

“EADS naval”: strategy and know-how

The French Navy (6th worldwide in terms of tonnage, with 307,400 tonnes, behind Japan, the U.K., China, Russia and the U.S.) is completing and upgrading its vessels, notably its second aircraft carrier (PA2). Also due for refurbishment are its Horizon air defence frigates (in cooperation with Italy), as well as its FREMM frigates, BPCs Mistral and Tonnerre (projection and command ships), SNLE Terrible (strategic nuclear submarine), fitted with the M51, and the SNA Barracuda (nuclear attack submarine). For industry (providers of platforms, system design services and manufacturing), and EADS in particular, this renewal of European programmes during a time of national consolidations (DCN-Thales) represents a landmark. Mainly known for its civilian activities through Airbus, EADS has progressively confirmed its position as a major industrial player in

the defence and security field. In recent years, the naval sector has become a growth segment for the European firm. This expansion was confirmed by the acquisition in 2005 (along with ThyssenKrupp) of Atlas Elektronik, a German company specialising in anti-submarine warfare and naval electronics. Today, EADS offers capabilities in four naval segments: maritime superiority; naval systems; integrating naval sensors, electronics and combat management systems. In the missiles business, MBDA (Scalp Naval, VL Mica), Eurocopter (naval version of the NH90) and EADS CASA complete the group's offer. EADS is thus developing network enhanced systems to cover the full range of naval actions, notably with regards to coordination between vessels. This type of system is generally capable of meeting the multi-mission needs of forces, combining the use of

satellites, aircraft (fitted with the FITS system), UAVs (ORKA), rotary wings, ships, submarines and coastal stations. In terms of in-depth, precision strikes, Atlas and MBDA are the only manufacturers to offer all categories of torpedoes and missiles, from anti-submarine combat to surface-to-air strikes. To meet the needs of joint and multinational forces, interoperability is a constant feature. EADS is closely following the evolution of the world's navies and their needs. In this context, maritime security could become a crucial component of its Defence & Security Systems division, notably since the company's acquisition of Sofrelog, known for its expertise in this field. Hervé Guillou, CEO of EADS Defence & Security Systems France, explains how this acquisition effects the business model in the following interview. ■

Interview with Hervé Guillou, CEO of EADS Defence & Security Systems France

How does DS position itself within EADS?

EADS' Defence & Security Systems division is the defence and security branch of the EADS group. As systems integrator, it offers integrated solutions to meet the new challenges faced by armed forces and agencies in charge of national security. Its activities include air combat and mission systems, both manned and unmanned, as well as their associated training programmes, missile systems, joint forces battlefield management services, national security, defence electronics, sensors and avionics, etc. The division comprises several operational units, which offer wide range of defence electronic equipment; defence and communications systems; mission systems & solutions; information infrastructure solutions; global security and secure networks, and finally military air systems. EADS' stake in MBDA is also part of the division led by Stefan Zoller.

And with regards to European consolidation in the naval field?

Our naval activities include on-board naval combat systems, coastal surveillance systems, naval defence systems as well as naval communication systems

designed by Hagenuk. These activities form an important part of EADS' array of products in the field of network-centric operations in Germany, in France and in the U.K. The merging of our naval system activities with Atlas Elektronik has resulted in the creation of an entity comprising a broader, complementary and more robust naval and maritime product line. Having access to these types of optimised solutions will provide Defence & Security Systems with an excellent springboard for growth. It is an important step towards the crucial consolidation of the European defence industry.

What does the acquisition of Sofrelog represent for the company?

The maritime services sector is even more segmented than the naval industry. The acquisition of Sofrelog and its know-how rounds out the expertise of EADS in global security and of Atlas Elektronik in military naval activities. This innovative consolidation will optimise competitiveness and visibility on the market, two key assets which will strengthen commercial prospects for future security systems. ■

Atlas: mastering underwater warfare

The positioning of Atlas Elektronik

Atlas Elektronik specialises in latest-generation electronic systems for naval defence activities. Well established on the German military market, Atlas offers a variety of combat systems, from “sensors to shooters,” destined for warships, submarines, mine countermeasure boats, coastal surveillance networks and hydrography. These systems are capable of fulfilling all naval combat missions, whether confronted with traditional threats or asymmetric threats in the context of global security operations. Over the years, Atlas has built a reputation for excellence in underwater battlespace systems. Its products cover sonar systems for anti-submarine warfare and the destruction of mines, submarine command and control systems (C2), surface ships and countermeasure vessels, heavyweight torpedoes, mine dispersal vehicles, unmanned underwater vehicle systems (UUVs) and autonomous underwater vehicles (AUVs). EADS has stressed that its acquisition of Atlas, along with ThyssenKrupp, is a boost to Atlas’ capital, but that the company will retain its autonomy to continue and develop its expertise.

Adapted SICs

On-board command and control systems are used to manage the flow of data and information. They provide operators with a real-time picture of an operational situation. Installed aboard submarines, Atlas’ ISUS (Integrated Sensor Underwater System) manages sensors, and controls weapon, navigation and command systems. ISUS is currently in service with 12 navies around the world, notably on Type 209 and Type 214 submarines.

► Sonar guns

Atlas offers active and passive sonars for anti-submarine operations, as well as antennas that can either be towed or fitted on the hull. The hull-mounted ASO 90 sonar, as well as the towed, low-frequency Actas sonar are used for long-range detection. They can be integrated into ASW sonar systems, which combine the long- and medium-range detection capabilities of the latest submarines, which are capable of travelling long distances very quietly. Numerous sonar systems, such as the HMS, VDS, TAS and ACTAS, have been designed for detection and pursuit. More than 70 ASW Atlas sonars are already in service in navies around the world.

► Automation of data

Atlas’ COSYS modular combat system can be installed aboard surface vessels. COSYS

ensures the automatic appraisal of the situation and enables decision-makers to deploy the appropriate shooters in real-time. With COSYS, several weapons systems can be simultaneously deployed against several targets. For naval surface operations, Atlas also offers the WECDIS tactical navigation system as well as numerous navigational radars.

► The latest-generation torpedoes

Atlas’ 4th-generation torpedoes are based on a broadband fibre-optic guidance system that makes them resistant to electronic interference and jamming. 17 navies—among them the German Navy, which has indicated its satisfaction with Atlas’ products—have to date acquired 1,600 Atlas torpedoes. The latest model is the SeaHake mod4 DM2A4.

Atlas: submarine security

The European UUV & AUV specialist

The array of unmanned underwater vehicle systems (UUVs) and autonomous underwater vehicles (AUVs) offered by Atlas Elektronik ranges from small-capacity systems (SeaFox A) with mission lengths adapted to the specificities of use in shallow waters, to long-endurance systems destined for deep sea operations DeepC. German engineers have come up with UUV and AUV solutions for all types of use. Several vehicles can in fact be coordinated in parallel. These AUVs can fulfil a variety of missions:

- countermine operations to establish the presence of mines and other underwater obstacles, whether in deep or shallow waters;
- mine destruction operations using ammunition;
- reconnaissance, surveillance and intelligence gathering missions in hostile ports or in amphibious areas;
- delivery and extraction of equipment or personnel during combat operations;
- support for special forces;
- installation of antennas along homogeneous points on the sea floor;
- installation of acoustic scramblers, and reconnaissance operations in coastal areas using thermal cameras, video or television.

Countermine systems

The spread of mines is an on-going danger for maritime traffic. Minehunters remain the equipment of choice for navies in combating this threat. For this reason, Atlas Elektronik offers a variety of countermine systems and equipment, such as the MDV SeaFox, SVDS systems, hull-mounted sonars, ADS antennas, non-piloted vehicles and tactical command and control systems. The MWS 80 and MWS 92 integrated countermine systems feature advanced sonar technology. The German Navy has in service one of the largest mine countermeasures forces - this is supplied by Atlas. Sonars that are either hull mounted or fitted on anti-submarine drones allow minehunting operations while avoiding risk for the crew. SeaFox is one such underwater drone that carries ammunition for the destruction of mines. Atlas recently delivered a version of the SeaFox, deployed on a rotary wing, to the U.S. Navy —an illustration of its expertise and worldwide reputation.

► Management of maritime traffic

Surveillance and monitoring of maritime traffic in straits and coastal areas ensures security for ships, making it possible to increase traffic while avoiding accidents and hence damage to ships or environmental pollution. Here, Atlas Elektronik offers system solutions for managing traffic,

automatic identification, coastal surveillance, as well as the associated training programmes.

► Research & security activities

Atlas's facilities are equipped with an acoustic chamber, a testing lake and an equipped ship, facilitating the testing of continuously evolving naval technologies.

Network-centric naval combat systems

► Certification for Finland

EADS is providing four ANCS systems to the Finnish Navy for its Hamina patrol ships (Squadron 2000 programme) for coastal defence. EADS is in charge of integration and tests and will also provide TRS-3Ds, Maigrets and MSSR 2000 identification friend or foe detection systems. Operational certification of the first ANCS systems was successfully carried out aboard the Haminas, in the Baltic Sea. Also, six Finnish mine layers are currently being fitted with a specific variant of the ANCS, with the first successful launch carried out in April 2006.

► PA2 combat system

As part of the MOPA2 (DCN-Thales Naval France team in charge of the second aircraft carrier programme), EADS is participating as a partner in the study and definition phase for the combat system, notably with regards to the architecture of the communication system. Also under study is an ammunition management concept (supply, stocking and handling) as well as the deployment of an embarked air group.

► CMS on the F-125

EADS is taking part in the development of the F-125 frigate for the German Navy for the replacement of Type F-122s in 2011. EADS has already issued offers regarding combat, communication, electronic warfare and radar detection systems. EADS has been selected to provide the combat management system (CMS). To combat asymmetric threats, EADS has developed the demonstrator of an on-board surveillance system for ships, based on optical and electro-optical elements for monitoring of a ship's surroundings and to provide warning of terrorist attacks.

Defence & Security Systems' (DS) naval expertise

As EADS' Defence and Security Division, DS is a major player in the area of Large System Integration solutions for naval combat and, among other activities, maritime security. Thanks to competencies ranging from design to development, as well as the deployment of integrated solutions, Defence & Security Systems can network a large number of platforms and subsystems -including high-tech naval sensors and radars. The sensors are installed on coastal stations and surface ships and transmit data gathered to command centres that process and combine information to provide decision-makers with a real-time picture of the operational situation. EADS can provide part of the platforms and sensors such as the TRS-3D and Maigret 5800. In terms of maritime security, EADS notably offers a complete range of open and modular high-tech systems, such as the Advanced Naval Combat System (ANCS) surface vessel battle management system and its offshoot, the Advanced Coastal Surveillance System (ACSS).

Network Enhanced Capabilities (NEC)

The multi-platform concept of engagement is a requirement expressed by the French Navy for the management of entire operational situations. It involves selecting the most appropriate vector (ship, submarine, aircraft, etc.) to deal with a given target in a real-time manner. The concept involves the exchange of data gathered by the various platforms, assessment of the tactical situation, correlation of information and selection of platforms to be deployed against each target (means of target acquisition). This technology could be operational sometime between 2010 and 2015. ANCS has been implemented in Finland by EADS, a first worldwide.

Network Centric Operation and Simulation for system architectures

EADS is relying on powerful simulation tools in the development of networked architectures. This simulations centre enables the simulation in a synthesised environment of interoperability among all kinds of equipment in various complex scenarios. Participants select a scenario and enter variables in order to test, for example, a device or an operational manoeuvre (e.g. the targeting of a terrorist vehicle or fast-moving ship that must be destroyed).

Advanced Naval Combat System (ANCS)

EADS has developed a latest-generation combat system that can be easily adapted to different naval vessels currently in service worldwide: the Advanced Naval Combat System features a modular open network architecture. A central programme integrates data provided by different sensors in service on a theatre of operation. The merging of this information makes it possible to determine the situation on the theatre of operations and transfer the data to weapon systems, which respond to the operational situation in real-time. ANCS makes it possible to coordinate naval vessels and other resources. ANCS can thus operate in all types of naval operations on high seas or along the coast, in the context of joint forces or allied operations. The singularity of this open architecture is its capability to adapt to any combination of sensors and equipment in service.

Maritime security and protection against asymmetric threats

Advanced Coastal Surveillance System (ACSS)

ACSS is a modular coastal surveillance system. In 2005, Portugal entrusted the creation of a Vessel Traffic System (VTS) to monitor maritime traffic along the Portuguese coast, to a German-Portuguese consortium. The VTS system will protect Europe's outer borders, improve maritime security and combat pollution. It consists of a control unit, digital data communication networks, radar stations and an electric power supply system. At the heart of the system, two centres, one in Lisbon, the other in Potimao, are linked to eight remote-controlled radar stations, as well as base stations in charge of automatic identification of ships, and other sensors and components. Eight radar stations are provided, as well as a port-based control centre.

TRS-3D radar

The TRS-3D, an electronic scanning radar for surveillance and weapon assignments has been selected by Germany (F122 and K130 programmes), Denmark (SF300 programme), Malaysia (patrol vessels), Finland (Squadron 2000), Spain (LPD2) and Lithuania. In October 2004, the U.S. Coast Guard selected the TRS-3D in aerial surveillance version to equip its future WMSL ships and coastal stations as part of the Deepwater programme. Under the aegis of the Department of Homeland Security, Deepwater covers the upgrading of equipment in order to identify and intercept suspicious ships as part of the war on terrorism. EADS was also chosen back in October 2004 to provide this radar in a naval version for the prototype of the Littoral Combat Ship (LCS), being developed by Lockheed Martin. The U.S. Navy plans to acquire 60 LCSs. Finally, in the summer of 2005, EADS was awarded the contract to provide radars for Norwegian Coast Guard patrol ships.

FITS integrated tactical system

EADS Military Transport Aircraft produces the FITS system (Fully Integrated Tactical System), currently fitted on the Patmar versions of the CN-235 and C-295, as well as the Spanish Air Force's upgraded Orion P-3s. The company will also provide Casa C-295s to Brazil and will upgrade Portugal's P-3s, notably with the FITS system. FITS carries out SAR, coastal surveillance, and submarine and ship detection missions. It consists of a tactical system connected to a network of sensors (ESM, acoustical, MAD, FLIR/TV, radar) making it possible to detect, identify and pursue ships and submarines. Thanks to its modularity, it can be fitted with sensors made by other manufacturers. Data is analysed using consoles, which are installed according to the needs of the client. CASA FITS can be fitted with sensors to detect oil spills (SLAR, MWR, IR/UV). Finally, the system features visualisation tools for the cockpit, a recording system, as well as a ground support station for mission preparation and analysis of the data gathered.

► Imarsec™, maritime security

During Euronaval 2006, EADS is unveiling Imarsec™, its new integrated system for global maritime security. An innovative and modular solution aimed at ensuring seaport, coastal and maritime security, the system features all types of sensors, based on ground, aerial or spatial platforms, as well as command centres that trigger the appropriate means of intervention.

► PMR on the FREMM

As part of the FREMM programme, MBDA is providing MM40, Scalp Naval and Aster missiles. For the communication system, EADS is providing HF subsystems and Professional Mobile Radio wireless communication (PMR) for security and firefighter forces. The PMR system offers secure mobile telephony services while ensuring total coverage of the ship, its surroundings and communication with the port when docked. It will evolve throughout the course of the programme to include high-speed data services. PMR with Tetrapol technology is already in use among NATO forces and German, French, British and Italian forces in Kosovo. It should also equip future German F-125 frigates.

► Sytar and Sofrelog

Sytar is a system developed by Sofrelog for both coastal surveillance (Spatonav programme in France) and monitoring of maritime and port traffic, an area in which Sofrelog is among the leading players. The new version of Sytar V2, the result of a long development process, is based on the most modern software technologies and has just been commercially launched.

MBDA: Versatility for naval use

► MM40 Block III

The Exocet MM40 Block III was selected in 2003 for French FREMM anti-ship warfare. Thanks to completely upgraded avionics and an increased range, the Block III meets future requirements for anti-ship combat. The Exocet MM40 Block III also meets the new requirements of navies already equipped with the Exocet that would like to increase their capabilities. In addition to an increased range, navies will benefit from the Block III's land attack capabilities.

► SM39

The Exocet SM39 has been chosen to equip the future Barracuda attack submarine. It is also expected to be fitted on Scorpene-class submarines to meet the needs of navies on the export market.

► AM39

The air-transported version of the AM39 benefits from enhancements in terms of avionics developed for the MM40 Block III. These will be gradually integrated onto the AM39.

► Teseo 2 Mk2A

The Teseo 2 Mk2A surface-to-surface system (Otomat Mk2 in export version) will equip Italian FREMM frigates. A long-range, sea-skimming missile, it is an upgraded version of the Teseo 2 in service in the Italian Navy. It will feature improved capabilities in terms of resistance to jamming. On 30 May 2006, MBDA launched its first Teseo Mk2/A from the Salto di Quirra launching site in Sardinia.

► Milas

The Milas torpedo-carrier, designed for anti-submarine combat, will equip Italian FREMM frigates. It will be fitted on the MU90 Franco-Italian light torpedo, whose capabilities in terms of detection and depth of action enable it to combat high-tech threats.

MBDA's naval expertise

As master builder, MBDA has been selected as the unique provider of missile systems to the main units of European navies. The company will contribute to the Horizon/Orizzonte and FREMM frigate programmes, British T45 destroyers, Barracuda submarines, Charles-de-Gaulle and Conte di Cavour programmes, as well as the second aircraft carrier project. MBDA will provide air defence, anti-ship, anti-submarine and land attack capabilities. On 16 November 2005, OCCAR awarded the first part of the FREMM development and production contract (17 for France and 10 for Italy). Although produced in two versions, they will be fitted with common air defence, anti-ship and anti-submarine missile systems. French FREMMs will be fitted with the Scalp Naval.

FSAF architectures in the naval field

As part of the European FSAF programme (Future Surface-to-Air Family) based on the Aster family of missiles, MBDA has been selected for the development and the production of SAAM self-defence systems (based on the Aster 15) and PAAMS area defence (based on the Aster 15 and 30). The SAAM system has already been fitted on the Charles-de-Gaulle and the Conte di Cavour. Last September the Saudi Navy concluded a series of operational firings of Aster 15 missiles from three Sawari 2 frigates equipped with SAAM. FREMM air defence is based on the Aster 15, with two eight-tube launchers, for a total of 16 missiles. PAAMS, a tri-national undertaking (France, the U.K. and Italy), will equip Horizon and Orizzonte frigates as well as T45 destroyers. Featuring 6 vertical launchers with eight tubes each capable of firing Aster 15 and 30 missiles, the PAAMS will ensure self defence and area defence of fleets during operations. The system's capabilities are scaleable, thus making it possible to integrate an anti-ballistic defence component with the introduction of the Aster Block I, derived from the Aster 30, and jointly developed by France and Italy.

Very short-range asymmetric threat

To deal with asymmetric threats (air or naval), MBDA offers the Tetral weapon system, which relies on the Mistral missile, already in service on Sadral and Simbad systems. Tetral ensures self defence of surface vessels via an economical and easy-to-use system that benefits from the proven capabilities of the latest versions of the Mistral.

Marte Mk2/S and Marte Mk2/N

The Marte Mk2/S anti-ship missile is an upgraded version of the Marte, whose development and adaptation for the NH90 NFH and EH101 is being financed by Italy. France will equip its NH90 NFHs with a light anti-ship missile to complement the Exocet in dealing with low-intensity threats. In response to a requirement for a light surface-to-surface weapon to protect the Exclusive Economic Zone (EEZ) and to resolve low-intensity conflicts, MBDA offers a version based on the surface platform Marte Mk2/N.

Scalp Naval, VL Mica and modular launchers

Scalp naval: in-depth strikes at sea

The need for in-depth strike capabilities on naval vessels (frigates and submarines) was confirmed by the decision to equip FREMM frigates and Barracuda nuclear attack submarines (SNA) with a naval cruise missile. An initial risk reduction phase for the Scalp Naval cruise missile programme was successfully carried out by the DGA and completed in mid-2005. With the awarding of the FREMM contract, development of the Scalp Naval's vertical launch system will get underway. Based on Sylver technology, it will include the development of a lengthened launcher (Sylver A70) as well as the weapon management electronics. The Scalp missile's development and manufacturing programme, common to both FREMM and Barracuda platforms, is expected to begin before the end of 2006.

Sylver A70 launchers: a flexible option

In order to better meet the requirement for operational versatility on the part of FREMM frigates, the vertical launch systems, initially planned for the Aster 15 and the Scalp Naval cruise missiles, have been designed in a modular fashion to ensure expansion with future capabilities or greater flexibility in terms of use. Here, the Scalp Naval (A70) launcher could in future permit vertical firing of the Exocet MM40 Block III. Moreover, the A70 launcher could also offer, in the case of T45 frigates (PAAMS), a solution for the addition, if necessary, of in-depth strike capabilities under optimal integration conditions.

Development of the Scalp Naval

The Scalp Naval benefits from the gains made by the Scalp EG in terms of propulsion, navigation and high-precision guidance. Integration onto naval platforms is based on experience with vertical firing of the Aster and underwater launching of the SM39. Activities carried out as part of a risk reduction programme in 2005 involving the initial acceleration phase, vertical launch and underwater launch capsule, resulted in the validation of the essential technologies to be added to the Scalp Naval.

VL Mica generating interest

In December 2005, the DGA awarded a contract for the VL Mica covering a new-generation self-defence system that will complete MBDA's product line with a surface-to-air in naval version. With the VL Mica, ships with limited available space can be fitted with a system that is efficient, easy to install and simple to use. The interest shown in the VL Mica by several navies confirms the technical choices made for this system, based on the Mica missile and available with electromagnetic or infrared guidance.

► Development of the Scalp Naval

The development of the Scalp Naval has begun and several platform compatibility tests have been successfully carried out. During her visit to Vélizy last September the French minister of defence, Michèle Alliot-Marie, was able to see the first prototypes of the Scalp Naval and its booster, the underwater launch capsule, and the vertical launcher for surface vessels. The missile will be fired from frigates using the versatile Sylver A70 launcher (also capable of firing the Aster 15 and 30) and from submarines via a torpedo launcher. The Scalp EG's entry in service on Rafale Ms is planned for 2007. This will provide forces with an initial strike capability on the Charles-de-Gaulle. By 2011, the French Navy will begin to gradually receive its allotment of Scalp Navals to be fitted on its FREMMs and Barracuda SNAs. Planned from the start to have a greater payload capacity than the Rubis, the Barracuda will tow the Scalp Naval with its torpedo launch tubes. Aside from the launch phase, which is different for submarines and frigates, missions and capabilities will be identical. The missile will be unique—a prime example of efficient cost management and logistical standardisation.

► Self defence

In order to adapt to the needs of the market, MBDA is, at the request of users, maintaining and upgrading SeaWolf and Albatros (along with the Aspide missile) self defence systems, in service in several navies around the world, notably those of the U.K. and Italy.

The third naval dimension

► AS 555 SN

The AS 555 SN is propelled by two ARRIEL 1As. It is equipped with a 360-degree radar for observation and surveillance. Fitted with a Telephonics 1500 panoramic radar and a data link, it can locate for the vessel firing anti-ship missiles targets that are beyond the line of sight of the latter. It can carry a torpedo for anti-submarine combat. A 20-mm gun enables it to engage rapid embarkations by pirates and smugglers. Optimised for SAR, the Fennec can be steered with night vision goggles. It has an autonomy of more than four hours in maritime patrol operations and two hours in armed patrol or anti-submarine missions.

► ORKA: Virtual Take-off and Landing UAV

This multi-mission helicopter Unmanned Aerial Vehicle (UAV) with a joint forces role is dedicated to reconnaissance and protection of maritime and air/land environments. The ORKA UAV is being jointly developed by Defence & Security Systems and Eurocopter. Featuring automatic take-off and landing on vessels equipped with a helicopter pad, ORKA offers operational flexibility and round-the-clock capabilities during interventions. The mission system consists of an electro-optical/infrared payload as well as a maritime surveillance radar and a secure, high-speed, real-time data link. Its payload capacity (180 kg) and its eight-hour autonomy enable it to carry out image or electromagnetic reconnaissance missions.

NH90 NFH: versatility for combat fleets

The NH90 is medium-capacity twin-engine helicopter that meets the needs of France, Germany Italy, the Netherlands and Portugal. It comes in a naval version, the NH90-NFH (NATO Frigate Helicopter). The body features a cutting-edge aerodynamic structure made of composite materials, infrared and acoustic radar discretion, and the latest-generation man-machine interface. The NH90 is the first transport helicopter with electric flight controls. It will carry out anti-ship and anti-submarine missions autonomously or in collaboration with warships and will provide logistic support for naval forces at sea. Its crew will consist of three or four persons. The NFH will be employed in the detection, pursuit and destruction of submarines or surface vessels. It will be capable of identifying for the vessel firing missiles targets that are located beyond the light of sight for the latter. It will feature a sonar, sonobuoys, a tactical radar, tactical FLIR, active and passive electronic protection equipment, anti-surface and/or anti-submarine weapons. It will be capable of operating by day or by night and in adverse weather conditions, notably during take-offs and landings on platforms agitated by waves. In series, it will feature a combat system enabling it to launch Marte Mk2 light anti-naval missiles. To date, 46 NH90 NFHs have been ordered by Italy, 27 by France, 20 by the Netherlands, and 14 by Norway.

A dedicated helicopter for naval combat

The AS532 SC, the naval version of the Cougar, is powered by two MAKILA 1A2s. It has been designed for anti-submarine and anti-ship missions, rescue operations and support of naval forces at sea. It will be capable of identifying for the vessel firing anti-ship missiles targets that are located beyond the light of sight of the latter. In anti-ship version, the AS 532SC can carry two Exocet AM39 Block II fire-and-forget sea-skimming missiles, enabling it to attack targets up to 150 nautical miles away from its carrier vessel. To detect, identify, pursue and destroy submarines, it uses a deep, low-frequency radar and is fitted with two torpedoes.

AS565 MB Panther aboard La Fayette frigates

The AS565 MB Panther is powered by two ARRIEL 2C engines. It is specialised in maritime surveillance, and search and rescue operations at sea. It can embark two torpedoes and be fitted with a 20-mm gun through a porthole for armed patrol missions against pirates or smuggling operations (speedboats often equipped with 300-hp motors) Its automatic four-axis steering system helps the pilot in all phases of the flight by enabling automatic night-time hovering flight without the need for visual references. A foldable tail fin and harpoon facilitate the Panther's landing on the deck of a ship. The helicopter can operate on naval platforms in all weather conditions.