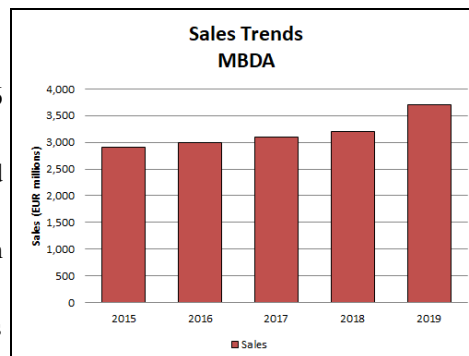


MBDA

Outlook

- For 2019, MBDA reported sales of EUR3.7 billion, up almost 16 percent compared to EUR3.2 billion in 2018
- FCAS Phase 1A officially launched in February 2020; MBDA and Airbus to investigate Unmanned Systems Remote Carrier
- Tempest Future Combat Air program moving along in U.K., with more partners joining effort both at home and abroad
- In November 2019, MBDA acquired GDI Simulation from Airbus for an undisclosed amount



Headquarters

MBDA UK (Head Office)
11 Strand
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Website: www.mbda-systems.com

In April 2001, BAE Systems, EADS (now Airbus Group), and Finmeccanica (now Leonardo) signed an agreement to incorporate a single company that would regroup the missiles and missile systems activities of their respective subsidiaries – Matra BAe Dynamics, EADS Aerospatiale Matra Missiles, and Alenia Marconi Systems (AMS) – into a new company named MBDA Missile Systems. Final documents formally establishing MBDA as a legal operating entity were signed in Paris on December 18, 2001.

Paving the way for the formation of the new company was the creation of Matra BAe Dynamics (1996) and Alenia Marconi Systems (1998), followed by the decision of BAE Systems and Finmeccanica to contribute the missile activity of Alenia Marconi Systems to MBDA.

The agreed-upon structure means the parties' shareholdings are held through two intermediate holding companies, MBDA Holdings SAS and AMS NV. The trading entity, MBDA SAS, is registered in France. The partners in MBDA's economic interests are as follows: BAE Systems, 37.5 percent; Airbus, 37.5 percent; and Leonardo, 25 percent.

Structure and Personnel

Éric Béranger
Chief Executive Officer
Stéphane Reb
Executive Director, Programs
Managing Director, MBDA France
Chris Allam
Executive Group Director, Engineering
Managing Director, MBDA United Kingdom
Lorenazo Mariani
Executive Group Director, Sales and Business Development
Managing Director, MBDA Italia

Thomas Gottschild
Executive Group Director, Strategy
Managing Director, MBDA Germany
Manlio Cuccaro
Executive Group Director,
Technology and Performance
Peter Bols
Executive Group Director Finance
Denis Ballet Executive
Executive Group Director, Operations
Craig Murray
Executive Group Director, Human Resources

MBDA**Product Areas**

MBDA is believed to be organized as follows:

1. MBDA UK
 - 1.1 MBDA Inc (USA)
2. MBDA France
 - 2.1 Matra Electronique
 - 2.2 GDI Simulation
3. MBDA Germany
 - 3.1 Bayern-Chemie
 - 3.2 TDW
4. MBDA Italy
5. MBDA Spain

MBDA numerous missile, missile system, and countermeasures programs in operational service and several more in development. Apart from the Meteor, Storm Shadow/SCALP, and ASTER (SAAM, SAMP/T, PAAMS) systems, key programs include the Brimstone air-launched anti-armor weapon, the ASRAAM and MICA air combat systems, the Exocet and Teseo anti-ship missile families, and a range of anti-armor systems (Eryx, MILAN, HOT) and air defense systems (Rapier FSC/Jernas, Mistral, Spada/Aspide 2000).

Facilities

MBDA UK (Head Office), 11 Strand, London WC2N 5RJ United Kingdom. Telephone: + 44 0207 451 6000.

MBDA France, 1 ave Réaumur, 92 358 Le Plessis-Robinson, France. Telephone: + 33 0 1 71 54 10 00.

MBDA Italia, Via Monte Flavio 45, 00131 Rome, Italy. Telephone: + 39 06 877 1.

MBDA Inc Headquarters, 1300 Wilson Blvd, Ste 550, Arlington, Virginia 22209 USA. Telephone: + 1 (703) 387-7120.

Website: www.mbdainc.com

MBDA Inc, Huntsville Division, 330 Wynn Dr, Ste 300, Huntsville, Alabama 35805 USA. Telephone: + 1 (256) 721-8801.

MBDA Spain, Torre Picasso, Plaza Pablo Ruiz Picasso, 1 - pl. 11, 28020 Madrid, Spain. Telephone: +34 91 769 38 04.

MBDA Deutschland, Hagenauer Forst 27, 86529 Schrobenhausen, Germany. Telephone: +49 8252 99 6001

TDW GmbH, PO Box 1340, Hagenauer Forst 27, D-86529 Schrobenhausen, Germany. Telephone: + 49 0 8252 99 6001. TDW designs and manufactures warheads and warhead systems, including the associated fuzes and safety and arming devices.

Website: www.tdw-warhead-systems.com

Bayern-Chemie GmbH, Liebigstrasse 17, 84544 Aschau am Inn, Germany. Telephone: + 49 8638 6010. Bayern-Chemie focuses on rocket propulsion for missiles and space systems.

Website: www.bayern-chemie.com

Eurosam GIE, Centre d'affaires de La Boursidière Bâtiment Kerguelen 92357 Le Plessis Robinson, France. Telephone: + 33 1 41 87 14 16. This is a joint venture between MBDA and Thales.

Website: www.eurosam.com

Matra Électronique, 4 rue Ferdinand Meunier, 60610 Lacroix-Saint-Ouen, France. Telephone: + 33 03 44 91 45 00. This is the electronic production center of excellence for MBDA.

Website: www.matra-electronique.com

GDI Simulation, MetaPole Elancourt, 1 boulevard Jean Moulin, CS40001 78996 Elancourt Cedex, France. Telephone: +33 (0) 1 61 38 50 00. This subsidiary offers various combat firing and gunnery training simulators.

Website: www.gdi-simulation.fr/

Roxel Propulsion Systems, Centre d'affaires La Boursidière, Immeuble Jura, 92357 Le Plessis-Robinson, France. Telephone: + 33 2 48 55 92 00. Roxel designs, develops, manufactures, and sells solid propulsion systems and related equipment for all types of rockets and tactical and cruise missiles. Roxel is a joint venture equally owned by Safran Ceramics and MBDA.

Website: www.roxelgroup.com

Roxel UK, Summerfield, Kidderminster, Worcestershire DY11 7RZ United Kingdom. Telephone: + 44 156 282 4061.

MBDA

Corporate Overview

The MBDA consortium is Europe's leading missile producer. Supported by its three powerful shareholders – BAE Systems, Airbus, and Leonardo – MBDA has a large industrial and technological base throughout the United Kingdom and Europe. The company is the second-largest missile producer in the world behind Raytheon Technologies of the U.S.

New Products and Services

Enforcer. In December 2019, the German Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw) awarded MBDA a contract for the acquisition of Enforcer missile systems for the German Armed Forces. The contract will fulfill the German requirement for a lightweight, day/night, precision-guided, shoulder-launched weapon system with an effective range of more than 1,800 meters. The initial order of 850 Enforcer missiles are destined for German special operations forces, with additional orders expected to follow for Bundeswehr infantry.

SPEAR-EW. In September 2019, MBDA was awarded a contract to demonstrate SPEAR-EW, a new electronic warfare version of the SPEAR weapon system family on order for the Royal Air Force (RAF). MBDA is developing SPEAR-EW in partnership with Leonardo to complete a wide range of Suppression of Enemy Air Defence (SEAD) missions, under a Technical Demonstration Program contract awarded by Defence Equipment & Support (DE&S). SPEAR-EW will integrate a miniaturized EW payload from Leonardo, which will act as a stand-in jammer to greatly increase the survivability of RAF aircraft and suppress enemy air defenses.

MICA NG. In November 2018, the French Defense Procurement Agency DGA selected MBDA to develop the next generation of the MICA missile. The NG program includes an extensive redesign of the current MICA family. This latest will provide the capability to counter future threats. This includes targets with reduced infrared and electromagnetic signatures, atypical targets (UAVs and small aircraft), as well as the threats normally countered by air-to-air missiles (combat aircraft and helicopters). Deliveries are scheduled to begin in 2026.

Spectre UAV. In September 2018, MBDA unveiled an electric Vertical Takeoff and Landing (eVTOL) unmanned air system concept, dubbed Spectre. The UAV can provide close air support via either two MBDA Enforcers or a single Missile Moyenne Portée (MMP) multirole weapons system. The Spectre can be

configured with a variety of modules, including resupply payloads, improved sensors, or electronic warfare payloads. The system is reportedly undergoing flight-testing as part of a five-year development. MBDA is also looking for partners to provide additional capabilities such as advanced avionic systems.

European Modular Missile. In May 2018, MBDA displayed its European Modular Missile design. The EMM is a lightweight air-to-ground missile aimed for use on the Airbus Helicopters Tiger attack helicopter. MBDA is proposing the EMM as an upgraded weapon system for the Tiger Mk III as both Germany and France have requirements to replace HOT 3 and AGM-114 Hellfire missiles, respectively.

SmartGlider. In June 2017, MBDA presented its new SmartGlider family of guided weapons at the Paris Air Show. This family of all-up-round glider weapons will have folding wings and a range of over 100 km. This new generation of air-to-ground weapons is designed to counter new networked short- and medium-range surface-to-air threats, as well as moving/relocatable targets or hardened fixed targets. The company expects the system to be available beginning in 2025.

CAMM Contract. In April 2017, the U.K. MoD awarded MBDA a GBP323 million order for its Common Anti-air Modular Missile. The CAMM will be deployed using the Sea Ceptor and Land Ceptor weapon systems that will protect the Royal Navy's Type 23 and future Type 26 warships, as well as enhancing the British Army's Ground Based Air Defence system.

Future Cruise/Anti-Ship Weapon (FC/ASW). In March 2017, the United Kingdom and France signed an agreement to launch a joint concept phase of the Future Cruise/Anti-Ship Weapon (FC/ASW) program with MBDA. The EUR100 million concept phase will run for three years, laying the groundwork for a decision by the partner nations on a possible procurement. The new missile would be a successor to the Exocet, Harpoon, SCALP, and Storm Shadow, which are currently in service. Should the program proceed, the missile would enter service around 2030.

Plant Expansion/Organization Update

Bolton Facility Opens. In July 2018, MBDA opened a new manufacturing GBP50 million facility in Bolton (U.K.). The new factory will employ some 670 people and will focus on the development of inert missile equipment and systems.

Demilitarization Facility Opens. In July 2014, MBDA inaugurated France's EUR12 million munitions

MBDA

demilitarization facility at MBDA's Bourges Subdray site in France, which handles the demilitarization of cluster bombs and other munitions.

Australian Office Opened. In July 2013, MBDA opened an office in Canberra, Australia, in line with its strategy of making Australia the hub of its Asia-Pacific operations.

Schrobenhausen Site Expanded. In September 2012, MBDA Germany opened a new simulation and integration center for air defense systems at its Schrobenhausen site. The building offers a modern infrastructure and sufficient space for integrating large items, such as radar systems, launchers, and command posts. It also houses a new simulation center enabling the simulation of air defense scenarios. The facilities additionally comprise a test center in Freinhausen and a laser weapons test facility.

MBDA Inc Reorganized. In March 2010, MBDA reorganized its U.S.-based subsidiary MBDA Inc as a stand-alone national company to better position MBDA Inc to grow and compete for missile business in the United States. The firm now reports to its board of directors and the MBDA group as a national company alongside MBDA France, MBDA UK, MBDA Italy, and MBDA Germany.

Mergers/Acquisitions/Divestitures

Numalis Stake Acquired. In February 2020, MBDA acquired a stake in Numalis in order to strengthen cooperation between the two companies. Numalis possesses the first IT solution for formally validating Artificial Intelligence (AI) applications and works to promote global AI standardization. MBDA has deep expertise in artificial intelligence and the most demanding critical systems. Both companies see this partnership as a way to take a decisive lead in the implementation of trustworthy AI.

Website: www.numalis.com

GDI Simulation Acquired. In November 2019, MBDA acquired GDI Simulation from Airbus for an undisclosed amount. GDI Simulation, based in the Ile de France, has over 70 employees and in 2018 generated sales of EUR15 million. It develops, assembles, integrates, and maintains simulation systems for ground vehicles and for MBDA battlefield missiles.

Website: www.gdi-simulation.fr

Roxel Ramjet Business Acquired. In December 2012, MBDA France acquired the ramjet integration and testing activities of Roxel France. This development, which did not include Roxel's ramjet integral booster or thermo-structural materials activities,

followed the signing of an agreement between MBDA and Herakles (a subsidiary of Safran group), equal joint shareholders of the Roxel group. This transaction saw the transfer to MBDA France of 18 Roxel France employees in addition to site facilities and ramjet test benches, all of which remained on the same Bourges Subdray site in France.

Northrop Grumman Viper Strike Acquired. In December 2011, MBDA Inc, the wholly owned U.S. subsidiary of MBDA, purchased Northrop Grumman's Viper Strike munitions business based in Huntsville, Alabama. As the first acquisition in the U.S., the purchase represents part of the company's growth strategy. The Viper Strike facilities, located at the U.S. Army's Redstone Arsenal, allow MBDA to design, build, and assemble complete precision-guided weapons in one location, as well as bring new business to the MBDA Huntsville facilities. The Viper Strike is a low-collateral-damage, precision-guided weapon designed for both manned and unmanned aircraft. Terms of the agreement were not disclosed.

Denel Stake Scuttled. In May 2010, it was reported that Denel Dynamics, the missile unit of South African state-owned Denel, wanted to sell a share of itself to MBDA. Denel Dynamics saw the sale as key to its new effort to promote its missiles – especially in new markets – and sustain profitability. However, Denel Dynamics failed to win the South African government's approval, and the sale did not go forward.

Protac Sold to Roxel. In May 2008, Bayern-Chemie GmbH completed the sale of its subsidiary Protac SA to Roxel, a 50-50 joint venture company of MBDA and SNPE. The Protac sale followed MBDA's acquisition of Bayern-Chemie in August 2007 and was a step toward the consolidation of the European propulsion industry. Protac, which has an annual turnover of EUR28 million and 90 employees at its site in La Ferté Saint-Aubin, France, develops and produces rocket motors and solid-propellant rockets. The company specializes in complex metallic structures, thermal insulations, laser welding, and pyrotechnics for civil applications.

BAE Systems Warhead Expertise Transferred. In January 2008, BAE Systems transferred its warhead expertise to MBDA's Lostock site in Lancashire, U.K., along with access to intellectual property rights and technology.

Teaming/Competition/Joint Ventures

Bharat Dynamics. In September 2019, MBDA signed an agreement with Bharat Dynamics Limited (BDL) for the final assembly, integration, and test (FAIT) of Mistral and ASRAAM missiles in India.

MBDA

Earlier, in February 2005, an MoU was signed reinforcing existing cooperation in the anti-tank sector. BDL has built approximately 30,000 MILAN anti-tank missiles since the initial agreement was signed at the beginning of the 1980s. The latest effort focuses on development of a MILAN ER variant.

Boeing. In September 2004, Boeing and MBDA signed an MoU aimed at establishing and developing a cooperative relationship in the area of regional and global missile defense. The MoU established an industrial framework whereby both companies could better explore complementary technologies and share expertise while examining architectures for defending against the threat the next generation of ballistic missiles posed regionally and globally.

In July 2001, Boeing and MBDA (then Alenia Marconi Systems) signed a teaming agreement involving the Joint Direct Attack Munition (JDAM) that could significantly expand the global market for the near-precision weapon. With this agreement, MBDA markets the JDAM throughout much of Europe and the Middle East. It may also assemble JDAMs and derivative weapons its customers purchase commercially rather than through the U.S. Foreign Military Sales (FMS) program.

Czech Air Defense. In November 2016, the Czech Republic Ministry of Defense received proposals from several firms for a mid-range air defense system that will replace aging Soviet-built 2K12M Kub systems. According to reports, the offers include the Lockheed Martin/MBDA MEADS system, Rafael's Spyder system, Kongsberg's NASAMS SAM, and Diehl Defence's IRIS-T SLM system. The missile portion of the program is valued at an estimated \$140 million.

Dolphin Design. In August 2018, Soitec and MBDA jointly acquired Dolphin Integration. Dolphin Integration, renamed Dolphin Design in 2019, is a provider of semiconductor design, silicon IP, and SoC (System-On-Chip) solutions for low-power applications. The company was formed in 1985 and employs 155 people. In 2018, it had revenues of about EUR17 million. Soitec owns 60 percent and MBDA 40 percent of the venture.

Website: www.dolphin-design.fr

Euro Rocket Systems. At the time of its formation, MBDA signed an agreement with Lockheed Martin and Diehl to acquire a stake in Euro Rocket Systems, which produces multiple-launch rocket systems for European customers. Under the agreement, Lockheed Martin would hold 50 percent of Euro Rocket Systems; Diehl, 25 percent; and MBDA, 25 percent. The companies developed the Guided Multiple Launch Rocket System,

the next major step in the evolution of the MLRS family of munitions, offering advanced capabilities, reduced logistics support, and precision attack.

Eurosam. Three major European aerospace companies (Aerospatiale, Alenia, and Thomson-CSF), known today as MBDA and Thales, established the Eurosam joint venture in June 1989. Eurosam is the prime contractor for the Future Surface-to-Air family of missiles. This joint venture has developed the naval surface-to-air anti-missile (SAAM) and SAAM AD systems for anti-air protection of naval ships using the ASTER 15 and ASTER 30 missiles guided by Arabel or EMPAR radars. In addition, the consortium has developed the ground-launched Sol-Air Moyenne Portée (SAMP-T or Land SAAM AD) using the longer-range ASTER 30 missile (guided by Arabel radar), which will replace both France and Italy's Hawk air defense missiles.

Website: www.eurosam.com

Future Combat Air System. In February 2020, France and Germany awarded Dassault Aviation and Airbus, together with their partners MTU Aero Engines, Safran, MBDA, and Thales, the initial framework contract (Phase 1A) that launches the demonstrator phase for the Future Combat Air System (FCAS). This EUR155 million framework contract covers a first period of 18 months and initiates work on developing the demonstrators and maturing cutting-edge technologies, with the ambition to begin flight tests as soon as 2026.

This phase will, in a first step, focus on the main technological challenges per domain:

- Next Generation Fighter (NGF), with Dassault Aviation as prime contractor and Airbus as main partner, to be the core element of the Future Combat Air System.
- Unmanned Systems Remote Carrier (RC), with Airbus as prime contractor and MBDA as main partner.
- Combat Cloud (CC), with Airbus as prime contractor and Thales as main partner.
- Engine, with Safran and MTU as main partners.

As part of the Phase 1A Demonstrators contract for the FCAS, Airbus and MBDA teamed to develop demonstrators for Remote Carriers. Designed to act as force multipliers, the Remote Carriers are unmanned aerial vehicles (UAVs). They aim at reducing the risks for manned aircraft by taking over specific air operations' roles within high risk environments, providing new air warfare capabilities, and teaming in

MBDA

combination with and coordinated by other manned air assets. The teaming involves MBDA focusing on the development of small and medium class platforms together and under the lead of Airbus. On its side, Airbus will address the whole Remote Carrier scope and in particular teaming intelligence while focusing on medium to large platforms.

The next step in the FCAS program will be the inclusion of Spain and the involvement of additional suppliers from Phase 1B onwards, which will succeed Phase 1A after its successful conclusion.

Inmize. MBDA helped create Spanish missile company Inmize in July 2002. This venture is owned 40 percent by MBDA, 40 percent by Spain's Indra, and 10 percent each by Spanish shipbuilder Izar and EADS CASA (now Airbus Military). Indra and Izar have joined stakes within Inmize. The main objective of Inmize, the operational headquarters of which are located at Indra's facilities, is to be Spain's center of excellence for missile systems. Its first contract covers participation in design and development of the Meteor missile. The company, which unites Spain's missile expertise under one roof, will also participate in other European missile projects.

Israel Aerospace Industries. In July 2004, MBDA and IAI signed an MoU to explore technological cooperation in the area of missile defense. Under the MoU, MBDA, and IAI planned to evaluate opportunities to mutually support ballistic missile interceptor system concepts. Both companies are examining their respective capabilities and expertise to see how to best evolve active defense systems to counter future threats.

Kongsberg. In September 2018, MBDA and Kongsberg teamed to integrate MBDA's MMP anti-tank guided weapon onto Kongsberg M153 Protector remote weapon stations.

Larsen & Toubro. In February 2017, MBDA and India's Larsen & Toubro (L&T) established a joint venture to develop and supply missiles and missile systems to meet the Indian armed forces' requirements. As per Indian law, the new L&T MBDA Missile Systems Ltd is 51 percent owned by L&T; the remainder is held by MBDA. Initially, the company will look to develop and supply fifth-generation Anti-Tank Guided Missiles, missiles for coastal batteries, and high-speed target drones.

Website: www.intmbda.com

Lockheed Martin. In March 2018, Lockheed Martin and MBDA formed a joint venture to pursue the next-generation Integrated Air and Missile Defense System, TLVS (Taktisches Luftverteidigungssystem), for the

German Bundeswehr. The joint venture, dubbed TLVS GmbH, is 60 percent held by MBDA and 40 percent by Lockheed Martin. The venture is expected to become the prime contractor for the new system, which is currently being negotiated with Germany's procurement office. The TLVS program is based on the trilateral Medium Extended Air Defense System (MEADS) program developed for Germany, Italy, and the United States. The company will also have operations in Dallas, Texas; Huntsville, Alabama; and Syracuse, New York; as well as locations in Ulm and Koblenz, Germany. Rheinmetall and Raytheon are offering a competing concept. The team submitted their proposal in June 2019.

However, In August 2020, the team submitted an updated proposal to the German Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw). The 2020 TLVS proposal provides protection from a broader threat spectrum with two mission-specific effectors, significantly enhanced sensor capabilities for long range engagements, and a new communications and Battle Management system to support enhanced interoperability, data fusion, and cyber resilience.

LynKEUs. This is an international project to define a preliminary concept of operations for a Beyond Line Of Sight (BLOS) European capability and demonstrate it through a full scale firing campaign. The project consists of a land missile system, a turret system to support and set up the missile using an UAV for target designation, a land platform, and a UAV providing a cyber-secured target location. MBDA leads 13 partners and subcontractors from five countries to develop a new capability based on its MMP missile system. In July 2020, MBDA and its 10 partners – from Belgium: The Royal Military Academy, John Cockerill Defense, FN Herstal, Thales Belgium, and Xenics; from Cyprus: Aditess, Cyprus Institute, and SignalGenerix; from France: Novadem and Safran; along with the 3 subcontractors: MILREM (from Estonia), DELAIR (from France), and Carmenta (from Sweden) – entered the negotiation phase of the grant agreement with the Commission.

MEADS International. This consortium, made up of Lockheed Martin and MBDA, was formed to develop and produce the Medium Extended Air Defense System. This venture is headquartered in Orlando, Florida. MEADS International was awarded the MEADS development contract in May 1999. In June 2005, the consortium formally signed a definitized contract to design and develop the MEADS.

In 2011, the United States decided not to procure the MEADS. Washington claimed the program was too far behind schedule. Germany followed suit shortly

MBDA

thereafter. However, in June 2015, Germany reversed course and selected the MEADS over Raytheon's Patriot system to form the base system for the country's Taktisches Luftverteidigungssystem (TVLS) (see Lockheed Martin entry above).

Milrem Robotics. In June 2018, MBDA teamed with Estonia's Milrem Robotics to develop an anti-tank unmanned ground vehicle. The joint effort incorporates a design that mounts a Milrem THeMIS UGV with MBDA's MMP anti-tank missile on an Integrated MMP Precision Attack Combat Turret (IMPACT).

Northrop Grumman. In June 2007, MBDA Deutschland/LFK GmbH and Alliant Techsystems (now Northrop Grumman) signed an MoU to assess potential work-share opportunities with the German Ministry of Defense regarding the AGM-88E Advanced Anti-Radiation Guided Missile (AARGM). The MoU detailed opportunities for German work under the product improvement phase of the AARGM program and opportunities for production of derivatives of the AGM-88 High-Speed Anti-Radiation Missile. In July 2019, the U.S. State Department has approved the sale of AGM-88E AARGM and AGM-88E AARGM captive air training missiles (CATM) to Germany.

Polish Agreements. In September 2019, MBDA and Polska Grupa Zbrojeniowa (PGZ) subsidiary MESKO signed an agreement to work on components for missile systems, including the Common Anti-air Modular Missile (CAMM) and the Brimstone.

In February 2017, PGZ and MBDA signed an agreement to enhance their cooperation on missiles and missile systems. The agreement provides a framework for future cooperation between PGZ and MBDA on missile programs included in the Polish Armed Forces' Technical Modernization Plan, especially programs related to the Narew short-range air defense system.

In September 2014, MBDA signed two letters of intent (LOIs) with MESKO and PIT-RADWAR SA relating to the Polish "Wisla" medium-range air and missile defense program. In the LOI with MESKO, MBDA is proposing to expand cooperation on ASTER 30 B1 missile equipment and be involved in the development of the new ASTER B1NT missile. The scope of cooperation starts from the production of main equipment for the missiles and continues through the final assembly line. The LOI with PIT-RADWAR SA includes a high degree of transfer of technology and know-how on both ASTER 30 B1 and ASTER 30 B1NT missile uplink receiver equipment. In March 2019, the U.S. Army awarded Northrop Grumman a \$713 million contract for the production of Integrated Air and Missile Defense (IAMD) Battle Command

System (IBCS) for the first phase of Poland's WISŁA air and missile defense program.

In July 2009, MBDA and Bumar Group of Poland signed a framework agreement to jointly modernize Poland's ground-based air defenses. The new system will draw on elements of MBDA's short-range VL MICA and medium-range ASTER 30 missiles, along with other major subsystems, such as the radars and command and control systems developed by PIT (Przemysłowy Instytut Telekomunikacji, the Warsaw-based telecommunications research institute) and RADWAR (one of several companies within Bumar Group, which is Poland's largest defense equipment manufacturer).

MBDA is also competing for Poland's \$2.5 billion Narew short-range air defense system program. The Polish government reportedly has examined proposals from MBDA and the Skyceptor variant jointly developed by Israel's Rafael and U.S.-based Raytheon utilizing the Stunner missile. The aim is to reach an agreement with a foreign company under which the missiles could be license-produced within Poland.

Rheinmetall. In August 2019, Rheinmetall and MBDA Deutschland agreed to collaborate in the high-energy laser effectors domain. The two companies intend to construct, integrate and test a laser demonstrator for the German Navy's corvette K130.

Roketsan. In May 2014, MBDA Deutschland GmbH and Roketsan signed an MoU for a collaboration in the manufacturing and integration of a 70mm guided weapon system. Under the terms of the agreement, the two companies will initiate the exchange of business and technical information for a guided weapon system based on the 70mm rocket concept for the German UH Tiger.

Romania Partnerships. In August 2017, MBDA signed an MoU with the Romanian state-owned defense group Romarm and its subsidiary Electromecanica Ploiesti. Under the MoU, the companies will submit a proposal for a land-based air defense missile system to meet the Romanian Armed Forces' needs.

Roxel. In March 2003, MBDA and France's SNPE formally founded a new company called Roxel to build rocket motors for missile systems. Roxel combines the operations of Celerg, a joint venture between MBDA and SNPE, and the Rocket Motors division of RO Defence, a subsidiary of BAE Systems. The operation is currently equally owned between Safran Ceramics (part of the Safran group) and MBDA.

Website: www.roxelgroup.com

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TAURUS Systems GmbH. This joint venture was founded in 1998 by its shareholders, LFK-Lenkflugkörpersysteme GmbH (now part of MBDA) and Saab Bofors Dynamics AB, to be the two firms' weapon system authority for standoff weapon systems. The venture is the prime contractor for the TAURUS KEPD 350 weapon system and its future derivatives.

Website: www.taurus-systems.de

Team Tempest. Lead by BAE Systems and including Leonardo, MBDA, Rolls-Royce, and the RAF's Rapid Capabilities Office, this team is developing the Tempest concept for the U.K.'s Future Combat Air effort. The British MoD's aim is to develop a sophisticated future fighter to replace the RAF's Eurofighter fleet in the 2040s, at which time they will serve alongside the F-35 Lightning II combat aircraft. The Team Tempest joint program office will spearhead development of a new design by 2025. This phase will be underwritten by GBP2 billion (\$2.6 billion) in funding technology originally committed under the 2015 Strategic Defense and Security Review (SDSR). According to government and industry officials, the Tempest aircraft is necessary to sustain the U.K.'s combat aerospace sector. The Tempest is intended to enter service around 2035, replacing the Eurofighter Typhoon. A full-scale model of the Tempest was shown at the 2018 Farnborough Air Show. In September 2019, the partners signed a Statement of Intent that will see the parties work together to define a concept and partnership model.

Also in September, MBDA displayed some of its concepts for arming the Tempest at DESI 2019. Working with Leonardo and BAE Systems has led to MBDA developing concepts for a Hard Kill Defensive Aid System (HK-DAS) capable of tracking, targeting, and intercepting incoming missiles in high-threat environments. Leveraging commonality, modularity, and reuse of the HK-DAS concept, MBDA is exploring a small form factor, scalable, Ground Attack Micromissile capability to enhance the Tempest system in the Close Air Support (CAS) role for Persistence in Attack. Drawing upon the prior weapons integration experience of both MBDA and BAE Systems, is the twin WVRAAM (Within Visual Range Air-to-Air Missile) concept.

In July 2020, seven other companies were selected by the U.K. to support Team Tempest: Bombardier Belfast, Collins Aerospace Systems, GE Aviation UK, GKN Aerospace, Martin-Baker, Qinetiq, and Thales UK.

Later that month, Italy and Sweden entered into formal discussions with U.K. on the program. The new trilateral framework sees industry from the three nations bringing together their skills and expertise in the combat

air sector to collaborate on the research and development effort. The three national industries comprise companies from the U.K. (BAE Systems, Leonardo UK, Rolls Royce, and MBDA UK), Italy (Leonardo Italy, Elettronica, Avio Aero and MBDA Italia), and Sweden (Saab and GKN Aerospace Sweden). This framework is another step on the path towards a full agreement between these national industries to formalize areas of joint collaboration on future combat air systems development.

Website: www.raf.mod.uk/what-we-do/team-tempest/

Thales. In June 2003, MBDA and Thales Airborne Systems signed a contract valued at EUR46 million covering development and initial production of the seeker system for the Meteor, the future beyond-visual-range air-to-air missile (BVRAAM). This contract formalized the cooperation agreement already in place between the two companies in the area of anti-aircraft missile seekers (in June 2002, MBDA and Thales signed an agreement combining their capabilities to develop and produce seekers for anti-aircraft missiles).

Initial production would meet the requirements of the U.K. Royal Air Force. Thales would contribute its experience and capabilities while participating in definition studies led by the MBDA Seeker Division and would produce four subassemblies representing approximately 35 percent of the seeker. In total, MBDA and Thales would produce seekers for more than 6,000 missiles. The seeker is an essential component determining a missile's performance.

TWISTER. In November 2019, the Council of the European Union gave the green light to the TWISTER (Timely Warning and Interception with Space-based TheaTER surveillance) capability project for implementation within the Permanent Structured Cooperation (PESCO) framework. This international missile defense project, which already includes five European countries, seeks to develop – with support from the European Defense Fund – a European multirole interceptor to address emerging threats. The interceptor is to be brought into service by 2030. MBDA will lead the effort to build a new endo-atmospheric interceptor to address a wide range of threats, including maneuvering ballistic missiles with intermediate ranges, hypersonic or high-supersonic cruise missiles, hypersonic gliders, anti-ship missiles, and more conventional targets, such as fighter aircraft.

UK DRAGONFIRE. This is a consortium led by MBDA with Qinetiq and Leonardo for the U.K.'s high-energy laser demonstration program. Other team members include Arke, BAE Systems, GKN, and Marshall ADG. The program will mature the key technologies for a high-energy defensive laser weapon

MBDA

system. The program will also provide a body of evidence for future procurement decisions. Selected in July 2016, the team faced competing bids from Thales UK, a Babcock-Raytheon team, Lockheed Martin, and Rheinmetall.

U.K. Portfolio Management Agreement. In March 2010, MBDA and the U.K. MoD signed a Portfolio Management Agreement. Under this agreement, MBDA will lead the transformation of the U.K.'s complex weapons capability through the management of a portfolio of projects potentially worth up to GBP4 billion over 10 years. As part of this arrangement, MBDA signed a contract, valued at GBP330 million, for the first package of projects focused on deployment of new military capabilities into Afghanistan. Over the 10-year agreement, as further military capabilities are added, this portfolio approach will deliver GBP1.2 billion of efficiencies for the U.K.

MoD. Under the initial contract, MBDA will deliver weapons capabilities that are directly relevant to today's warfighting environment – the Fire Shadow loitering munition for the British Army and SPEAR Capability 2 Block 1 for Royal Air Force fast jets.

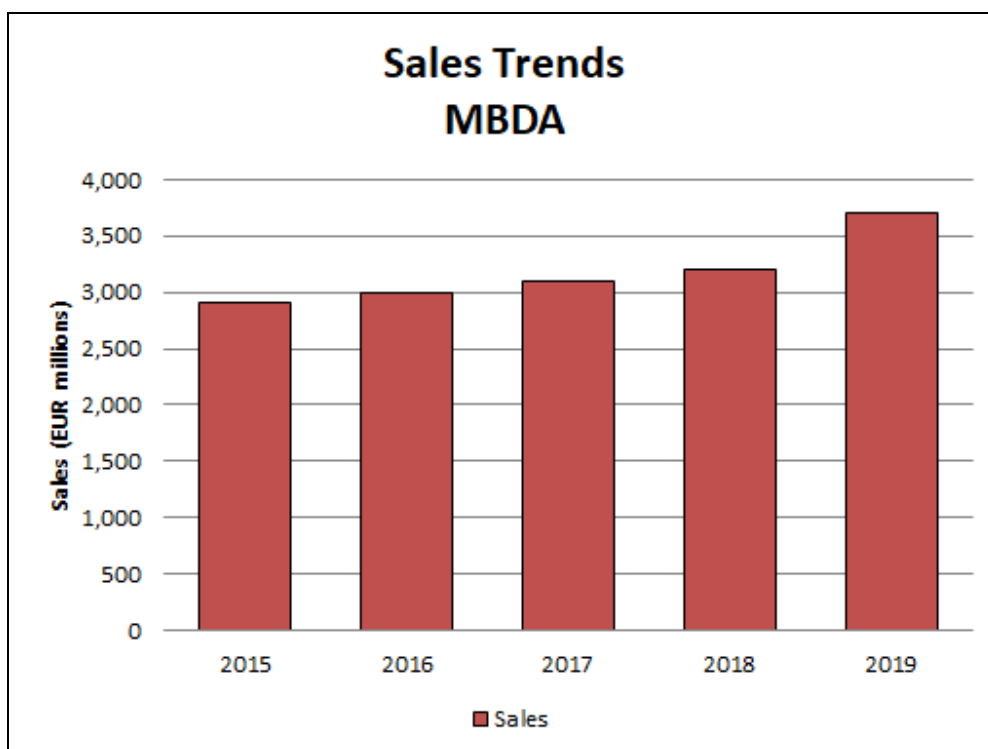
Previously, in July 2008, the U.K. launched Team Complex Weapons (Team CW), a partnership between the MoD, MBDA (U.K.), Thales UK, Qinetiq, and Roxel UK Ltd. According to MBDA, the teaming agreement, signed by all Team CW members, creates the environment necessary to develop a partnering approach to the planning and delivery of a long-term strategy for the complex weapons sector in the U.K. Team CW is working on the Common Anti-air Modular Missile (Camm) for FLAADS, an air defense missile development program (see **New Products and Services**).

Financial Results/Corporate Statistics

Because MBDA is a multinational consortium, detailed financial information is not published. However, some basic figures have been reported on websites and in press releases and media reports. For 2019, MBDA reported sales of EUR3.7 billion, compared to EUR3.2 billion in 2018. The jump in 2015 orders of EUR5.2 billion was due to the Rafale and FREMM contracts signed by Egypt and Qatar. U.S. dollar figures, in millions, were translated as of December 31, 2019, at the rate of EUR1 = USD1.11986.

MBDA						
(EUR millions)	2015	2016	2017	2018	2019	(USD) 2019
Net Sales	2,900	3,000	3,100	3,200	3,700	4,143
Backlog	15,100	15,900	16,800	15,900	17,500	19,598
Orders	5,200	4,700	4,200	4,000	3,600	4,032
Employees	10,000	10,000	10,500	11,000	11,500	-

MBDA



Major Competitors

MBDA's competitors in the missile market are also involved in other major segments of the aerospace and defense industry. Key competitors include units of Boeing, Lockheed Martin, Raytheon Technologies, Bharat Dynamics Ltd, and Rafael.

Strategic Outlook

MBDA continues to perform reasonably well. While the COVID-19 pandemic slowed operations in the first half of 2020, work has begun to return to a new normal at its operations.

The key to the company's current success has been the firm's strategy of building up its exports. At present, the company is benefitting from export sales linked to contracts for the Rafale, Eurofighter Typhoon, and FREMM frigate. Sales of complementary missile systems and support related to those systems will continue to drive company growth in the years ahead.

In its home markets, MBDA has been very successful in transforming the way it does business. Over the past few years, MBDA received a production order for the new-generation MMP land combat missile system in France as well as contracts for the Sea Ceptor naval air defense system in the U.K. and the Meteor missile in Germany. In addition, the company received the go-ahead for the new British-French FASGW/ANL missile program. Looking ahead, the company is hoping for wins in Poland as that country's new government begins

bolstering its military. Other markets targeted for growth include India, Brazil, and the Middle East.

The company has retreated from the U.S. market for the most part due to the entrenched positions of domestic players Lockheed Martin and Raytheon. With limited opportunities in the U.S., MBDA will focus on its traditional markets in Europe.

Here, the focus is on the development of new programs, such as Tempest in the U.K. and Future Combat Air System in Europe.

According to the company, being a Team Tempest partner, involved from the inception of a future combat air system, is helping ensure innovative weapons systems complement the cutting-edge design and the novel technologies of the platform around them. As such, the company is developing a variety of weapon systems for the new platform, ranging from deep strike cruise missiles to ground attack micro missiles.

Outside the U.K., MBDA is partnered with principle contractors Dassault Aviation and Airbus on FCAS. As

MBDA

part of the Phase 1A Demonstrators contract for the FCAS, Airbus and MBDA teamed to develop demonstrators for Remote Carriers. Designed to act as force multipliers, the Remote Carriers are unmanned aerial vehicles (UAVs) that aim at reducing the risks for manned aircraft by taking over specific air operations' roles within high risk environments.

Both Tempest and FCAS so far have high levels of government support. This level of investment is not likely to abate anytime soon as governments seek to keep jobs in place while they deal with the economic fallout of the pandemic.

Prime Award Summary

Unavailable.

Program Activity

The following are some important aerospace and government programs currently underway at MBDA. The briefs are intended to provide a listing of programs that are of major importance to the company. For detailed information on or analysis of specific aerospace and defense programs or equipment, please refer to the applicable Forecast International service (for example, *Civil Aircraft*, *Military Aircraft*, *Military Vehicles*, *Warships*, *Missiles*, *Electronic Systems*, and *Aviation Gas Turbines*). The company's business interests are as follows:

- Missiles
- Unmanned Vehicles

Missile Programs

(Air-to-Air Missiles)

ASRAAM

This is an advanced short-range air-to-air missile system produced by MBDA. Only the U.K. and Australia have purchased the ASRAAM. MBDA is looking toward the development of a new generation of missile systems. A common missile is among the successor options the company is studying. The British government will incorporate technology from the Common Anti-Air Modular Missile program into the existing ASRAAM, which will be less expensive than developing an all-new missile. Production of this new ASRAAM version, tentatively called the ASRAAM 2, began in 2016.

Meteor

The Meteor is a medium-range air-to-air missile currently in development. In May 2000, the U.K. selected the MBDA Meteor to meet its BVRAAM (beyond-visual-range air-to-air missile) requirement. The estimated value of the Meteor development phase and an initial production lot was \$1.2 billion. The Meteor is one of MBDA's cornerstone programs and has the potential to become Europe's best-selling medium-

range air-to-air missile in recent history. Raytheon's AMRAAM dominates this market segment, but MBDA could accrue thousands of orders for its missile. The missile entered service with the Swedish Air Force in July 2016. The U.K. and France began fielding the missile in 2018. Helping to spur orders for the Meteor is a recent series of orders for European-made combat aircraft.

In November 2019, Korea Aerospace contracted MBDA to integrate the Meteor on the future KF-X fighter.

MICA

The MICA (Missile d'Interception et de Combat Aerien, or combat and air intercept missile) is a short-, medium- and long-range air-to-air missile. With French demand dwindling, the future of the MICA program may depend on France winning export orders for the Rafale fighter. The Rafale is an all-MICA aircraft. New orders for European-made combat aircraft offer opportunities for MBDA's MICA. In addition, the MICA is experiencing a surge in demand due to recent Rafale fighter orders in Egypt and Qatar. MBDA will keep this missile relevant through the development of the MICA NG as well as a new upgrade package for existing models. The MICA NG will arm Rafale F3-R and F4 fighters, and the missiles incorporating the upgrade kit will equip certain Mirage 2000 versions. The MICA NG will be introduced in the late 2020s.

CVW102 FlexiS. In June 2015, MBDA unveiled a new modular missile concept for 2035 and beyond. The CVW102 FlexiS is a configurable missile system that can be tailored to mission requirements. This system includes a central command unit, a common missile power and communications bus with "universal contactless interfaces," and a common composite chassis that allows for the installation of mission-specific elements, including common standardized diameters. Weapons can be assembled as required and tailored to particular missions.

MBDA

(Air-to-Surface Missiles)

ASMP/ASLP

The Air-Sol Moyenne Portée and Air-Sol Longue Portée are standoff missile systems with nuclear and conventional payloads. Fabrication of the ASMP has concluded. The ASMP has been superseded by the ASMP Plus, also called ASMP Amélioré (ASMP-A). Conventional versions of the ASMP have been proposed to perform anti-ship, anti-radar, and fixed-site attacks. MBDA is also developing the Anti-Navires Futur. France planned to meet its air-launched nuclear deterrent need with the ASMP-A, which entered service in 2010. Production has since concluded. Although France has retired its land-based nuclear missiles, it plans to maintain its airborne and sea-launched systems. As part of its desire to maintain a strong nuclear capability, France is studying the development of an all-new nuclear-armed cruise missile. This may be a cooperative effort, perhaps involving the United Kingdom.

Brimstone/SPEAR 3

This is an air-to-surface standoff weapon designed to attack a variety of stationary and moving targets (including armored vehicles) both day and night. Currently, only the United Kingdom uses the missile. As British overseas operations progressed, the nation's armed forces began to look for a weapon more suited for use in unconventional warfare. The British military needed a weapon capable of hitting small targets, such as unarmored vehicles or even individuals, but with greater precision in order to limit collateral damage. An urgent operational requirement was issued, and a modified version of the Brimstone was quickly designed. British military operations are generating demand for the Brimstone sufficient to support a moderate annual production rate. British combat aircraft have used the Brimstone against Islamic State militant targets in Iraq and Syria. MBDA hopes this success will fuel new orders for the system. A Brimstone 2 variant, which meets the U.K. SPEAR Segment 2 Block 1 requirement, is being tested. The SPEAR Capability 3, also known as SPEAR 3, will provide the U.K. with a missile that offers much greater range than the Brimstone. This missile will be equipped with a turbojet engine, multimode seeker, datalink, and multieffect warhead. The new missile will be available in the early 2020s.

SCALP

This is a modular weapon system designed to attack a variety of stationary and moving targets (including armored targets) at various standoff ranges. Production of the system is underway. Deliveries of the APACHE-AP to the French Air Force began in 2001. Deliveries

of the Storm Shadow began in 2002, and shipments of the SCALP-EG began in 2003. Continued involvement of British and French combat aircraft in the anti-ISIS air campaign may result in further use of SCALP-EG missiles. A surge in orders for French-made combat aircraft has helped MBDA win new production contracts. Egypt will arm its new Rafale fighters with the SCALP-EG, and Qatar may follow suit.

HOPLITE. In June 2013, MBDA unveiled CVS302 HOPLITE, which is designed to supply an indirect precision attack capability for land and naval artillery in 2035 and beyond. This represents the fourth of MBDA's annual Concept Visions projects, which seek innovative solutions in missile systems for the future battlefield. The HOPLITE system consists of a mission-control system and two missile variants, HOPLITE-S and HOPLITE-L, both of which can fly 70 kilometers in under two minutes at low altitude or up to 160 kilometers at high altitude in under four minutes when the way is clear.

TAURUS

This is a modular air-to-surface standoff weapon system designed to attack a variety of stationary and moving targets (including armored targets) both day and night. A joint venture of MBDA and Saab Bofors Dynamics developed the TAURUS; the first production missiles were delivered to the German Air Force in November 2004. Production of the initial orders is now complete. Germany and Spain were the only customers for this missile, and both acquired the KEPD 350 version. Germany purchased 600 KEPD 350s and Spain, 43. In 2013, South Korea purchased around 170 TAURUS missiles as part of its "Kill Chain" program. Overall, however, the outlook for TAURUS is not good. The chances of further orders from Germany or Spain are nil. TAURUS Systems is hoping to interest South Korea in a land-based version and may invite local firms to join its development team. In addition, TAURUS Systems could widen this missile's market appeal by offering a new version for internal carriage and to arm light attack aircraft.

(Surface-to-Air Missiles)

Aspide

This program includes a family of all-weather, medium-range, multirole missiles originally developed by Alenia Marconi Systems (now part of MBDA). Production has restarted, but the follow-on air-to-air Aspide effort has been discontinued. MBDA is still receiving upgrade contracts for in-service Aspide air defense systems. The Aspide will remain in service into the next decade, but next-generation missiles, such as the ASTER and MICA, will slowly replace it.

MBDA**ASTER 15/ASTER 30**

The ASTER is one of MBDA's major missile development efforts. The ASTER systems are designed for multiplatform surface-to-air defense missions, and the program has the potential to help propel MBDA to the top of the surface-to-air missile market. This system can meet a variety of land-based and shipborne air defense requirements and can intercept certain ballistic missile threats. Orders placed by partners in France, Italy, and the United Kingdom have given this program a solid production base. MBDA is also hoping to profit from Europe's successful warship exporting business. Already, orders from Saudi Arabia, Qatar, and Singapore are in place. Other interested parties include Brazil, Bulgaria, India, Indonesia, Poland, Turkey, and Ukraine.

MEADS

In June 2005, the joint venture MEADS International formally signed a definitized contract to design and develop the trinational MEADS for the U.S., Italy, and Germany. The contract had a value of approximately \$2 billion, plus \$1.4 billion for the program's design and development phase. In 2011, the United States decided not to procure the MEADS (Medium Extended Air Defense System). Washington claimed the program was too far behind schedule. Germany followed suit shortly thereafter. However, in June 2015, Germany reversed course and selected the MEADS over Raytheon's Patriot system to form the base system for the country's TVLS. With this success, interest in the system has grown. Now, other possible customers for the MEADS in Europe include Italy, Poland, Romania, Spain, and Finland.

MICA-VL

This is a short- and medium-range surface-to-air missile system. Originally, MBDA designed the MICA as an air-to-air missile. Later, the company began to examine ways for MICA to fulfill other missions. The vertical-launch (MICA-VL) version is designed for use from ground platforms and naval vessels. The MICA-VL is benefiting from an upswing in orders for naval surface combatants. Egypt, Malaysia, and Singapore became customers in quick succession. Other orders soon followed. MBDA continues to seek additional customers. Poland is investing billions of dollars in its military, and the MICA-VL is a candidate to meet part of its air defense needs. Other potential customers are in the Middle East and Asia.

Mistral

The Mistral is a short-range anti-aircraft missile that can be transported by two persons and operated by one. MBDA's Mistral is the dominant man-portable SAM on the market today. The Mistral air defense system has

won more export orders than any of its current competitors have. Through the introduction of the Mistral 2 and new launch configurations such as TETRAL, MBDA aims to hold onto its hard-won gains and expand its overall share of the man-portable close-range air defense market. France is largest single user of Mistral. Export clients include Botswana, Estonia, Saudi Arabia, and Turkmenistan.

Rapier/Ceptor

This is a towed or vehicle-based, surface-to-air, low-level anti-aircraft missile. The Rapier entered service in the 1970s and was used to help protect the 2012 Summer Olympics in London. This system is now out of production. The company is hoping to repeat its success with the Rapier air defense system with the new Land Ceptor. The Land Ceptor system incorporates technology from the Common Anti-air Modular Missile (Camm) program. The U.K. is the first customer for the Land Ceptor air defense system. The Land Ceptor could find customers among existing Rapier operators or users of other Western air defense systems.

Seawolf/Sea Ceptor

The Seawolf is a quick-reaction, short-range, supersonic anti-missile and anti-aircraft missile used against supersonic aircraft and anti-ship cruise missiles. The Sea Ceptor SAM is operational with the Royal Navy. This missile is replacing existing Seawolf air defense systems on Royal Navy Type 23 frigates. In the future, the Sea Ceptor will equip the Royal Navy's new Type 26 Global Combat Ships and possibly the Type 31 corvettes. MBDA's campaign to secure additional Sea Ceptor orders is already bearing fruit. New Zealand, Brazil, and Chile are clients for the Sea Ceptor, and more customers will emerge in the future. Targets for the company's customer expansion efforts include users of warships already armed with the Seawolf or other MBDA-made SAMs.

(Anti-Ship/Submarine Missiles)**Exocet**

This is MBDA's premier anti-ship missile family. The Exocet is among the best-known anti-ship missile systems in the world. Fabrication of the AM39, MM40, and SM39 Exocet missiles is continuing in both Block 2 and Block 3 configurations. This production includes the fabrication of new units and the remanufacture of existing systems. A turbojet-powered Block 3 is being offered as an all-new missile or as an upgrade package for existing operators of the Exocet. The Block 3 offers greater range than the Block 2 and an enhanced guidance system providing better performance against defensive systems while engaging land-based targets and ships in harbors. Additional upgrades could be added in the future, including a dual-mode seeker and

MBDA

an improved warhead. Demand for the Exocet remains strong. France is purchasing this missile, but MBDA sees strong overseas interest in Exocet, especially in the Middle East and Asia. Proven in combat, the Exocet is the best-selling European anti-ship missile on the market, and new orders continue to arrive.

Marte Mk 2

The Marte Mk 2 is a medium-range air/ship-launched anti-ship missile. The Sea Killer Mk 1 and Mk 2 are surface-to-surface anti-ship missiles. The Marte Mk 1 is a surface-to-surface follow-on to the Sea Killer. The Marte Mk 2 is deployed on helicopters and surface warships. The latest variant, the Marte Mk 2/S, is being offered to meet the Italian military's need for an anti-ship missile to arm its NH90 and EH101 helicopters, as well as its Harrier fighters. The Marte Mk 2/N aims to meet Europe's need for a shipborne missile. The Marte Mk 2 series depends heavily on foreign orders to support its manufacturing line. Although the Italian Navy has long been the primary Marte customer, its demand alone is insufficient to sustain the program. While MBDA's marketing campaign is producing results – Qatar and the UAE have already placed orders – more sales are needed if production is to continue.

OTOMAT

The OTOMAT is a multipurpose, long-range, anti-ship missile. There are French and Italian OTOMAT versions of the Mk 1 and Mk 2 missiles. Oto Melara, which produces naval guns and missile systems, and MBDA (then Matra) privately entered into a joint venture in 1968 to produce a first-generation anti-ship missile. The missile was labeled OTOMAT, which combines the first three letters of the Italian (OTO) and French (MAT) corporate titles. Development of the OTOMAT Mk 2E is underway, and the system could be available for delivery by 2023. This missile will bridge the capability gap until next-generation systems are available. This upgraded model will enable the OTOMAT to remain operational until 2040.

Sea Skua/Sea Venom

The Sea Skua was primarily designed as a helicopter-launched anti-ship missile, although MBDA has also integrated this system with shipborne and land-based platforms. Sea Skua production is complete. France and the U.K. have decided to jointly develop a new lightweight anti-ship/strike missile. This cooperative project could meet France's ANL and the U.K.'s Sea Venom – formerly known as FASGW(H) – requirements. MBDA is conducting this effort.

Sea Venom/ANL. In March 2014, MBDA was awarded a demonstration and manufacture contract for the

FASGW(H)/ANL (Future Anti-Surface Guided Weapon (Heavy)/Anti-Navire Léger) missile. This jointly funded British-French contract, valued at more than GBP500 million (EUR600 million), has been awarded to MBDA by U.K. Defence Equipment & Support on behalf of the French and U.K. defense ministries and will be managed as part of MBDA's Team Complex Weapons Portfolio. The Sea Venom/ANL will equip the U.K. Royal Navy's AW159 Lynx Wildcat helicopters and the French Navy's maritime helicopters. The U.K. will procure around 400 missiles, and France may purchase a similar number of weapons. Neither customer will receive its first missile until 2021 (with another delay possible). Germany is showing interest in a new missile to arm its maritime patrol helicopters and could become a customer for this possible Anglo-French weapon.

(Anti-Tank Missiles)

Eryx/Enforcer

The Eryx is a man-portable anti-armor missile. The Eryx provides the French Army with a lightweight missile that can engage a multitude of armored targets. MBDA has developed the Enforcer (KFK), which complements existing shoulder-fired weapons. The Enforcer is not a specific Eryx successor, but it could replace it in some roles. Enforcer received a boost with the announcement of Germany's decision to procure it in early 2020. This missile will meet the German Army's Leichtes Wirkmittel 1800+ requirement. The German order could involve the delivery of 3,100 units (perhaps initially). MBDA is looking for other clients, with Australia and Poland expressing interest in the Enforcer.

HOT/MLP

The HOT is one of the most successful missile programs Europe ever launched. As part of the Euromissile consortium, MBDA has been involved in development and production of the high-subsonic, optically guided, tube-launched anti-tank missile. The HOT entered service in 1976, and production concluded in 2012, but the missile remains in service. Among MBDA's new proposals for a HOT follow-on is the Missile Longue Portée (MLP). If this program proceeds as planned, a new missile could enter production by 2025.

MILAN/MMP

The Euromissile consortium, which MBDA now controls, developed and produced the MILAN ground-launched anti-tank missile. This Cold War veteran is set for replacement in both France and Germany. The related contracts involve the production of thousands of new missiles, and their selection will influence similar decisions by other MILAN operators.

MBDA

In December 2011, French defense procurement agency DGA awarded MBDA a risk-reduction contract for the medium-range missile (Missile Moyenne Portée) program, destined to replace the MILAN weapon system. In December 2013, MBDA won a DGA contract for development and production of the new MMP. Subsequently, series production of the system began. Deliveries to the French Army began in 2017, and the MMP is now in active service. This initial contract involves the production of just under 3,000 missiles. MBDA has already won its first export order for the MMP, from an unidentified Middle Eastern nation.

(Anti-Radiation Missiles)**ALARM**

The ALARM is an anti-radiation missile MBDA developed and produced. The ALARM saw action in the Persian Gulf during Operation Iraqi Freedom. U.K. Royal Air Force Tornado GR.4s equipped with Enhanced Paveway II precision-guided bombs and

ALARM missiles conducted successful strikes aimed at Iraq's air defense network. However, no surge in orders for the ALARM occurred afterward. While the suppression of enemy air defenses is an integral part of modern warfare, it remains critical to only a handful of nations. Production of the ALARM for the U.K. is complete.

ARMAT

This is an anti-radiation missile system. Production of the ARMAT has concluded; this missile is operational and considered to be a combat-proven system. Little information has been released on the ARMAT, as production and delivery figures remain classified. France is studying the development of next-generation anti-radar missiles, but no specific program has been launched. The Anti-Radar Futur project could produce a next-generation missile, and the MARS (Missile Anti-Radar Subsonique) could provide an enhanced weapon based on the ARMAT. MBDA was the prime contractor for the ARMAT program.

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