	51°43′24.87″N 45°02′48.29″E		RS-12M2
2-9	51°40′08.74″N 45°02′19.46″E		RS-12M2
2-10	51°40′00.00″N 45°09′41.00″E		RS-12M2

Silo Launcher Group: Tatishchevo-3

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
3-1	52°14′16.00″N 45°23′12.00″E		RS-12M2
3-2	52°13′23.00″N 45°15′55.00″E		RS-12M2
3-3	52°10′43.00″N 45°12′47.00″E		RS-12M2
3-4	52°07′12.00″N 45°12′34.00″E		RS-12M2
3-5	52°08′32.00″N 45°17′30.00″E		RS-12M2
3-6	52°11′10.00″N 45°20′55.00″E		RS-12M2
3-7	52°07′51.00″N 45°22′40.00″E		RS-12M2
3-8	52°12′43.00″N 45°28′35.00″E		RS-12M2
3-9	52°15′56.00″N 45°31′52.00″E		RS-12M2
3-10	52°16′17.00″N 45°27′31.00″E		RS-12M2

Silo Launcher Group: Tatishchevo-4

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
4-1	51°48′24.84″N 45°39′25.48″E		RS-12M2
4-2	51°51′10.61″N 45°41′04.22″E		RS-12M2
4-3	51°48′05.36″N 45°44′56.14″E		RS-12M2

4-4	51°45′08.28″N 45°40′56.28″E		RS-12M2
4-5	51°44′42.23″N 45°35′35.15″E		RS-12M2
4-6	51°47′42.00″N 45°34′23.00″E		RS-12M2
4-7	51°50′43.44″N 45°34′52.91″E		RS-12M2
4-8	51°49′30.27″N 45°29′50.61″E		RS-12M2
4-9	51°53′52.82″N 45°36′18.42″E		RS-12M2
4-10	51°52′49.24″N 45°31′16.80″E		RS-12M2

Silo Launcher Group: Tatishchevo-5

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
5-1	51°36′38.83″N 45°29′49.39″E		RS-12M2
5-2	51°34′29.99″N 45°24′08.94″E		RS-12M2
5-3	51°33′25.78″N 45°29′09.95″E		RS-12M2
5-4	51°32′26.93″N 45°35′34.19″E		RS-12M2
5-5	51°29′45.25″N 45°27′47.03″E		RS-12M2
5-6	51°35′56.14″N 45°35′27.12″E		RS-12M2
5-7	51°31′18.00″N 45°23′11.00″E		RS-12M2
5-8	51°38′55.00″N 45°23′07.00″E		RS-12M2
5-9	51°29′36.40″N 45°33′59.69″E		RS-12M2
5-10	51°40′29.84″N 45°29′07.22″E		RS-12M2

Silo Launcher Group: Tatishchevo-6

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
6-1	51°52′48.00″N 45°20′14.00″E		RS-12M2
6-2	51°49′04.00″N 45°18′51.00″E		RS-12M2
6-3	51°45′54.00″N 45°21′35.00″E		RS-12M2
6-4	51°45′47.00″N 45°27′30.00″E		RS-12M2
6-5	51°48′28.00″N 45°24′47.00″E		RS-12M2
6-6	51°51′51.00″N 45°25′54.00″E		RS-12M2
6-7	51°55′19.00″N 45°23′44.00″E		RS-12M2
6-8	51°55′30.00″N 45°17′49.00″E		RS-12M2
6-9	51°52′23.00″N 45°14′44.00″E		RS-12M2
6-10	51°49′00.00″N 45°11′20.00″E		RS-12M2

Silo Launcher Group: Tatishchevo-7

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
7-1	52°02′45.00″N 45°26′44.00″E		RS-18
7-2	51°58′47.00″N 45°23′57.00″E		RS-18
7-3	51°55′55.00″N 45°28′56.00″E		RS-18
7-4	51°59′05.00″N 45°30′37.00″E		RS-18
7-5	51°57′02.00″N 45°34′58.00″E		RS-18
7-6	52°03′59.00″N 45°30′48.00″E		RS-18
7-7	52°06′22.00″N 45°25′55.00″E		RS-18
7-8	52°03′54.00″N 45°22′17.00″E		RS-18
7-9	52°01′09.00″N 45°14′16.00″E		RS-18
7-10	51°58′45.00″N 45°18′37.00″E		RS-18

Silo Launcher Group: Tatishchevo-8

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
8-1	52°09′33.00″N 45°38′23.00″E		RS-12M2
8-2	52°05′44.00″N 45°35′01.00″E		RS-12M2
8-3	52°03′05.00″N 45°38′17.00″E		RS-12M2
8-4	52°06′12.00″N 45°41′02.00″E		RS-12M2
8-5	52°06′25.00″N 45°46′22.00″E		RS-12M2
8-6	52°09′06.51″N 45°44′12.95″E		RS-12M2
8-7	52°09′18.00″N 45°49′32.00″E		RS-12M2
8-8	52°12′23.00″N 45°48′12.00″E		RS-12M2
8-9	52°14′35.00″N 45°40′20.00″E		RS-12M2
8-10	52°12′40.00″N 45°35′37.00″E		RS-12M2

Silo Launcher Group: Tatishchevo-9

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
9-1	51°55′19.00″N 45°49′10.00″E		RS-18
9-2	51°52′13.00″N 45°51′54.00″E		RS-18
9-3	51°50′58.80″N 45°57′01.56″E		RS-18
9-4	51°54′33.00″N 45°55′12.00″E		RS-18
9-5	51°57′58.00″N 45°54′25.00″E		RS-18
9-6	51°58′27.00″N 45°49′31.00″E		RS-18
9-7	52°01′53.00″N 45°45′36.00″E		RS-18
9-8	51°58′50.00″N 45°43′15.00″E		RS-18
9-9	51°55′10.00″N 45°43′32.00″E		RS-18
9-10	51°52′34.00″N 45°46′28.00″E		RS-18

Silo Launcher Group: Tatishchevo-10

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
10-1	51°41′33.00″N 45°41′01.00″E		RS-18
10-2	51°39′21.00″N 45°36′25.00″E		RS-18
10-3	51°38′27.00″N 45°43′07.00″E		RS-18

10-4	51°35′54.00″N 45°40′37.00″E		RS-18
10-5	51°30′21.00″N 45°40′48.00″E		RS-18
10-6	51°33′34.00″N 45°44′47.00″E		RS-18
10-7	51°36′32.00″N 45°48′25.00″E		RS-18
10-8	51°40′44.00″N 45°47′06.00″E		RS-18
10-9	51°41′52.00″N 45°51′25.00″E		RS-18
10-10	51°44′09.00″N 45°46′52.00″E		RS-18

Silo Launcher Group: Tatishchevo-11

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
11-1	51°50′53.00″N 46°07′59.00″E		RS-18
11-2	51°52′60.00″N 46°02′53.00″E		RS-18
11-3	51°47′60.00″N 45°58′38.00″E		RS-18
11-4	51°45′19.00″N 45°55′31.00″E		RS-18
11-5	51°44′53.00″N 46°01′01.00″E		RS-18
11-6	51°47′42.00″N 46°03′42.00″E		RS-18
11-7	51°45′52.00″N 46°09′08.00″E		RS-18
11-8	51°48′42.00″N 46°14′45.00″E		RS-18
11-9	51°49′57.51″N 46°19′08.70″E		RS-18
11-10	51°52′14.00″N 46°13′35.00″E		RS-18

Silo Launcher Group: Tatishchevo-12

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
12-1	52°00′33.00″N 46°02′54.00″E		RS-18
12-2	52°04′03.00″N 46°00′21.00″E		RS-18
12-3	52°06′24.00″N 45°55′19.00″E		RS-18
12-4	52°03′25.00″N 45°52′12.00″E		RS-18
12-5	52°01′15.00″N 45°57′21.00″E		RS-18
12-6	51°57′00.00″N 46°01′40.00″E		RS-18
12-7	51°57′05.00″N 46°07′09.00″E		RS-18
12-8	51°58′09.00″N 46°12′29.00″E		RS-18
12-9	52°00′40.00″N 46°09′43.00″E		RS-18
12-10	52°03′26.00″N 46°05′57.00″E		RS-18

Maintenance Facility

Name/Location: Tatishchevo
Coordinates: 51°41′54.91″N 45°32′24.78″E

	ICBM Type or Variant of a Type	
	RS-18	RS-12M2 for silo launchers
Non-deployed ICBMs	4	0
Silo Training Launchers	1	0

ICBM Base for Mobile Launchers of ICBMs

Name/Location: Teykovo
Coordinates: 56°53′33.87″N 40°34′33.76″E

	ICBM Type or Variant of a Type		
	RS-12M	RS-12M2 for mobile launchers	RS-24
Deployed ICBMs	0	18	18
Warheads on Deployed ICBMs	0	18	108
Deployed Mobile Launchers of ICBMs	0	18	18

Basing area: Teykovo-1
Coordinates: 56°55′56.00″N 40°32′35.48″E

	ICBM Type or Variant of a Type		
	RS-12M	RS-12M2 for mobile launchers	RS-24
Deployed ICBMs	0	9	0
Deployed Mobile Launchers of ICBMs	0	9	0
Fixed Structures for Mobile Launchers of ICBMs	0	9	0

Basing area: Teykovo-2
Coordinates: 56°42′15.00″N 40°26′15.00″E

	ICBM Type or Variant of a Type		
	RS-12M	RS-12M2 for mobile launchers	RS-24
Deployed ICBMs	0	9	0
Deployed Mobile Launchers of ICBMs	0	9	0
Fixed Structures for Mobile Launchers of ICBMs	0	9	0

Basing area: Teykovo-3
Coordinates: 56°48′34.00″N 40°10′16.00″E

	ICBM Type or Variant of a Type		
	RS-12M	RS-12M2 for mobile launchers	RS-24
Deployed ICBMs	0	0	9
Deployed Mobile Launchers of ICBMs	0	0	9
Fixed Structures for Mobile Launchers of ICBMs	0	0	9

Basing area: Teykovo-4
Coordinates: 56°54′56.48″N 40°18′30.75″E

	ICBM Type or Variant of a Type		
	RS-12M	RS-12M2 for mobile launchers	RS-24
Deployed ICBMs	0	0	9
Deployed Mobile Launchers of ICBMs	0	0	9
Fixed Structures for Mobile Launchers of ICBMs	0	0	9

Maintenance Facility

Name/Location: Teykovo
Coordinates: 56°53′33.87″N 40°34′33.76″E

	ICBM Type or Variant of a Type		
	RS-12M	RS-12M2 for mobile launchers	RS-24
Non-deployed ICBMs	0	0	0
Non-deployed Mobile Launchers of ICBMs	0	0	0

ICBM Base for Mobile Launchers of ICBMs

Name/Location: Yoshkar-Ola
Coordinates: 56°33′41.56″N 48°03′42.78″E

	ICBM Type or Variant of a Type
	RS-12M
Deployed ICBMs	27
Warheads on Deployed ICBMs	27
Deployed Mobile Launchers of ICBMs	27

Basing area:	Yoshkar-Ola-1
Coordinates:	56°34′57.00″N 48°09′17.00″E

	ICBM Type or Variant of a Type
	RS-12M
Deployed ICBMs	9
Deployed Mobile Launchers of ICBMs	9
Fixed Structures for Mobile Launchers of ICBMs	9

Basing area:	Yoshkar-Ola-2
Coordinates:	56°33′36.00″N 48°12′55.00″E

	ICBM Type or Variant of a Type
	RS-12M
Deployed ICBMs	9
Deployed Mobile Launchers of ICBMs	9
Fixed Structures for Mobile Launchers of ICBMs	9

Basing area: Yoshkar-Ola-3
Coordinates: 56°35′55.00″N 48°21′26.00″E

	ICBM Type or Variant of a Type
	RS-12M
Deployed ICBMs	9
Deployed Mobile Launchers of ICBMs	9
Fixed Structures for Mobile Launchers of ICBMs	9

Maintenance Facility

Name/Location: Yoshkar-Ola
Coordinates: 56°33′41.56″N 48°03′42.78″E

	ICBM Type or Variant of a Type
	RS-12M
Non-deployed ICBMs	0
Non-deployed Mobile Launchers of ICBMs	0

ICBM Base for Mobile Launchers of ICBMs

Name/Location:	Nizhniy Tagil
Coordinates:	58°03′13.65″N 60°24′22.16″E

	ICBM Type or Variant of a Type
	RS-12M
Deployed ICBMs	27
Warheads on Deployed ICBMs	27
Deployed Mobile Launchers of ICBMs	27

Basing area:	Nizhniy Tagil-1
Coordinates:	58°06′07.93″N 60°21′28.49″E

	ICBM Type or Variant of a Type
	RS-12M
Deployed ICBMs	9
Deployed Mobile Launchers of ICBMs	9
Fixed Structures for Mobile Launchers of ICBMs	9

Basing area:	Nizhniy Tagil-2
Coordinates:	58°08′18.00″N 60°32′11.00″E

	ICBM Type or Variant of a Type
	RS-12M
Deployed ICBMs	9
Deployed Mobile Launchers of ICBMs	9
Fixed Structures for Mobile Launchers of ICBMs	9

Basing area:	Nizhniy Tagil-3
Coordinates:	58°11′50.00″N 60°34′41.00″E

	ICBM Type or Variant of a Type
	RS-12M
Deployed ICBMs	9
Deployed Mobile Launchers of ICBMs	9
Fixed Structures for Mobile Launchers of ICBMs	9

Maintenance Facility

Name/Location:	Nizhniy Tagil
Coordinates:	58°03′13.65″N 60°24′22.16″E

	ICBM Type or Variant of a Type
	RS-12M
Non-deployed ICBMs	0
Non-deployed Mobile Launchers of ICBMs	0

ICBM Base for Mobile Launchers of ICBMs

Name/Location:	Novosibirsk
Coordinates:	55°16′15.58″N 83°01′28.73″E

	ICBM Type or Variant of a Type
	RS-12M
Deployed ICBMs	0
Warheads on Deployed ICBMs	0
Deployed Mobile Launchers of ICBMs	0

Basing area:	Novosibirsk-12
Coordinates:	55°19′37.00″N 82°56′30.00″E

	ICBM Type or Variant of a Type
	RS-12M
Deployed ICBMs	0
Deployed Mobile Launchers of ICBMs	0
Fixed Structures for Mobile Launchers of ICBMs	9

Basing area:	Novosibirsk-13
Coordinates:	55°18′50.00″N 83°01′54.00″E

	ICBM Type or Variant of a Type
	RS-12M
Deployed ICBMs	0
Deployed Mobile Launchers of ICBMs	0
Fixed Structures for Mobile Launchers of ICBMs	9

Basing area: Novosibirsk-21
Coordinates: 55°19′06.00″N 83°10′04.00″E

	ICBM Type or Variant of a Type
	RS-12M
Deployed ICBMs	0
Deployed Mobile Launchers of ICBMs	0
Fixed Structures for Mobile Launchers of ICBMs	9

Maintenance Facility

Name/Location: Novosibirsk
Coordinates: 55°16′15.58″N 83°01′28.73″E

	ICBM Type or Variant of a Type
	RS-12M
Non-deployed ICBMs	0
Non-deployed Mobile Launchers of ICBMs	0

ICBM Base for Mobile Launchers of ICBMs

Name/Location:	Irkutsk
Coordinates:	52°19′45.04″N 104°23′49.63″E

	ICBM Type or Variant of a Type
	RS-12M
Deployed ICBMs	0
Warheads on Deployed ICBMs	0
Deployed Mobile Launchers of ICBMs	0

Basing area:	Irkutsk-1
Coordinates:	52°30′31.00″N 104°23′36.00″E

	ICBM Type or Variant of a Type
	RS-12M
Deployed ICBMs	0
Deployed Mobile Launchers of ICBMs	0
Fixed Structures for Mobile Launchers of ICBMs	9

Basing area:	Irkutsk-2
Coordinates:	52°40′10.00″N 104°31′11.00″E

	ICBM Type or Variant of a Type
	RS-12M
Deployed ICBMs	0
Deployed Mobile Launchers of ICBMs	0
Fixed Structures for Mobile Launchers of ICBMs	9

Basing area:	Irkutsk-3
Coordinates:	52°33′06.00″N 104°09′31.00″E

	ICBM Type or Variant of a Type
	RS-12M
Deployed ICBMs	0
Deployed Mobile Launchers of ICBMs	0
Fixed Structures for Mobile Launchers of ICBMs	9

Maintenance Facility

Name/Location:	Irkutsk
Coordinates:	52°19′45.04″N 104°23′49.63″E

	ICBM Type or Variant of a Type
	RS-12M
Non-deployed ICBMs	0
Non-deployed Mobile Launchers of ICBMs	0

ICBM Base for Mobile Launchers of ICBMs

Name/Location:	Barnaul
Coordinates:	53°33′43.17″N 83°47′50.14″E

	ICBM Type or Variant of a Type
	RS-12M
Deployed ICBMs	36
Warheads on Deployed ICBMs	36
Deployed Mobile Launchers of ICBMs	36

Basing area:	Barnaul-1
Coordinates:	53°46′08.00″N 83°57′11.00″E

	ICBM Type or Variant of a Type
	RS-12M
Deployed ICBMs	9
Deployed Mobile Launchers of ICBMs	9
Fixed Structures for Mobile Launchers of ICBMs	9

Basing area:	Barnaul-2
Coordinates:	53°18′47.00″N 84°30′27.00″E

	ICBM Type or Variant of a Type
	RS-12M
Deployed ICBMs	9
Deployed Mobile Launchers of ICBMs	9
Fixed Structures for Mobile Launchers of ICBMs	9

Basing area:	Barnaul-3
Coordinates:	53°18′21.00″N 84°08′47.00″E

	ICBM Type or Variant of a Type
	RS-12M
Deployed ICBMs	9
Deployed Mobile Launchers of ICBMs	9
Fixed Structures for Mobile Launchers of ICBMs	9

Basing area:	Barnaul-4
Coordinates:	53°13′29.00″N 84°40′10.00″E

	ICBM Type or Variant of a Type
	RS-12M
Deployed ICBMs	9
Deployed Mobile Launchers of ICBMs	9
Fixed Structures for Mobile Launchers of ICBMs	9

Maintenance Facility

Name/Location: Barnaul
Coordinates: 53°33′43.17″N 83°47′50.14″E

	ICBM Type or Variant of a Type
	RS-12M
Non-deployed ICBMs	0
Non-deployed Mobile Launchers of ICBMs	0

ICBM Base for Mobile Launchers of ICBMs

Name/Location: Vypolzovo
Coordinates: 57°52′20.12″N 33°39′11.38″E

	ICBM Type or Variant of a Type
	RS-12M
Deployed ICBMs	18
Warheads on Deployed ICBMs	18
Deployed Mobile Launchers of ICBMs	18

Basing area:	Vypolzovo-1
Coordinates:	57°51′47.00″N 33°39′06.00″E

	ICBM Type or Variant of a Type
	RS-12M
Deployed ICBMs	9
Deployed Mobile Launchers of ICBMs	9
Fixed Structures for Mobile Launchers of ICBMs	9

Basing area:	Vypolzovo-2
Coordinates:	57°47′18.00″N 33°51′55.00″E

	ICBM Type or Variant of a Type
	RS-12M
Deployed ICBMs	9
Deployed Mobile Launchers of ICBMs	9
Fixed Structures for Mobile Launchers of ICBMs	9

Maintenance Facility

Name/Location: Vypolzovo
Coordinates: 57°52′20.12″N 33°39′11.38″E

	ICBM Type or Variant of a Type
	RS-12M
Non-deployed ICBMs	0
Non-deployed Mobile Launchers of ICBMs	0

ICBM Loading Facilities

Production Facilities for ICBMs

Name/Location: Votkinsk Machine Building Plant, Votkinsk
Coordinates: 57°02′36.46″N 53°59′10.61″E

	ICBM Type or Variant of a Type			
	RS-12M	RS-12M2 for silo launchers	RS-12M2 for mobile launchers	RS-24
Non-deployed ICBMs	***	***	***	***

Name/Location: M.V. Khrunichev Machine Building Plant, Moscow
Coordinates: 55°45′27.79″N 37°29′25.79″E

	ICBM Type or Variant of a Type
	RS-18
Non-deployed ICBMs	***

Production Facilities for Mobile Launchers of ICBMs

Name/Location: Barrikady Plant, Volgograd
Coordinates: 48°46′38.83″N 44°35′03.96″E

	ICBM Type or Variant of a Type		
	RS-12M	RS-12M2 for mobile launchers	RS-24
Non-deployed Mobiles Launchers of ICBMs (Returned)	***	***	***

Storage Facilities for ICBMs

Name/Location: Surovatikha
Coordinates: 55°42′54.15″N 43°52′34.80″E

	ICBM Type or Variant of a Type		
	RS-12M	RS-18	RS-20
Non-deployed ICBMs	***	***	***

Name/Location:	Piban'shur
Coordinates:	57°51′29.21″N 53°16′44.33″E

	ICBM Type or Variant of a Type
	RS-18
Non-deployed ICBMs	***

Name/Location:	Khrizolitovyy
Coordinates:	56°40′46.93″N 61°05′57.48″E

	ICBM Type or Variant of a Type			
	RS-12M	RS-12M2	RS-18	RS-20
Non-deployed ICBMs	***	***	***	***

Name/Location:	Plesetsk
Coordinates:	62°45′45.46″N 40°22′14.55″E

	ICBM Type or Variant of a Type
	RS-18
Non-deployed ICBMs	***

Name/Location: Znamenka
Coordinates: 62°45′45.46″N 40°22′14.55″E

	ICBM Type or Variant of a Type
	RS-18
Non-deployed ICBMs	***

Storage Facilities for Mobile Launchers of ICBMs

Name/Location: Piban'shur
Coordinates: 57°51′29.21″N 53°16′44.33″E

	ICBM Type or Variant of a Type		
	RS-12M	RS-12M2 for mobile launchers	RS-24
Non-deployed Mobile Launchers of ICBMs	***	***	***

Repair Facilities for ICBMs

Repair Facilities for Mobile Launchers of ICBMs

Test Ranges

Name/Location: Plesetsk
Coordinates: 62°56′42.00″N 41°26′13.00″E

	ICBM Type or Variant of a Type

	RS-12M	RS-12M2 for mobile launchers	RS-24
Non-deployed ICBMs	0	0	0
Test Launchers	0	2	1

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
Plesetsk-1	62°53′20.51″N 41°45′34.01″E		***
Plesetsk-2	62°52′59.08″N 41°47′59.31″E		***
Plesetsk-3	62°52′57.21″N 41°48′06.07″E		***

Name/Location: Kapustin Yar
Coordinates: 48°35′29.30″N 46°12′17.83″E

	ICBM Type or Variant of a Type
	RS-12M
Non-deployed ICBMs	***
Test Launchers	***

Name/Location: Baykonur
Coordinates: 45°37′31.92″N 63°19′11.86″E

	ICBM Type or Variant of a Type	
	RS-18	RS-20
Non-deployed ICBMs	0	0
Test Launchers	2	0

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
18-1	46°03′07.00″N 62°59′09.00″E		RS-18
18-2	46°02′06.71″N 63°02′54.01″E		RS-18

Training Facilities

Name/Location: Serpukhov
Coordinates: 54°53′51.69″N 37°22′51.81″E

	ICBM Type or Variant of a Type
	RS-12M
Non-deployed Mobiles Launchers of ICBMs	8
Silo Training Launchers	---

Name/Location: Balabanovo
Coordinates: 55°11′30.76″N 36°37′20.47″E

	ICBM Type or Variant of a Type	
	RS-12M	RS-18
Non-deployed Mobiles Launchers of ICBMs	1	---
Silo Training Launchers	---	1

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
1	55°11′16″N 36°36′52″E		RS-18

Conversion or Elimination Facilities for ICBMs

Name/Location: Votkinsk
Coordinates: 57°02′36.46″N 53°59′10.61″E

	ICBM Type or Variant of a Type
	RS-12M
Non-deployed ICBMs	***

Conversion or Elimination Facilities for Mobile Launchers of ICBMs

Name/Location: Piban'shur
Coordinates: 57°51′29.21″N 53°16′44.33″E

	ICBM Type or Variant of a Type
	RS-12M
Non-deployed Mobile Launchers of ICBMs	***

Section IV. SLBMs, SLBM Launchers, and Warheads on Deployed SLBMs

Russian Federation

	SLBM Type or Variant of a Type		
	RSM-50	RSM-52	RSM-54
Deployed SLBMs	48	0	64
Warheads on Deployed SLBMs	144	0	256
Non-deployed SLBMs	***	***	***

Deployed and Non-deployed Launchers of SLBMs	48	42	96
Deployed Launchers of SLBMs	48	0	64
Non-deployed Launchers of SLBMs	0	42	32
Test Launchers	0	2	0

	SLBM Type or Variant of a Type	
	RSM-56	Total
Deployed SLBMs	0	112
Warheads on Deployed SLBMs	0	400
Non-deployed SLBMs	***	***
Deployed and Non-deployed Launchers of SLBMs	52	238
Deployed Launchers of SLBMs	0	112
Non-deployed Launchers of SLBMs	52	126
Test Launchers	0	2

Submarine Base

Name/Location: Nerpich'ya
Coordinates: 69°25'55.38"N 32°21'41.53"E

	SLBM Type or Variant of a Type	
	RSM-52	RSM-56
Deployed SLBMs	0	0
Warheads on Deployed SLBMs	0	0
Non-deployed SLBMs	***	***
Deployed Launchers of SLBMs	0	0
Non-deployed Launchers of SLBMs	40	20

Ballistic Missile Submarines Based at this Submarine Base

	Number of Submarines/Aggregate Number of Launchers by SLBM Type	
	RSM-52	RSM-56
Submarine Type		
Typhoon/Project 941	2/40	

Submarine Name:
TK-17 Arkhangel'sk
TK-20 Severstal'

Submarine Type		
Typhoon/Project 941		1/20

Submarine Name:

TK-208 Dmitriy Donskoy

Submarine Base

Name/Location: Yagel'naya
Coordinates: 69°15'27.43"N 33°19'53.25"E

	SLBM Type or Variant of a Type	
	RSM-54	RSM-56
Deployed SLBMs	64	0
Warheads on Deployed SLBMs	256	0
Non-deployed SLBMs	***	***
Deployed Launchers of SLBMs	64	0
Non-deployed Launchers of SLBMs	32	32

Ballistic Missile Submarines Based at this Submarine Base

	Number of Submarines/Aggregate Number of Launchers by SLBM Type	
	RSM-54	RSM-56
Submarine Type		
Del'fin/Project 667BDRM/Delta IV	6/96	

Submarine Name:

K-114 Tula
K-117 Bryansk
K-18 Karelia
K-407 Novomoskovsk
K-51 Verkhoturie
K-84 Ekaterinburg

Submarine Type	
Kasatka/Project 955	2/32

Submarine Name:

K-535 Yuriy Dologrukiy
K-550 Aleksandr Nevskiy

Submarine Base

Name/Location: Rybachiy
Coordinates: 52°55′07.58″N 158°29′56.12″E

	SLBM Type or Variant of a Type
	RSM-50
Deployed SLBMs	48
Warheads on Deployed SLBMs	144
Non-deployed SLBMs	***
Deployed Launchers of SLBMs	48
Non-deployed Launchers of SLBMs	0

Ballistic Missile Submarines Based at this Submarine Base

	Number of Submarines/Aggregate Number of Launchers by SLBM Type
	RSM-50
Submarine Type	
Kal′mar/Project 667BDR/Delta III	3/48

Submarine Name:

K-44 Ryazan'
K-223 Podol'sk
K-433 Svyatoy Georgiy Pobedonosets

SLBM Loading Facilities

Name/Location: Okol'naya
Coordinates: 69°05'33.98"N 33°28'10.84"E

SLBM Type or Variant of a Type

BLANK

Non-deployed SLBMs BLANK

Name/Location: Severodvinsk
Coordinates: 64°34'07.00"N 39°46'09.00"E

SLBM Type or Variant of a Type

BLANK

Non-deployed SLBMs BLANK

Production Facilities for SLBMs

Name/Location: Krasnoyarsk Machine Building Plant, Krasnoyarsk
Coordinates: 56°00'44.33"N 92°59'22.82"E

SLBM Type or Variant of a Type

RSM-54

Non-deployed SLBMs ***

Name/Location: Votkinsk Machine Building Plant, Votkinsk
Coordinates: 57°02′36.46″N 53°59′10.61″E

	SLBM Type or Variant of a Type
	RSM-56
Non-deployed SLBMs	***

Production Facilities for Ballistic Missile Submarines

Storage Facilities for SLBMs

Name/Location: Okol′naya
Coordinates: 69°05′33.98″N 33°28′10.84″E

	SLBM Type or Variant of a Type
	RSM-54
Non-deployed SLBMs	***

Name/Location: Revda
Coordinates: 67°59′42.00″N 34°24′08.00″E

	SLBM Type or Variant of a Type
	BLANK
Non-deployed SLBMs	BLANK

Name/Location: Nenoksa
Coordinates: 64°38′41.19″N 39°13′18.89″E

	SLBM Type or Variant of a Type
	BLANK
Non-deployed SLBMs	BLANK

Repair Facilities for SLBMs

Name/Location: Severodvinsk
Coordinates: 64°34′07.00″N 39°46′09.00″E

	SLBM Type or Variant of a Type
	BLANK
Non-deployed SLBMs	BLANK

Test Ranges

Name/Location: Nenoksa
Coordinates: 64°38′41.19″N 39°13′18.89″E

	SLBM Type or Variant of a Type
	BLANK
Non-deployed SLBMs	BLANK
Test Launchers	2

Designation	Coordinates	UID	ICBM Type or Variant of Type
1	64°38′58.47″N 39°10′51.58″E		RSM-52

Conversion or Elimination Facilities for SLBMs

Name/Location: Pashino
Coordinates: 55°10′40.17″N 82°58′55.42″E

	SLBM Type or Variant of a Type
	BLANK
Non-deployed SLBMs	BLANK

Conversion or Elimination Facilities for SLBM Launchers

Name/Location: Zvezdochka Plant, Severodvinsk
Coordinates: 64°35′14.43″N 39°49′10.62″E

	SLBM Type or Variant of a Type
	BLANK
Non-deployed Launchers of SLBMs	BLANK

Name/Location: Zvezda Far Eastern Plant, Bol'shoy Kamen', Primorskiy krai
Coordinates: 43°07′01.88″N 132°20′20.04″E

	SLBM Type or Variant of a Type
	BLANK
Non-deployed Launchers of SLBMs	BLANK

Name/Location:	Kamchatka Maritime Plant, Vilyuchinsk, Kamchatskaya oblast
Coordinates:	52°53′51.40″N 158°25′56.93″E

	SLBM Type or Variant of a Type
	BLANK
Non-deployed Launchers of SLBMs	BLANK

Name/Location:	Production Combine Northern Machine Building Enterprise Severodvinsk
Coordinates:	64°34′38.53″N 39°49′28.61″E

	SLBM Type or Variant of a Type
	RSM-52
Non-deployed Launchers of SLBMs	0

Section V. Heavy Bombers and Nuclear Warheads Counted for Deployed Heavy Bombers

Russian Federation

	Heavy Bomber Type or Variant of a Type		
	Tu-95MS	Tu-160	Total
Deployed Heavy Bombers	56	11	67
Nuclear Warheads Counted for Deployed Heavy Bombers	56	11	67
Non-deployed Heavy Bombers	6	9	15
Test Heavy Bombers	5	7	12

Heavy Bombers Equipped for Non-nuclear Armaments	0	0	0

Airbase

Name/Location: Ukrainka
Coordinates: 51°10′12.00″N 128°26′42.00″E

	Heavy Bomber Type or Variant of a Type
	Tu-95MS
Heavy Bombers Based at this Base	
Deployed Heavy Bombers	36
Non-deployed Heavy Bombers	0
Heavy Bombers Equipped for Non-nuclear Armaments	0
Nuclear Warheads Counted for Deployed Heavy Bombers	36
Heavy Bombers Located at this Base	
Deployed Heavy Bombers	36
Test Heavy Bombers	0
Heavy Bombers Equipped for Non-nuclear Armaments	0

Airbase

Name/Location: Engel's
Coordinates: 51°28′52.00″N 46°12′38.00″E

	Heavy Bomber Type or Variant of a Type	
	Tu-95MS	Tu-160
Heavy Bombers Based at this Base		
Deployed Heavy Bombers	16	11
Non-deployed Heavy Bombers	0	0
Heavy Bombers Equipped for Non-nuclear Armaments	16	11
Nuclear Warheads Counted for Deployed Heavy Bombers	16	11
Heavy Bombers Located at this Base		
Deployed Heavy Bombers	16	11
Test Heavy Bombers	0	0
Heavy Bombers Equipped for Non-nuclear Armaments	0	0

Airbase

Name/Location:	Ryazan′
Coordinates:	54°38′37.07″N 39°34′19.29″E

	Heavy Bomber Type or Variant of a Type
	Tu-95MS
Heavy Bombers Based at this Base	
Deployed Heavy Bombers	4
Non-deployed Heavy Bombers	0
Heavy Bombers Equipped for Non-nuclear Armaments	0
Nuclear Warheads Counted for Deployed Heavy Bombers	4
Heavy Bombers Located at this Base	
Deployed Heavy Bombers	4
Test Heavy Bombers	0
Heavy Bombers Equipped for Non-nuclear Armaments	0

Production Facilities for Heavy Bombers

Name/Location: Kazan' Aircraft Production Combine, Kazan'
Coordinates: 55°51'28.42"N 49°07'04.79"E

	Heavy Bomber Type or Variant of a Type
	Tu-160
Heavy Bombers Located at this Production Facility	
Non-deployed Heavy Bombers	0
Test Heavy Bombers	0
Heavy Bombers Equipped for Non-nuclear Armaments	0

Storage Facilities for Heavy Bombers

Repair Facilities for Heavy Bombers

Name/Location: Ryazan'
Coordinates: 54°39'27.05"N 39°34'07.16"E

	Heavy Bomber Type or Variant of a Type
	Tu-95MS
Heavy Bombers Located at this Repair Facility	
Non-deployed Heavy Bombers	0
Test Heavy Bombers	0

Heavy Bombers Equipped for Non-nuclear Armaments	0

Heavy Bomber Flight Test Centers

Name/Location: Zhukovskiy
Coordinates: 55°34′09.59″N 38°08′21.57″E

	Heavy Bomber Type or Variant of a Type	
	Tu-95MS	Tu-160
Heavy Bombers Based at this Flight Test Center		
Test Heavy Bombers	5	7
Heavy Bombers Located at this Flight Test Center		
Deployed Heavy Bombers	0	0
Test Heavy Bombers	5	7
Heavy Bombers Equipped for Non-nuclear Armaments	0	0

Conversion or Elimination Facilities for Heavy Bombers

***

Section VI. Space Launch Facilities

Russian Federation

	Total
Non-deployed ICBMs and SLBMs	0
Non-deployed Launchers of ICBMs and SLBMs	3

Space Launch Facilities

Name/Location: Nenoksa
Coordinates: 64°38′41.19″N 39°13′18.89″E

	Total
Non-deployed ICBMs	0
Non-deployed SLBMs	0
Non-deployed Launchers of ICBMs	0
Non-deployed Launchers of SLBMs	0

Name/Location: Svobodnyy
Coordinates: 51°45′38.02″N 128°07′37.82″E

	Total
Non-deployed ICBMs	0
Non-deployed SLBMs	0

Non-deployed Launchers of ICBMs	2
Non-deployed Launchers of SLBMs	0

Name/Location: Plesetsk
Coordinates: 62°45′55.45″N 40°21′39.52″E

	Total
Non-deployed ICBMs	0
Non-deployed SLBMs	0
Non-deployed Launchers of ICBMs	3
Non-deployed Launchers of SLBMs	0

Section VII. ICBM and SLBM Technical Data

Classification A:

Assembled ICBMs or SLBMs in Launch Canisters

Classification B:

Assembled ICBMs or SLBMs Without Launch Canisters

Classification C:

ICBMs or SLBMs Maintained, Stored, and Transported in Stages

Russian Federation

(a) Intercontinental Ballistic Missiles

	ICBM Type or Variant of a Type		
	RS-12M	RS-12M2	RS-18
Missile			
Classification	A	A	A
Number of Stages	3	3	2
Length of Assembled Missile Without Front Section (m)	18.5	17.9	21.1
Maximum Diameter of Missile Airframe (Without Stabilizers, Raceways, Lug Guides, or Other Protruding Elements) (m)	1.80	1.86	2.50

Total Length of a Missile as a Unit With Launch Canister			
With Front Section (m)	22.3	22.7	24.3
Without Front Section (m)	20.0	19.4	20.0
Length of Launch Canister Body (m)	20.0	19.4	19.4
Diameter of Launch Canister Body (Without Protruding Elements) (m)	2.00	1.95	2.90
Missile Stages			
First Stage			
Length (m)	8.1 (6.5)	8.04	17.20
Length of First Stage Without Nozzle Attached (m)	6.5	***	
Diameter (m)	1.80	1.86	2.50
Type of Propellant (Liq/Sol)	Sol	Sol	Liq

Second Stage			
Diameter (m)	1.55	1.61	2.50
Type of Propellant (Liq/Sol)	Sol	Sol	Liq
Third Stage			
Diameter (m)	1.34	1.58	2.50
Type of Propellant (Liq/Sol)	Sol	Sol	Liq
Size Criteria for Conducting Inspections			
97% of the Length of Launch Canister Body (m)	***	***	***
97% of the Diameter of Launch Canister Body (Without Protruding Elements) (m)	***	***	***
97% of the Length of First Stage (m)	***	***	***
97% of the Diameter of First Stage (m)	***	***	***
	ICBM Type or Variant of a Type		
	RS-20	RS-24	
Missile			
Classification	A	A	

Number of Stages	2	3
Length of Assembled Missile Without Front Section (m)	28.5	17.9
Maximum Diameter of Missile Airframe (Without Stabilizers, Raceways, Lug Guides, or Other Protruding Elements) (m)	3.00	1.86
Total Length of a Missile as a Unit With Launch Canister		
With Front Section (m)	35.7	22.7
Without Front Section (m)	30.5	19.4
Length of Launch Canister Body (m)	29.7	19.4
Diameter of Launch Canister Body (Without Protruding Elements) (m)	3.50	1.95
Missile Stages		
First Stage		
Length (m)	22.30	8.04
Length of First Stage Without Nozzle Attached (m)		***
Diameter (m)	3.00	1.58

Type of Propellant (Liq/Sol)	Liq	Sol
Second Stage		
Diameter (m)	3.00	1.61
Type of Propellant (Liq/Sol)	Liq	Sol
Third Stage		
Diameter (m)	3.00	1.58
Type of Propellant (Liq/Sol)	Liq	Sol
Size Criteria for Conducting Inspections		
97% of the Length of Launch Canister Body (m)	***	***
97% of the Diameter of Launch Canister Body (Without Protruding Elements) (m)	***	***
97% of the Length of First Stage (m)	***	***
97% of the Diameter of First Stage (m)	***	***

Mobile Launchers of ICBMs

	Type or Version of a Type		
	RS-12M	RS-12M2	RS-24
Mobile Launcher of ICBMs (In Transport Position, Without Missile)			
Length (m)	17.3 (18.4)	19.3	19.3
Height (m)	3.0	2.9	2.9
Width (m)	3.1	3.4	3.4
Size Criteria for Conducting Inspections			
97% of the Length (m)	***	***	***
97% of the Height (m)	***	***	***
97% of the Width (m)	***	***	***

External and Functional Differences Between Training Models of Missiles and ICBMs of Corresponding Types

For Training Models of RS-12M Types of Missiles:

***

For Training Models of RS-12M2 Types of Missiles:

***

For Training Models of RS-24 Types of Missiles:

***

(b) Submarine-Launched Ballistic Missiles

	SLBM Type or Variant of a Type			
	RSM-50	RSM-52	RSM-54	RSM-56
Missile				
Classification	B	B	B	B
Number of Stages	2	3	3	3
Length of Assembled Missile Without Front Section (m)	14.1	16	14.8	11.5
Maximum Diameter of Missile Airframe (Without Stabilizers, Raceways, Lug Guides, or Other Protruding Elements) (m)	1.8	2.4	1.9	2.0
Total Length of a Missile as a Unit With Launch Canister				
With Front Section (m)	---	---	---	12.1
Without Front Section (m)	---	---	---	---
Length of Launch Canister Body (m)	---	---	---	12.1
Diameter of Launch Canister Body (Without Protruding Elements) (m)	---	---	---	2.1

Missile Stages				
First Stage				
Length (m)	9.3	9.5	7.3	3.8
Length of First Stage Without Nozzle Attached (m)	***			
Diameter (m)	1.8	2.4	1.9	2.0
Type of Propellant (Liq/Sol)	Liq	Sol	Liq	Sol
Second Stage				
Diameter (m)	1.8	2.4	1.9	2.0
Type of Propellant (Liq/Sol)	Liq	Sol	Liq	Sol
Third Stage				
Diameter (m)	---	2.3	1.85	2.0
Type of Propellant (Liq/Sol)	---	Sol	Liq	Sol
Size Criteria for Conducting Inspections				
97% of the Length of Launch Canister Body (m)	***	***	***	***

97% of the Diameter of Launch Canister Body (Without Protruding Elements) (m)	***	***	***	***
97% of the Length of First Stage (m)	***	***	***	***
97% of the Diameter of First Stage (m)	***	***	***	***

External and Functional Differences Between Training Models of Missiles and SLBMs of Corresponding Types

For Training Models of RSM-50 Types of Missiles:

***

For Training Models of RSM-52 Types of Missiles:

***

For Training Models of RSM-54 Types of Missiles:

***

For Training Models of RSM-56 Types of Missiles:

***

Section VIII. Heavy Bomber Distinguishing Features

Russian Federation

(a) Heavy Bombers Equipped for Nuclear Armaments

(i) For Tu-95MS Heavy Bombers

(A) Externally Observable Distinguishing Features:

***

(B) Distinguishing Features Under Wing/Fuselage:

***

(C) Distinguishing Features of Weapons Bay:

***

(D) Technical Data for Recognition of Heavy Bombers:

***

(i) For Tu-160 Heavy Bombers

(A) Externally Observable Distinguishing Features:

***

(B) Distinguishing Features Under Wing/Fuselage:

***

(C) Distinguishing Features of Weapons Bay:

***

(D) Technical Data for Recognition of Heavy Bombers:

***

(b) Heavy Bombers Equipped for Non-nuclear Armaments

Differences that make heavy bombers equipped for non-nuclear armaments distinguishable from heavy bombers of this type equipped for nuclear armaments:

Section IX. Other Data Required by the Treaty

2. To each Party, ICBMs, SLBMs, submarines, heavy bombers, inspection airplanes, and, where applicable, variants referred to in the Treaty, are known as follows:

Russian Federation

	[In the Host Country]	[Other Designation]
ICBMs:	RS-12M	Topol/SS-25
	RS-12M2	Topol-M
	RS-18	UR-100NUTTH/SS-19
	RS-24	Yars
SLBMs:	RSM-50	R-29R/SS-N-18
	RSM-52	R-39/SS-N-20
	RSM-54	R-29RM/SS-N-23
	RSM-56	Bulava
Submarines:	Kal'mar	Delta III/Project 667BDR
	Del'fin	Delta IV/Project 667BDRM
	Kasatka	Project 955 Borey
	Typhoon	Typhoon/Project 941
Heavy Bombers:	TU-95MS	Bear H
	TU-160	Blackjack

ANNEX D. UNITED KINGDOM

Data as of: 01 September 2012

CATEGORIES OF DATA PERTAINING TO STRATEGIC OFFENSIVE ARMS

Section II. Aggregate Numbers

	United Kingdom
Deployed ICBMs, Deployed SLBMs, and Deployed Heavy Bombers	24
Warheads on Deployed ICBMs, on Deployed SLBMs, and Nuclear Warheads Counted for Deployed Heavy Bombers	88
Deployed and Non-deployed Launchers of ICBMs, Deployed and Non-deployed Launchers of SLBMs, and Deployed and Non-deployed Heavy Bombers	64

Section III. ICBMs, ICBM Launchers, and Warheads on Deployed ICBMs

United Kingdom

Section IV. SLBMs, SLBM Launchers, and Warheads on Deployed SLBMs

United Kingdom

	SLBM Type or Variant of a Type	
	Trident II	Total
Deployed SLBMs	24	24
Warheads on Deployed SLBMs	88	88
Non-deployed SLBM s	0	0
Deployed and Non-deployed Launchers of SLBMs	64	64
Deployed Launchers of SLBMs	24	24
Non-deployed Launchers of SLBMs	40	40
Test Launchers	0	0

Submarine Base

Name/Location: HM Naval Base Clyde, Scotland
Coordinates: 56°03'57.6"N 04°49'1.2"W

	SLBM Type or Variant of a Type
	Trident II
Deployed SLBMs	24

Warheads on Deployed SLBMs	88
Non-deployed SLBMs	0
Deployed Launchers of SLBMs	24
Non-deployed Launchers of SLBMs	40

Ballistic Missile Submarines Based at this Submarine Base

Number of Submarines/Aggregate Number of Launchers by SLBM Type	
Trident II	
Submarine Type	
Vanguard	4/64

Submarine Name:

HMS Vanguard
HMS Victorious
HMS Vigilant
HMS Vengeance

SLBM Loading Facilities

Production Facilities for SLBMs

Production Facilities for Ballistic Missile Submarines

Name/Location:	BAE Systems Maritime/Barrow-in-Furness, Cumbria, England
Coordinates:	54°6′36″N 3°14′11″W

	SLBM Type or Variant of a Type
	Trident II
Non-deployed SLBMs	0

Storage Facilities for SLBMs

Repair Facilities for SLBMs

Test Ranges

Conversion or Elimination Facilities for SLBMs

Conversion or Elimination Facilities for SLBM Launchers

Section V. Heavy Bombers and Nuclear Warheads Counted for Deployed Heavy Bombers

United Kingdom

Section VI. Space Launch Facilities

United Kingdom

Section VII. ICBM and SLBM Technical Data

Classification A:

Assembled ICBMs or SLBMs in Launch Canisters

Classification B:

Assembled ICBMs or SLBMs Without Launch Canisters

Classification C:

ICBMs or SLBMs Maintained, Stored, and Transported in Stages

United Kingdom

(a) Intercontinental Ballistic Missiles

(b) Submarine-Launched Ballistic Missiles

	SLBM Type or Variant of a Type
	Trident II
Missile	
Classification	C
Number of Stages	3
Length of Assembled Missile Without Front Section (m)	13.4
Maximum Diameter of Missile Airframe (Without Stabilizers, Raceways, Lug Guides, or Other Protruding Elements) (m)	2.1

Total Length of a Missile as a Unit With Launch Canister	
With Front Section (m)	---
Without Front Section (m)	---
Length of Launch Canister Body (m)	---
Diameter of Launch Canister Body (Without Protruding Elements) (m)	---
Missile Stages	
First Stage	
Length (m)	7.0
Length of First Stage Without Nozzle Attached (m)	6.8
Diameter (m)	2.1
Type of Propellant (Liq/Sol)	Sol
Second Stage	
Diameter (m)	2.1
Type of Propellant (Liq/Sol)	Sol

Third Stage

Diameter (m)	.81
Type of Propellant (Liq/Sol)	Sol

Size Criteria for Conducting Inspections

97% of the Length of Launch Canister Body (m)	---
97% of the Diameter of Launch Canister Body (Without Protruding Elements) (m)	---
97% of the Length of First Stage (m)	6.8
97% of the Diameter of First Stage (m)	2.0

External and Functional Differences Between Training Models of Missiles and SLBMs of Corresponding Types

For Training Models of Trident II Types of Missiles:

One hole, no less than 25 millimeters in diameter, drilled through the casing of the first stage rocket motor and into the inert propellant

Section VIII. Heavy Bomber Distinguishing Features

United Kingdom

(a) Heavy Bombers Equipped for Nuclear Armaments

(b) Heavy Bombers Equipped for Non-nuclear Armaments

ANNEX E. UNITED STATES

Data as of: 01 September 2012

CATEGORIES OF DATA PERTAINING TO STRATEGIC OFFENSIVE ARMS

Section II. Aggregate Numbers

	United States of America
Deployed ICBMs, Deployed SLBMs, and Deployed Heavy Bombers	806
Warheads on Deployed ICBMs, on Deployed SLBMs, and Nuclear Warheads Counted for Deployed Heavy Bombers	1,722
Deployed and Non-deployed Launchers of ICBMs, Deployed and Non-deployed Launchers of SLBMs, and Deployed and Non-deployed Heavy Bombers	1,034

Section III. ICBMs, ICBM Launchers, and Warheads on Deployed ICBMs

United States of America

	ICBM Type or Variant of a Type		
	MM-III	PK	Total
Deployed ICBMs	449	0	449
Warheads on Deployed ICBMs	***	***	***

Non-deployed ICBMs	263	58	321
Deployed and Non-deployed Launchers of ICBMs	506	51	557
Deployed Launchers of ICBMs	449	0	449
Non-deployed Launchers of ICBMs	57	51	108
Test Launchers	6	1	7

ICBM Base for Silo Launchers of ICBMs

Name/Location: F.E. Warren Missile Complex, Wyoming
Coordinates: 41°08′48.73″N 104°52′09.05″W

	ICBM Type or Variant of a Type	
	MM-III	PK
Deployed ICBMs	149	0
Warheads on Deployed ICBMs	***	***
Deployed Silo Launchers of ICBMs	149	0
Non-deployed Silo Launchers of ICBMs	1	50

Silo Launcher Group: Alpha

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
A-2	41°25′03.58″N 104°11′41.93″W		MM-III
A-3	41°23′17.40″N 104°04′42.86″W		MM-III
A-4	41°19′04.18″N 104°10′30.13″W		MM-III
A-5	41°18′11.06″N 104°04′45.84″W		MM-III
A-6	41°14′33.92″N 104°15′08.03″W		MM-III
A-7	41°10′25.00″N 104°18′05.00″W		MM-III

A-8	41°12′55.00″N 104°23′21.00″W	MM-III
A-9	41°17′24.00″N 104°20′52.00″W	MM-III
A-10	41°21′36.00″N 104°21′01.00″W	MM-III
A-11	41°25′11.12″N 104°17′03.28″W	MM-III

Silo Launcher Group: Bravo

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
B-2	41°38′21.00″N 103°56′43.00″W		MM-III
B-3	41°38′21.00″N 103°50′35.01″W		MM-III
B-4	41°32′09.00″N 103°54′25.00″W		MM-III
B-5	41°28′22.00″N 103°53′17.00″W		MM-III
B-6	41°25′17.00″N 103°58′38.00″W		MM-III
B-7	41°26′22.00″N 104°05′27.01″W		MM-III
B-8	41°30′12.00″N 104°07′35.00″W		MM-III
B-9	41°39′34.00″N 104°14′32.00″W		MM-III
B-10	41°37′46.00″N 104°07′55.00″W		MM-III
B-11	41°38′17.70″N 104°03′13.62″W		MM-III

Silo Launcher Group: Charlie

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
C-2	41°40′59.33″N 103°40′30.11″W		MM-III
C-3	41°38′48.00″N 103°31′13.00″W		MM-III
C-4	41°34′56.00″N 103°33′12.00″W		MM-III
C-5	41°30′42.13″N 103°29′39.91″W		MM-III
C-6	41°27′55.00″N 103°25′38.00″W		MM-III
C-7	41°28′57.00″N 103°34′54.00″W		MM-III
C-8	41°31′00.00″N 103°39′23.00″W		MM-III
C-9	41°29′11.01″N 103°47′29.00″W		MM-III
C-10	41°34′52.00″N 103°48′10.00″W		MM-III
C-11	41°38′23.30″N 103°45′03.54″W		MM-III

Silo Launcher Group: Delta

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
D-2	41°25′24.00″N 103°46′17.00″W		MM-III
D-3	41°26′16.61″N 103°39′39.95″W		MM-III
D-4	41°21′47.08″N 103°39′39.00″W		MM-III
D-5	41°17′42.02″N 103°39′41.00″W		MM-III
D-6	41°15′60.00″N 103°46′35.00″W		MM-III
D-7	41°15′28.00″N 103°53′38.00″W		MM-III
D-8	41°16′44.88″N 103°58′40.99″W		MM-III
D-9	41°19′23.00″N 103°53′39.00″W		MM-III
D-10	41°20′35.00″N 103°59′11.00″W		MM-III
D-11	41°23′20.00″N 103°53′38.00″W		MM-III

Silo Launcher Group: Echo

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
E-2	41°10′32.23″N 103°55′56.21″W		MM-III
E-3	41°10′34.00″N 103°50′23.00″W		MM-III
E-4	41°06′15.03″N 103°53′37.98″W		MM-III
E-5	41°04′10.51″N 103°48′54.05″W		MM-III
E-6	41°02′19.00″N 103°53′43.00″W		MM-III
E-7	41°02′02.00″N 103°59′14.00″W		MM-III
E-8	41°00′13.00″N 104°03′55.00″W		MM-III
E-9	41°04′13.00″N 104°04′06.00″W		MM-III
E-10	41°05′10.93″N 104°11′01.52″W		MM-III
E-11	41°08′15.00″N 104°03′41.00″W		MM-III

Silo Launcher Group: Foxtrot

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
F-2	41°24′07.00″N 103°23′10.00″W		MM-III
F-3	41°20′15.35″N 103°20′23.08″W		MM-III
F-4	41°19′20.33″N 103°14′34.39″W		MM-III
F-5	41°15′08.05″N 103°15′42.99″W		MM-III
F-6	41°16′49.00″N 103°23′42.00″W		MM-III
F-7	41°11′42.00″N 103°19′20.00″W		MM-III
F-8	41°17′28.98″N 103°28′45.97″W		MM-III
F-9	41°15′48.70″N 103°35′14.14″W		MM-III
F-10	41°19′54.00″N 103°35′05.00″W		MM-III
F-11	41°24′16.16″N 103°34′22.04″W		MM-III

Silo Launcher Group: Golf

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
G-2	41°17′00.10″N 103°05′02.06″W		MM-III
G-3	41°21′12.98″N 103°02′22.01″W		MM-III
G-4	41°17′30.01″N 102°59′50.00″W		MM-III
G-5	41°13′26.13″N 102°59′40.01″W		MM-III
G-6	41°10′45.00″N 102°54′52.00″W		MM-III
G-7	41°05′37.00″N 103°01′51.00″W		MM-III
G-8	41°08′51.99″N 103°06′32.98″W		MM-III
G-9	41°10′39.00″N 103°13′15.98″W		MM-III
G-10	41°16′41.97″N 103°10′06.02″W		MM-III
G-11	41°21′11.00″N 103°07′43.00″W		MM-III

Silo Launcher Group: Hotel

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
H-2	41°21′55.97″N 102°45′06.05″W		MM-III
H-3	41°18′38.07″N 102°41′17.08″W		MM-III
H-4	41°14′08.00″N 102°40′08.00″W		MM-III
H-5	41°15′58.00″N 102°46′51.98″W		MM-III

H-6	41°11′09.03″N 102°43′25.02″W		MM-III
H-7	41°12′28.99″N 102°49′08.96″W		MM-III
H-8	41°15′00.91″N 102°54′50.13″W		MM-III
H-9	41°19′24.26″N 102°55′00.70″W		MM-III
H-10	41°23′39.00″N 102°57′42.00″W		MM-III
H-11	41°23′48.00″N 102°52′11.04″W		MM-III

Silo Launcher Group: India

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
I-2	41°06′24.91″N 102°49′54.05″W		MM-III
I-3	41°07′16.99″N 102°43′35.06″W		MM-III
I-4	41°02′56.01″N 102°46′26.99″W		MM-III
I-5	41°02′57.00″N 102°41′21.22″W		MM-III
I-6	40°58′48.10″N 102°48′47.83″W		MM-III
I-7	40°58′51.00″N 102°54′20.98″W		MM-III
I-8	40°58′18.12″N 103°00′05.77″W		MM-III
I-9	41°01′37.25″N 103°03′29.35″W		MM-III
I-10	41°02′26.94″N 102°58′00.18″W		MM-III
I-11	41°06′02.95″N 102°55′03.38″W		MM-III

Silo Launcher Group: Juliet

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
J-2	41°02′48.24″N 103°09′18.74″W		MM-III
J-3	40°56′35.86″N 103°06′50.20″W		MM-III
J-4	40°52′17.28″N 103°06′49.62″W		MM-III
J-5	40°52′39.66″N 103°13′39.76″W		MM-III
J-6	40°53′32.83″N 103°20′32.92″W		MM-III
J-7	40°57′00.48″N 103°17′03.93″W		MM-III
J-8	40°57′48.52″N 103°22′53.09″W		MM-III
J-9	41°01′15.18″N 103°16′36.35″W		MM-III
J-10	41°04′43.39″N 103°19′00.05″W		MM-III
J-11	41°05′25.54″N 103°13′42.32″W		MM-III

Silo Launcher Group: Kilo

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
K-2	41°10′41.00″N 103°24′47.00″W		MM-III
K-3	41°06′27.02″N 103°23′47.00″W		MM-III
K-4	41°02′23.34″N 103°24′09.59″W		MM-III
K-5	41°03′40.85″N 103°29′19.13″W		MM-III
K-6	41°04′38.41″N 103°35′45.14″W		MM-III
K-7	41°03′40.53″N 103°42′09.84″W		MM-III
K-8	41°07′16.08″N 103°39′52.66″W		MM-III
K-9	41°08′05.94″N 103°45′39.19″W		MM-III
K-10	41°11′28.15″N 103°35′07.29″W		MM-III
K-11	41°13′06.92″N 103°29′29.50″W		MM-III

Silo Launcher Group: Lima

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
L-2	40°59′34.21″N 103°41′09.37″W		MM-III
L-3	40°59′56.55″N 103°35′38.77″W		MM-III
L-4	40°59′39.07″N 103°28′15.06″W		MM-III
L-5	40°55′40.68″N 103°29′52.36″W		MM-III
L-6	40°53′31.68″N 103°34′29.28″W		MM-III
L-7	40°51′05.31″N 103°29′45.45″W		MM-III
L-8	40°51′20.39″N 103°41′14.59″W		MM-III
L-9	40°47′27.10″N 103°41′23.28″W		MM-III
L-10	40°55′00.50″N 103°47′00.91″W		MM-III
L-11	40°59′58.06″N 103°46′53.76″W		MM-III

Silo Launcher Group: Mike

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
M-2	40°50′47.68″N 103°24′09.72″W		MM-III
M-3	40°46′45.36″N 103°22′52.80″W		MM-III
M-4	40°49′10.76″N 103°17′15.12″W		MM-III
M-5	40°42′11.75″N 103°22′40.69″W		MM-III
M-6	40°36′33.29″N 103°30′11.31″W		MM-III
M-7	40°36′33.87″N 103°35′38.57″W		MM-III
M-8	40°40′04.23″N 103°33′01.79″W		MM-III
M-9	40°44′47.72″N 103°36′45.70″W		MM-III
M-10	40°48′34.47″N 103°36′44.23″W		MM-III
M-11	40°46′59.75″N 103°30′56.20″W		MM-III

Silo Launcher Group: November

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
N-2	40°42′59.75″N 103°46′14.44″W		MM-III
N-3	40°43′00.37″N 103°41′12.16″W		MM-III
N-4	40°38′30.34″N 103°40′29.41″W		MM-III
N-5	40°36′43.75″N 103°45′44.30″W		MM-III
N-6	40°35′24.37″N 103°53′47.05″W		MM-III
N-7	40°33′43.71″N 103°58′22.84″W		MM-III
N-8	40°37′26.79″N 103°59′35.88″W		MM-III
N-9	40°40′47.94″N 104°03′32.33″W		MM-III
N-10	40°41′46.76″N 103°58′24.39″W		MM-III
N-11	40°41′57.30″N 103°51′16.46″W		MM-III

Silo Launcher Group: Oscar

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
O-2	40°57′40.50″N 103°58′28.21″W		MM-III
O-3	40°57′53.92″N 103°52′28.93″W		MM-III
O-4	40°53′38.66″N 103°52′38.83″W		MM-III
O-5	40°50′29.81″N 103°48′18.27″W		MM-III

O-6	40°47′02.88″N 103°51′32.81″W		MM-III
O-7	40°47′17.88″N 103°58′20.10″W		MM-III
O-8	40°44′39.95″N 104°01′40.14″W		MM-III
O-9	40°49′20.70″N 104°03′02.79″W		MM-III
O-10	40°52′12.00″N 104°06′26.77″W		MM-III
O-11	40°55′42.93″N 104°03′59.68″W		MM-III

Silo Launcher Group: Papa

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
P-2	41°32′20.55″N 104°26′23.06″W		PK
P-3	41°28′05.54″N 104°20′10.13″W		PK
P-4	41°24′45.27″N 104°26′14.13″W		PK
P-5	41°19′50.70″N 104°27′54.53″W		PK
P-6	41°23′42.89″N 104°32′21.02″W		PK
P-7	41°27′22.71″N 104°36′46.26″W		PK
P-8	41°27′46.10″N 104°45′21.06″W		PK
P-9	41°30′18.22″N 104°41′25.06″W		PK
P-10	41°30′35.51″N 104°33′10.97″W		PK
P-11	41°33′24.99″N 104°38′45.29″W		PK

Silo Launcher Group: Quebec

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
Q-2	41°45′53.53″N 104°51′58.32″W		PK
Q-3	41°36′23.94″N 104°49′59.28″W		PK
Q-4	41°32′47.11″N 104°48′33.01″W		PK
Q-5	41°28′10.67″N 104°52′38.14″W		PK
Q-6	41°25′18.51″N 105°00′56.23″W		PK
Q-7	41°30′58.44″N 104°58′46.73″W		PK
Q-8	41°35′51.42″N 104°58′54.76″W		PK
Q-9	41°46′00.92″N 104°57′45.90″W		PK
Q-10	41°42′13.18″N 104°55′51.12″W		PK
Q-11	41°38′25.72″N 104°54′54.63″W		PK

Silo Launcher Group: Romeo

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
R-2	41°43′50.87″N 104°25′11.29″W		PK
R-3	41°38′23.42″N 104°20′32.56″W		PK
R-4	41°39′56.54″N 104°25′47.63″W		PK
R-5	41°39′56.31″N 104°32′35.94″W		PK
R-6	41°39′14.33″N 104°39′07.30″W		PK
R-7	41°43′11.18″N 104°36′55.93″W		PK
R-8	41°45′16.55″N 104°41′35.27″W		PK
R-9	41°48′15.37″N 104°45′05.13″W		PK
R-10	41°48′51.34″N 104°39′47.15″W		PK
R-11	41°47′00.75″N 104°34′36.57″W		PK

Silo Launcher Group: Sierra

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
S-2	42°00′54.78″N 104°12′35.89″W		PK
S-3	41°55′53.00″N 104°11′49.15″W		PK
S-4	41°55′48.42″N 104°05′40.45″W		PK
S-5	41°51′26.97″N 104°05′32.03″W		PK
S-6	41°46′32.65″N 104°12′32.72″W		PK
S-7	41°44′29.33″N 104°18′49.04″W		PK
S-8	41°47′56.54″N 104°24′12.74″W		PK
S-9	41°51′04.65″N 104°21′51.46″W		PK
S-10	41°56′28.21″N 104°28′39.71″W		PK
S-11	41°55′22.10″N 104°22′59.44″W		PK

Silo Launcher Group: Tango

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
T-2	42°02′56.62″N 104°43′55.03″W		PK
T-3	42°06′17.84″N 104°39′53.96″W		PK
T-4	41°58′51.32″N 104°43′37.03″W		PK
T-5	41°52′22.00″N 104°43′43.24″W		PK
T-6	41°55′49.61″N 104°47′14.23″W		PK
T-7	41°52′14.82″N 104°49′51.17″W		PK
T-8	41°51′20.05″N 104°54′49.50″W		PK
T-9	41°55′55.04″N 104°55′59.66″W		PK
T-10	42°00′03.35″N 104°57′06.41″W		PK
T-11	42°06′44.38″N 104°52′02.99″W		PK

Maintenance Facility

Name/Location: F.E. Warren Missile Complex, Wyoming
Coordinates: 41°08′ N 104°52′ W

	ICBM Type or Variant of a Type	
	MM-III	PK
Non-deployed ICBMs	2	0
Silo Training Launchers	0	0

ICBM Base for Silo Launchers of ICBMs

Name/Location: Malmstrom Missile Complex, Montana
Coordinates: 47°30′47.71″N 111°10′50.66″W

	ICBM Type or Variant of a Type
	MM-III
Deployed ICBMs	150
Warheads on Deployed ICBMs	***
Deployed Silo Launchers of ICBMs	150
Non-deployed Silo Launchers of ICBMs	50

Silo Launcher Group: Alpha

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
A-2	47°22′21.15″N 110°47′32.24″W		MM-III
A-3	47°20′24.29″N 110°40′21.36″W		MM-III
A-4	47°10′56.78″N 110°43′40.23″W		MM-III
A-5	47°03′04.03″N 110°40′11.39″W		MM-III
A-6	47°03′42.48″N 110°48′38.64″W		MM-III
A-7	47°09′45.08″N 110°50′37.05″W		MM-III
A-8	47°10′44.00″N 110°58′12.24″W		MM-III
A-9	47°16′39.01″N 111°09′00.77″W		MM-III
A-10	47°18′15.06″N 111°01′17.63″W		MM-III
A-11	47°23′30.26″N 110°54′51.10″W		MM-III

Silo Launcher Group: Bravo

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
B-2	47°18′42.88″N 110°10′08.20″W		MM-III
B-3	47°23′19.78″N 110°03′60.00″W		MM-III
B-4	47°17′39.98″N 110°02′40.05″W		MM-III
B-5	47°14′04.66″N 110°11′34.76″W		MM-III
B-6	47°08′59.10″N 110°22′16.58″W		MM-III
B-7	47°13′53.72″N 110°27′25.80″W		MM-III
B-8	47°15′16.43″N 110°34′25.13″W		MM-III

B-9	47°19′05.23″N 110°29′17.59″W		MM-III
B-10	47°23′45.34″N 110°34′30.86″W		MM-III
B-11	47°23′00.02″N 110°25′49.95″W		MM-III

Silo Launcher Group: Charlie

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
C-2	47°10′20.22″N 110°06′26.90″W		MM-III
C-3	47°11′11.52″N 109°55′30.32″W		MM-III
C-4	47°07′33.95″N 110°00′30.67″W		MM-III
C-5	47°02′23.94″N 110°01′55.06″W		MM-III
C-6	46°57′44.53″N 110°06′10.16″W		MM-III
C-7	46°54′24.42″N 110°13′30.76″W		MM-III
C-8	46°58′51.95″N 110°17′11.78″W		MM-III
C-9	47°01′34.70″N 110°24′34.56″W		MM-III
C-10	47°04′33.23″N 110°18′23.60″W		MM-III
C-11	47°09′33.83″N 110°14′25.40″W		MM-III

Silo Launcher Group: Delta

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
D-2	47°32′39.17″N 109°46′15.55″W		MM-III
D-3	47°33′47.45″N 109°37′36.40″W		MM-III
D-4	47°28′49.22″N 109°38′27.28″W		MM-III
D-5	47°23′47.05″N 109°41′25.60″W		MM-III
D-6	47°14′41.56″N 109°38′13.74″W		MM-III
D-7	47°16′29.17″N 109°45′02.29″W		MM-III
D-8	47°16′19.05″N 109°52′26.87″W		MM-III
D-9	47°20′51.96″N 109°57′24.56″W		MM-III
D-10	47°26′30.44″N 109°58′24.52″W		MM-III
D-11	47°28′03.73″N 109°49′36.61″W		MM-III

Silo Launcher Group: Echo

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
E-2	47°38′42.55″N 109°20′31.32″W		MM-III
E-3	47°31′35.75″N 109°20′45.14″W		MM-III
E-4	47°35′06.76″N 109°14′47.56″W		MM-III
E-5	47°29′51.23″N 109°13′53.65″W		MM-III
E-6	47°24′56.86″N 109°18′40.23″W		MM-III
E-7	47°20′05.54″N 109°21′40.41″W		MM-III
E-8	47°18′19.58″N 109°32′51.68″W		MM-III
E-9	47°23′07.06″N 109°29′24.50″W		MM-III
E-10	47°29′29.64″N 109°30′56.97″W		MM-III
E-11	47°34′57.88″N 109°26′22.55″W		MM-III

Silo Launcher Group: Foxtrot

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
F-2	47°47′42.41″N 112°13′59.88″W		MM-III
F-3	47°40′44.81″N 112°14′03.68″W		MM-III
F-4	47°34′59.97″N 112°08′47.14″W		MM-III
F-5	47°29′24.09″N 112°13′04.69″W		MM-III
F-6	47°31′46.11″N 112°21′40.45″W		MM-III
F-7	47°27′01.07″N 112°27′01.93″W		MM-III
F-8	47°38′52.07″N 112°25′39.49″W		MM-III
F-9	47°44′21.22″N 112°30′46.42″W		MM-III
F-10	47°49′19.11″N 112°28′04.25″W		MM-III
F-11	47°44′34.00″N 112°21′59.46″W		MM-III

Silo Launcher Group: Golf

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
G-2	47°23′38.42″N 112°01′20.97″W		MM-III
G-3	47°23′48.25″N 111°53′07.52″W		MM-III
G-4	47°20′29.02″N 111°47′25.94″W		MM-III
G-5	47°18′21.79″N 111°54′22.33″W		MM-III
G-6	47°14′02.17″N 112°05′17.88″W		MM-III
G-7	47°13′52.57″N 112°13′33.60″W		MM-III
G-8	47°15′11.28″N 112°21′03.75″W		MM-III
G-9	47°20′12.88″N 112°13′27.33″W		MM-III
G-10	47°25′07.33″N 112°17′29.10″W		MM-III
G-11	47°24′40.01″N 112°08′41.28″W		MM-III

Silo Launcher Group: Hotel

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
H-2	47°47′44.92″N 111°46′35.42″W		MM-III
H-3	47°42′42.18″N 111°47′14.06″W		MM-III
H-4	47°37′09.73″N 111°40′33.68″W		MM-III
H-5	47°34′56.13″N 111°50′24.52″W		MM-III
H-6	47°27′45.20″N 111°48′33.70″W		MM-III
H-7	47°28′42.62″N 111°58′02.86″W		MM-III
H-8	47°30′12.15″N 112°05′11.56″W		MM-III
H-9	47°36′19.39″N 112°01′43.13″W		MM-III
H-10	47°44′28.64″N 112°08′03.08″W		MM-III
H-11	47°46′55.07″N 111°59′21.69″W		MM-III

Silo Launcher Group: India

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
I-2	47°15′27.51″N 111°16′38.07″W		MM-III
I-3	47°12′11.83″N 111°27′17.77″W		MM-III
I-4	47°08′53.73″N 111°33′46.96″W		MM-III

I-5	47°14′03.56″N 111°34′43.49″W	MM-III
I-6	47°17′53.46″N 111°41′08.00″W	MM-III
I-7	47°21′48.80″N 111°35′26.92″W	MM-III
I-8	47°24′31.64″N 111°42′30.27″W	MM-III
I-9	47°29′46.10″N 111°40′50.85″W	MM-III
I-10	47°33′57.81″N 111°32′02.87″W	MM-III
I-11	47°29′00.24″N 111°30′37.38″W	MM-III

Silo Launcher Group: Juliet

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
J-2	47°50′31.10″N 111°31′21.43″W		MM-III
J-3	47°49′48.08″N 111°23′51.99″W		MM-III
J-4	47°50′06.47″N 111°15′18.02″W		MM-III
J-5	47°47′25.99″N 111°04′16.76″W		MM-III
J-6	47°45′18.96″N 111°19′08.84″W		MM-III
J-7	47°45′06.91″N 111°11′47.79″W		MM-III
J-8	47°41′50.90″N 111°25′45.35″W		MM-III
J-9	47°39′19.60″N 111°32′26.69″W		MM-III
J-10	47°42′51.72″N 111°39′29.15″W		MM-III
J-11	47°48′53.53″N 111°38′46.60″W		MM-III

Silo Launcher Group: Kilo

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
K-2	46°31′33.08″N 109°45′45.01″W		MM-III
K-3	46°29′49.34″N 109°37′14.76″W		MM-III
K-4	46°28′29.97″N 109°29′07.36″W		MM-III
K-5	46°23′44.46″N 109°31′36.21″W		MM-III
K-6	46°24′43.37″N 109°41′23.04″W		MM-III
K-7	46°18′09.52″N 109°31′45.54″W		MM-III
K-8	46°22′16.87″N 109°51′43.15″W		MM-III
K-9	46°29′27.49″N 109°59′47.77″W		MM-III
K-10	46°31′59.90″N 109°53′29.58″W		MM-III
K-11	46°35′59.64″N 109°58′34.72″W		MM-III

Silo Launcher Group: Lima

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
L-2	46°50′55.28″N 109°39′14.82″W		MM-III
L-3	46°40′12.59″N 109°37′18.09″W		MM-III
L-4	46°38′57.64″N 109°30′08.57″W		MM-III
L-5	46°33′44.13″N 109°30′48.52″W		MM-III
L-6	46°35′12.54″N 109°38′21.01″W		MM-III
L-7	46°36′31.69″N 109°45′43.56″W		MM-III
L-8	46°40′46.97″N 109°52′16.06″W		MM-III
L-9	46°51′06.32″N 109°54′05.39″W		MM-III
L-10	46°47′40.82″N 109°45′10.45″W		MM-III
L-11	46°53′36.76″N 109°45′45.14″W		MM-III

Silo Launcher Group: Mike

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
M-2	47°13′08.45″N 109°31′01.39″W		MM-III
M-3	47°12′22.73″N 109°23′16.56″W		MM-III
M-4	47°08′09.79″N 109°27′14.86″W		MM-III
M-5	47°03′11.79″N 109°31′13.50″W		MM-III
M-6	46°56′04.50″N 109°34′10.32″W		MM-III
M-7	46°58′45.64″N 109°44′30.56″W		MM-III
M-8	46°56′19.31″N 109°55′22.30″W		MM-III
M-9	47°02′10.89″N 109°53′01.88″W		MM-III
M-10	47°08′03.19″N 109°46′48.25″W		MM-III
M-11	47°05′41.49″N 109°40′13.23″W		MM-III

Silo Launcher Group: November

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
N-2	47°06′28.08″N 108°55′13.05″W		MM-III
N-3	47°04′45.88″N 108°47′44.84″W		MM-III
N-4	46°59′35.18″N 108°56′03.56″W		MM-III
N-5	46°56′22.47″N 109°02′29.66″W		MM-III
N-6	46°59′43.15″N 109°08′00.10″W		MM-III
N-7	46°58′51.34″N 109°16′13.75″W		MM-III
N-8	46°59′42.89″N 109°24′40.70″W		MM-III
N-9	47°04′28.96″N 109°21′54.31″W		MM-III
N-10	47°04′57.55″N 109°09′01.66″W		MM-III
N-11	47°09′52.76″N 109°06′42.93″W		MM-III

Silo Launcher Group: Oscar

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
O-2	47°25′13.60″N 108°54′40.56″W		MM-III
O-3	47°25′35.56″N 108°45′46.86″W		MM-III
O-4	47°20′39.41″N 108°47′21.05″W		MM-III
O-5	47°15′41.64″N 108°50′00.68″W		MM-III
O-6	47°09′52.42″N 108°47′46.19″W		MM-III
O-7	47°15′11.29″N 108°59′02.10″W		MM-III
O-8	47°15′56.53″N 109°17′20.77″W		MM-III
O-9	47°18′24.57″N 109°10′28.41″W		MM-III
O-10	47°20′17.42″N 109°03′13.12″W		MM-III
O-11	47°24′08.68″N 109°08′16.98″W		MM-III

Silo Launcher Group: Papa

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
P-2	48°27′11.00″N 111°54′05.15″W		MM-III
P-3	48°20′46.14″N 111°50′32.50″W		MM-III
P-4	48°16′49.63″N 111°52′46.24″W		MM-III

P-5	48°10′37.53″N 112°03′59.02″W		MM-III
P-6	48°16′00.70″N 112°05′44.78″W		MM-III
P-7	48°20′05.49″N 112°06′22.72″W		MM-III
P-8	48°18′36.29″N 111°58′27.30″W		MM-III
P-9	48°24′17.56″N 112°03′07.57″W		MM-III
P-10	48°22′25.02″N 111°57′03.52″W		MM-III
P-11	48°29′37.06″N 111°59′14.86″W		MM-III

Silo Launcher Group: Quebec

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
Q-2	48°17′38.17″N 111°31′56.47″W		MM-III
Q-3	48°16′31.54″N 111°25′58.32″W		MM-III
Q-4	48°13′02.81″N 111°30′09.23″W		MM-III
Q-5	48°12′24.48″N 111°41′06.55″W		MM-III
Q-6	48°13′04.98″N 111°47′35.07″W		MM-III
Q-7	48°16′31.89″N 111°43′41.23″W		MM-III
Q-8	48°25′11.02″N 111°44′41.97″W		MM-III
Q-9	48°28′56.10″N 111°47′25.55″W		MM-III
Q-10	48°21′45.61″N 111°40′49.05″W		MM-III
Q-11	48°28′33.26″N 111°41′02.74″W		MM-III

Silo Launcher Group: Romeo

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
R-2	48°08′04.73″N 111°30′06.32″W		MM-III
R-3	48°03′47.55″N 111°28′36.13″W		MM-III
R-4	47°57′22.29″N 111°23′27.39″W		MM-III
R-5	47°59′38.82″N 111°28′34.80″W		MM-III
R-6	47°54′09.41″N 111°28′34.49″W		MM-III
R-7	47°56′24.58″N 111°33′44.31″W		MM-III
R-8	48°00′24.09″N 111°35′00.59″W		MM-III
R-9	47°58′04.22″N 111°40′11.33″W		MM-III
R-10	48°08′04.08″N 111°39′45.73″W		MM-III
R-11	48°10′41.65″N 111°35′11.10″W		MM-III

Silo Launcher Group: Sierra

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
S-2	48°02′23.46″N 111°40′40.63″W		MM-III
S-3	47°51′18.96″N 111°57′42.56″W		MM-III
S-4	47°59′36.49″N 111°52′44.85″W		MM-III
S-5	47°56′20.67″N 111°58′16.39″W		MM-III
S-6	48°02′30.38″N 112°09′34.53″W		MM-III
S-7	48°02′43.48″N 111°59′55.412W		MM-III
S-8	48°05′57.54″N 112°04′56.02″W		MM-III
S-9	48°04′37.68″N 111°54′00.08″W		MM-III
S-10	48°08′06.56″N 111°57′32.94″W		MM-III
S-11	48°08′32.79″N 111°51′01.82″W		MM-III

Silo Launcher Group: Tango

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
T-2	48°26′47.21″N 112°12′34.85″W		MM-III
T-3	48°22′42.08″N 112°12′12.50″W		MM-III
T-4	48°18′22.12″N 112°12′08.66″W		MM-III
T-5	48°11′53.61″N 112°10′28.18″W		MM-III
T-6	48°07′08.50″N 112°10′50.51″W		MM-III
T-7	48°03′03.95″N 112°16′03.84″W		MM-III
T-8	48°04′33.76″N 112°22′59.27″W		MM-III
T-9	48°11′06.20″N 112°18′54.85″W		MM-III
T-10	48°08′59.47″N 112°25′01.57″W		MM-III
T-11	48°13′12.03″N 112°24′24.99″W		MM-III

Maintenance Facility

Name/Location: Malmstrom Missile Complex, Montana
Coordinates: 47°30′ N 111°10′ W

	ICBM Type or Variant of a Type
	MM-III
Non-deployed ICBMs	1
Silo Training Launchers	0

ICBM Base for Silo Launchers of ICBMs

Name/Location: Minot Missile Complex, North Dakota
Coordinates: 48°24′55.61″N 101°20′44.03″W

	ICBM Type or Variant of a Type
	MM-III
Deployed ICBMs	150
Warheads on Deployed ICBMs	***

Deployed Silo Launchers of ICBMs 150

Non-deployed Silo Launchers of ICBMs 0

Silo Launcher Group: Alpha

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
A-2	48°00′05.77″N 100°27′14.70″W		MM-III
A-3	47°56′13.99″N 100°22′08.10″W		MM-III
A-4	47°55′59.71″N 100°28′51.91″W		MM-III
A-5	47°52′30.42″N 100°25′59.23″W		MM-III
A-6	47°50′03.45″N 100°30′57.75″W		MM-III
A-7	47°53′36.70″N 100°35′00.98″W		MM-III
A-8	47°51′02.16″N 100°39′31.83″W		MM-III
A-9	48°00′34.62″N 100°40′22.08″W		MM-III
A-10	48°06′09.80″N 100°37′39.91″W		MM-III
A-11	48°02′09.87″N 100°35′19.93″W		MM-III

Silo Launcher Group: Bravo

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
B-2	48°04′33.96″N 100°50′26.24″W		MM-III
B-3	48°04′17.78″N 100°44′08.39″W		MM-III
B-4	47°59′33.13″N 100°49′15.63″W		MM-III
B-5	47°55′37.88″N 100°49′15.40″W		MM-III
B-6	47°51′41.55″N 100°47′54.88″W		MM-III
B-7	47°49′52.71″N 100°55′36.16″W		MM-III
B-8	47°53′13.96″N 101°04′52.14″W		MM-III
B-9	47°57′03.71″N 101°04′25.00″W		MM-III
B-10	47°58′46.90″N 100°58′49.27″W		MM-III
B-11	48°02′22.33″N 100°55′51.65″W		MM-III

Silo Launcher Group: Charlie

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
C-2	47°45′13.01″N 100°54′35.17″W		MM-III
C-3	47°47′02.90″N 100°48′05.88″W		MM-III
C-4	47°40′52.72″N 100°54′13.42″W		MM-III
C-5	47°36′16.96″N 100°52′19.07″W		MM-III
C-6	47°38′01.13″N 100°58′25.21″W		MM-III
C-7	47°35′29.08″N 101°04′35.63″W		MM-III
C-8	47°39′28.78″N 101°04′35.58″W		MM-III
C-9	47°42′07.56″N 101°09′46.46″W		MM-III
C-10	47°45′32.33″N 101°04′38.01″W		MM-III
C-11	47°49′05.40″N 101°01′36.28″W		MM-III

Silo Launcher Group: Delta

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
D-2	47°54′55.70″N 101°17′47.52″W		MM-III
D-3	47°52′27.47″N 101°12′32.36″W		MM-III
D-4	47°46′36.68″N 101°11′30.62″W		MM-III
D-5	47°39′49.52″N 101°17′09.43″W		MM-III
D-6	47°43′45.20″N 101°17′27.47″W		MM-III
D-7	47°39′44.93″N 101°23′42.52″W		MM-III
D-8	47°43′50.25″N 101°25′11.61″W		MM-III
D-9	47°47′33.46″N 101°25′13.43″W		MM-III
D-10	47°51′41.04″N 101°27′49.69″W		MM-III
D-11	47°51′51.55″N 101°20′59.70″W		MM-III

Silo Launcher Group: Echo

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
E-2	47°48′13.37″N 101°31′23.75″W		MM-III
E-3	47°43′07.03″N 101°31′09.16″W		MM-III
E-4	47°38′27.27″N 101°29′44.18″W		MM-III
E-5	47°38′53.69″N 101°35′50.06″W		MM-III
E-6	47°41′01.22″N 101°40′52.80″W		MM-III
E-7	47°38′43.99″N 101°45′41.60″W		MM-III
E-8	47°41′14.58″N 101°50′15.05″W		MM-III
E-9	47°41′22.30″N 101°56′04.48″W		MM-III
E-10	47°44′52.02″N 101°53′06.83″W		MM-III
E-11	47°47′16.74″N 101°48′22.36″W		MM-III

Silo Launcher Group: Foxtrot

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
F-2	47°57′56.43″N 101°40′36.89″W		MM-III
F-3	47°58′48.22″N 101°34′35.21″W		MM-III
F-4	47°55′19.23″N 101°31′18.39″W		MM-III
F-5	47°51′40.29″N 101°35′10.70″W		MM-III
F-6	47°51′40.46″N 101°45′41.63″W		MM-III
F-7	47°50′03.86″N 101°52′47.61″W		MM-III
F-8	47°53′31.72″N 101°56′53.33″W		MM-III
F-9	47°55′08.57″N 101°50′41.54″W		MM-III
F-10	47°58′45.55″N 101°53′48.20″W		MM-III
F-11	47°58′36.10″N 101°47′32.33″W		MM-III

Silo Launcher Group: Golf

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
G-2	48°11′00.86″N 101°56′50.94″W		MM-III
G-3	48°07′10.41″N 101°51′32.45″W		MM-III
G-4	48°03′11.57″N 101°44′34.37″W		MM-III

G-5	48°03′04.94″N 101°51′16.90″W	MM-III
G-6	48°02′36.74″N 101°57′49.57″W	MM-III
G-7	48°03′17.06″N 102°04′17.76″W	MM-III
G-8	48°07′23.40″N 102°04′29.10″W	MM-III
G-9	48°08′17.49″N 102°10′38.40″W	MM-III
G-10	48°12′06.02″N 102°13′33.55″W	MM-III
G-11	48°12′01.24″N 102°04′29.26″W	MM-III

Silo Launcher Group: Hotel

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
H-2	48°03′37.93″N 102°10′43.24″W		MM-III
H-3	47°59′37.02″N 102°07′36.78″W		MM-III
H-4	47°58′35.98″N 101°59′49.14″W		MM-III
H-5	47°53′24.48″N 102°02′25.95″W		MM-III
H-6	47°55′21.30″N 102°07′51.87″W		MM-III
H-7	47°51′13.89″N 102°07′36.93″W		MM-III
H-8	47°53′19.84″N 102°12′59.68″W		MM-III
H-9	47°58′35.14″N 102°26′48.26″W		MM-III
H-10	47°58′49.72″N 102°20′28.90″W		MM-III
H-11	48°05′47.86″N 102°16′35.80″W		MM-III

Silo Launcher Group: India

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
I-2	48°22′17.54″N 102°10′25.21″W		MM-III
I-3	48°16′21.22″N 102°13′22.66″W		MM-III
I-4	48°12′28.87″N 102°21′19.61″W		MM-III
I-5	48°16′46.46″N 102°22′37.86″W		MM-III
I-6	48°13′58.80″N 102°27′46.39″W		MM-III
I-7	48°18′41.25″N 102°29′59.49″W		MM-III
I-8	48°19′33.33″N 102°36′08.23″W		MM-III
I-9	48°23′03.85″N 102°24′05.96″W		MM-III
I-10	48°25′02.88″N 102°27′58.79″W		MM-III
I-11	48°27′27.02″N 102°24′35.20″W		MM-III

Silo Launcher Group: Juliet

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
J-2	48°27′20.44″N 101°49′11.40″W		MM-III
J-3	48°23′21.39″N 101°43′56.34″W		MM-III
J-4	48°19′34.03″N 101°46′10.79″W		MM-III
J-5	48°20′52.85″N 101°52′35.24″W		MM-III
J-6	48°17′09.85″N 101°56′32.60″W		MM-III
J-7	48°21′17.53″N 101°58′27.41″W		MM-III
J-8	48°17′21.68″N 102°04′17.93″W		MM-III
J-9	48°21′37.75″N 102°04′17.93″W		MM-III
J-10	48°25′11.45″N 102°01′06.82″W		MM-III
J-11	48°29′31.26″N 101°54′22.86″W		MM-III

Silo Launcher Group: Kilo

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
K-2	48°41′32.58″N 102°07′24.14″W		MM-III
K-3	48°37′11.29″N 102°06′24.54″W		MM-III
K-4	48°33′31.05″N 102°00′54.31″W		MM-III
K-5	48°29′15.19″N 102°01′07.59″W		MM-III
K-6	48°26′52.51″N 102°06′18.40″W		MM-III
K-7	48°28′01.03″N 102°12′37.79″W		MM-III
K-8	48°32′41.96″N 102°16′45.77″W		MM-III
K-9	48°32′40.14″N 102°24′37.24″W		MM-III
K-10	48°37′03.49″N 102°20′12.69″W		MM-III
K-11	48°37′04.78″N 102°12′32.48″W		MM-III

Silo Launcher Group: Lima

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
L-2	48°55′51.37″N 102°14′28.54″W		MM-III
L-3	48°51′33.16″N 102°14′16.10″W		MM-III
L-4	48°48′31.41″N 102°09′39.15″W		MM-III
L-5	48°45′45.04″N 102°04′30.22″W		MM-III
L-6	48°44′09.59″N 102°12′14.93″W		MM-III
L-7	48°44′13.06″N 102°19′46.37″W		MM-III
L-8	48°45′38.38″N 102°26′18.27″W		MM-III
L-9	48°49′15.37″N 102°22′08.24″W		MM-III
L-10	48°53′44.73″N 102°26′22.14″W		MM-III
L-11	48°53′34.48″N 102°19′57.04″W		MM-III

Silo Launcher Group: Mike

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
M-2	48°44′42.91″N 101°49′33.18″W		MM-III
M-3	48°38′58.86″N 101°42′48.94″W		MM-III
M-4	48°34′40.03″N 101°42′38.05″W		MM-III
M-5	48°37′12.39″N 101°48′44.79″W		MM-III
M-6	48°30′14.74″N 101°44′25.85″W		MM-III
M-7	48°32′59.06″N 101°50′38.76″W		MM-III
M-8	48°37′11.88″N 101°56′54.96″W		MM-III
M-9	48°40′40.36″N 102°00′45.93″W		MM-III
M-10	48°44′46.40″N 101°58′33.99″W		MM-III
M-11	48°48′21.02″N 101°54′48.55″W		MM-III

Silo Launcher Group: November

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
N-2	48°53′20.00″N 101°33′51.34″W		MM-III
N-3	48°49′37.66″N 101°31′11.32″W		MM-III
N-4	48°45′54.06″N 101°28′16.28″W		MM-III

N-5	48°41′32.21″N 101°24′38.69″W	MM-III
N-6	48°42′11.56″N 101°31′05.87″W	MM-III
N-7	48°37′20.74″N 101°36′06.90″W	MM-III
N-8	48°41′32.25″N 101°37′51.23″W	MM-III
N-9	48°45′54.06″N 101°42′36.93″W	MM-III
N-10	48°49′07.49″N 101°46′45.40″W	MM-III
N-11	48°49′32.54″N 101°37′47.34″W	MM-III

Silo Launcher Group: Oscar

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
O-2	48°58′01.57″N 101°15′37.16″W		MM-III
O-3	48°52′14.07″N 101°12′39.42″W		MM-III
O-4	48°47′39.60″N 101°08′39.72″W		MM-III
O-5	48°45′42.96″N 101°14′13.73″W		MM-III
O-6	48°41′56.47″N 101°18′05.28″W		MM-III
O-7	48°45′43.18″N 101°20′54.88″W		MM-III
O-8	48°49′28.88″N 101°23′20.49″W		MM-III
O-9	48°53′26.59″N 101°25′47.41″W		MM-III
O-10	48°56′55.43″N 101°22′01.93″W		MM-III
O-11	48°53′33.36″N 101°18′26.01″W		MM-III

Maintenance Facility

Name/Location: Minot Missile Complex, North Dakota
Coordinates: 48°24′ N 101°20′ W

	ICBM Type or Variant of a Type
	MM-III
Non-deployed ICBMs	1
Silo Training Launchers	0

ICBM Loading Facilities

Production Facilities for ICBMs

Name/Location: ATK Launch Systems - ICBM, Utah
Coordinates: 41°39′41.17″N 112°26′03.79″W

	ICBM Type or Variant of a Type	
	MM-III	PK
Non-deployed ICBMs	2	0

Production Facilities for Mobile Launchers of ICBMs

Storage Facilities for ICBMs

Name/Location: Camp Navajo, Arizona
Coordinates: 35°12′29.34″N 111°50′21.55″W

	ICBM Type or Variant of a Type	
	MM-III	PK
Non-deployed ICBMs	129	0

Name/Location: Oasis Complex, Utah*
Coordinates: 41°07′58.89″N 111°59′47.18″W

	ICBM Type or Variant of a Type	
	MM-III	PK
Non-deployed ICBMs	71	0

* The facility listed as OASIS COMPLEX, UTAH is a single facility listed in Section III, Section IV and Section IX. The OASIS COMPLEX, UTAH "Storage Facility for ICBMs and SLBMs" function is the storage of ICBMs and SLBMs. ICBMs located at this facility are listed in Section III. SLBMs located at this facility are listed in Section IV.

Storage Facilities for Mobile Launchers of ICBMs

Repair Facilities for ICBMs

Name/Location: Hill Air Force Base, Utah
Coordinates: 41°07′58.89″N 111°59′47.18″W

	ICBM Type or Variant of a Type	
	MM-III	PK
Non-deployed ICBMs	54	58

Repair Facilities for Mobile Launchers of ICBMs

Test Ranges

Name/Location: Vandenberg Air Force Base, California
Coordinates: 34°44′23.64″N 120°32′19.89″W

	ICBM Type or Variant of a Type	
	MM-III	PK
Non-deployed ICBMs	3	0
Test Launchers	6	1

Silo Launchers	Coordinates	UID	ICBM Type or Variant of Type
LF4	34°51′32″N 120°36′23″W		MM-III
LF6	34°52′57″N 120°38′08″W		MM-III
LF9	34°52′42″N 120°38′00″W		MM-III
LF10	34°51′02″N 120°35′36″W		MM-III
LF25	34°52′56″N 120°37′46″W		MM-III

LF26	34°53′18″N 120°38′11″W	MM-III
LF-5	34°51′44″N 120°36′33″W	PK

Training Facilities

Conversion or Elimination Facilities for ICBMs

Conversion or Elimination Facilities for Mobile Launchers of ICBMs

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Section IV. SLBMs, SLBM Launchers, and Warheads on Deployed SLBMs

United States of America

	SLBM Type or Variant of a Type	
	Trident II	Total
Deployed SLBMs	239	239
Warheads on Deployed SLBMs	***	***
Non-deployed SLBMs	180	180
Deployed and Non-deployed Launchers of SLBMs	336	336
Deployed Launchers of SLBMs	239	239
Non-deployed Launchers of SLBMs	97	97
Test Launchers	0	0

Submarine Base

Name/Location: Strategic Weapons Facility, Atlantic, Kings Bay, Georgia
Coordinates: 30°47′15.49″N 81°32′24.32″W

	SLBM Type or Variant of a Type
	Trident II
Deployed SLBMs	103
Warheads on Deployed SLBMs	***
Non-deployed SLBMs	107
Deployed Launchers of SLBMs	103
Non-deployed Launchers of SLBMs	41

Ballistic Missile Submarines Based at this Submarine Base

	Number of Submarines/Aggregate Number of Launchers by SLBM Type
	Trident II
Submarine Type	
Ohio	6/144

Submarine Name:

Alaska
Maryland
Rhode Island
Tennessee
West Virginia
Wyoming

Submarine Base

Name/Location: Strategic Weapons Facility, Pacific, Silverdale, Washington
Coordinates: 47°42′52.47″N 122°42′40.85″W

	SLBM Type or Variant of a Type
	Trident II
Deployed SLBMs	136
Warheads on Deployed SLBMs	***
Non-deployed SLBMs	68
Deployed Launchers of SLBMs	136
Non-deployed Launchers of SLBMs	56

Ballistic Missile Submarines Based at this Submarine Base

Submarine Type	Number of Submarines/Aggregate Number of Launchers by SLBM Type
	Trident II
Ohio	8/192

Submarine Name:

Alabama
Henry M Jackson
Kentucky
Louisiana
Maine
Nebraska
Nevada
Pennsylvania

SLBM Loading Facilities

Production Facilities for SLBMs

Name/Location: ATK Launch Systems - SLBM, UTAH
Coordinates: 41°39′41.17″N 112°26′3.79″W

	SLBM Type or Variant of a Type
	Trident II
Non-deployed SLBMs	5

Production Facilities for Ballistic Missile Submarines

Storage Facilities for SLBMs

Name/Location: Oasis Complex, Utah*
Coordinates: 41°07′58.89″N 111°59′47.18″W

	ICBM Type or Variant of a Type
	Trident II
Non-deployed ICBMs	0

* The facility listed as OASIS COMPLEX, UTAH is a single facility listed in Section III, Section IV and Section IX. The OASIS COMPLEX, UTAH "Storage Facility for ICBMs and SLBMs" function is the storage of ICBMs and SLBMs. ICBMs located at this facility are listed in Section III. SLBMs located at this facility are listed in Section IV.

Repair Facilities for SLBMs

Test Ranges

Conversion or Elimination Facilities for SLBMs

Conversion or Elimination Facilities for SLBM Launchers

Section V. Heavy Bombers and Nuclear Warheads Counted for Deployed Heavy Bombers

United States of America

	Heavy Bomber Type or Variant of a Type			
	B-2A	B-52G	B-52H	Total
Deployed Heavy Bombers	10	30	78	118
Nuclear Warheads Counted for Deployed Heavy Bombers	10	30	78	118
Non-deployed Heavy Bombers	10	0	13	23
Test Heavy Bombers	1	0	2	3
Heavy Bombers Equipped for Non-nuclear Armaments	0	0	0	0

Airbase

Name/Location: Whiteman Air Force Base, Missouri
Coordinates: 38°43′37.98″N 93°33′32.13″W

	Heavy Bomber Type or Variant of a Type		
	B-2A	B-52G	B-52H
Heavy Bombers Based at this Base			
Deployed Heavy Bombers	10	0	0
Non-deployed Heavy Bombers	9	0	0
Heavy Bombers Equipped for Non-nuclear Armaments	0	0	0
Nuclear Warheads Counted for Deployed Heavy Bombers	10	0	0
Heavy Bombers Located at this Base			
Deployed Heavy Bombers	10	0	0
Test Heavy Bombers	0	0	0
Heavy Bombers Equipped for Non-nuclear Armaments	0	0	0

Airbase

Name/Location: Barksdale Air Force Base, Louisiana
Coordinates: 32°30′34.02″N 93°40′15.82″W

	Heavy Bomber Type or Variant of a Type		
	B-2A	B-52G	B-52H
Heavy Bombers Based at this Base			
Deployed Heavy Bombers	0	0	41
Non-deployed Heavy Bombers	0	0	7
Heavy Bombers Equipped for Non-nuclear Armaments	0	0	0
Nuclear Warheads Counted for Deployed Heavy Bombers	0	0	41
Heavy Bombers Located at this Base			
Deployed Heavy Bombers	0	0	40
Test Heavy Bombers	0	0	0
Heavy Bombers Equipped for Non-nuclear Armaments	0	0	0

Airbase

Name/Location: Minot Air Force Base, North Dakota
Coordinates: 48°24′56.21″N 101°20′49.46″W

	Heavy Bomber Type or Variant of a Type		
	B-2A	B-52G	B-52H
Heavy Bombers Based at this Base			
Deployed Heavy Bombers	0	30	37
Non-deployed Heavy Bombers	0	0	4
Heavy Bombers Equipped for Non-nuclear Armaments	0	0	0
Nuclear Warheads Counted for Deployed Heavy Bombers	***	***	***
Heavy Bombers Located at this Base			
Deployed Heavy Bombers	0	0	18
Test Heavy Bombers	0	0	0
Heavy Bombers Equipped for Non-nuclear Armaments	0	0	0

Production Facilities for Heavy Bombers

Name/Location: Northrop Plant, Palmdale, California
Coordinates: 34°37′48.00″N 118° 5′4.00″W

	Heavy Bomber Type or Variant of a Type		
	B-2A	B-52G	B-52H
Heavy Bombers Located at this Production Facility			
Non-deployed Heavy Bombers	3	0	0
Test Heavy Bombers	0	0	0
Heavy Bombers Equipped for Non-nuclear Armaments	0	0	0

Storage Facilities for Heavy Bombers

Name/Location: Davis-Monthan Air Force Base, Arizona
Coordinates: 32° 9′52.52″N 110°52′5.04″W

	Heavy Bomber Type or Variant of a Type		
	B-2A	B-52G	B-52H
Heavy Bombers Located at this Storage Facility			
Non-deployed Heavy Bombers	0	30	13
Test Heavy Bombers	0	0	0
Heavy Bombers Equipped for Non-nuclear Armaments	0	0	0

Repair Facilities for Heavy Bombers

Name/Location: Boeing Plant, Palmdale, California
Coordinates: 34°37′48.00″N 118° 5′4.00″W

	Heavy Bomber Type or Variant of a Type		
	B-2A	B-52G	B-52H
Heavy Bombers Located at this Repair Facility			
Non-deployed Heavy Bombers	0	0	0
Test Heavy Bombers	0	0	0
Heavy Bombers Equipped for Non-nuclear Armaments	0	0	0

Name/Location: Boeing Plant, Witchita, Kansas
Coordinates: 37°36′57.35″N 97°17′9.70″W

	Heavy Bomber Type or Variant of a Type		
	B-2A	B-52G	B-52H
Heavy Bombers Located at this Repair Facility			
Non-deployed Heavy Bombers	0	0	2
Test Heavy Bombers	0	0	0
Heavy Bombers Equipped for Non-nuclear Armaments	0	0	0

Name/Location: Tinker Air Force Base, Oklahoma
Coordinates: 35°25′20.05″N 97°23′24.81″W

	Heavy Bomber Type or Variant of a Type		
	B-2A	B-52G	B-52H
Heavy Bombers Located at this Repair Facility			
Non-deployed Heavy Bombers	0	0	9
Test Heavy Bombers	0	0	0
Heavy Bombers Equipped for Non-nuclear Armaments	0	0	0

Name/Location: Whiteman Air Force Base, Missouri
Coordinates: 38°43′49.27″N 93°33′7.90″W

	Heavy Bomber Type or Variant of a Type		
	B-2A	B-52G	B-52H
Heavy Bombers Located at this Repair Facility			
Non-deployed Heavy Bombers	6	0	0
Test Heavy Bombers	0	0	0
Heavy Bombers Equipped for Non-nuclear Armaments	0	0	0

Heavy Bomber Flight Test Centers

Name/Location: Edwards Air Force Base, California
Coordinates: 34°54′18.00″N 117°53′1.01″W

	Heavy Bomber Type or Variant of a Type		
	B-2A	B-52G	B-52H
Heavy Bombers Based at this Flight Test Center			
Test Heavy Bombers	1	0	2
Heavy Bombers Located at this Flight Test Center			
Deployed Heavy Bombers	0	0	0
Test Heavy Bombers	1	0	2
Heavy Bombers Equipped for Non-nuclear Armaments	0	0	0

Conversion or Elimination Facilities for Heavy Bombers

Name/Location: Davis-Monthan Air Force Base, Arizona
Coordinates: 32° 9′53.24″N 110°52′1.11″W

	Heavy Bomber Type or Variant of a Type		
	B-2A	B-52G	B-52H
Heavy Bombers Located at this Conversion or Elimination Facility			
Deployed Heavy Bombers	0	0	0

Test Heavy Bombers	0	0	0
Heavy Bombers Equipped for Non-nuclear Armaments	0	0	0

Section VI. Space Launch Facilities

United States of America

	Total
Non-deployed ICBMs and SLBMs	0
Non-deployed Launchers of ICBMs and SLBMs	0

Space Launch Facilities

Name/Location: Kodiak Launch Facility, Alaska
Coordinates: 57°26′9″N 152°20′16″W

	Total
Non-deployed ICBMs	0
Non-deployed SLBMs	0
Non-deployed Launchers of ICBMs	0
Non-deployed Launchers of SLBMs	0

Name/Location: Vandenberg Space Launch Complex, California
Coordinates: 34°38′11.85″N 120°35′58.99″W

	Total
Non-deployed ICBMs	0
Non-deployed SLBMs	0
Non-deployed Launchers of ICBMs	0
Non-deployed Launchers of SLBMs	0

Name/Location: Wallops Flight Facility, Virginia
Coordinates: 37°56′23.27″N 75°27′57.73″W

	Total
Non-deployed ICBMs	0
Non-deployed SLBMs	0
Non-deployed Launchers of ICBMs	3
Non-deployed Launchers of SLBMs	0

Section VII. ICBM and SLBM Technical Data

Classification A:

Assembled ICBMs or SLBMs in Launch Canisters

Classification B:

Assembled ICBMs or SLBMs Without Launch Canisters

Classification C:

ICBMs or SLBMs Maintained, Stored, and Transported in Stages

United States of America

(a) Intercontinental Ballistic Missiles

	ICBM Type or Variant of a Type	
	MM-III	PK
Missile		
Classification	C	C
Number of Stages	3	3
Length of Assembled Missile Without Front Section (m)	14.6	17.1
Maximum Diameter of Missile Airframe (Without Stabilizers, Raceways, Lug Guides, or Other Protruding Elements) (m)	1.68	2.4

Total Length of a Missile as a Unit With Launch Canister		
With Front Section (m)	---	---
Without Front Section (m)	---	---
Length of Launch Canister Body (m)	---	---
Diameter of Launch Canister Body (Without Protruding Elements) (m)	---	---
Missile Stages		
First Stage		
Length (m)	7	8.4
Length of First Stage Without Nozzle Attached (m)	6.5	7.4
Diameter (m)	1.68	2.3
Type of Propellant (Liq/Sol)	Sol	Sol

Second Stage		
Diameter (m)	1.39	2.4
Type of Propellant (Liq/Sol)	Sol	Sol
Third Stage		
Diameter (m)	1.33	2.3
Type of Propellant (Liq/Sol)	Sol	Sol
Size Criteria for Conducting Inspections		
97% of the Length of Launch Canister Body (m)	---	---
97% of the Diameter of Launch Canister Body (Without Protruding Elements) (m)	---	---
97% of the Length of First Stage (m)	6.8	8.1
97% of the Diameter of First Stage (m)	1.63	2.2

Mobile Launchers of ICBMs

External and Functional Differences Between Training Models of Missiles and ICBMs of Corresponding Types

For Training Models of Peacekeeper Types of Missiles:

One hole, no less than 25 millimeters in diameter, drilled through the casing of the first stage rocket motor and into the inert propellant.

For Training Models of RS-12M2 Types of Missiles:

A triangular notch, no less than ten centimeters in height, as measured from the edge of the nozzle, in one of the nozzles of the first stage rocket motor.

(b) Submarine-Launched Ballistic Missiles

	SLBM Type or Variant of a Type
	Trident II
Missile	
Classification	C
Number of Stages	3
Length of Assembled Missile Without Front Section (m)	13.4
Maximum Diameter of Missile Airframe (Without Stabilizers, Raceways, Lug Guides, or Other Protruding Elements) (m)	2.1

Total Length of a Missile as a Unit With Launch Canister	
With Front Section (m)	---
Without Front Section (m)	---
Length of Launch Canister Body (m)	---
Diameter of Launch Canister Body (Without Protruding Elements) (m)	---
Missile Stages	
First Stage	
Length (m)	7
Length of First Stage Without Nozzle Attached (m)	6.8
Diameter (m)	2.1
Type of Propellant (Liq/Sol)	Sol
Second Stage	
Diameter (m)	2.1
Type of Propellant (Liq/Sol)	Sol

Third Stage

Diameter (m)	0.81
Type of Propellant (Liq/Sol)	Sol

Size Criteria for Conducting Inspections

97% of the Length of Launch Canister Body (m)	---
97% of the Diameter of Launch Canister Body (Without Protruding Elements) (m)	---
97% of the Length of First Stage (m)	6.8
97% of the Diameter of First Stage (m)	2

External and Functional Differences Between Training Models of Missiles and SLBMs of Corresponding Types

For Training Models of Trident II Types of Missiles:

One hole, no less than 25 millimeters in diameter, drilled through the casing of the first stage rocket motor and into the inert propellant.

Section VIII. Heavy Bomber Distinguishing Features

United States of America

(a) Heavy Bombers Equipped for Nuclear Armaments

(i) For B-52G Heavy Bombers

(A) Externally Observable Distinguishing Features:

No horizontally mounted antennas on the side of the aircraft fuselage (as compared to the B-52H).

(B) Distinguishing Features Under Wing/Fuselage:

(C) Distinguishing Features of Weapons Bay:

(D) Technical Data for Recognition of Heavy Bombers:

(i) For B-52H Heavy Bombers

(A) Externally Observable Distinguishing Features:

Horizontally mounted antennas on the side of the aircraft fuselage (as compared to the B-52G).

(B) Distinguishing Features Under Wing/Fuselage:

(C) Distinguishing Features of Weapons Bay:

(D) Technical Data for Recognition of Heavy Bombers:

(b) Heavy Bombers Equipped for Non-nuclear Armaments

Differences that make heavy bombers equipped for non-nuclear armaments distinguishable from heavy bombers of this type equipped for nuclear armaments:

Section IX. Other Data Required by the Treaty

[...]

ABBREVIATIONS

ALCM	air-launched cruise missile
CASC	China Aerospace Science and Technology Corporation
CASIC	China Aerospace Science and Industry Corporation
HMNB	Her Majesty's Naval Base
ICBM	intercontinental ballistic missile
SLBM	submarine-launched ballistic missile
SSBN	nuclear-powered ballistic missile submarine