

Indian nuclear weapons capability

[Overview]

As of May 2018, India is estimated to possess a total of 120-130 nuclear warheads (Kristensen, Hans M. & Norris, Robert S. 2017). India's nuclear weapon is believed to be plutonium-based (Kile, Shannon N. & Kristensen, Hans M. 2016). As of late 2016, India possessed approximately 580 kg of weapons-grade plutonium (IPFM 2018). Given that 4-6 kg of plutonium is needed to manufacture a nuclear bomb (although this is influenced by the level of technology), this amount is the equivalent of 97-145 nuclear warheads. With higher levels of technical sophistication, however, it is possible to obtain a bomb from 2-4kg plutonium, in which case the same Indian stockpile would suggest an arsenal of 145-290 warheads (Union of Concerned Scientists 2004). The warheads are not deployed, and they are viewed as being held in a central depository (Kristensen, Hans M. & Norris, Robert S. 2015). India possesses about six tons of reactor-grade plutonium, in addition to weapons-grade plutonium cited above (IPFM 2018).

India, like the U.S. and Russia, is aiming to build a three pillar system of nuclear weapons. India's nuclear capability consists of four types of ground-launched ballistic missile, one sea-launched ballistic missile type, and two types of aircraft. There are also at least four more types of ballistic missiles in development (two ground-launched, two sea-launched). One of them, Agni-5, has a range approximating the ICBM trajectory and Agni-6 is expected to have a longer reach. According to India's naval program, it will build a fleet of four Indian-manufactured nuclear ballistic missiles. The first vessel, Arihant, was believed to be commissioned in August 2016 (Pndit, Rajat 2016). A second Arihant-class submarine is currently being rigged out (Gady, Franz-Stefan 2017). Construction has commenced on a third vessel (Kile, Shannon N. & Kristensen, Hans M. 2016).

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● Nuclear warheads

120-130

● Nuclear weapons delivery vehicles ^{1), 2)}

Type / designation	Missile/bomb	No. of warheads per weapon	No. of warheads	Range (km)	Payloads (kg)	Year first deployed	Remarks
Ground-launched ballistic missile			~68				3)
Prithvi – 2	~24	1	~24	350	500	2003	4)
Agni – 1	~20	1	~20	700 +	1,000	2007	5)
Agni – 2	~16	1	~16	2,000 +	1,000	2011	6)
Agni – 3	~8	1	~8	3,200 +	1,500	2014 ?	7)
Agni – 4	unknown	unknown	unknown	3,500 +	1,000	2018 ?	8)
Agni – 5	unknown	unknown	unknown	5,200 +	1,000	In development (2020)	9), 10)
SLBM			2-14				
Dhanush	2	1	2	350	500	2013	11)
Sagarika (K-15/B-05)	(12)	1	(12)	700	500-600	In development	12)
K-4	unknown	unknown	unknown	~ 3,000		In development	13)
Airborne weapons			~48				14)
Loading machine : Mirage 2000H (Vajra)	~32	1	~32	1,850	6,300	1985	15)
Loading machine : Jaguar 1S/1B (Shamsher)	~16	1	~16	1,400	4,760	1981	16)

[Notes]

- The source for information on payloads is Kile, Shannon N. & Kristensen, Hans M. 2014. Other sources for information are Kristensen, Hans M. & Norris, Robert S. 2017.
- There have been reports that the Nirbhay cruise missile (range: 700-1,000 km, payload: 450 kg) is also capable of carrying a nuclear warhead. A test launch on October 16, 2015, failed due to glitches in guidance technology (Kile, Shannon N. & Kristensen, Hans M. 2016). India is now developing a sea-launched variant of Nirbhay to be deployed on the INS Arihant (SSBN 80) ballistic missile submarine (see footnote 14) (Kile, Shannon N. & Kristensen, Hans M. 2016).
- In June 2013, the DRDO announced that the Prithvi 1 (150km range) will be retired and DRDO will replace it with a new missile, the Prahaar (150km range, solid fuel). Whether Prahaar has nuclear delivery capability is unknown (Kile, Shannon N. & Kristensen, Hans M. 2014).
- Single-stage. Liquid-propellant. Road-mobile. The yield of the nuclear warhead is 12kt. The recent test launches were conducted on February 6 (Rout, Kumar Hemant 2018-1) and February 21, 2018 (first night time test; Rout, Kumar Hemant 2018-3).
- Single-stage. Solid-propellant. Road-mobile. The yield of the nuclear warhead is 40kt. Operational in 2007 and deployed with 334th Missile Group (Kile, Shannon N. & Kristensen, Hans M. 2014). The latest test launch was conducted on February 6, 2018 (The Times of India, 2018-2).
- Single-stage. Solid-propellant. Road-mobile. The yield of the nuclear warhead is 40kt. The latest test launch was conducted on February 20, 2018 (Rout, Kumar Hemant 2018-2).
- Two-stage. Solid-propellant. Road-mobile. The yield of nuclear warhead is 40kt. The latest test launch was conducted on April 27, 2017 (The New Indian Express 2017).
- Two-stage. Solid-propellant. Road-mobile. The yield of nuclear warhead is 40kt. The latest test launch was conducted on January 2, 2017 (Hindustan Times 2017-1).
- Three-stage. Solid-propellant. Rail-mobile. The yield of nuclear warhead is 40kt. The latest test launch was conducted on January 18, 2018 (The times of India 2018-1). While many reports allude to Indian plans to MIR the Agni-5, Kristensen and Norris discount the scenario (Kristensen, Hans M. & Norris, Robert S. 2017).
- Public statements by DRDO officials claim India is capable of developing ICBMs with a trajectory of more than 10,000km (NDTV 2015).
- Single-stage. Liquid-propellant. The yield of nuclear warhead is 12kt. The naval version of the Prithvi-2. It is launched from Sukanya-class offshore patrol vessels. The latest test launch was conducted on February 23, 2018 (The Times of India 2018-3).
- Two-stage. Solid-propellant. The yield of nuclear warhead is 12kt. The latest test launch was conducted on January 27, 2013 (Mallikarjun, Y. & Subramanian, T. S. 2013). It will be deployed on Arihant-class submarines. Arihant nuclear submarine can carry 12 K-15 missiles (Kile, Shannon N. & Kristensen, Hans M. 2014). The ground-launched model of the K-15 is called the Shourya, and it may attain nuclear capability (Kile, Shannon N. & Kristensen, Hans M. 2014). Shourya was successfully test launched for the third time on September 23, 2011 (Subramanian, T. S. & Mallikarjun, Y. 2011).
- Two-stage. Solid-propellant. A launch test on March 22, 2016, was a success (Gady, Franz-Stefan 2016), only to be followed by a failure on December 17, 2017 (The Print 2017). It is expected to replace the K-15s on the Arihant-class fleet (Kile, Shannon N. & Kristensen, Hans M. 2016). The Arihant nuclear submarine can carry four K-4 missiles (Kile, Shannon N. & Kristensen, Hans M. 2014). There are reports on the ongoing development of a K-5 variant with a 5,000km range (Kile, Shannon N. & Kristensen, Hans M. 2016).

- 14) Other fighter-bombers (including the Su-30MKI) are believed to have a secondary role in delivering nuclear missions.
- 15) No. 1 Squadron and No. 7 Squadron (a total of 49 aircraft) of 40 Wing are deployed at Maharajpur Air Force Station, and No. 1 Squadron is thought to have a nuclear mission (Kristensen, Hans M. & Norris, Robert S. 2012).
- 16) Out of four squadrons (a total of 76 aircraft), two are considered to have nuclear missions (Kristensen, Hans M. & Norris, Robert S. 2012).

[Source]

- Gady, Franz-Stefan 2016:** "India Successfully Tests New Ballistic Missile," *The Diplomat*, 22 March 2016, <http://thediplomat.com/2016/03/india-successfully-tests-new-ballistic-missile/> (accessed May 28, 2018)
- Gady, Franz-Stefan 2017:** "India Launches Second Ballistic Missile Sub," *The Diplomat*, 13 December 2017, <https://thediplomat.com/2017/12/india-launches-second-ballistic-missile-sub/> (accessed May 28, 2018)
- IPFM (International Panel on Fissile Materials) 2018:** "Fissile material stocks: India," <http://fissilematerials.org/countries/india.html> (accessed May 28, 2018)
- Kile, Shannon N. & Kristensen, Hans M. 2016:** "Indian nuclear forces," SIPRI Yearbook 2016 Armaments, Disarmament and International Security, Oxford University Press 2016, pp.641-646.
- Kristensen, Hans M. & Norris, Robert S. 2012:** "Indian nuclear forces," 2012, *Bulletin of the Atomic Scientists*, July/August 2012, vol. 68, no. 4, pp.96-101.
- Kristensen, Hans M. & Norris, Robert S. 2015:** "Indian nuclear forces, 2015," *Bulletin of the Atomic Scientists*, vol. 71, no. 5, pp.77-83.
- Kristensen, Hans M. & Norris, Robert S. 2017:** "Indian nuclear forces, 2017," *Bulletin of the Atomic Scientists*, vol. 73, no. 4, pp.205-209.
- Kristensen, Hans M. & Norris, Robert S. 2018:** "Status of World Nuclear Forces," Federation of American Scientists. <http://fas.org/issues/nuclear-weapons/status-world-nuclear-forces/> (accessed May 28, 2018)
- Mallikarjun, Y. & Subramanian, T. S. 2013:** 'India successfully test-fires underwater missile', *The Hindu*, 27 Jan. 2013. <http://www.thehindu.com/news/national/india-successfully-testfires-underwater-missile/article4350553.ece> (accessed May 28, 2018)
- NDTV 2015:** "India capable of developing ICBM beyond 10,000 Kilometre range: DRDO," 4 April 2015, <http://www.ndtv.com/india-news/india-capable-of-developing-icbm-beyond-10-000-kilometer-range-drdo-752239> (accessed May 28, 2018)
- The New Indian Express 2017:** "India successfully test fires nuclear capable Agni-III missile off Odisha coast," 27 April 2017, <http://www.newindianexpress.com/nation/2017/apr/27/india-successfully-test-fires-nuclear-capable-agni-iii-missile-off-odisha-coast-1598412.html> (accessed May 28, 2018)
- Pandit, Rajat 2016:** "India set to complete N-triad with Arihant commissioning," 18 October 2016, <http://timesofindia.indiatimes.com/india/India-set-to-complete-N-triad-with-Arihant-commissioning/articleshow/54907081.cms> (accessed May 28, 2018)
- The Print 2017:** "Setback for Indian missile programme: Two failures in a week, submarine version stuck," 24 December 2017, <https://theprint.in/report/setback-for-indian-missile-programme-two-failures-in-a-week-submarine-version-stuck/24671/> (accessed May 28, 2018)
- Rout, Hemant K. 2018-1:** "Indian army test fires surface-to-surface Prithvi-II missile signalling its operational readiness," *The New Indian Express*, 7 February 2018, <http://www.newindianexpress.com/nation/2018/feb/07/indian-army-test-fires-surface-to-surface-prithvi-ii-missile-signalling-its-operational-readiness-1769758.html> (accessed May 28, 2018)
- Rout, Hemant K. 2018-2:** "India successfully test fires nuclear capable Agni-II missile off Odisha coast," *The New Indian Express*, 20 February 2018, <http://www.newindianexpress.com/nation/2018/feb/20/india-successfully-test-fires-nuclear-capable-agni-ii-missile-off-odisha-coast-1776110.html> (accessed May 28, 2018)
- Rout, Hemant K. 2018-3:** "First night trial of nuke capable ballistic missile Prithvi-II successfully conducted in Odisha," *The New Indian Express*, 21 February 2018, <http://www.newindianexpress.com/nation/2018/feb/21/first-night-trial-of-nuke-capable-ballistic-missile-prithvi-ii-successfully-conducted-in-odisha-1776889.html> (accessed May 28, 2018)
- Subramanian, T. S. & Mallikarjun Y. 2011:** "India successfully test-fires Shourya missile," *The Hindu*, 24 September 2011. <http://www.thehindu.com/sci-tech/science/india-successfully-testfires-shourya-missile/article2482010.ece> (accessed May 28, 2018)
- Pandit, Rajat 2016:** "India successfully test-fires nuclear capable Agni-V," *The Times of India*, 26 December 2016, <http://timesofindia.indiatimes.com/india/india-successfully-test-fire-nuclear-capable-agni-5/articleshow/56177457.cms> (accessed May 28, 2018)
- The Times of India 2018-1:** "India test-fires nuclear-capable ICBM Agni-V," 18 January 2018, <https://timesofindia.indiatimes.com/india/india-test-fires-nuclear-capable-icbm-agni-v/articleshow/62550347.cms> (accessed May 28, 2018)
- The Times of India 2018-2:** "India successfully test-fires nuclear capable Agni-1," 6 February 2018, <https://timesofindia.indiatimes.com/india/india-successfully-test-fires-nuclear-capable-agni-1/articleshow/62801316.cms> (accessed May 28, 2018)
- The Times of India 2018-3:** "'Dhanush' ballistic missile successfully test-fired," 23 February 2018, <https://timesofindia.indiatimes.com/india/dhanush-ballistic-missile-successfully-test-fired/articleshow/63043606.cms> (accessed May 28, 2018)
- Union of Concerned Scientists 2004:** "Weapon Materials Basics (2009)," <http://www.ucsusa.org/nuclear-weapons/nuclear-terrorism/fissile-materials-basics#.WUTTElFpyM8> (accessed June 17, 2017)