

PROCUREMENT AND MODERNISATION PROGRAMMES AND ACTIVITIES

The functions of *Integrated Maritime Surveillance and Capabilities, at sea and from the sea* require a balanced naval instrument, capable to rapidly intervene during emerging crisis through the exploitation of a whole set of capabilities that are inherent to maritime forces – such as versatility, logistic sustainability, autonomy, flexibility and independence from host nation support – in line with the NATO Response Force concept and with the developing European Union Maritime Dimension.

Meanwhile, resources are shrinking and the Italian Navy is requested to operate with reduced budgets. This requires to constantly revise organisational structures, procedures and commitments by adopting change management processes aimed at optimising the use of available resources to meet the national defence requirements and steering the renewal of the fleet.

In so far as modernization and procurement are concerned, these processes have to include the important synergies and the contribution obtainable from the industrial sector and scientific community, which in the last few years have been developing new systems to cover the growing needs of security, safety and environmental protection. A cooperative approach to the problem plainly emerges as the most effective way to achieve the best solutions, which obviously require effective information technology, improved operational logistics and the use of enhanced training techniques. The way to the renewal is nowadays benefiting, moreover, from another procedure: the handover of decommissioned ships to other Navies; this is the case, for example, of the four "Lupo" class frigates, transferred to the Peruvian Navy in the recent past.

In order to acquire the balanced fleet capable to fulfil the tasks emerging from the strategic functions, the Italian Navy choose, at the end of the 90s, to extend the operational life-time of its frigates, until to about forty years for some of the "Maestrale" class ships, investing the major part of resources to start with the procurement of the aircraft carrier "Cavour", the key element to sustain Italy's projection capabilities, at sea and from the sea.

SURFACE SHIP NEW BUILDINGS

Aircraft Carrier "Cavour"

The, project, aimed at replacing the Cruiser "Vittorio Veneto", was formally started at the end of 2000, with the initial elements of the hull laid down in 2001, and will result in the commissioning, in 2008, of the largest warship-ever built in Italy since the end of the second World War. The "Cavour" was launched at Fincantieri shipyards near Genoa on 20th July 2004. The ship will soon become the Navy's flagship, capable-of fulfilling several roles thanks to its flexibility, including command and control for joint (full CJTF division sized HQ staff), maritime (MCC) and amphibious (CATF/CLF) operations. The available space is 70% larger than "Garibaldi", the other Italian Navy operated carrier, with possibility to accommodate on board a deployable HQ of 200 members and availability of sophisticated communications and command & control systems. The ship can operate as a pure carrier, with a mixed wing made of 18-20 AV-8B Plus STOVL fighters (to bbe replaced in due time by the F-35B JSF), EH-101 helicopters (including at least two in AEW configuration) and NH90 helicopters. In its amphibious role, the carrier can transport up to 360+90 marines, with light equipment. The carrier displaces 27,100 tons, with total length of 244 metres and maximum width of 39 metres. The flight deck, with a 12° ski-jump and 6 landing spots, measures 220x34.5 metres. The propulsion system relies on four LM-2500

gas turbines, delivering 88,000kW and allowing, for a top speed close to 30 knots. The range is 7,000 nautical miles at a cruising speed of 16 knots. The ship crew consists of 450 men and women, although the ship can accommodate a total of 1,210. The "Cavour" is being fitted with a state of the art combat management system and sensors, including long range and 3D search radars. The ship defence weapon systems include the SAAM-IT missile system, the OTO Melara 76/62mm Super Rapido DAVIDE, 25mm mounts and the SLAT anti-torpedo system (see below for more details on the systems).



ITS "Doria", a Horizon type air warfare destroyer.

Destroyers "Doria" and "Duilio"

These AAW vessels are the result of the Horizon joint programme with the French Navy and are intended to replace the two destroyers of the "Audace" class decommissioned in 2006. The go-ahead for the programme came in October 2000 with the signing of the contract. Construction of the first ship, ITS "Doria", started in July 2002 whilst the sister ship, ITS "Duilio", followed in September 2003 at the Riva Trigoso Fincantieri yard. "Doria" will enter service in fall 2008 while the second frigate, launched in October of 2007, will follow 12 months later. These 7,000 metric tons ships, with an overall length of 150 metres and a maximum beam of 20 metres, have a design top speed of 29 knots thanks to a Combined Diesel or Gas (CoDOG) propulsion plant based on two LM 2500 gas turbines and two S.E.M.P.T. Pielstick (now MAN Diesel) diesels. Thanks to enhanced automation, the crew is reduced to just 195, although the ship can also accommodate a staff of 35 to either perform the flagship role at Task Group level or to embark a higher command staff. The combat management system is tailored to allow these staffs to conduct their mission while the ship performs her role, that is primarily anti-air warfare. To this extent the "Doria" class ships will

be fitted with the PAAMS (Principal Anti-Aircraft Missile System), featuring a 48 cell VLS System for both ASTER 15 and ASTER 30 missiles, associated with an AMS EMPAR Multi-Function Radar and a surveillance and early warning long range radar TNNL T 1850. The weapons fit includes 8 anti-ship TESEO missiles, 3 Super Rapido 76/62mm guns, a SLAT torpedo defence system and a naval helicopter, either NH-90 or EH-101.

FREMM – "Bergamini" class Frigates

The joint French-Italian programme FREMM (European Multi-Mission Frigate) calls for the construction of a total of 27 frigates, in both Land Attack-General Purpose and Anti-submarine Warfare versions, to replace a large number of different ships in the two Navies. In the Italian Navy, the FREMM will replace the "Lupo" and "Maestrale" class frigates. After the first national studies started in 2001 and the following talks with the French Navy, an agreement was signed in October 2002 paving the way for a joint programme. A bi-national programme office was setup in Paris in January 2003 and a Memorandum of Understanding, was signed in June 2003 by the two Defence Ministers. The contract for the first two ships was signed in November 2006, with the aim of completing the programme within ten years from the delivery of the first ship. The lead of class should be commissioned in 2011. The Italian Navy could then receive one ship every year from 2012 onwards. The Italian Navy has a requirement for 10 of these frigates, in two different configurations, 4 ASW and 6 in a land attack/general purpose version. All ships will share a 128 metre hull at the waterline, with a beam of 18.5 metres and a displacement of 5,800 metric tons at full-load. The propulsion plant will have a CODLAG configuration, featuring a gas turbine, four diesel generators and two electrical motors for a top design speed of 27 knots. Endurance will reach 45 days and range is expected to be 6,000nm at cruising speed. Thanks to extensive automation and very reliable systems, the crew size will be reduced to about 120, with accommodation for a total of 165, considering the need to perform CTG (Commander Task Group) role and to embark a staff or boarding parties or special forces. The ASW version will be fitted with both towed and hull mounted sonars and Unmanned Under-Water Vehicles. The land attack version will have the capability to operate two large RHIBs to support special forces and boarding operations. Both will have a hangar for two helicopters. The ships will have 32 cell VLS system, capable of firing ASTER anti-air/anti-missile missiles, plus a land attack cruise missile that the Italian Navy has not yet selected. The Italian ASW version will also carry MILAS ASW missiles and some TESEO anti-ship missiles, while the GP version will have 8 TESEO anti-ship missiles. Artillery is to include a 127mm gun (Vulcano configuration) in the GP version, while the 76mm SR in the DAVIDE configuration will provide inner defence for both versions. The advanced combat management system will offer state of the art C4I2SR capability and will link also communications and EW suites derived from those on board the "Doria" class, as well as a variety of sensors, including, a Multi-Functional Radar (MFR) EMPAR.

MODERNIZATION PROGRAMMES

Amphibious Forces

The Navy has been considering for several years the opportunity of a new, large assault ship, that could better support the amphibious forces and satisfy the growing need of spacious ships, fitted with state of the art command, control and communication equipment, to embark a large, eventually joint staff. Although financial constraints have not yet allowed to start the operational phase of the procurement, studies have moved far on and a requirement is now quite defined. This requirement results from an attempt to match the typical naval tasks of an amphibious Force with the needs of the Civil Protection Department. In fact, considering Italy's 8,000km of coastline, ships like LPDs (Landing Platform Dock)

could play a decisive role as command facilities for Civil Protection in case of major natural disasters.

The requirement is now pointing at an LHD (Landing Helicopter Dock) rather than an LPD, similar to the in-service "San Giorgio". This choice will provide more assault capability to the amphibious and landing forces, besides important maritime transportation enhancements and stronger joint integration capabilities. A preliminary design aims at a 16,000 tons ship, 160 metres long, 30 metres wide, powered by a propulsion plant providing top speed of 20 knots and a range of more than 9,000nm. Accommodations shall host and support up to 800 personnel/troops for a considerably long time, including modern equipment for medical assistance. The programme is for three LHDs, the first of which is expected to enter service in 2012.



Artist's impression of a FREMM class frigate. These ships will replace the "Lupo" and "Maestrale" class frigate.

MCM Command and Support Ship (MCSS)

The Italian Navy currently employs the Fleet Patrol Vessels of the "Soldati" class in the special role of Command platform for MCM operations and support to the MCM Force. Derived from the "Lupo" class frigates, these ships are yet far from being the ideal platform to satisfy the MCSS requirement. Moreover, the Soldati class units are mainly employed in blue water patrol tasks and it is therefore not convenient to modify their structures and facilities to better meet the MCM Force needs. The Navy is therefore developing, a requirement for a dedicated ship,

large enough to carry spares, unmanned underwater vehicles, support equipment, cranes, large containers, technical personnel and even to provide the MCMs with command & control, energy, fuel and with complete net connections through umbilical cables. This refers to a true floating base to support MCM forces deployed far abroad and for extended periods of time. The requirement is therefore for a quite large hull, with one of the investigated concepts calling for a 5,000 tons ship.

Logistic Support Ships (LSSs)

The Italian Navy has three AORs in service. The newest, the "Etna", was commissioned in 1998 and is fulfilling its fleet support role. Thanks to her large working areas, staff accommodations and comprehensive C2 equipment, "Etna" can also serve as command ship up to MCC level. The two smaller and older ships of the "Stromboli" class are ending their operational lifetime before 2015. There is yet the need to replace them with two larger LSSs, capable to fulfil the same comprehensive tasks of the "Etna", far exceeding the simple role of a replenishment ship. The Navy is developing the requirements for these ships, using the "Etna" as a starting point, but with the consciousness that important modifications are needed, first of all to cope with the new international environment protection rules. A solution could be seen in a "double hulled" variant of the existing ship, lengthening the hull to keep good load carrying capabilities, without affecting too much speed and other marine performance. The new LSSs are appointed to operate in joint and combined task forces, and will support the forces not only with technical items and command facilities, but also with equipment to transport and assist troops and personnel.

MCM Vessels

The Navy is aware of the need for a new class of MCM vessels and is therefore planning to build a class of at least ten ships before 2020, while modernization of the existing "Gaeta" class units is currently ongoing. Initial studies have been carried out involving both an advanced SES (Surface Effect Ship) design and a more conventional mono-hull alternative. The second is, by now, the preferred option, although a final choice on hull and main structures has still to be made. As far as special equipments are concerned, the Navy is working on a research programme centred on a mother MCM controlling a number of small unmanned vessels to perform the mission planned on board the MCM in a fully automated mode or in a radio controlled mode. The remotely controlled vessels will either tow or carry different sensors and equipment to perform mine detection, mine countermeasures and mine sweeping missions.

Littoral Combatant Ship (LCS)

The littoral is a growing importance environment for Navies, since asymmetric threat remains dramatically relevant. The Italian Navy is considering to take up the challenge with the acquisition of new ships, specifically designed to operate in the "brown waters", but also capable to be deployed far from Italian coastlines, to operate in the littoral of the area of operations. The Navy is defining a requirement for these units, to be employed for homeland security and for sea control/maritime interdiction. The key words will be manoeuvrability and high speed for the platform, modularity and integration for the weapon systems; low life-cycle cost will be a must. An embryonic design already indicates some characteristics: top speed of 30 knots, displacement of approx 2000 tons, surface effect hull, to enhance performance of a Diesel propulsion plant; a flight deck will be available. For the weapon system, modularity will enable the ship to fulfil typical mine warfare tasks, anti-submarine warfare, anti-surface ship role alternatively, simply by shifting the equipments, a basic capability of self-defence will be always granted. Great importance will be given to Command & Control systems, to provide effective integration by exchanging data and information also

with the Coast Guard, with other Services and national agencies as well as with foreign Navies. The ship will be able to carry out search and rescue and environment protection missions.

SUBMARINE FORCE

The modernization process of the Italian submarine force started in 1996 through the U212A Programme. The U212A first construction phase (two submarines) is completed: the first unit, ITS "Todaro", was commissioned on 29th of March 2006; the second unit, the ITS "Scire", was commissioned on 19th of February 2007. The acquisition of two further submarines is ongoing, with in-service date expected within 2015-2016, to replace the two "Sauro" class boats already planned for decommissioning. These new boats will be basically identical to the already commissioned U212A, except for some technical solutions to be implemented in order to face system obsolescence.

The remarkable innovations of this new generation submarine – such as non magnetic hull, advanced ship automation and systems integration, Air-Independent Propulsion (AIP) based on fuel cell technology, etc. – allow to fulfil a wide range of operations, especially in littoral warfare, like Intelligence-Surveillance-Recognition and SOF support. During the first year at sea, the main achieved operational results consist of significant increases in submerged endurance for AIP propulsion, reduction of global signatures (radar, acoustic, infrared and magnetic), increase of RMP "covert" compilation capability by passive long range detection with low frequency acoustic sensors (flank array and towed array). Another achieved goal is weapons interoperability: Todaro class submarines, in fact, can fire both Italian and German torpedoes.

Due to technology innovations implemented on board U212A submarines, the training sector has been adequate to the requirement of reduced crew, yet with higher skills, particularly in electronics and software. Logistic Support has been simplified by combining all logistic facilities in Taranto, which has been consolidated as "logistic focal point" of U212A submarines deployed in the Mediterranean.



AV-8B Plus HARRIER II on ITS „Garibaldi's" flight deck.

NAVAL AVIATION

AV-8B Plus "Harrier II" Fighter Aircraft

The current force of 15 single-seat aircraft and 2 twin-seat trainers, belonging to a single Squadron based in NAS Grottaglie, will remain in service until the JSF/F-35 becomes available. The Italian Navy, which operates these aircraft from the ITS "Garibaldi" and soon from the ITS "Cavour", still has a requirement for an additional 4 single-seaters, although the production line is now closed and the only option is to get some second-hand airframes from the USMC, budget permitting. Meanwhile, the Harriers II have received many upgrades, including the LIGHTENING II targeting pods, AMRAAM (AIM-120) air-to-air missiles, JDAM smart bombs, being introduced alongside the PAVE-WAY LGBs and SIDEWINDER and MAVERICK missiles. A quadri-lateral agreement between the Italian Navy, the Spanish Navy, the UK Royal Navy and the USMC will allow to continue supporting and improving these fighters for many years.

JSF / F-35 Fighter Aircraft

To replace its Harrier II fleet, the Navy selected the STOVL variant of the Lockheed Martin Joint Strike Fighter (F-35B). This version was also chosen by the USMC and the RAF/RN. The requirement is for 20 aircraft, even if some additional assets could be needed in order to establish a logistical and attrition reserve, while keeping enough aircraft on the front line to provide two operational detachments, each 6/8 aircraft strong, for the carriers. At the moment, a single squadron is envisaged and the first deliveries are expected not earlier than 2014.

Maritime Patrol Aircraft (MPA)

The remaining 12 "Atlantic 1" MPA's, belonging to a single Wing based in Sigonella (Sicily), will be dismissed by 2012. To replace this fleet, Italy is considering several options, whose acquisition had to be yet postponed after 2020 due to financial constraints. Meanwhile, in the short term, the Italian DoD is evaluating a "gap filling" interim solution to grant a limited yet acceptable maritime patrol capability until procurement of the Atlantic-replacing aircraft.



The fleet of three P-180 liaison and logistic transport aircraft in close formation.

P-180 Transport Aircraft

To satisfy its liaison and logistic support needs, the Navy procured 3 "P-180 Maritime" fixed wing aircraft, capable of transporting up to 6 passengers and cargo. Whenever required, a removable FLIR system can be installed under their fuselage to allow the conduct of maritime surveillance missions.

EH-101 Helicopter

The EH 101 is a medium lift (15 tons), multi-role helicopter selected by the Navy to replace the Sea King fleet. The aircraft, which is the result of a joint Italian Navy – Royal Navy programme started back in 1984, was designed and developed by Agusta and Westland (under the former EHI joint venture) to operate worldwide, in all weather conditions, and to meet the requirements of naval, troop transport and SAR roles.

The Italian Navy acquisition programme started in 2001 and is still ongoing, with 20 helicopters already delivered, 2 additional helicopters under production (deliveries foreseen in 2010) and 2 more options pending confirmation. Three different configurations are envisaged. The "maritime patrol" variant (10 helicopters), devoted to ASW and ASuW operations, is fitted with search radar, low frequency dipping sonar, ESM suite and FLIR and is armed with both MU90 torpedoes and the new Marte Mk2/S anti-ship missile. The "early warning" variant (4 helicopters) is equipped with a long range HEW radar to work as the "eye" of the fleet. The "maritime assault" variant (8 helicopters) is configured with a defensive weapon systems and an hydraulically operated rear ramp, able to load light vehicles, artillery, ammunitions, bulk cargo and NATO standard pallets.

The EH 101 fleet is presently based in NAS Luni (La Spezia, Italy) where the first operational Squadron has been established. These aircraft are mainly shore-based or operated from carriers, although they will be able to land on DDGs and large-deck frigates.

NH-90 Helicopter

The NH90, selected by the Navy to gradually replace the AB-212 helicopter fleet, is the result of a joint European cooperation started in 1990 by Italy, France, Germany and the Netherlands. On the industrial side, the programme is managed by the NHI consortium, combining Eurocopter, AgustaWestland and Stork (former Fokker). This twin-engine, medium lift (11 ton) helicopter has been designed and developed in two configurations, the naval version (Nato Frigate Helicopter–NFH) and the tactical transport version (Tactical Transport Helicopter –TTH).

The Italian Navy ordered a total of 56 helicopters, with 46 NFH devoted to ASW and ASuW operations, fitted with search radar, FLIR, dipping sonar with sonobuoys system, ESM suite and armed with MU90 torpedoes and Marte Mk2/S anti-ship missile. The remaining 10 helicopters will be in the TTH version, equipped with rear cargo ramp, self defence machine guns and capable to transport up to 20 fully equipped soldiers to support amphibious assault and special operations.

The delivery of the first NFH is foreseen in 2009, whereas the TTHs will be delivered in the 2016-2018 period. The NH90 will be embarked on all main surface ships.

UAV

The Italian Navy has a strong interest in UAVs and has been involved, since the beginning, in the PREDATOR joint procurement programme, intended to support the Italian four Services as well as to gain all initial operational experience. Navy's plans currently foresee, in the mid term, the procurement of a fleet of

tactical VTOL UAV to be operated from the flight decks of ships down to the size of a corvette.

Helicopter modernization

Whilst waiting for the completion of the EH 101 fleet and for the delivery of the NH90, the Navy will continue operating both the SH-3D (Sea King) and the AB-212 helicopters for some other years. There are still 10 SH-3D and 33 AB-212 soldiering on, which have received several upgrades. Some of them have been made compatible with NVGs and fitted with complete self protection suites, armour kits, machine guns and are presently employed in the frame of ISAF operation.

MAIN WEAPON SYSTEMS' RESEARCH AND DEVELOPMENT ACTIVITIES

Missiles and Anti-aircraft/anti missile systems

"Marte" Mk2/S

The MBDA air-launched, anti ship missile is all evolved version of the original MARTS and benefits from many improvements first intended for the TESEO 2 Block IV anti-ship missile, plus some other specific characteristics.

It was designed and developed for the Italian Navy's operational requirement, to provide medium-heavy helicopters with stand-off anti-ship capabilities. It is a "fire and forget", all weather, medium range, sea-skimming weapon, with high target discrimination capability even in a cluttered environment, typical of littoral warfare. The missile, developed to fit both the EH 101 and the NH 90 helicopters, will enter service in 2008, when all qualification activities will be completed.

Principal Anti Air Missile System (PAAMS)

The PAAMS programme is being jointly conducted by Italy, France and the U.K., to develop all area defence anti-missile system to be embarked on Italian and French "Horizon" destroyers and on the UK Royal Navy's "Type 45" destroyers. PAAMS development is on track, and is to be completed in time to be fielded on board of the "Doria" class destroyers. The system can operate with both ASTER 15 and ASTER 30 missiles, respectively for short and medium range defence. These weapons can engage and defeat any airborne target, including air breathing aircraft and UAVs and missiles, at long ranges and high and low altitude. A limited capability against tactical ballistic missiles is going to be provided as well.

Programme FSAF

The programme FSAF, (the acronym indicates the family of future surface-air systems) is an international cooperation between Italy and France, developed by an industrial consortium, named Eurosam. Aim of the programme is the development of a system for anti-aircraft and anti-missile naval defence, which will be produced in French configuration, already operational on the carrier "Charles de Gaulle", and Italian configuration, to be installed onboard "Cavour" and "Doria" class. The programme is now in the industrialization phase, to end with the acquisition of ASTER 15 missiles and logistic support for the carrier "Cavour", for the short range defence system (SAAM/IT: Surface-Air Anti Missile/Italian configuration). Next step will be the acquisition of ASTER 15 and ASTER 30 missiles, to equip the PAAMS of the "Doria" class destroyers.

Guns and ammunitions

127mm Light Weight (LW) Gun

Development of the 127mm LW naval gun started in 1992; the trial phase was completed in 2003, with the ITS "Bersagliere" having fired around 500 rounds.

The weapon system development in its initial form, with a 54 calibre barrel, is now completed.

The turret weighs a mere 17 tons, while the complete system, without ammunitions, reaches 24 tons and is capable of firing 35 rounds per minute, in both Naval Surface Fire Support (NSFS) and anti-air role. Oto Melara is now working on the 127/64LW Vulcano, sporting a lengthened barrel of 64 calibres capable of firing an unguided projectile at a maximum range of 90km. Even with the new barrel, the gun total weight is not to exceed 30 tons. The development of the 127/64 LW started in 2005, and the in-service date is scheduled for 2012, with its installation on board of the first "General Purpose" FREMM.

Inner layer defence system "DAVIDE "

Development of this new-generation inner layer defence system (ILDS) started in the late '90s, with the Navy's requirement for a minimum keep-out range of one mile, to prevent missile debris hitting the ship, and a very high SSKP (Single Shot Kill Probability) against sea-skimming and manoeuvrable anti-ship missile.

Oto Melara, after a contract signed in 2001, is developing the programme, that will be completed in 2008; the IOC is scheduled for 2010. DAVIDE is made up of three elements: a 76/62mm SR (Super Rapido) gun, RF (Radio Frequency) beam generator installed in the gun cupola and the DART (Driven Ammunition Reduced Time of flight) ammunition. An initial muzzle velocity of 1,200m/s allows the projectile to reach the distance of 5km within 5 seconds, with a very high manoeuvring capability. Guidance is provided by an RF beam and the target destruction is accomplished by a pre-engraved warhead, equipped with a proximity microwave fuse. An unguided version of the DART, called ART, is under consideration, for invalidating and warning fire.

Underwater systems

BLACK SHARK torpedo

While the procurement of the Eurotorp MU90 lightweight torpedo is under completion, the development of the WASS heavyweight torpedo BLACK SHARK is ongoing. This programme was started in 1999 to renew the submarine-launched torpedoes line, providing a torpedo with both anti-ship and anti-submarine capabilities. The new torpedo, already selected by several foreign Navies, reaches a top speed of more than 50 knots and a range of more than 30 miles; it will be ready to start onboard integration in 2009.

Underwater vehicles

The Italian Navy is going to procure new light AUVs (Autonomous Underwater Vehicles) while it is completing the acquisition of the line of PLUTO family ROVs (Remotely Operated Vehicles). Still cooperating with the NATO Undersea Research Centre (NURC), hosted in La Spezia, the Navy is involved in several initiatives that will lead to the development and testing of advanced unmanned underwater vehicles able to perform classic MCM roles and harbour protection tasks. A national R&D programme, aimed to search for new solutions in the UUV (Unmanned Underwater Vehicle) field, is now being completed and is promising interesting results for ROV transition to AUV and semi-AUV, as well as for a mines disposal vehicle prototype.

SLAT anti-torpedo system

Development of the SLAT anti-torpedo system (SLAT=Système de Lutte Anti-Torpille), stems from a cooperation programme with the French Navy. The system, validated in 2003, is now under production. The SLAT system provides surface vessels with means to detect, classify and evade torpedo attacks, thanks to a combination of a towed array sonar sensor, a set of countermeasures

(jammers and decoys) to deceive the torpedo's homing system, and the provision of directions for carrying out evasion manoeuvres. The SLAT will be installed onboard ITS "Doria" class ships and onboard the new FREMM units.



The Italian Navy has ordered a total of 56 NH 90 helicopters.

Radar and Fire Control Systems

The Italian Navy is acquiring several new radar sensors, whose development is being conducted or completed by the Company AMS, now turned into Selex Sistemi Integrate. The Multi Function Radar EMPAR (European Multifunction Phased Array Radar) is being installed on the ITS "Cavour" and on the ITS "Doria" class, to work within the PAAMS. The same system will be installed on the FREMM frigates, integrated with the SAAM/IT. The Navy is currently discussing with Selex S.I. further evolution of the EMPAR.

Selex has also developed the RAN-40-L, long range 3D air search and early warning radar, to be installed on the ITS "Cavour" and on the ITS "De La Penne" class DDGs, during their refitting. This radar benefits from the technology developed for the former RAT-31-L radar, combining impressive performance with low weight and small antennas, fulfilling severe stealth requirements. Other radars developed in last years, to upgrade existing Frigates and Destroyers, are the RAN-21-S, intended to replace the SPS-774 air search radar, the RASS surface search radar, to replace the SPS-702, and the SPN-753 ARPA navigation radar.

Selex is cooperating with the Navy also in the development of the fire control systems, mainly consisting in the setting up of the DARDO F system, intended both for the new ships and as a part of many retrofit packages for the mid-life upgrade of several ships already in service.

Naval Platforms

Recently, the development of innovative electrical technologies rose the interest of the Italian Navy towards non-conventional architectures of electrical distribution plants. The exploitation of new technologies is aimed at improving operational flexibility and system reliability, minimizing operation risks and simplifying equipment provisioning.

A remarkable example is the ITS "Cavour", where the Italian 50Hz standard frequency was applied, thereby allowing the adoption of commercial technologies and COTS (Commercial Off-The Shelf) and consequently minimizing costs. The "Cavour" main electrical distribution plant is based on a ring-type scheme, provided with an advanced protection system of modular type with a directional fault-detection criteria. Each generator and each load centre is connected to the ring through its own switchboard. The new aircraft carrier is also provided with two shaft alternators connected to the main ring through dedicated switchboards. The electrical system will be controlled by an advanced automation system that integrates also the functions related to propulsion, auxiliaries, safety and damage control.

The project of the FREMM frigates is characterized by a hybrid type propulsion plant that comprises a gas turbine and is able to exploit some of the advantages of electric propulsion, keeping within acceptable limits the platform costs and dimensions. The FREMM project will be the occasion for the Italian Navy to experience new concepts and new schemes for propulsion and energy distribution on board its warships. It will be possible to evaluate the expected advantages and to acquire experience in the operation of reversible Electric Propulsion Motors. It represents a first step towards the possibility to implement the AES (All Electric Ship) concept for future Italian combatant and non-combatant ships.

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