FREMM Class Frigates of the Italian Navy

by Cem Devrim YAYLALI

In the early 2000s, the French and Italian Navies had a common problem. Various ships of both naval forces were rapidly aging, reaching the end of their useful service lives, and unable to respond to current threats.

The French navy wanted to replace their Tourville, Georges Leygues, and D'Estienne D'Orves class ships, while the Italian navy wanted to replace their Lupo and Maestrale class ships. The mentioned ships were commissioned in the late 1970s and mid-1980s, and they needed to be replaced.

The FREMM (Fregate Europeen Multi-Missione) project initially started as a national project in France and became a multinational with Italy's participation in 2002.

The prime contractors of the FREMM program were the French Aramis joint venture between DCNS (now Naval Group) and Thales, working in collaboration with the Italian Orizzonte Sistemi Navali (OSN) consortium of Fincantieri and Finmeccanica. The overall supervision of the procurement was allocated to the European intergovernmental organization OCCAR (Organization for Joint Armament Cooperation). Influenced by the success of the preceding Horizon project, both countries decided to join forces in further collaboration.

However, both navies had different expectations from this project. The Italian operational requirements have resulted in notable differences in visual appearance and capability compared to the French FREMM variants. Italy's desire to provide its ships with area air defense capability resulted in the selection of the EMPAR multifunctional radar, which is also used onboard the Horizon class vessels. Additionally, the Italian FREMMs incorporate Sylver A50 Vertical Launching System (VLS) modules, which can support Aster 30 medium-range surface-to-air missiles. Another significant difference between the two countries' ships is their length. French ships are 142.2 meters long, while Italian ships are 143.9 meters. The difference arises from the lengthening of the vessel to overcome some balance problems experienced in the first Italian ship. Since the added part incorporates additional fuel tanks, the maximum cruising range of the Italian vessels is slightly longer than the French ones.

Six of the ten FREMM class vessels built for the Italian Navy are general-purpose frigates mainly designed for surface warfare (ASuW) scenarios, while four of the ships are in anti-submarine warfare (ASW) configuration.

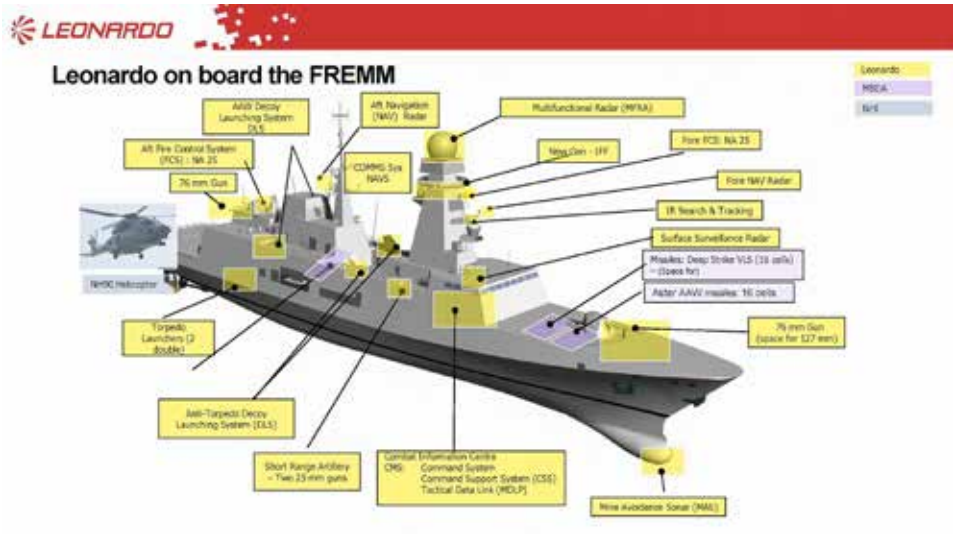
The contract for the first two ships, one general-purpose and one anti-submarine warfare configuration, was signed in 2005. The first general-purpose frigate ITS Carlo Bergamini (F-590) was launched in 2011, followed by the anti-submarine warfare ship ITS Virginio Fasan (F-591) in 2012.

In 2008, Italy ordered four additional ships, one general-purpose and three anti-submarine warfare configurations. The last batch of four ships,

all in general-purpose configuration, were ordered in 2013. The last ship of the class, ITS Emilio Bianchi (F-589), was planned to be commissioned in 2021 before the Covid-19 outbreak.

With a displacement of around 6,700 tons, the FREMM class frigates have an overall length of 144m, a beam of 19.7m, and a draught of 5.1m. The Italian FREMM frigates are powered by a CODLAG (Combined diesel-electric and gas) propulsion system. A single GE/Avio LM 2500+G4 gas turbine, which is rated at 32MW, can sustain a top speed of 27 knots. The ship's primary source of electrical energy is supplied by four sets of 2.1MW diesel generators manufactured by Isotta Fraschini. The generators permit electric propulsion up to speeds of around 12 knots. The diesel-electric propulsion is especially preferred for anti-submarine warfare as it generates less noise than gas turbine propulsion. The ships have a range of 6,000 nautical miles and could carry enough food for about 40 days. The vessel can accommodate 165 crew members. This number may ultimately increase to 200 by installing more cabin units in the space currently reserved for Sylver A70 VLS cells, providing additional accommodation space.

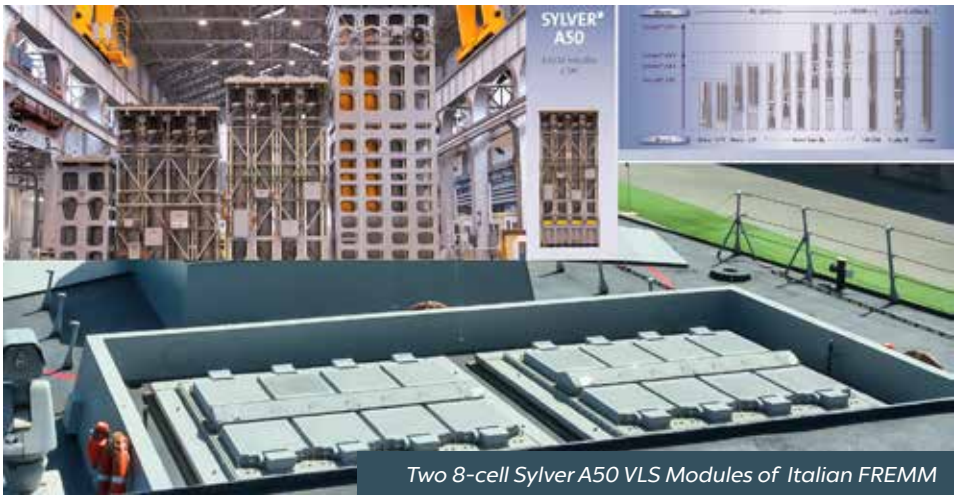
The appearance of the Italian FREMMs is heavily influenced by previous La Fayette class ships commissioned by the French Navy in the 1990s. The vessels' design reflects the attention to stealth that is apparent in all modern



frontline warships. The VLS modules are placed in front of the superstructure just behind the ship's main gun. The small mast on the bridge houses the fire control and surface surveillance radar, and just behind it, the mainmast of the vessel rises, featuring two small exhausts on its either side. Resembling a Padoga, the most eye-catching systems on the mainmast are the Kronos radar inside the spherical radome at the top, and the ESM sensors immediately below the radome with a collar of IFF antennas positioned slightly lower down.

The 25mm autocannons are located on the same deck with the bridge on either side of the mainmast. The launchers of Teseo or MILAS missiles are placed between the mast and the main exhaust funnel. Against air and underwater threats, two OTO Melara SCLAR-H decoy launchers are positioned abreast the funnel on both sides of the ship. The antennas of various satellite communication systems are installed in the area between the exhaust funnel and the 76mm gun mounted on the starboard roof of the helicopter hangar. The ships also have two positions for rigid inflatable boats (RIBs) located to port and starboard of the main exhaust funnel. The 76mm gun on the helicopter hangar has an approximately 270-degree continuous firing arc thanks to its elevated position. The flight deck is located at the stern of the vessel and incorporates a Curtis-Wright TC-ASIST recovery system to assist safe handling and recovery. The ASW type ships have a variable depth towed sonar array housed in a room below the flight deck.

Italian FREMM frigates incorporate two 8-cell Sylver A50 VLS modules capable of launching 16 Aster 15 and Aster 30 missiles in total. Both FREMM types are fitted with the MBDA Teseo Mk 2/A surface-to-surface missile, which can be



Two 8-cell Sylver A50 VLS Modules of Italian FREMM

Counter Measure Decoy & Weapon Systems

used against both surface ships and coastal targets. Ships in general-purpose configuration can carry up to eight Teseo missiles. When necessary, the ASW type frigates can be deployed with half of this loadout, using the other four launchers for MILAS anti-submarine missiles.

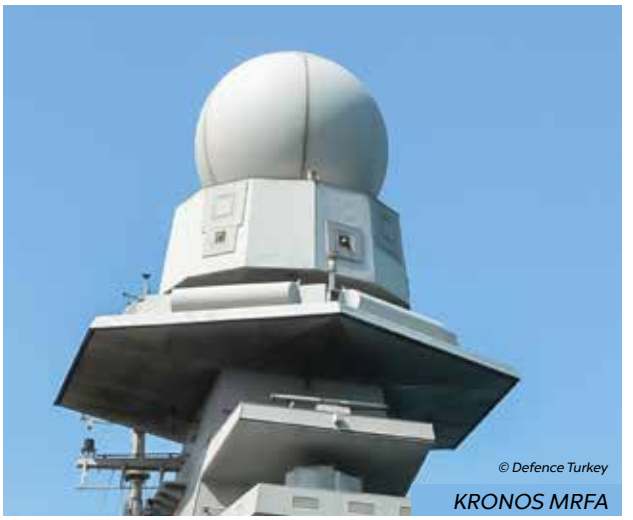
Both hull configurations look very similar in terms of their external appearance. The most significant distinction between the two types is the general-purpose ships use the new OTO Melara (now Leonardo) 127/64 Lightweight (LW) naval gun system capable of firing Vulcano extended range munitions. On the other hand, the vessels in the anti-submarine warfare configuration use the Leonardo 76mm/62 Super Rapid defense systems (STRALES) as their primary gun in place of the 127/64 LW gun.

For close-in ship defense, all FREMM frigates are equipped with one 76mm/62 Super Rapid defense systems (STRALES) naval gun and with a pair of Oto Melara Oerlikon KBA 25mm/80 guns that have limited air-defense capability. The 25mm autocannons on the last two ships of the class will be replaced with remote-controlled weapon stations. The manual mounts of the 25mm autocannons on the other vessels will also be replaced with remote-controlled systems in the future.

For anti-submarine warfare (ASW) operations, both vessel types are fitted with two Eurotorp/WASS (Leonardo) B513 324mm triple torpedo launchers for MU90 Impact torpedoes which are also used by the co-operating ASW helicopter.

The hangar on ships is large enough to accommodate two SH-90 helicopters (the name given to the NH-90 helicopters by the Italian Navy) or one SH-90 and one AW-101 helicopter. Helicopters are used for various missions, primarily the anti-submarine warfare.

The ships' primary sensor is the Leonardo Kronos Grand Naval (MFRA) Active electronically scanned array radar. The KRONOS radar family was created by the redesign of the Selex EMPAR naval radar following the purchase of Italian defence and electronics manufacturer Selex by Leonardo. The Kronos can identify and then track potential hostile targets out to a range of more than 300 nautical miles and can control engagements with Aster missiles, directing them towards the target via data uplink. The first eight ships are equipped with the SPS-791 air/surface surveillance radar, while the last two frigates have SPS-732. Additionally, each vessel is fitted with three SPN-753 navigation radars for safe navigation. The fire-control roles of the naval guns on the ships are carried out by two Selex MSTIS (multi-sensor target indicator system) NA-25XP radars.



KRONOS MRFA

For offensive anti-submarine operations and frigate self-defense, both types have Thales UMS 4110 CL hull-mounted sonar. The anti-submarine ships are also fitted with Thales UMS 4249 (CAPTAS-4) variable-depth sonar housed in a handling room below the flight deck. These systems form an integrated sonar suite with mine avoidance and echo sounding capabilities. With this integrated sonar suite, including B513 torpedo tubes and SLAT torpedo defense system, the ASW type frigates can effectively combat underwater threats.

Advanced protection systems are installed on Italian FREMM Class frigates for self-defense


© Defence Turkey

against modern threats. The primary electronic warfare system on ships is the MM/SMQ-765 system produced by the joint venture between the Italian Elettronica Group and French Thales. This system can conduct electronic attack (EA) against both the enemy's communication (C-ECM) and radar (R-ECM) systems. The main receiving antennas of the system are located just below the Kronos radar dome on the ship's mainmast. One of the antennas of the Nettuno 4100 system, which is used for jamming enemy communications and radar systems, is located aft of the ship's hangar on the port side, while the other is on the mainmast under the navigation radar. This system uses an active phased array transmitter.

Italy started the FREMM project together with France, however visually similar yet quite different ships were emerged according to the needs and budgets of both countries.

On April 30, 2020, the United States Navy announced that Italian Fincantieri won the FFG(X) Next-generation Frigate Competition with its solution based on the Italian Navy's FREMM class ships, which will be modified according to the specific requirements of the US Navy ■

© Italian Navy

F-592 Carlo Margottini