# US nuclear weapons capability

#### [Overview]

The United States has traditionally been considered to be the most transparent (though insufficient) of the nuclear-weapon states. In May 2010, the U.S. Department of Defense issued a fact sheet on its nuclear stockpile, which reported 5,113 warheads as of September 2009 (U.S.Department of Defense 2010). Since 2014, it has been updated almost annually. The last update, provided in March 2018, reported a total 3,822 warheads as of September 30, 2017(U.S.Department of Defense 2018), indicating a reduction of 1,291 over a eight-year period. However, in response to an October 1, 2018 petition by the Federation of American Scientists (FAS) seeking status on stocked and dismantled nuclear warheads as of the end of September 2018, the Department of Defense wrote in April 2019 that it could not disclose the data without offering any rationale (Aftergood, Steven 2019). This episode suggests the likelihood of the Trump administration continuing into the future to block public access to the current size of stocked and dismantled nuclear warheads, raising concerns for limited transparency.

Nuclear warheads in operational deployment are estimated to number 1,750: 1,600 strategic warheads and 150 non-strategic (**Kristensen, Hans M. & Korda, Matt 2019-1**), almost unchanged from a year ago. The strategic warheads are deployed with ICBMs, SLBMs and strategic bombers. This number is greater than the 1,365 strategic nuclear warheads in operational deployment registered under the New START as on March 1, 2019 (**U.S. Department of State 2019**). One reason for the discrepancy may be due to the New START Treaty of counting only one warhead per strategic bomber, as opposed to accounting for all other warheads stored on base where bombers are stationed. Besides these, there exist some 2,050 warheads in reserve, bringing the total size of the stockpile for military use to a combined 3,800 warheads.

On February 2, 2018, the Trump administration's Nuclear Posture Review (NPR) fundamentally reversed the previous administration's NPR, which had sought to reduce the role of nuclear weapons. The Trump administration's posture has indicated willingness to respond to conventional attack with nuclear weapons, aiming to lower the threshold for nuclear retaliation and broaden the role of nuclear weapons. The W76-2, a W76-1 modification with reduced yields of 5-7 kilotons, is now in production and will be turned over to the Navy starting from late FY2019 (Kristensen, Hans M. & Korda, Matt 2019-1). The U.S. has long-term plans to develop SLCMs and other nuclear weapons that could be used for preemptive strike.

Meanwhile, a major modernization of the U.S. nuclear arsenal initiated by the previous administration is believed to be in progress today. The plan is to cut back on surplus warheads dramatically by integrating seven existing types of warhead into a single type and also converting two ICBM warheads and three SLCM warheads into three mutually compatible warheads (NNSA 2018). In addition, it will begin replacing strategic nuclear submarines and bombers. For these initiatives, there will be an outlay of USD 494 billion between FY2019 and FY2028 (Congressional Budget Office 2019) and, over the next 30 years, USD 1.7 trillion (Arms Control Association 2018). Basically these initiatives are believed to be in progress under the current administration but there have already been some changes made to the warhead-sharing component (NNSA 2019). We need to continue monitoring how these changes may be implemented.

The U.S. is continuing with subcritical experiments without ratifying the Comprehensive Nuclear-Test-Ban Treaty. The Trump administration also conducted in December 2017 Vega, a subcritical experiment (SCE) using a downsized mockup of the otherwise identical design (Maskaly, Garry R. 2018) and in February 2019, Ediza (LLNL 2019).

Last year the U.S. also test-launched the ICBM Minuteman III five times (Kristensen, Hans M. & Korda, Matt 2019-1) and three times this year by the end of May (Space Launch Reports 2019). Meanwhile, the SLBM Trident II saw two test launches last year (Kristensen, Hans M. & Korda, Matt 2019-1) and once this year by the end of May (Gady, Franz-Stefan 2019).

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Updated: June 1, 2019

Type / designation	Missile /bomb	No. of warheads per weapon	No. of warheads	Types of nuclear warheads	Yield (kt)	Year first deployed	Remarks
Deployed	1,062		1,750				1)
Intercontinental ballistic missile (ICBM)	400		400				2)
MinutemanIII	200	1	200	W78	335	1979	
a) Mk-12A							
MinutemanIII Mk-21/SERV	200	1	200	W87	300	2006	
Submarine-launched ballistic missile (SLBM)	212		900				3)
Trident II D5	122	3~6	516	W76-1	100	2008	Carried by the Ohio-class nuclear submarine
b) Mk-4A							
Trident II D5 Mk-4A	?	1~2	- 204	W76-2 4)	5-7	(2019) 1990	c)
Trident II D5 Mk-5 Strategic bomber payloads	90 450	3~6	384 450	W88	455	1990	5)
Cruise missile	200	1	200	W80-1	5–150	1961	Carried by the B-52H
d) Strategic nuclear bomb							f) Carried by the B-2A
	100	1	100	B61-7 B61-11 B83-1	10-360 400 low-1,200	1985 1997 1993	
e)							g)
Non-strategic nuclear and airborne weapons  h)	150	1	150	B61-3 B61-4	0.3-170 0.3-50	1979	6)
Reserve / Nondeployed			2,050				7)
ICBM			400				8)
							9)

SLBM			1,020		
Air-launched systems (Bombers, etc.)	630		630		
Strategic bomber Payload	550	1	550		10)
Non-strategic nuclear weapons	80	1	80	B61-3/-4	11)
Retired warheads awaiting dismantlement, etc.			~2,385		12)
Total inventory			~6,185		

#### [Notes]

- 1) In line with the latest estimates on operational deployment (Kristensen, Hans M. & Korda, Matt 2019-2).
- 2) The United States has announced that the number of deployed ICBMs will be 400 on completion of New START implementation (U.S. Department of Defense 2014). It was announced that, as of September 1, 2017, there were a total of 399 ICBMs in deployment (U.S. Department of State 2018). While the Minuteman III Mark 12A used to carry a maximum of three W78 warheads, single-warhead modification is reported to have been complete by 2014 (NTI 2014), so deployed warheads are estimated to be 400. This matches the latest estimate (Kristensen, Hans M. & Korda, Matt 2019-1).
- 3) The United States announced that it would have 240 SLBMs deployed on completion of New START implementation (U.S. Department of Defense 2014). This required cutting back on the 24 launch tubes to 20 on each of twelve strategic nuclear submarines in operational deployment. This process was complete by the end of 2017, bringing down the number of warheads to 240 (Kristensen, Hans M. & Korda, Matt 2019-1). The New START Treaty data as of September 1, 2017 (U.S. Department of State 2018), SLBMs in deployment were 212, with no direct reference to warheads involved. Here, we estimate 900 warheads with SLBMs by subtracting 400 on ICBMs and 300 on strategic bombers from a total 1,600 strategic warheads in operational deployment.
- 4) On February 22, 2019, the Pantex Plant completed the first production unit of the W76-2 warhead, a variant of the W76-1 warhead with reduced yields ranging 5-7 kilotons. Turnover to the navy is expected to begin by the end of FY2019 (Kristensen, Hans M. & Korda, Matt 2019-1).
- 5) Of nuclear nuclear warheads allocated to bombers in operational deployment, about 300 are estimated to be strategic and 150, non-strategic. Those nuclear-capable bombers are 20 B-2s and 46 B-52Hs (Kristensen, Hans M. & Korda, Matt 2019-1). Since the B-52 can carry up to 16 nuclear bombs, our estimate is a total 320. The B-52H carries up to 20 cruise missiles but, considering operational conditions, we estimate their allocation to be 530 warheads. Of these, we see about 100 nuclear bombs and about 200 cruise missiles in operational deployment. 150 weapons are deployed in five European countries for use by NATO forces.
- 6) These 150 warheads break down into 20 in Belgium, 20 in Germany, 40 in Italy, 20 in the Netherlands, and 50 in Turkey (Kristensen, Hans M. & Korda, Matt 2019-1).
- 7) In March 2018, the Pentagon announced that, as of the end of September 2017, the U.S. stockpile in deployment and reserve consisted of 3,822 warheads (U.S. Department of Defence 2018). Based on this figure, we have applied a retirement rate and estimate the current stockpile to be 3,800 warheads. Subtracting 1,750 in operational deployment, we arrived at a reserve storage of 2,050 (Kristensen, Hans M. & Korda, Matt 2019-2).
- 8) These are W78 warheads made redundant by the single-warhead modification on the Minuteman III Mark-12A.
- 9) From 2,050 warheads in reserve, subtracting 400 in reserve for ICBMs, 550 for strategic bombers, and 80 non-strategic warheads. The figure includes arsenal for two Ohio-class nuclear submarines in overhaul (20 missiles, some 170 warheads) and hundreds of the W76-0s replaced by W76-1s.
- 10) Of all nuclear weapons allocated to strategic bombers, those stored not on other air force bases but in central storage at Kirtland Air Force Base (Kristensen, Hans M. & Korda, Matt 2019-1).
- 11) They are stockpiled in central storage at Kirtland Air Force Base, New Mexico. This consists of B61-3 and B61-4 warheads only, with all B61-10s retired by the end of September 2016 (NNSA 2017). They may be deployed in future on fighter bombers to assist allies outside of Europe.
- 12) According to the January 2017 fact sheet, there are approximately 2,800 nuclear warheads are currently retired and awaiting dismantlement (The White House 2017). Following this announcement, 354 were dismantled by the end of September 2017 (**The Department of Defence 2018**). Assuming further retirement and dismantlement, those warheads retired or awaiting dismantlement are estimated to be 2,385. In addition, 20,000 plutonium pits for primary detonation and 4,000 for secondary detonation are thought be stockpiled at the Pantext (Texas) and Y-12 plants (Tennessee) (Kristensen, Hans M. & Korda, Matt 2019-2).

Aftergood, Steven 2019: "Pentagon Blocks Declassification of 2018 Nuclear Stockpile," Federation of American Scientists, Secrecy News, April 17, 2019. https://fas.org/blogs/secrecy/2019/04/stockpile-2018/ (accessed May 23,2019)

Arms Control Association 2018: "U.S. Nuclear Modernization Programs," August, 2018. https://www.armscontrol.org/factsheets/USNuclearModernization (accessed June 5,2019)

Congressional Budget Office 2019: "Projected Costs of U.S. Nuclear Forces, 2019 to 2028," January, 2019. https://www.cbo.gov/system/files/2019-01/54914-NuclearForces.pdf (accessed June 9 2019

Gady, Franz-Stefan 2019: "US Submarine Test Fires Ballistic Missile," The Diplomat, May 9, 2019. https://thediplomat.com/2019/05/us-submarine-test-fires-ballistic-missile/ (accessed June 9.2019)

Kristensen, Hans M. & Korda, Matt 2019-1: "US nuclear forces, 2019," Bulletin of the Atomic Scientists, 75:3, 122-134, DOI: 10.1080/00963402.2019.1606503 (accessed May 23,2019) Kristensen, Hans M. & Korda, Matt 2019-2: "Status of World Nuclear Forces," Federation of American Scientists, May 2019. http://fas.org/issues/nuclear-weapons/status-world-nuclear-forces/ (accessed May 21,2019)

NNSA 2017: "Fiscal Year 2018 Stockpile Stewardship and Management Plan," November, 2017. https://www.nukewatch.org/importantdocs/resources/fy18ssmp final november 2017.pdf (accessed June 9,2019)

NNSA 2018: "Fiscal Year 2019 Stockpile Stewardship and Management Plan," October, 2018. https://www.energy.gov/sites/prod/files/2018/10/f57/FY2019%20SSMP.pdf (accessed June 9,2019)

NTI 2014: "U.S. Eliminates Multi-Warheads on All Ground-Based Nuclear Missiles," http://www.nti.org/gsn/article/us-pulls-multiple-warheads-all-nuclear-missiles/ (accessed June 9,2019)

Space Launch Report 2019: "2019 Major Suborbital Log." http://www.spacelaunchreport.com/log2019.html#log2 (accessed June 9.2019) U.S. Department of Defense 2010: "Fact Sheet Increasing Transparency in the U.S. Nuclear Weapons Stockpile," May 3, 2010. https://www.hsdl.org/?view&did=25157 (accessed June 9,2019)

U.S. Department of Defense 2014: "Fact Sheet on U.S. Nuclear Force Structure under the New START Treaty," April 8, 2014. https://archive.defense.gov/documents/Fact-Sheet-on-US-Nuclear-Force-Structure-under-the-New-START-Treaty.pdf (accessed May 23,2019)

U.S. Department of Defense 2018: "Stockpile Numbers: End of Fiscal Years 1962-2017," https://open.defense.gov/Portals/23/Documents/frddwg/2017\_Tables\_UNCLASS.pdf (accessed June

U.S. Department of State 2018: "New START Treaty Aggregate Numbers of Strategic Offensive Arms, Fact Sheet," January 12, 2018. https://www.state.gov/wp-content/uploads/2019/05/AVC-01122018.pdf (accessed June 9,2019)

U.S. Department of State 2019: "New START Treaty Aggregate Numbers of Strategic Offensive Arms, Fact Sheet," March 1, 2019.

https://www.state.gov/wp-content/uploads/2019/05/AVC-03012019.pdf (accessed June 9,2019)

The White House 2017: Fact Sheet: The Prague Nuclear Agenda, Jan. 11, 2017. https://obamawhitehouse.archives.gov/the-press-office/2017/01/11/fact-sheet-prague-nuclear-agenda (accessed May 23,2019)

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## **ICBM LGM-30G**

Designation: MinutemanIII

Propulsion: Three-stage solid-propellant

Launch platform:

No. of Maximum 3 warheads warheads :

Warhead W78, W87

Specifications: Length 18 m, Diameter 1.67 m, Weight 32.2 ton

Range: Over 9,600 km

Circular error 110 m probability:

Where

F.E. Warren Air Base (Wy) Malmstrom Air Base (Mont) deployed:

Minot Air Base (N.D.)

The Minuteman III is deployed on three air force bases. Annually, each of the these bases conducts a test launch from Vandenberg Air Force Base aimed at the test range in Kwajalein Atoll in the Marshall Islands. 2018 saw a total five such tests (of which one was a failure); in 2019, as of the end of May, there were three (February 5, May 1 and 9). The "Mk-" designation is the identifying mark for the heat-resistant protective capsule for the nuclear warheads. Work Remarks:

on conversion of the Mk-12A/W78 warheads to single warheads has been proceeding since 2002, and the Obama

on conversion of the Mk-12A/W78 warheads to single warheads has been proceeding since 2002, and the Obama administration completed that work in 2014. Development is under way to modify the W78 warhead and use this variant (previously known as IW-1) on the Mark-21 and SLBMs. The W87 warhead, too, will be compatible with the SLBM. The Minuteman III completed a modernization program in 2015, extending its service life into 2030. Currently, the U.S. is planning the development of ground-based strategic deterrent (GBSD) missiles, the next-generation ICBMs. It will appoint manufacturers in 2020 and produce 600 units to replace all Minuteman IIIs by 2030.

#### [Source]

Air Force Global Strike Command 2019-1: "F.E. Warren AFB tests Minuteman III missile from Vandenberg," May 01, 2019. https://www.af.mil/News/Article-Display/Article/1831488/fe-warren-afb-tests-minuteman-iii-missile-with-launch-from-vandenberg/ (accessed June 9,2019)

Air Force Global Strike Command 2019-2: "AFGSC tests Minuteman III missile with launch from Vandenberg," May 09, 2019. https://www.afgsc.af.mil/News/Article- $Display/Article/1841729/afgsc-tests-minute man-iii-missile-with-launch-from-vandenberg/\ (accessed\ June\ 9, 2019)$ 

Arms Control Association 2018: "U.S. Nuclear Modernization Programs," August, 2018. https://www.armscontrol.org/factsheets/USNuclearModernization (accessed June 5,2019)

Global Security Newswire 2014: "U.S. Eliminates Multi-Warheads on All Ground-Based Nuclear Missiles," http://www.nti.org/gsn/article/us-pulls-multiple-warheadsall-nuclear-missiles/ (accessed July 1,2014)

Kristensen, Hans M. & Korda, Matt 2019: "US nuclear forces, 2019," Bulletin of the Atomic Scientists, 75:3, 122-134, DOI: 10.1080/00963402.2019.1606503 (accessed May 23,2019)

NNSA 2017: "Fiscal Year 2018 Stockpile Stewardship and Management Plan," November, 2017.

https://www.nukewatch.org/importantdocs/resources/fy18ssmp\_final\_november\_2017.pdf (accessed June 9,2019)

NNSA 2018: "Fiscal Year 2019 Stockpile Stewardship and Management Plan," October, 2018.

https://www.energy.gov/sites/prod/files/2018/10/f57/FY2019%20SSMP.pdf (accessed June 9,2019)

Space Launch Report 2018: "2018 Major Suborbital Log," http://www.spacelaunchreport.com/log2018.html#log2 (accessed June 9,2019)

Space Launch Report 2019: "2019 Major Suborbital Log," http://www.spacelaunchreport.com/log2019.html#log2 (accessed June 9,2019)

Scully, Janene 2019: "Minuteman III ICBM Tested with Late-Night Launch from Vandenberg AFB," Noozhawk, February 5, 2019. https://www.noozhawk.com/article/minuteman\_iii\_icbm\_test\_at\_vandenberg\_afb (accessed June 9,2019)

U.S. Air Force 2002: "Fact Sheet: LGM-30 MINUTEMAN III" May, 2002. http://www.au.af.mil/au/awc/space/factsheets/minuteman\_iii.htm (accessed June 9,2019)

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#### b) SLBM UGM-133A

Designation: Trident II D5

Propulsion: Three-stage solid-propellant

Launch Ohio-Class strategic nuclear submarine platform: No. of 4~5warheads (Maximum 8 warheads) warheads :

Warhead: W76, W76-1, W88

Specifications: Length 13.4 m, Diameter 1.85 m, Weight 59.0 ton

6,500 km Range: Circular error probability:

Remarks:

The Trident II D5 is being replaced by the D5LE with improved precision and extended service life. This new model will deploy with Columbia-class strategic nuclear submarines currently projected for construction.

The "Mk-" designation is the identifying mark for the heat-resistant protective capsule for the nuclear warheads. Mk-4A/ W76-1 warheads are modifications of Mk-4/ W76 warheads and have the same yield but with modernized armor, fusing, and firing (AF&F) systems. It is this W76-1 warhead that is being supplied to the United Kingdom. The modernization is expected to be completed by FY2019.

The Mark 5/W88 warhead, too, is undergoing modernization, in which the arming, fusing, and firing (AF&F) device is updated and the neutron-generating device and gas (deuterium and tritium) storage pit are replaced. This life-extended upgrade, W88 Alteration (Alt) 370, will be in production by FY2020 and have completed the replacement program by FY2024. Several Trident test lanches are conducted every year. Last year there were two, the most recent being May 9, 2019, from off the coast of Florida. An alteration of the W78 warhead for ICBMs for use with SLBMs is also in development. There are also plans to standardize the ICBM W87 for SLBMs and the SLBM W76-1 for ICBMs. also in development. There are also plans to standardize the ICBM W87 for SLBMs and the SLBM W76-1 for ICBMs.

## [Source]

Arms Control Association 2018: "U.S. Nuclear Modernization Programs," August, 2018. https://www.armscontrol.org/factsheets/USNuclearModernization (accessed

Gady, Franz-Stefan 2019: "US Submarine Test Fires Ballistic Missile," The Diplomat, May 20, 2019. https://thediplomat.com/2019/05/us-submarine-test-fires-ballisticmissile/ (accessed June 9,2019)

Kristensen, Hans M. & Korda, Matt 2019: "US nuclear forces, 2019," Bulletin of the Atomic Scientists, 75:3, 122-134, DOI: 10.1080/00963402.2019.1606503

NNSA 2017: "Fiscal Year 2018 Stockpile Stewardship and Management Plan," November, 2017.

https://www.nukewatch.org/importantdocs/resources/fy18ssmp\_final\_november\_2017.pdf (accessed June 9,2019)

NNSA 2018: "Fiscal Year 2019 Stockpile Stewardship and Management Plan," October, 2018. https://www.energy.gov/sites/prod/files/2018/10/f57/FY2019%20SSMP.pdf (accessed June 9,2019)

Lockheed Martin 2018: "MODERNIZED LOCKHEED MARTIN TRIDENT II D5 MISSILE TEST CERTIFIES SUBMARINE FOR PATROL," March 28, 2018.

https://news.lockheedmartin.com/2018-03-28-Modernized-Lockheed-Martin-Trident-II-D5-Missile-Test-Certifies-Submarine-for-Patrol (accessed June 9,2019)

U.S. Navy 2019: "Fact Sheet: TRIDENT II (D5) MISSILE," https://www.navy.mil/navydata/fact display.asp?cid=2200&tid=1400&ct=2 (accessed June 9,2019)

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# Ohio-Class strategic nuclear submarine

No. of tubes:

SLBM: Trident II D-5/D-5LE

Specifications: Length 171 m, Width 13 m, Emissions 16,600 ton

Submerged 25 knot (46 km/h) speed : Depth: Around 250 m

Where Kings Bay Naval Base(Ga) 6 vessels deployed: Bangor Naval Base(Wa) 8 vessels

Remarks:

Deployment started in 1981, and 14 vessels are presently engaged in nuclear missions. Of them, two are always being overhauled. In order to satisfy the New START Treaty's restrictions on the number of launch platforms (allowing a total 280 launchers for the U.S.), the Ohio-class reduced through 2017 launch tubes on each vessel by 20. Plans are presently being made for 12 Columbia-class nuclear submarines to replace the Ohio-class. The first of them is scheduled to start building in FY2021 and to be commissioned around FY2026. The U.S. Navy estimates the total procurement cost at USD 122 billion.

#### [Source]

Arms Control Association 2018: "U.S. Nuclear Modernization Programs," August, 2018. https://www.armscontrol.org/factsheets/USNuclearModernization (accessed June 5,2019)

Congressional Budget Office 2018: "An Analysis of the Navy's Fiscal Year 2019 Shipbuilding Plan," October, 2018. https://www.cbo.gov/system/files/2019-01/54564-FY19Shipbuilding.pdf (accessed June 9,2019)

Congressional Research Service 2019: "Navy Columbia (SSBN-826) Class Ballistic Missile Submarine Program: Background and Issues for Congress," May 17, 2019.

https://fas.org/sgp/crs/weapons/R41129.pdf (accessed June 9.2019)

FAS 2009: "SSBN-726 Ohio-Class FBM Submarines," http://www.fas.org/nuke/quide/usa/slbm/ssbn-726.htm (accessed June 9,2019)

Kristensen, Hans M. & Korda, Matt 2019: "US nuclear forces, 2019," Bulletin of the Atomic Scientists, 75:3, 122-134, DOI: 10.1080/00963402.2019.1606503

U.S. Department of Defense 2014: "Fact Sheet on U.S. Nuclear Force Structure under the New START Treaty," April 8, 2014.

https://archive.defense.gov/documents/Fact-Sheet-on-US-Nuclear-Force-Structure-under-the-New-START-Treaty.pdf (accessed May 23,2019)

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d) Cruise missile AGM-86

Type: Air-launched cruise missile Warhead: W80-1 (5-150kt, Variable-yield)

Length 6.29 m, Diameter 0.62 m, Weight 1.4 ton Specifications:

Max. speed: 880 km/h 2,500 km Range:

Carried by: B52-H Stratofortress

Remarks:

The missiles are planned to be keep operational by the 2020s. Ordinarily they are not carried by bombers but instead stored at Minot Air Base in North Dakota. They are said to be ready for loading onto delivery systems within several days if needed. Reserve stockpile is stored in central storage at at Kirtland Air Force Base.

Meanwhile, new-model Long Range Stand Off (LRSO) missiles are in development, and its production will begin from 2026. Its warhead will be the W80-4, a life-extended modification of the W80-1. The U.S. Air Force plans to purchase

1,000 warheads, twice as much as its current arsenal of 1,000 warheads.

# [Source]

Arms Control Association 2018: "U.S. Nuclear Modernization Programs," August, 2018. https://www.armscontrol.org/factsheets/USNuclearModernization (accessed June 5,2019)

Kristensen, Hans M. 2014: "W80-1 Warhead Selected For New Nuclear Cruise Missile," October 10, 2014, https://fas.org/blogs/security/2014/10/w80-1 Irso/ (accessed June 9,2019)

Kristensen, Hans M. & Korda, Matt 2019: "US nuclear forces, 2019," Bulletin of the Atomic Scientists, 75:3, 122-134, DOI: 10.1080/00963402.2019.1606503 (accessed May 23,2019)

NNSA 2018: "Fiscal Year 2019 Stockpile Stewardship and Management Plan," October, 2018. https://www.energy.gov/sites/prod/files/2018/10/f57/FY2019%20SSMP.pdf (accessed June 9,2019)

U.S. Air Force 2010: "AGM-86B/C/D Missiles," May 24, 2010. https://www.af.mil/About-Us/Fact-Sheets/Display/Article/104612/agm-86bcd-missiles/ (accessed June

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#### e) Strategic nuclear bomb

Type:

Gravity bomb B61-7 (Variable-yield : 10–360kt) B61-11 (Earth-penetrating weapons : 400kt) B83-1 (Variable-yield : low-1,200kt)

Specifications:

Length 3.56 m, Diameter 0.33 m, Weight 0.32 ton

B83-1

Length 3.7 m, Diameter 0.46 m, Weight 1.1 ton

Carried by: B-2 Spirit Remarks:

Ordinarily not carried by bombers but instead stored at Whiteman Air Base in Missouri. They are thought to be ready

Kirtland Air Force Base. The B61-12 new-model precision guided bomb is presently being developed with the B61-4 tactical nuclear bomb as a base, and the production of the B62-12 is schedule to be started by FY2020. The B61-12 will replace all gravity bombs by FY2024.

# [Source]

f)

Arms Control Association 2018: "U.S. Nuclear Modernization Programs," August, 2018. https://www.armscontrol.org/factsheets/USNuclearModernization (accessed June 5,2019)

Kristensen, Hans M. & Norris, Robert S. 2014: "The B61 family of nuclear bombs," Bulletin of the Atomic Scientists, 70:3, 79-84, DOI: 10.1177/0096340214531546 (accessed June 9,2019)

Kristensen, Hans M. & Korda, Matt 2019: "US nuclear forces, 2019," Bulletin of the Atomic Scientists, 75:3, 122-134, DOI: 10.1080/00963402.2019.1606503 (accessed May 23,2019)

Pawlyk, Oriana 2018: "Nuclear Gravity Bomb Completes First Qual Tests on B-2 Bomber," Military.com, June 30, 2018. https://www.military.com/daily-news/2018/06/30/b61-12-nuclear-gravity-bomb-completes-first-qual-tests-b-2-bomber.html (accessed June 9,2019)

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## Strategic bomber B52-H

Designation: Stratofortress

Nuclear Maximum 20 warheads (Air-launched cruise missile AGM-86) Weapons:

Specifications: Length 48.5 m, Span 56.4 m

Max. speed: 1,000 km/h Range: 16,000 km

No. of deployed: 93 (Nuclear mission: 44) Barksdale Air Base (LA) Minot Air Base in North Dakota Where deployed:

In service since 1961. Improvements in GPS functionality as well as storage and operational capability have been under way since 1989. It will carry longer-range cruise missiles and the B61-12 precision guided nuclear bomb currently under development to replace cruise missiles it presently carry. With replaced engines, the B-52H is set to remain in service into the 2050s. Northrop Grumman is the main contractor developing the B-21 Raider, a new stealth long-range bomber to replace B-52s and B-1Bs. The unit cost is estimated to be about USD 600 million per aircraft. It is scheduled to be in operation in the late 2020s. It will carry new cruise missiles, also in development, and the B61-12 guided nuclear bomb.

the B61-12 guided nuclear bomb.

# [Source]

Remarks:

Arms Control Association 2018: "U.S. Nuclear Modernization Programs," August, 2018. https://www.armscontrol.org/factsheets/USNuclearModernization (accessed June 5,2019)

Boaing 2019: "B-52 bomber," https://www.boeing.com/defense/b-52-bomber/ (accessed June 9,2019)

Kristensen, Hans M. & Korda, Matt 2019: "US nuclear forces, 2019," Bulletin of the Atomic Scientists, 75:3, 122-134, DOI:

10.1080/00963402.2019.1606503(accessed May 23,2019)

Osborn, Kris 2019: "Air Force Maps Plan to Arm B-21 Stealth Bomber With Nuclear Weapons," Warrior Maven, May 29, 2019. https://defensemaven.io/warriormaven/air/air-force-maps-plan-to-arm-b-21-stealth-bomber-with-nuclear-weapons-ErnTrICemU6l6qetb4FGLQ/ (accessed June 9,2019)

U.S. Air Force 2016: "The B-21 has a name: Raider." September 19, 2016. http://www.af.mil/News/Article-Display/Article/948366/the-b-21-has-a-name-raider/

U.S. Air Force 2018: "Air Force outlines future of bomber force," February 12, 2018. https://www.af.mil/News/Article-Display/Article/1438634/air-force-outlinesfuture-of-bomber-force/ (accessed June 9,2019)

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#### Strategic bomber B-2

Spirit Designation:

Nuclear Maximum 16 warheads (Gravity bomb B61-7, B61-11, B83-1) Weapons:

Specifications: Length 21 m, Span 52 m (Stealth aircraft)

Max. speed: 1,100 km/h Range: 11,100 km

No. of 20 (Nuclear mission: 16) deployed:

Where

g)

Whiteman Air Force Base (Missouri)

deployed : Remarks:

In service since 1997. Between 2000 and 2015, the U.S. spent USD 9.5 billion upgrading the bomber's nuclear command and control, radar and satellite communications capability. Plans are to carry B61-12 new-model precision guided bombs and new-model Long Range Stand Off (LRSO) missiles to replace the B61-7 and B61-11 from the 2020s. Currently, flight tests continue with the B61-12 released from the B-2. Originally, the B-2 was to remain operational, even after the new B-21 strategic bomber has entered service, but the Air Force chnaged course in 2018, opting to keep the B-52H instead, whose fleet size is four times as large as the B-2 counterpart. Once a certain number of B-21s are operational, the B-2 will commence its retirement program.

#### [Source]

h)

Arms Control Association 2018: "U.S. Nuclear Modernization Programs," August, 2018. https://www.armscontrol.org/factsheets/USNuclearModernization (accessed June 5,2019)

Kristensen, Hans M. & Korda, Matt 2019: "US nuclear forces, 2019," Bulletin of the Atomic Scientists, 75:3, 122-134, DOI: 10.1080/00963402.2019.1606503 (accessed May 23,2019)

Northrop Grumman 2007: "B-2 Spirit Stealth Bomber," https://www.northropgrumman.com/Capabilities/B2SpiritBomber/Documents/pageDocuments/B2-Fact-Sheet.pdf (accessed June 9,2019)

Pawlyk, Oriana 2018: "Nuclear Gravity Bomb Completes First Qual Tests on B-2 Bomber," Military.com, June 30, 2018. https://www.military.com/dailynews/2018/06/30/b61-12-nuclear-gravity-bomb-completes-first-gual-tests-b-2-bomber.html (accessed June 9,2019)

U.S. Air Force 2018: "Air Force outlines future of bomber force," February 12, 2018. https://www.af.mil/News/Article-Display/Article/1438634/air-force-outlines-future-of-bomber-force/ (accessed June 9,2019)

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# Air-launched, Non-strategic nuclear weapons

Type:

Gravity bomb B61-3 (Variable-yield : 0.3, 1.5, 60, 170kt) B61-4 (Variable-yield : 0.3, 1.5, 10, 50kt)

Specifications: Length 3.56 m, Diameter 0.33 m, Weight 0.32 ton

Carried by: F-15E, F-16, PA200 Tornado Belgium: Kleine Brogel Air Base Where deployed: Germany : Büchel Air Base Italy: Aviano Air Base (U.S.) : Ghedi Torre Air Base Holland: Volkel Air Base Turkey: Incirlik Air Base (U.S.)

Shared with NATO forces. The earth-penetrating, precision-guided B61-12 is in development and slated to begin replacing the B61-3 and B61-4 from mid-2022. It is projected to deploy aboard the latest stealth fighter F35-A. Remarks:

## [Source]

Norris, Robert S. & Kristensen, Hans M. 2011: "US tactical nuclear weapons in Europe, 2011," Bulletin of the Atomic Scientists, 67:1, 64-73, DOI: 10.1177/0096340210393931 (accessed June 9,2019)

Kristensen, Hans M. 2013: "Capabilities of B61-12 Nuclear Bomb Increase Further," October 30, 2013. http://blogs.fas.org/security/2013/10/b61-12hearing/ (accessed June 5,2019)

 $\textbf{Kristensen, Hans M. 2014}: "B61-12: The New Guided Standoff Nuclear Bomb," http://fas.org/programs/ssp/nukes/publications1/Brief2014\_PREPCOM2.pdf (accessed Standoff Nuclear Bomb," https://fas.org/programs/ssp/nukes/publications1/Brief2014\_PREPCOM2.pdf (accessed Standoff Nuclear Bomb," https://fas.org/programs/ssp/nukes/publications1/Brief2014\_PREPCOM2.pdf (acc$ 

Kristensen, Hans M. & Norris, Robert S. 2012: "Nonstrategic nuclear weapons, 2012," Bulletin of the Atomic Scientists, 68:5, 96-104, DOI:

Kristensen, Hans M. & Korda, Matt 2019: "US nuclear forces, 2019," Bulletin of the Atomic Scientists, 75:3, 122-134, DOI: 10.1080/00963402.2019.1606503 (accessed May 23,2019)

NNSA 2018: "Fiscal Year 2019 Stockpile Stewardship and Management Plan," October, 2018.

https://www.energy.gov/sites/prod/files/2018/10/f57/FY2019%20SSMP.pdf (accessed June 9,2019)

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