= Kolkata @-@ class destroyer =

The Kolkata class (Project 15A) are a class of stealth guided missile destroyers constructed for the Indian Navy . The class comprises three ships ? Kolkata , Kochi and Chennai , all of which are being built by Mazagon Dock Limited (MDL) in India , and are the largest destroyers to be operated by the Indian Navy . Due to delays in their construction , and a problem found during the sea trials , the initial commissioning date of the first ship of the class had been pushed back from 2010 to 2014 .

The destroyers are a follow @-@ on of the Project 15 Delhi @-@ class destroyers , but are considerably more capable due to major improvements in the design , the addition of substantial land @-@ attack capabilities , and the fitting @-@ out of modern sensors and weapons systems .

= = Development = =

In 1986 , the Cabinet Committee on Political Affairs (CCPA) approved a follow @-@ on class of the earlier Project 15 Delhi @-@ class destroyers . The aim was that the follow @-@ on class would incorporate a higher level of air @-@ defence , land attack , anti @-@ submarine and anti @-@ ship capabilities than the preceding class . However , the Indian Navy did not initially take up the option . By the year 2000 , the Indian Navy had redesigned the follow @-@ on Kolkata class to incorporate even higher levels of technology (including modern stealth characteristics) and in May of that year , approval for the construction was given . Concept and function for Project 15A was framed by the navy 's Directorate of Naval Design , while the detailed design was developed by Mazagon Dock Limited (MDL) .

= = = Construction = = =

Construction of three Kolkata @-@ class ships was sanctioned by the Government of India in May 2000 , and steel for the lead ship was cut in March 2003 . Construction began in September 2003 at Mazagon Docks , Mumbai , with an initial expectation that the first of the class would be handed over to the navy by 2010 . However , since then the Kolkata class has suffered consecutive delays , slow construction procedures and technical problems which saw the first ship of the class enter service during mid 2014 . The delays in the construction programme have been attributed to persistent design changes made by the Indian Navy to incorporate new weapons systems and sensors , failure by a Ukrainian shipyard to deliver the ship 's propellers and shafts and the contract later being awarded to a Russian firm , and finally the delay in the delivery of the Barak 8 anti @-@ air missiles , which are still in the final stages of completion with Israel Aerospace Industries and the Defence Research and Development Organisation .

The Kolkata class are the largest destroyers ever to be constructed at Mazagon Docks , and as of 2013 , all three ships of the class have been launched and are being fitted out . Technical problems were found during the sea trials of the lead ship Kolkata , which delayed the project by six months to early 2014 .

= = Design and description = =

The Kolkata class share similar dimensions to the previous Delhi class , however they have 2 @,@ 363 modifications which include major upgrades in weaponry , sensors and helicopter systems . With a standard displacement of 6 @,@ 800 t (6 @,@ 700 long tons ; 7 @,@ 500 short tons) and a full @-@ load displacement of 7 @,@ 400 t (7 @,@ 300 long tons ; 8 @,@ 200 short tons) , they are the largest destroyers ever operated by the Indian Navy . Some media reports have even given a full @-@ load displacement of 7 @,@ 500 t (7 @,@ 400 long tons ; 8 @,@ 300 short tons) . These are the first stealth destroyers being built by India and marked a significant development in India 's shipbuilding technology . The ships would incorporate modern weapons and sensors , and will have an advanced information warfare suite , an auxiliary control system with a sophisticated power distribution architecture , and modular crew quarters .

The class have a length of 163 m (535 ft) , a beam of 17 @.@ 4 m (57 ft) and a draught of 6 @.@ 5 m (21 ft) . The ship 's power and propulsion features a standard Combined gas and gas system utilizing twin Zorya M36E gas turbine plants and four DT @-@ 59 reversible gas turbines . The class also features two KVM diesel engines . On @-@ board Wartsila WCM @-@ 1000 generators and Kirloskar AC generators supply the ship 's electricity . The two propellers are run via two RG @-@ 54 gearboxes . This configuration allows the ship to reach speeds in excess of 30 kn (56 km / h ; 35 mph) . Aviation facilities include a large flight deck , which was re @-@ designed to handle larger helicopters than the Delhi @-@ class , and an enclosed hangar for up to two maritime helicopters .

The primary radar sensor of the class is the EL / M @-@ 2248 MF @-@ STAR multi @-@ mission AESA . It is also equipped with Thales LW @-@ 08 long range volume search radar and EL / M @-@ 2238 S @-@ band STAR surveillance radar from Israel Aerospace Industries . A Nagin active towed array sonar and a bow @-@ mounted sonar HUMSA @-@ NG (hull @-@ mounted sonar array - new generation) are carried for sub @-@ surface surveillance . To protect against anti @-@ ship missiles coming from multiple directions , the ship carries the Elbit Systems Deseaver MK @-@ II decoy control and launching system .

The ship 's main air @-@ defence armament is composed of two 4x8 @-@ cell vertical launching systems (VLS) allowing for up to 32 Barak 8 (medium @-@ long range) air @-@ defence missiles . In addition , four AK @-@ 630 CIWS are fitted for close @-@ in defence .

The supersonic BrahMos anti @-@ ship and land @-@ attack missiles are the primary offensive armament of the Kolkata @-@ class . The BrahMos missiles are fitted into a 16 @-@ cell Universal Vertical Launcher Module (UVLM) allowing one missile per launch silo , and all 16 missiles can be fired in salvo . Perhaps the most distinctive and noticeable armament of the Kolkata class is its 76 mm (3 @.@ 0 in) naval gun located forward of the bridge . The 76 mm gun provides limited anti @-@ shipping capability and anti @-@ air capability in addition to its naval gun fire @-@ support role for land based operations . For anti @-@ submarine warfare , the Kolkata @-@ class are equipped with a torpedo launching system via four torpedo tubes and two RBU @-@ 6000 anti @-@ submarine rocket launchers . BEL 's Electronic Modular Command & Control Applications (EMCCA) Mk4 provides combat management .

Four million lines of codes have been written to develop the advanced combat management system onboard INS Kochi . The system is designed so that all the data about the surrounding threat comes in one place , along with analysis about the kind of threat . The system also advises the commanding officer about the kind of weaponry he should use to tackle the threat . Obviously , all this happens in real @-@ time . The Ship is equipped with sophisticated digital networks , such as Asynchronous Transfer Mode based Integrated Ship Data Network (AISDN) , Combat Management System (CMS) , Automatic Power Management System (APMS) and Auxiliary Control System (ACS) . The AISDN is the information highway on which data from all the sensors and weapon ride . The CMS is used to integrate information from other platforms using indigenous data @-@ link system , to provide Maritime Domain Awareness . The intricate power supply management is done using APMS , and remote control and monitoring of machinery is achieved through the ACS .

= = Ships of the class = =

Initially in 2008 , the total program cost with long @-@ term spare parts was expected to cost ? 3 @,@ 800 crore (US $ 560 million) , but the construction costs escalated about 225 % , and by 2011 , cost of the program became ? 11 @,@ 662 crore (US $ 1 @.@ 7 billion) , with each ship costing ? 3 @,@ 900 crore (US $ 580 million) . The Defense Minister A. K. Antony cited the causes being the delay in supply of warship @-@ grade steel by Russia , increase in costs of Russian specialists due to inflation during the build period , wage revision due from October 2003 and delay in finalisation of cost of weapons and sensors .