

Table 2.9 - Operational Nuclear Delivery Systems, 2015-2016

NAME/DESIGNATION	AKA	NUMBER OF SYSTEMS Active+Spares	YEAR FIRST DEPLOYED	WARHEAD TYPE	NUMBER OF WARHEADS x YIELD (kilotons)	RANGE (km)	TOTAL NUMBER OF WARHEADS Active+Spares
LAND BALLISTIC MISSILES							
UNITED STATES							
ICBM							
LGM-30G	Minuteman III					13,000	
	MK-12A	200	1979	MIRV, Single	1-3 x 335		200
	MK-21 SERV	250	2006	Single	1 x 300		250
TOTAL 15(SIPRI) 15(BULL)		450					450
SRBM							
ATACMS Block I		Some	1991	Single	1 x 560kg payload	165	Some
ATACMS Block IA		Some	1998	Single	1 x 160kg payload	300	Some
ATACMS Block II		Some	2002	Single	1 x 270kg payload	140	Some
TOTAL 08(WIKI)		Some					Some
RUSSIA							
ICBM							
SS-18 M6 Satan	RS-20V	46	1988	MIRV	10 x 500-800	11,000-15,000	460
SS-19 M3 Stiletto	RS-18 (UR- 100NUTTH)	30	1980	MIRV	6 x 400	10,000	180
SS-25 Sickle	RS-12M (Topol)	99	1988	Single	1 x 800	10,500	99
SS-27 Mod. 1 (mobile)	RS-12M1 (Topol-M)	18	2006	Single	1 x (800)?	10,500	18
SS-27 Mod. 1 (silo)	RS-12M2 (Topol-M)	60	1997	Single	1 x 800	10,500	60
SS-27 Mod. 2 (mobile)	RS-24 (Yars)	54	2010	MIRV	4 x (100)?	10,500	216
SS-27 Mod. 2 (silo)	RS-24 (Yars)	4	2014	MIRV	4 x (100)?	10,500	16
SS-27 Mod. 3 (mobile)	RS-26 (Yars- M)	-	(2015)	MIRV	3 x (100)?		-
SS-27 Mod. ? (rail)	Barguzin	-	(2019)	MIRV	4 x (100)?		-
"heavy" ICBM 2 (silo)	Sarmat	-	(2020)	MIRV	10 x (100)?		-
TOTAL 15(SIPRI) 15(BULL)		311					1,049
SRBM							
SS-1c Mod 1	Scud-B	Some	1964	Single	1 x 1,000kg payload	300	Some
SS-1c Mod 2	Scud-B	Some	1964	Single	1 x 950kg payload	240	Some

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SS-21 Scarab	Tochka	80	1981	Single	(1 x 10)	120	~/(~80)
SS-26 Stone	Iskander	60	2005	Single	(1 x 10)	500	~/(~60)
TOTAL 15(SIPRI) 15(BULL) 08(WIKI)		~140					~140
CHINA							
ICBM							
CSS-4 Mod 2	DF-5A	10	1981	Single	1 x 4,000-5,000	13,000+	10
CSS-4 Mod 3	DF-5B	10	2014	MIRV	3 x (200-300)?	<13,000+	30
CSS-10 Mod 1	DF-31	~8	2006			>7,200	~8
				Single	1 x 200-300		
				MIRV	3 x 50-100		
CSS-10 Mod 2	DF-31A	~25	2007			>11,200	~25
				Single	1 x 200-300		
				MIRV	3-5 x 20-150		
TOTAL 15(SIPRI) 15(BULL)		~53					~73
IRBM							
CSS-2	DF-3A	?	1971	Single	1 x 3,300	3,100	?
CSS-3	DF-4	~10	1980	Single	1 x 3,300	5,500	~10
CSS-5	DF-21, DF-21A	<100	1991	Single	1 x 200-300	2,150	~80
TOTAL 15(SIPRI) 15(BULL) 11(WIKI)		~110					~90
SRBM							
CSS-6	DF-15/M-9	~100	1990	Single	1 x 50-350	600	Some
CSS-7	DF-11/M-11	32	1999	Single	1 x 0.5	300	Some
CSS-8	DF-7	30	?	Single	1 x 500kg payload	150	?
TOTAL 15(SIPRI) 15(BULL) 04(IISS)		~162					Some
INDIA							
IRBM							
Agni II		~8	2011	Single	1 x 40	>2,000	~8
Agni III		~4	2014?	Single	1 x 40	>3,200	~4
Agni IV		?	(2016)		1,000kg	>3,500	?
Agni V		?	(2017)	Single	1 x (1,000kg) payload	>5,200	?
TOTAL 15(SIPRI) 15(BULL) 12(JDW)		~12					~12

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11(WIKI)							
SRBM							
Agni I		~20	2007	Single	1 x 40	~700	~20
Prithvi II		~24	2003	Single	1 x 12	250	~24
TOTAL 15(SIPRI) 15(BULL)		~44					~44
PAKISTAN							
IRBM							
Ghauri-1	Haft 5	<50	2003	Single	1 x 700-1,000kg payload	1,250	Some
Ghauri-2	Haft 5A	Some	2003	Single	1 x 15-30	2,000	Some
Ghauri-3		Some	(>2011)	Single		3,000-3,500	Some
Shaheen-2	Haft 6	Some	2007	Single	~1 x 1,000+kg payload	2,500	Some
Shaheen-3		Some	(>2011)	Single		2,750	Some
TOTAL 15(SIPRI) 11(BULL) 15(WIKI)		Some					Some
SRBM							
	Haft 1	Some	1989	Single	1 x 500kg payload	70	Some
	Haft 1A	Some	1995	Single	1 x 500kg payload	100	Some
	Haft 1B	Some	2001	Single	1 x 500kg payload	100	Some
Abdali	Haft 2	Some	2002	Single	1 x 200-400kg payload	180	Some
Ghaznavi	Haft 3	<50	2004	Single	1 x 500kg payload	290-320	Some
Shaheen-1	Haft 4	<50	2003	Single	1 x 750-900kg payload	750	Some
Shaheen-1A	Haft4	Some	(2012)	Single	1 x 1,000kg payload	900	Some
Nasr	Haft 9	Some	(2011)	Single	1 x 0.5-5	60	Some
TOTAL 15(SIPRI) 11(BULL) 15(WIKI)		Some					Some
ISRAEL							
ICBM							
Jericho 3		2-5	2008				Some
				Single	1 x 1,000-1,300	11,500	
				MIRV	6 x 100	11,500	
Jericho 2B		Some	1990	Single	1 x 500kg	>7,800	Some
TOTAL		Some					Some

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15(SIPRI) 14(BULL) 12(JDW) 11(WIKI) Note [1], [2], [3], [4], [5]							
IRBM							
Jericho 2		24	1990				Some
				Single	1 x 750- 1,000kg payload	1,500-1,800	
TOTAL 16(ISS) 15(SIPRI) 14(BULL) 11(WIKI)		24					Some
NORTH KOREA							
IRBM							
No-Dong-1		Some	1997	Single	1 x 750- 1,000kg payload	1,250	Some
Rodong-1		Some		Single		1,300	Some
Rodong-2		Some		Single		2,000	Some
Taepodong-1		Some		Single		2,500	Some
Musudan		Some	(>2011)	Single	~1,000kg payload	3,500-4,000	Some
Hwasong-13		Some				>5,500	Some
Taepodong		Some				>5,500	Some
TOTAL 15(ISS) 15(SIPRI) 05(BULL) 11(WIKI)		0(6)					Up to 20
SRBM							
Scud-B		Some	1979-1980	Single	1 x 1,000kg payload	300	Some
Scud-C variant		Some	1989	Single	1 x 700kg payload	500	Some
Scud-D		Some	2006	Single	1 x 500kg payload	700	Some
TOTAL 15(SIPRI) 05(BULL)		Some					Some
SLBM							
UNITED STATES							
UGM-133	Trident II D-5	288					
	MK-4		1992	MIRV	4 x 100	12,000	168
	MK-4A		2008	MIRV	4 x 100	>7,400	600
	MK-5		1990	MIRV	4 x 475	12,000	384
TOTAL 15(SIPRI)		288					1,152

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15(BULL)							
UNITED KINGDOM							
UGM-135	Trident II D-5	48	1994	MIRV	1-3 x 100	12,000	215
TOTAL 15(SIPRI) 11(BULL)		48					215
RUSSIA							
SS-N-18 M1 Stingray	RSM-50	32	1978	MIRV	3 x 50	6,500	96
SS-N-23 M1	RSM-54 (Sineva)	96	2007	MIRV	4 x 100	9,000	320/384
SS-N-32	RSM-56 (Bulava)	16	2014	MIRV	6 x 100	>8,050	96
TOTAL 15(SIPRI) 15(BULL)		144					512/576
FRANCE							
M-45		16	1996	MIRV	4-6 x 100	6,000	80
M-51.1		32	2010-2011	MIRV	4-6 x 100	8,000-10,000	160
M-51.2		0	(2015)	MIRV	4-6 x TNO	6,000	0
M-51.3		0					0
TOTAL 15(SIPRI) 08(BULL)		48					240
CHINA							
CSS-NX-3		?	1986				?
	JL-1			Single	1 x 200-300	>1,770	
	JL-1			Single	1 x 25-50	2,150	
	JL-1A			Single	1 x 25-50	2,500	
CSS-NX-14	JL-2	(48)	(2015)			>8,000	(48)
				Single	1 x 200-300		
				MIRV	3-4 x 90		
TOTAL 15(SIPRI) 15(BULL)		(48)					(48)
INDIA							
	K-4	?	?	Single	1 x 1,000kg payload	~3,000	?
Sagarika / Arihant	K-15	(12)	(2017)	Single	1 x 12	700	(12)
Dhanush	NA	2	2013	Single	1 x 12	400	2
TOTAL 15(SIPRI) 15(BULL)		(14)					(14)
AIRCRAFT							
UNITED STATES							
STRATEGIC							
B-52H	Stratofortress	78/44	1961	ALCM	5-150	16,000	200

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				ACM	5-150		
B-2A	Spirit	11/16	1994	Bombs B61-7, -11, B83-1	ACM 5-150	11,000	100
TOTAL 15(SIPRI) 15(BULL)		89/60					300
SUB-STRATEGIC							
F-15E	Strike Eagle	Some	1988	Bomb B61-3, B61-4	1 x 0.3-170, 1 x 0.3-45	2,500	Some
F-16A/B/C/D	Fighting Falcon	Some	1976	Bomb B61-3, B61-4	1 x 0.3-170, 1 x 0.3-45	2,500	Some
F-117A	Nighthawk	Some	1983	Bomb B61-3, B61-4	1 x 0.3-170, 1 x 0.3-45	2,100	Some
TOTAL 11(SIPRI) 09(WIKI) 04(IIS) 08(BULL)		Some					200
RUSSIA							
STRATEGIC							
Bear H6	Tu-95 MS6	24/29	1984	ALCM	6 x ?	6,500-10,500	24/174
				Bombs	? x ?		
Bear H16	Tu-95 MS16	25/30	1984	ALCM	16 x ?	6,500-10,500	25/480
				Bombs	? x ?		
Blackjack	Tu-160	11/13	1987	ALCM	12 x ?	10,500-13,200	11/156
				SRAM	? x ?		
				Bombs	? x ?		
TOTAL 15(SIPRI) 15(BULL)		60/72					60/810
SUB-STRATEGIC							
Land-based bombers							
Tu-22M-3	Backfire	120	1974	ASM	3 x ?	4,800-7,000	~/(~350)
				Bombs	? x ?		
Su-24M/M2	Fencer	250	1974	Bombs	2 x ?	2,100-3,000	~/(~250)
Su-34	Fullback	46	2006	Bombs	2 x ?		~/(~46)
TOTAL 15(SIPRI) 15(BULL)		~430					~/(~650)
Naval bombers, submarines, surface ships							
TOTAL 15(SIPRI) 15(BULL)		Some					~650
FRANCE							
LAND-BASED							
Mirage 2000N		~20	1988	ASMP	1 x 300	2,750	~20
Rafale F3		~20	2010-2011	ASMP	1 x 300	2,000	~20
TOTAL 15(SIPRI) 08(BULL)		~40					~40

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CARRIER-BASED							
Rafale MK3		~10	2010-2011	ASMP	1 x 300	2,000	~10
TOTAL 15(SIPRI) 08(BULL)		~10					~10
CHINA							
STRATEGIC							
H-6	B-6	~20	1965	Bomb	1 x 3,000kg payload	3,100	~20
Fighters		?	1972-	Bomb			?
TOTAL 15(SIPRI) 15(BULL)		>~20					>~20
ISRAEL							
SUB-STRATEGIC							
F-4E-2000	Kurnass	Some	1989	Bomb	1 x 8,480kg payload	2,200	Some
F-16A Fighting Falcon	Netz/Hawk	88	1980	Bomb	1 x 5,400kg payload	2,500	Some
F-16B Fighting Falcon	Netz/Hawk	16		Bomb	1 x 5,400kg payload	2,500	Some
F-16C Fighting Falcon	Barak / Lightning	75		Bomb	1 x 5,400kg payload	2,500	Some
F-16D Fighting falcon	Barak / Thunderbolt	46		Bomb	1 x 5,400kg payload	2,500	Some
F-16I Fighting Falcon	Sufa / Storm	101		Bomb	1 x 5,400kg payload	2,500	Some
F-15I Strike Eagle	Ra'am / Thunder	25	1997	Bomb	1 x 10,400kg payload	2,500	Some
F-35I Lightning II		(20)+(55)	(2015)-(2030)	Bomb	5,895kg payload	2,200	(Some)
TOTAL 15(SIPRI) 14(BULL) 15(WIKI) 12(JDW)		351+(20)+(55)					Some
INDIA							
SUB-STRATEGIC							
Jaguar IS/IB	Shamsher	~16	1981	Bomb	1 x 4,760kg payload	1,400	~16
Mirage 2000H	Vajra	~32	1985	Bomb	1 x 6,300kg payload	1,850	~32
TOTAL 15(SIPRI) 15(BULL)		~48					~48
PAKISTAN							
SUB-STRATEGIC							
F-16A/B	Fighting	~30	1983	Bomb/Babur	1 x 4,500kg	1,600	Some

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	Falcon			LACM	payload		
Mirage 2000-5		Some	2002	Bomb	1 x 4,000kg payload	2,100	Some
JF-17		Some					Some
TOTAL 15(SIPRI) 11(BULL)		~30					Some
NORTH KOREA							
SUB-STRATEGIC							
H-5	Il-28	80	1950	Bomb	1 x 3,000kg payload	2,100	Some
TOTAL 15(SIPRI) 05(BULL)		80					Some
SLCM							
UNITED STATES							
Tomahawk	TLAM-N	325	1984	Single	1 x 5-150	2,500	(0)
TOTAL 12(BULL) 11(SIPRI) 10(BULL)		325					(0)
RUSSIA							
SS-N-9	Siren	Some	1972	Single	1 x 200	110	Some
SS-N-12	Sandbox	Some	1959-1960	Single	1 x 350	550	Some
SS-N-19	Shipwreck	Some	1980	Single	1 x 500	550	Some
SS-N-21	Sampson	Some	1984	Single	1 x 200	2,400	Some
SS-N-22	Sunburn	Some	1980	Single	1 x 320kg payload	120	Some
SS-N-30	Kalibr	Some	2012	Single	1 x 450kg payload	2,500	Some
TOTAL 15(WIKI) 15(JDW) 11(SIPRI) 10(BULL)		Some					~280
ISRAEL							
Turbo-Popeye 3		Some	2000	Single	1 x 200kg payload	1,500	Some
TOTAL 15(SIPRI) 14(BULL) 04(IISS)		Some					Some
ALCM							
UNITED STATES							
AGM-868		1,140	1982/1991	Single	1 x 900- 1,400kg payload	2,500	Some
AGM-129		460	1990	Single	1 x 5-200	3,500	Some

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TOTAL 11(SIPRI) 08(BULL)		1,600					Some
RUSSIA							
AS-4	Kh-24 Kitchen	Some	1964	Single	1 x 1,000	310	Some
AS-15A	Kh-55 Kent	Some	1971	Single	1 x 200-250	2,500	Some
AS-15B	Kh-55SM Kent	Some	1986	Single	1 x 200-250	3,000	Some
AS-16	Kh-15 Kickback	Some	1980	Single	1 x 350	150	Some
TOTAL 11(SIPRI) 08(BULL)		Some					Some
FRANCE							
ASMP		Some	1985	Single	1 x 300	250	Some
TOTAL 11(SIPRI) 08(BULL)		Some					Some
CHINA							
DH-10	CJ-10	150-350	2007	Single	1 x ?	>1,500	Some
DH-20?	CJ-20	?	2014	?	1 x ?	>1,500	Some
TOTAL 15(SIPRI) 15(BULL)		150-350					Some
PAKISTAN							
Babur	Haft-7	Some	2005	Single	1 x 300kg payload	700	Some
Ra'ad	Haft-8	Some	(>2011)	Single	1 x 10-35	350	Some
TOTAL 15(SIPRI) 11(BULL) 15(WIKI)		Some					Some
GLCM							
INDIA							
Nirbhay		?	?	Single	1 x 250-450kg payload	>700	?
15(SIPRI)							
MISSILE AND AIR DEFENSE SYSTEMS							
RUSSIA							
STRATEGIC DEFENSIVE SYSTEMS							
53T6	SH-08 Gazelle	68	1986	Single	1 x 1,000 / 10	30	(68)
S-300 and S-400	SA-10/20 Grumble, and SA-21	~1,000	1980 and 2007	Single	1 x low yield	5-150	(~340)

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	Growler						
SSC-1B Sepal	Redut	34	1973	Single	1 x 500	500	(~17)
TOTAL 15(SIPRI) 15(BULL)		~1,100					(~425)
UNITED STATES							
STRATEGIC DEFENSIVE SYSTEMS							
LAND-BASED							
Fort Greely (Alaska)		26	2004				0
Fort Greely (Alaska)		(14)	(2017)				(0)
Vandenburg (California)		4	2004				0
TOTAL ground-based interceptors		30+(14)					0
SEA-BASED							
Aegis BMD cruisers		5					0
Aegis BMD destroyers		25					0
TOTAL Aegis BMD ships		30(80-97)					0
15(IISS) 14(WIKI) 08(SIPRI)							
SUB-STRATEGIC DEFENSIVE SYSTEMS							
PAC-3 missiles		546					0
TOTAL 08(SIPRI)		546					0

ACM advanced cruise missile

AKA also known as

ALCM air-launched cruise missile

ASM air-to-surface missile

MIRV multiple independently targetable re-entry vehicles

ICBM intercontinental ballistic missile

IRBM intermediate-range ballistic missile

SRBM short-range ballistic missile

SLBM submarine-launched ballistic missile

SLCM submarine-launched cruise missile

LACM land-attack cruise missile

GBI ground-based interceptors

BMD ballistic missile defense

PAC-3 Patriot advanced capability-3

SOURCES: SIPRI, BULL, WIKI, IISS, JDW

Notes.

- 1) According to an official report which was submitted to the American congress in 2004, it may be that with a payload of 1,000 kg the Jericho 3 gives Israel nuclear strike capabilities within the entire Middle East, Africa, Europe, Asia and almost all parts of North America, as well as within large parts of South America and North Oceania.
- 2) Henry A. Kissinger (16 July 1969), "Israeli Nuclear Program," Memorandum for the President (The White House), Retrieved 2009-07-26
- 3) Proliferation of Weapons of Mass Destruction: Assessing the Risks, U.S. Congress Office of Technology Assessment, August 1993, OTA-ISC-559, Retrieved 2008-12-09
- 4) Missile Survey: Ballistic and Cruise Missiles of Foreign Countries, by Andrew Feikert, Congressional Research Service, Updated March 5, 2004
- 5) Study on a Possible Israeli Strike on Iran's Nuclear Development Facilities, by Abdullah Toukan, Center for Strategic and International Studies, March 14, 2009

Table 2.10 – Operational Nuclear Warheads, 2015-2016, Strategic

OBS	COUNTRY	ICBM	IRBM	SLBM	ALCM/BOMBS	TOTAL
1	Russia	1,049		512/576	60/810	~1,648-1,780
2	U.S.	447/450		1,152	300	~1,538-1,900
3	France			240	50	~280-290
4	China	~73	96	0(48)	~20	~240-250
5	U.K.			215		120-215
6	India		12	~14		~Up to 26-120
7	Israel	2-5	24			~80
8	Pakistan		30			Up to 130
9	N. Korea					Up to 20

ALCM air-launched cruise missile

ICBM intercontinental ballistic missile

IRBM intermediate-range ballistic missile

SLBM submarine-launched ballistic missile

SOURCES: SIPRI, BULL, IISS, JDW

Table 2.11 – Operational Nuclear Warheads, 2015-2016, Sub-Strategic

OBS	COUNTRY	SRBM	SLCM, NAVY WEAPONS	ABM, AIR/CO ASTAL DEFENS E	AIRCRAFT STRIKE	TOTAL
1	Russia		192	~425	~650	~1,950-2,000
2	U.S.				Some	~180-500
3	Pakistan	30			~50-60	Some
4	India	42			~48	Some
5	Israel	Some	Some		50	Some
6	N. Korea				Some	Some
7	China	Some			Some	Some
8	France					Some
9	U.K.					Some

SLCM sea-launched cruise missile

SRBM short-range ballistic missile

SOURCES: SIPRI, BULL, IISS, JDW

Table 2.12 – Operational Nuclear Warheads, 2015-2016, Total Strategic and Sub-Strategic

OBS	COUNTRY	STOCKPILE			DELIVERABLE			
		15(BULL)	15(SIPRI)	See [1], [2], [3]	15(BULL)	15(SIPRI)	15(IISS)	10(JDW)
1	Russia	~7,200	~7,500		~4,500	~1,780	3,648	
2	U.S.	~7,100	~7,260		~2,080	~2,080	2,038	
3	Israel		~80	Up to 400		~80	80	100-300
4	France		~300		300	290	280	
5	China	~260	~260		~230	~260	Up to 250	
6	U.K.	225	225		160	160	120	
7	Pakistan		100-120			100-120	Up to 130	
8	India	~118	90-110		~106	90-110	Up to 120	
9	N. Korea				6-8		Up to 20	

Notes:

- 1) “Background Information, 2005 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons,” United Nations, Retrieved 2006-07-02.
- 2) Brower, Kenneth S., “A Propensity for Conflict: Potential Scenarios and Outcomes of War in the Middle East,” Jane’s Intelligence Review, Special Report no. 14 (February 1997), p. 14-15.
- 3) “Nuclear Weapons: Who Has What at a Glance,” Arms Control Association, Retrieved 2007-05-30.
- 4) The Bulletin of the Atomic Scientists puts the Israeli nuclear stockpile at 60-80 but notes that it is believed that Israel has produced nuclear material enough for 115-190 warheads.
- 5) In 1986, Mordechai Vanunu, a former technician at Dimona, revealed to the media some evidence of Israel’s nuclear program. Israeli agents abducted him from Italy and transported him to Israel. An Israeli court then tried him in secret on charges of treason and espionage, and sentences him to 18 years imprisonment. At the time of Vanunu’s arrest, *The Times* reported that Israel had material for approximately 20 hydrogen bombs and 200 fission bombs. If we take this information at face value, by now Israel should have material for considerably more nuclear bombs and that seems to corroborate the opinion of the sources

- from Notes [1], [2], [3] that Israel now may have up to 400 nuclear weapons.
- 6) Vanunu's information in October 1986 said that based on a reactor operating at 150 megawatts Israel produces 40 kg of plutonium per year. Israel possesses a 200 kg warhead, containing 6 kg of plutonium (Farr, Warner D. The Third Temple's Holy of Holies: Israel's Nuclear Weapons, USAF Counterproliferation Center, September 1999, Retrieved 2007-07-03). During 30 years after 1986 until 2016, Israel could have produced $30 \times 40 = 1,200$ kg of plutonium; divided by 6, it gives us 200 warheads; plus 220 warheads, which, according to Vanunu, Israel already had in 1986, we receive a possible number of Israel's warheads now at 420.
 - 7) The substantial discrepancy over data about Israel (between the Bulletin of the Atomic Scientists and the Stockholm International Peace Research Institute on one side and the International Institute for Strategic Studies, Jane's Defense Weekly, and sources from the notes [1], [2], [3] on the other side) may be explained by the following:
 - 7.1) "Israel's nuclear weapons are not believed to be fully operational under normal circumstances" (Bulletin of the Atomic Scientists, article "Nuclear Notebook: Worldwide deployment of nuclear weapons, 2009").
 - 7.2) As Zbigniew Brzezinski stated on Book TV in 2009, Israel had acquired a second-strike capability.
 - 7.3) The opinion of Brzezinski is supported by other less prominent sources stating that Israel's nuclear weapons can now be launched from land, sea and air (Douglas Frantz, Israel Adds Fuel to Nuclear Dispute, Officials confirm that the nation can now launch atomic weapons from land, sea and air, Los Angeles Times, Sunday, October 12, 2003). This gives Israel a second strike option even if much of the country is destroyed (David Eberhart, Samson Option: Israel's Plan to Prevent Mass Destruction Attacks, NewsMax.Com, October 16, 2001).
 - 7.4) The second strike strategy may mean that at any given time some of Israel's nuclear weapons are in storage.

Table 2.13 – States Possessing, Pursuing Or Capable Of Acquiring Weapons Of Mass Destruction, As Well As Those Which Used To Have Or Used To Pursue Them, 2015-2016

STATE	NUCLEAR ENERGY	URANIUM ENRICHMENT	PLUTONIUM PRODUCTION	NUCLEAR WEAPONS	CHEMICAL WEAPONS	BIOLOGICAL WEAPONS	MISSILE TECHNOLOGY
Algeria				Used to pursue			
Argentina	Possessing		Possessing	Capable			Pursuing
Armenia	Possessing		Possessing				
Australia				Capable	Capable	Capable	Capable
Belarus				Capable			
Belgium	Possessing		Possessing				
Brazil	Possessing	Pursuing	Possessing	Capable			Possessing
Bulgaria	Possessing		Possessing			Capable	
Burma					Pursuing		
Canada	Possessing		Possessing				
Chile					Capable		
China	Possessing	Possessing	Possessing	Possessing	Possessing	Possessing	Possessing
Cuba						Capable	
Czechia	Possessing		Possessing				
Ethiopia					Used to pursue		
Egypt					Possessing	Possessing	Pursuing
Finland	Possessing		Possessing				
France	Possessing	Possessing	Possessing	Possessing	Possessing	Capable	Possessing
Germany	Possessing	Possessing	Possessing	Capable	Capable	Capable	Capable
Hungary	Possessing		Possessing				
India	Possessing	Possessing	Possessing	Possessing	Possessing	Possessing	Possessing
Indonesia					Pursuing		
Iran	Possessing	Possessing	Pursuing	Used to pursue	Possessing	Possessing	Pursuing
Iraq			Used to have	Used to pursue	Used to have	Used to have	Used to pursue
Israel			Possessing	Possessing	Possessing	Possessing	Possessing
Italy			Possessing				
Japan	Possessing	Possessing	Possessing	Capable	Capable	Capable	Possessing
Kazakhstan			Possessing	Capable			
Laos					Used to pursue	Used to pursue	
Libya				Used to pursue	Used to have	Used to have	
Lithuania	Possessing		Possessing				
Mexico	Possessing		Possessing				
Netherlands	Possessing	Possessing	Possessing				
North Korea	Possessing		Possessing	Possessing	Possessing	Possessing	Possessing

Table 2.13 – States Possessing, Pursuing Or Capable Of Acquiring Weapons Of Mass Destruction, As Well As Those Which Used To Have Or Used To Pursue Them, 2015-2016

STATE	NUCLEAR ENERGY	URANIUM ENRICHMENT	PLUTONIUM PRODUCTION	NUCLEAR WEAPONS	CHEMICAL WEAPONS	BIOLOGICAL WEAPONS	MISSILE TECHNOLOGY
Pakistan	Possessing	Possessing	Possessing	Possessing	Possessing	Possessing	Possessing
Romania	Possessing		Possessing				
Russia	Possessing	Possessing	Possessing	Possessing	Possessing	Possessing	Possessing
Saudi Arabia				Pursuing	Pursuing	Pursuing	Pursuing
Serbia				Pursuing	Capable		
Slovakia	Possessing		Possessing				
Slovenia	Possessing		Possessing				
South Africa	Possessing		Possessing	Capable	Capable	Capable	Capable
South Korea	Possessing		Possessing		Capable	Capable	Possessing
Spain	Possessing		Possessing				
Sudan					Used to pursue		
Sweden	Possessing		Possessing				
Switzerland	Possessing		Possessing				
Syria					Pursuing	Pursuing	Pursuing
Taiwan	Possessing		Possessing		Possessing	Possessing	Possessing
Thailand					Pursuing		
Ukraine	Possessing		Possessing	Capable			
Vietnam					Pursuing	Pursuing	
United Kingdom	Possessing	Possessing	Possessing	Possessing	Capable	Capable	Possessing
United States	Possessing	Possessing	Possessing	Possessing	Possessing	Possessing	Possessing

SOURCES: BULL, SIPRI, EST, E, CIA, WIKI

Table 2.14 Global Stocks Of Highly Enriched Uranium (HEU), 2014	
STATE	STOCKPILE (TONNES)
Argentina	0.001-0.01
Australia	0.001-0.01
Belarus	0.1-1
Belgium	0.1-1
Canada	1-10
China	16 ± 4
France	30 ± 6
Germany	0.1-1
Ghana	~0.001
India	3.2 ± 1.1
Indonesia	~0.001
Iran	0.001-0.01
Israel	0.3
Italy	0.1-1
Jamaica	~0.001
Japan	1-10
Kazakhstan	1-10
Netherlands	0.1-1
Nigeria	~0.001
North Korea	0.01-0.1
Norway	0.001-0.01
Pakistan	3.1 ± 0.4
Poland	0.1-1
Russia	666 ± 120
South Africa	0.1-1
Switzerland	0.001-0.01
Syria	~0.001
United Kingdom	21.2
United States	589
Uzbekistan	0.01-0.1
TOTAL	~1345

Notes.

- 1) Most of highly-enriched material is 90-93% enriched uranium-235, which is typically considered as weapon-grade. Important exceptions are noted. Blending down (i.e. reducing the concentration of U-235) of excess Russian and U.S. weapon-grade HEU up to the end of 2014 has been taken into account.
- 2) France declared 4.72 tonnes of civilian HEU to the International Atomic Energy Agency (IAEA) as of the end of 2013; it is assumed here to be weapon-grade, 93% HEU, even

though some of the material is in irradiated form. The uncertainty in the estimate applies only to the military stockpile of 26 tonnes and does not apply to the declared stock of 4.72 tonnes.

- 3) It is believed that India is producing HEU (enriched to 30-45%) for use as naval reactor fuel. The estimate is for HEU enriched to 30%.
- 4) Israel may have acquired 300 kg of weapon-grade HEU from the USA in or before 1965.
- 5) The estimate given for the Russian reserve for naval reactors is based on the estimate of the size of the Russian fleet. “666 ± 120” looks like a dishonest estimate. “666” being “the number of the Beast” this represents a literal attempt to demonize Russia.
- 6) The United Kingdom declared a stockpile of 21.9 tonnes of HEU as of March 31, 2012, the average enrichment of which was not given. The United Kingdom declared a stock of 1.4 tonnes of civilian HEU to the IAEA as of the end of 2013.
- 7) The amount of the United States HEU is given in actual tonnes, not 93% enriched equivalent. The USA has declared that as of September 30, 1996 it had an inventory of 741 tonnes of HEU containing 620 tonnes of U-235. As of the end of Dec. 2014, it had down-blended down 146.1 tonnes and 05. Tonnes had been shipped, for a total of 146.6 tonnes. In 2012 the USA withdrew 24 tonnes of HEU from its stockpile of material declared excess for military purposes and earmarked for blend-down; this material is now reserved for naval fuel, bringing the total amount of HEU in this category to 152 tonnes of (fresh) weapon-grade HEU. In addition, at least 100 tonnes is in the form of irradiated naval fuel.
- 8) The 2013 IAEA Annual Report lists 190 significant quantities of HEU under comprehensive safeguards in non-nuclear weapon states as of the end of 2013. In order to reflect the uncertainty in the enrichment levels of this material, mostly in research reactor fuel, a total of 15 tonnes of HEU is assumed. About 10 tonnes of this is in Kazakhstan and has been irradiated; it was initially slightly higher than 20%-enriched fuel.

SOURCES: SIPRI, BULL, CIA, WIKI

Table 2.15 Global Stocks Of Separated Plutonium, 2013-2015		
STATE	MILITARY STOCKS (TONNES)	CIVILIAN STOCKS (TONNES)
Argentina (2015)	-	17.6
Armenia (2015)	-	2.1
Belgium (2015)	-	40.9
Brazil (2015)	-	5.9
Bulgaria (2015)	-	8.8
Canada (2015)	-	213
China	1.8 ± 0.8	32.5
Czechia (2015)	-	16.8
Finland (2015)	-	17.6
France	6 ± 1.0	354.4
Germany	-	115.1
Hungary (2015)	-	10.8
India	0.59 ± 0.2	34.8
Israel	0.86 ± 0.13	-
Italy (2015)	-	<0.4
Japan	-	171.8
Kazakhstan (2015)	-	3.0
Lithuania (2015)	-	12.3
Mexico (2015)	-	5.2
Netherlands (2015)	-	1.4-1.7
North Korea	0.03	-
Pakistan	0.17 ± 0.02	2.17
Romania (2015)	-	10.4
Russia	128 ± 8	199.2
Slovakia (2015)	-	14.3
South Africa (2015)	-	9.46
South Korea (2015)	-	97.9
Spain (2015)	-	44.4
Sweden (2015)	-	54.4
Switzerland (2015)	-	18.0
Taiwan (2015)	-	32.4
Ukraine (2015)	-	50.6
United Kingdom	3.2	156.3
United States	87.6	629
TOTALS	~230	~2,388

Notes.

- 1) Some countries own civilian plutonium that is stored overseas, mostly in France and the

United Kingdom, but do not submit IAEA declaration, including Australia, Belgium and the Netherlands. The data on civilian plutonium stocks is for the end of 2013 because of delayed annual declarations to the International Atomic Energy Agency by the United States and Russia; their declarations for the end of 2013 were released in October 2014.

- 2) The amount for Germany may be an overestimate since Germany apparently reports plutonium as being in unirradiated mixed oxide (MOX) fuel even if the fuel has started being irradiated in a reactor.
- 3) As part of the 2005 Indian-U.S. Civil Nuclear Cooperation Initiative, India has included in the military sector much of the plutonium separated from its spent power-reactor fuel. While it is labelled civilian here since it is intended for breeder reactor fuel, this plutonium was not placed under safeguards in the 'India-specific' safeguards agreement signed by the Indian government and the IAEA on February 2, 2009. New estimates of the efficiency of India's reprocessing plants are much lower than previously assumed. The estimate is for the end of 2014.
- 4) Israel is believed to still be operating the Dimona plutonium production reactor but may be using it primarily for tritium production (tritium is an important component in nuclear weapons; it is used to enhance the efficiency and yield of fission bombs and the fission stages of hydrogen bombs in a process known as "boosting" as well as in external neutron initiators for such weapons). The estimate is for the end of 2014.
- 5) North Korea stopped plutonium production in 2007 and in 2008 reportedly declared plutonium production of 31 kg. It briefly resumed plutonium separation in 2009, adding 8-10 kg. Satellite imagery since 2013 suggests intermittent activity at the plutonium production reactor.
- 6) As of the end of 2014, Pakistan was operating 4 plutonium production reactors at its Khushab site. Khushab I and II were operating before 2013. Khushab III began operating at some point in 2013 and Khushab IV began operating in 2014; it is assumed that their spent fuel had not been reprocessed by the end of 2014.
- 7) Russia does not include its plutonium declared as excess in its IAEA statement. The military stockpile includes 6 tonnes of weapon-grade plutonium that is not part of the material declared excess nor declared as civilian and was produced between 1994 and 2010.
- 8) The United Kingdom declared 100.5 tonnes of civilian plutonium (not including 23.4 tonnes of foreign-owned plutonium in the United Kingdom). This includes 4.4 tonnes of military plutonium declared excess and placed under Euroatom safeguards and designated for IAEA safeguarding.
- 9) In 2012, the USA declared a government-owned plutonium inventory of 95.4 tonnes as of the 30 Sep. 2009. In its 2014 IAEA statement, the USA declared 49 tonnes of unirradiated plutonium (both separated and in MOX) as excess for military purposes as of the end of 2013, with additional 4.5 tonnes sent for disposal as waste.
- 10) Data for other states is estimated by subtracting plutonium declared as 'held elsewhere' from plutonium declared as 'belongs to others' in IAEA statements.

SOURCES: SIPRI, BULL, CIA, WIKI