= Arihant @-@ class submarine =

The Arihant class (Sanskrit , for Killer of Enemies) is a class of nuclear @-@ powered ballistic missile submarines being built for the Indian Navy . They were developed under the US $ 2 @.@ 9 billion Advanced Technology Vessel (ATV) project to design and build nuclear @-@ powered submarines .

The lead vessel of the class , INS Arihant was launched in 2009 and after extensive sea trials , was confirmed as ready for operations on 23 February 2016 . Arihant is the first ballistic missile submarine to have been built by a country other than one of the five permanent members of the United Nations Security Council .

= = History = =

In December 1971 , during the Indo @-@ Pakistani War of 1971 , the US President Richard Nixon sent a carrier battle group named Task Force 74 , led by the nuclear @-@ powered USS Enterprise into the Bay of Bengal in an attempt to intimidate India . In response , the Soviet Union sent a submarine armed with nuclear missiles from Vladivostok to trail the US task force . The event demonstrated the significance of nuclear weapons and ballistic missile submarines to then Prime Minister Indira Gandhi . Following the 1974 Smiling Buddha nuclear test , the Director of Marine Engineering (DME) at Naval Headquarters initiated a technical feasibility study for an indigenous nuclear propulsion system (Project 932) .

The Indian Navy 's Advanced Technology Vessel project to design and construct a nuclear submarine took shape in the 1990s . Then Defence Minister George Fernandes confirmed the project in 1998 . The initial intent of the project was to design nuclear @-@ powered fast attack submarines , though following nuclear tests conducted by India in 1998 at Pokhran Test Range and the Indian pledge of no first use , the project was re @-@ aligned towards the design of a ballistic missile submarine in order to complete India 's nuclear triad .

= = Description = =

The Arihant @-@ class submarines are nuclear powered ballistic missile submarines built under the Advanced Technology Vessel (ATV) project . They will be the first nuclear submarines designed and built by India . The submarines are 112 m (367 ft) long with a beam of 11 m (36 ft) , a draught of 10 m (33 ft) , displacement of 6 @,@ 000 tonnes (5 @,@ 900 long tons ; 6 @,@ 600 short tons) and a diving depth of 300 m (980 ft) . The complement is about 95 , including officers and sailors . The boats are powered by a single seven blade propeller powered by an 83 MW (111 @,@ 000 hp) pressurised water reactor and can achieve a maximum speed of 12 ? 15 knots (22 ? 28 km / h) when surfaced and 24 knots (44 km / h) when submerged .

The submarines have four launch tubes in their hump and can carry up to 12 K @-@ 15 Sagarika missiles with one warhead each (with a range of 750 km or 470 mi) or 4 K @-@ 4 missiles (with a range of 3 @,@ 500 km or 2 @,@ 200 mi) . The submarines are similar to the Akula @-@ class submarine of Russia . The Indian Navy will train on INS Chakra , an Akula @-@ class submarine leased from Russia in 2012 .

= = Development = =

The submarines are powered by a pressurised water reactor with highly enriched uranium fuel . The miniaturized version of the reactor was designed and built by the Bhabha Atomic Research Centre (BARC) at the Indira Gandhi Centre for Atomic Research (IGCAR) in Kalpakkam . It included a 42 @-@ metre (138 ft) section of the submarine 's pressure hull containing the shielding tank with water and the reactor , a control room , as well as an auxiliary control room for monitoring safety parameters . The prototype reactor became critical on 11 November 2003 and was declared operational on 22 September 2006 . Successful operation of the prototype for three years enabled

the production version of the reactor for Arihant . The reactor subsystems were tested at the Machinery Test Center in Visakhapatnam . Facilities for loading and replacing the fuel cores of the naval reactors in berthed submarines were also established .

The detailed engineering of the design was implemented at Larsen & Toubro 's submarine design center at their Hazira shipbuilding facility . Tata Power SED built the control systems for the submarine . The steam turbines and associated systems integrated with the reactor were supplied by Walchandnagar Industries . The lead vessel underwent a long and extensive process of testing after its launch in July 2009 . The propulsion and power systems were tested with high @-@ pressure steam trials followed by harbor @-@ acceptance trials that included submersion tests by flooding its ballast tanks and controlled dives to limited depths . INS Arihant 's reactor went critical for the first time on 10 August 2013 . On 13 December 2014 , the submarine set off for its extensive sea trials .

= = Ships in class = =

Exact number of planned submarines remains unclear , according to media reports about three to six submarines are planned to be built . The first boat of the class , INS Arihant is expected to be commissioned by 2016 . The first four vessels are expected to be commissioned by 2023 . In December 2014 , the work on a second nuclear reactor began and the second boat , INS Aridhaman is being prepared for sea trials . The next three ships in the class , after the lead ship , will be larger and have 8 missile launch tubes to carry up to 8 K4 and a more powerful pressurized water reactor than INS Arihant . A larger follow on class to the arihant class is also planned , these new boats will be capable of carrying 12 to 16 ballistic missiles .

= = Timeline = =