

India's first nuclear sub

Prime Minister Manmohan Singh's wife Gursharan Kaur will launch India's first nuclear-powered ballistic missile submarine, Arihant, in Vishakhapatnam on the east coast on July 26 – the 10th anniversary of the Kargil war

A new undersea destroyer

Arihant, literally, destroyer of enemies, is likely to be commissioned by 2011, and will form a crucial leg of India's nuclear triad. India can deliver nuclear weapons using warplanes and land-launched missiles. Arihant will provide India with stronger strategic deter-

rence. It will allow India to rapidly launch retaliatory strikes against nuclear attacks. Two more Arihant-class vessels will be inducted before 2015. Arihant is based on the design of the Russian Charlie-1 submarine, which is of 1980s vintage.

How ballistic missiles are launched



Missiles are fired from 100 m below the sea

Launched by underwater booster

Sonar developed by DRDO

Special rubber tile-coated steel hull that reduces noise emissions

Crew quarters

Pod for towed array sonar

Hydroplanes for diving and surfacing

Torpedoes and missiles

80 MW nuclear reactor

12 Sagarika ballistic missiles stored in four launch containers

Shielded bulkhead

Seven-bladed propeller

N-powered submarines are of two types

■ Nuclear-powered ballistic missile submarines provide nuclear strike and counter-strike capability. Arihant falls in this category.

■ Nuclear-powered attack submarines pursue and attack enemy submarines, surface ships using torpedoes and land-based targets using cruise missiles.

headway on project.
1983: India signs deal to lease nuclear submarine from Russia. Launches ATV project.
1987: India acquires Charlie-1 class submarine from Soviet Union on three-year lease.

1998: Hull of ATV laid down, L&T begins construction.
2007: Reactor fused into the hull.
2009: Arihant launched. Two more in the same class to follow.

1970: Indira Gandhi asks BARC and DRDO teams to build a nuclear submarine.
1976: Raja Ramanna and BARC scientists come up with nuclear submarine reactor design but make no

INDIA HAS 16 diesel-electric submarines of Russian and German origin, which are 25-40 years old

Kilo class (Russian)



10

Inducted: 1986
Vintage: Early 1970s
Crew: 52
Range: 9,000 km
Weapons: Cruise missiles, torpedoes, anti-ship missiles, mines
Speed: 17 knots (31.5 kmph)
 ■ Silent as a grave but runs the risk of detection when they come to periscope depth to recharge their batteries.

HDW (German)



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Inducted: 1986
Vintage: Early 1970s
Crew: 40
Range: 9,000 km
Weapons: Torpedoes and mines
Speed: 20 knots (37 kmph)
 ■ Silent as a grave but runs the risk of detection when they come to periscope depth to recharge their batteries. Two of these were built in India.

Foxtrot (Russian)



2

Inducted: 1968
Vintage: 1960s
Crew: 60
Range: 9,000 km
Weapons: Torpedoes
Speed: 15 knots (27 kmph)
 ■ Silent as a grave but runs the risk of detection when they come to periscope depth to recharge their batteries. This submarine is at the end of its operational life.

ONGOING PROJECTS

Akula-2: The navy will get its first nuclear attack submarine, an Akula-2 class vessel, on a 10-year lease from Russia by the end of this year.

Scorpene: Six French electric-diesel submarines are being built at Mazagon Docks. The first will roll out by 2012 and the entire fleet by 2018.

How Arihant stacks up against other subs

Arihant (nuclear)

India will induct three of these subs over six years

100 Officers Sailors

CREW
 1 figure = 10

Length/displacement
 104 metres / 5,500 tonne

Max speed (submerged)
 30 knots (55.5 kmph)

Endurance
 90 days

Can operate for 25 years but crew endurance and rations are limitations

Kilo class

Forms a major part of India's current fleet

52

73 metres / 3,000 tonne

17 knots (31.5 kmph)

60 days

Has to come to periscope depth every other day for oxygen

Ohio class

World's largest sub, in service with the US Navy

155

170 metres / 17,000 tonne

25 knots (46.3 kmph)

90 days

Can operate for 25 years but crew endurance and rations are limitations

TIMELINE



Nuclear submarine club

Only five nations operate nuclear-powered submarines. With around 70 such vessels, the US Navy has more than half the world's nuclear submarines.

