

US nuclear weapons capability

【Overview】

The Trump administration's Nuclear Posture Review (NPR) in 2018 included the development of smaller warheads to be deployed in regional conflicts, thereby lowering the threshold for the use of nuclear weapons and enhancing the role of the nuclear arsenal in US national security. The US, having converted the W76-1 into a lower-yield W76-2 (5-7 kilotons)(**Kristensen, Hans M. & Korda, Matt 2020-1**), began to deploy the variant in February 2020 aboard the USS Tennessee (SSBN-734) (**U.S. Department of Defense 2020, FAS Strategic Security Blogs**). Furthermore, the FY2021 budget requested provisions to develop a next-generation SLBM warhead, the W93 (**NNSA 2020**). The U.S. has long-term plans to develop SLCMs and other nuclear weapons that could be used for preemptive strike.

Meanwhile, there is a major modernization plan of the U.S. nuclear arsenal initiated by the previous administration as described below. 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**). The newly authorized budget provisions to develop the W76-2 and W93 warheads, however, go beyond the original modernization scope and imply moves, already under way, to supersede it. This requires close monitoring. Nuclear warheads in operational deployment are estimated to number 1,750: 1,600 strategic warheads and 150 non-strategic (**Kristensen, Hans M. & Korda, Matt 2020-1**), almost unchanged from a year ago. The strategic warheads are deployed with ICBMs, SLBMs and strategic bombers. This number is greater than the 1,376 strategic nuclear warheads in operational deployment registered under the New START as on March 1, 2020 (**U.S. Department of State 2020**). 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.

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 an 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.

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 four times (Kristensen, Hans M. & Korda, Matt 2020-1) and once this year by the end of May (Space Launch Reports 2020). Meanwhile, the SLBM Trident II saw five test launches last year (Kristensen, Hans M. & Korda, Matt 2020-1) and once this year by the end of May (Gady, Franz-Stefan 2020). Also, twice in 2019, on August 18 and December 12, the US test-fired a new ground-launched, intermediate-range cruise missile (GLCM), which used to be banned by the INF Treaty (U.S. Department of Defense 2019, Vandenberg Air force Base 2019).

Updated: June 1, 2020

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)
Minuteman III Mk-12A	200	1	200	W78	335	1979	
Minuteman III Mk-21/SERV	200	1	200	W87	300	2006	
Submarine-launched ballistic missile (SLBM)	212		900				3)
Trident II D5 Mk-4A	122	3~6	466	W76-1	100	2008	Carried by the Ohio-class nuclear submarine
Trident II D5 Mk-4A	?	1~2	50	W76-2 ⁴⁾	5 - 7	2019	
Trident II D5 Mk-5	90	3~6	384	W88	455	1990	
Strategic bomber payloads	450		450				5)
Cruise missile	200	1	200	W80-1	5 - 100	1961	Carried by the B-52H
Strategic nuclear bomb	100	1	100	B61-7	10 - 360	1985	
				B61-11	400	1997	Carried by the B-2A
				B83-1	low - 1,200	1993	
Non-strategic nuclear and airborne weapons	150	1	150	B61-3	0.3 - 170	1979	6)
				B61-4	0.3 - 50		
Reserve / Nondeployed			2,050				7)
ICBM			400				8)
SLBM			1,020				9)
Air-launched systems (Bombers, etc.)		630	630				
Strategic bomber Payload		550	550				10)
Non-strategic nuclear weapons		80	80	B61-3/4			11)
Retired warheads awaiting dismantlement, etc.			~2,000				12)
Total inventory			~5,800				

【Notes】

- 1) In line with the latest estimates on operational deployment (Kristensen, Hans M. & Korda, Matt 2020-2).

- 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 July 1, 2019, there were a total of 398 ICBMs in deployment (**U.S. Department of State 2019**). 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 2020-1**).
- 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**). The New START Treaty data as of July 1, 2019 (**U.S. Department of State 2019**), SLBMs in deployment were 209, 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. 50 W76-2s were transferred to the Navy by the end of FY2019 (**Kristensen, Hans M. & Korda, Matt 2020-1**) and deployed on board USS Tennessee (SSBN-734) in February 2020 (**FAS Strategic Security Blogs 2020**).
- 5) Of 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 2020-1**). Since the B-2A 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**).
- 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 2020-2**).
- 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 2020-1**).
- 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 Pantex (Texas) and Y-12 plants (Tennessee) (**Kristensen, Hans M. & Korda, Matt 2020-2**).

【Source】

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ICBM

Designation	:	Minuteman III
Propulsion	:	Three-stage solid-propellant
No. of warheads	:	Maximum 3 warheads
Launch platform	:	Silo
Specifications	:	Length 18m, Diameter 1.7m, Weight 32.2tons
Range	:	Over 9,600km
Circular error probability	:	110m

SLBM

Designation	:	Trident II D5
Propulsion	:	Three-stage solid-propellant
No. of warheads	:	Maximum 8 warheads
Specifications	:	Length 13.4m, Diameter 1.85m, Weight 59tons
Range	:	6,500km
Circular error probability	:	120m
Submarine	:	Ohio-Class strategic nuclear submarine

Strategic nuclear submarine

Model	:	Ohio-Class
Submerged speed	:	25knot (46km/h)
No. of tubes	:	24
Specifications	:	Length 171m, Width 13m, Emissions 16,600tons
No. of submarines in service	:	14

Cruise missile

Designation	:	AGM-86
Range	:	2,500km
Specifications	:	Length 6.29m, Diameter 0.62m, Weight 1.4tons
Carried by	:	B52-H Stratofortress

Strategic nuclear bomb

Type	:	Gravity bomb
Specifications	:	
Carried by	:	B-2A Spirit

Air-launched, Non-strategic nuclear weapons

Designation	:	Gravity bomb B61-3, B61-4
Specifications	:	Length 3.56m, Diameter 0.33m, Weight 0.32tons
Carried by	:	F-15E, F-16, Tornado
Remarks	:	Deployed in Europe, shared with NATO forces.

Strategic bomber

Type & Designation	:	B-52H Stratofortress
Max. speed	:	1,200km/h
Specifications	:	Length 48.5m, Span 56.4m
Range	:	16,000km
Payload	:	Capable of carrying twenty AGM-86 cruise missiles
No. of submarines in service	:	93 (Nuclear mission: 44)

Strategic bomber		
Type & Designation	:	B-2A Spirit
Max. speed	:	1,010km/h
specifications	:	Length 21m, Span 52m (stealth aircraft)
Range	:	11,100km
Payload	:	Carrying 16 strategic nuclear bombs
No. of submarines in service	:	20 (Nuclear mission: 16)