LEONARDO SPA

PUBLIC CONSULTATION RESPONSE
for
THE COMMISSION ON THE IRISH DEFENCE FORCES

CAPABILITIES

As one of the 10 major Aerospace, Defence and Space (AD&S) industry players in the World today, With 13.8 bn€ of revenues in 2019, 1.5 bn€/Y in R&D and more than 49500 as head count Leonardo S.p.A. is proud to daily enable our customers' success, through the provision of our wide spectrum of innovative products and services in any domain.
Air, land, sea, space and cyberspace: wherever defence and security are needed, our customers find in Leonardo effective solutions for their requirements, through a complete and integrated offer based on state-of-the-art technologies with dual-use applications, as well as on innovative support and training services.

Our overall offer to the Irish Defence Forces include the following.

Air Platforms & Systems

With over 100 years of experience in the aeronautical sector, Leonardo is committed to relentless research and development activities to provide high-performance aircraft and helicopters suitable for every type of mission, innovative support services in line with evolving customers' needs, as well as advanced solutions for training and simulation.
We design and produce an extensive range of advanced helicopters covering all the main categories, from the 1.8 tonne single engine to the 16 tonne three-engine. Most of our products are designed for dual-use and ensure a wide range of missions with outstanding performance and safety. We manage the entire helicopter development and production cycle, including avionics and weapon systems integration.

We design, develop and produce a range of training aircraft that covers the entire pilot training syllabus, which can be tailored to the requirements of pilots assigned to fly with any Air Force. Platforms are complemented by an integrated Ground Based Training System to offer customers worldwide a turnkey solution, delivering the highest quality standards.
Our tactical airlifters are multi-mission platforms, combining operational flexibility with the robustness needed to accomplish military missions, thus carrying out an extensive range of specific tasks, both in civil protection and in battlefield support (last tactical mile).
Our multi-mission aircraft, dedicated to surveillance, maritime patrol and antisubmarine warfare, are highly cost-effective, as they have been developed combining existing civil platforms for regional transport with dedicated avionic systems including mission management systems and specific sensors for maritime patrol missions and environmental monitoring. We take part in major

global military aircraft and helicopter programmes to develop new generation fighters, as well as helicopters for land and naval applications.

- **Multi-role utility transport capabilities (C-27J Spartan)**
  Our C-27J Spartan tactical airlifter is a modern, robust, powerful, versatile and highly cost-effective military transport aircraft expressly designed by Leonardo S.p.A. to operate in high threat environments, bringing disaster response teams and equipment to stricken areas around the globe or resupplying of personnel and supplies to military troops in overseas operations.
  The aircraft is employed with full satisfaction by 16 Armed Forces including the Italian Air Force (It AF), the Royal Australian Air Force (RAAF), the U.S. Special Operation Command (USSOCOM) and the U.S. Coast Guard (USCG), becoming the benchmark in the medium tactical transport aircraft category.
  With our operators, the C-27J has already fully demonstrated its capability to effectively accomplish any transport mission related to disaster relief efforts, humanitarian aid and support of homeland security missions, thanks to its total autonomy from ground support and its unmatched ability to airlift materiel, equipment and people from/to remote and unprepared fields or areas where civil infrastructure has been damaged or destroyed, including precisely and timely airdrop of pallets and bundles with goods and lifesaving supplies as needed on the ground. The success of the C-27J is based on robustness and flexibility being able to operate where heavier military transport airplanes cannot operate due to performance, runway length (STOL) and CBR but without compromises on payload. The maximum payload of the C-27J is 11,6 tons.
  Furthermore, thanks to multiple roll-on/roll-off easily installable and transportable mission kits and systems, the C-27J can be quickly reconfigured to perform a high number of additional missions including medical evacuation (MEDEVAC), Air Ambulance, VIP/Ministerial Air Transport Service, passengers transport and firefighting/water bomber and chemical dispersant.
  The C27J is the ideal platform for repatriation of civil or military personnel; for example, it can undertake a repatriation flight from Goma, DRC, to Baldonnel having a flight duration of under 16 hours and only one refueling stop.
  The C-27J Spartan growth capability further allows it to perform also search and rescue, ISR and fire support missions, providing our Customers with year-around multiple-missions operations.
  We believe the C-27J offers the Irish Defense Forces the most cost-effective solution while representing the best value for money for the Irish taxpayer.

- **Air policing/homeland defence/pilots training capabilities (M-346FA)**

  Combat aircraft acquisitions and support always require major financial commitments from procuring Countries. Furthermore, in addition to the procurement of fighter aircraft, Air Forces also either need to set-up additional in-country training capabilities for their fighter pilots or have to rely on equivalent services provided by Allied Countries.

  To respond to both requirements with a single platform, Leonardo M-346FA aircraft has been designed since the beginning to perform not only advanced / pre-operational training tasks but also Air Policing, homeland defence and Close Air Combat.

The M-346FA is a twin-engine, tandem-seat, light multi-role aircraft, with performances and flight envelope similar to that of a 4th / 5th generation fighter
The aircraft is equipped with the Grifo-346 multi-mode radar, produced by Leonardo, an enemy identification system (IFF), a self-defence system and a wide range of weapons, to provide a highly cost-effective and interoperable solution for **air policing and interception.**
The M-346FA also keeps all the attributes of the M-346 Advanced Jet Trainer (AJT), including the Embedded Tactical Training Simulation (ETTS) suite. This enables the M-346FA to still be used as an Advanced Jet Trainer, Lead-In Fighter Trainer (LIFT), to offer
the whole spectrum of simulated training functions in flight and to be integrated in the fully validated M-346 Integrated Training System (ITS) with Live, Virtual, Constructive (LVC)
capabilities. Aggressor and Companion Training roles can also be carried out effectively. This ensures maximum efficiency, effectiveness, commonality, operational flexibility and combat training capabilities to the Air Forces.

With only one platform, Leonardo M-346FA will provide the Irish Air Corps with both a cost-effective air policing and intercept capability, which will fully secure Irish airspace, thus also offering the best value for money to the Irish taxpayers.

New Generation Multipurpose Dual Use Helicopters for Government and Public Services (AW169, AW139, AW189)

Leonardo is poised to offer an unrivalled off-the-shelf, right-sized product range to maximum operational flexibility at best operating & support costs and is the first rotorcraft manufacturer to introduce a modular, scalable and dual-use approach to several helicopters with the AW139 representing a turning point in the rotary-wing sector through the introductory concept of the Leonardo "Helicopter Family".
The **AW139** is, in fact, the forefather of a family of advanced helicopters comprising of the smaller and lighter **AW169**, the larger and heavier **AW189** and their military versions.
Models: the only case in the world, that share the same design philosophy and latest certification standards, superior performance thanks to best in class power-to-weight ratio, unparalleled flight characteristics and high cruise speed, as well as the same unobstructed cabin interiors and large cabin doors that enable rapid role changes and optimised accessibility to suit all operational requirements in both land and maritime environments.
All AW Family products are already proven in the most demanding scenarios and benefit from maturity programs to deliver higher availability and lower maintenance burden for substantial life cycle savings. In particular, almost 130 AW Family helicopters are in operations in the challenging North Europe environment in the most demanding roles and missions (e.g. Maritime Patrolling, SAR, EMS, Utility), with many civil and government operators, including UK Maritime and Coastguard Agency, Norwegian Police, Swedish Maritime Administration, Dutch Police, Estonian Border Guard and, of course the **Irish Air Corps.**
All platforms can be customised with a large range of equipment, sensor and specific military systems to provide unrivalled mission flexibility and share a common concept to maintenance and training. A concept that allows operators with large diversified fleets, with models ranging from 4 to 9 tons of weight, to create significant synergies in crew training, flight operations, maintenance and logistics support.

- **AW139**
  The AW139 intermediate-twin engine 7 tonne boasts orders of almost 1,200 units from more than 280 customers in over 70 countries on all continents. The helicopter has shown extraordinary levels of reliability and operational capabilities with more than 3 million flight

hours recorded since the first delivery took place at the beginning of 2004. Data of use testifies the extreme versatility of the AW139 which satisfies any market need: approximately half the world's fleet for public utility tasks such as SAR, air ambulance, law enforcement, fire-fighting, disaster relief and military duties. The spacious and versatile cabin can be configured in a variety of layouts including dedicated EMS interiors, rapid installation of mission console and role equipment for SAR, CASEVAC/MEDEVAC, ISR maritime operations and can accommodate up to 15 troops providing exceptional payload potential and best in class hot and high performance. With an operating speed of 165 knots, it has the fastest cruise speed in its category.

Large sliding doors and low floor height enable rapid ingress and egress of passengers/troops, ease of loading and unloading of cargo and equipment and rapid deployment of NATO stretchers on the ground. Fast roping and hoist operations through the large lateral accesses enable special forces insertion and extraction from the hover, whilst allowing simultaneous threat suppression from window mounted crew-served weapons.
The AW139 is also suitable for naval / shipboard operations and can be equipped with folding main rotor blades, mooring / lashing points and enhanced maritime protection.

- **AW189**
  The AW189 is characterised by class-leading speed, range and payload providing the highest performance in demanding SAR and MEDEVAC missions, as well as troops transport and other military roles.
  Unique features of the helicopter include the main transmission's capability to run without oil for 50 minutes and a built-in Auxiliary Power Unit (APU) ensuring continued operation of the rescue equipment (hoist and lights), radios and medical devices in flight in case of electrical emergency.
  The AW189 features the largest cabin in its class and a spacious baggage compartment accessible from the passenger cabin in flight as well as from two large sliding doors that ensure easy stretcher loading also during hoist operations. .
  The modern, reliable and cost-effective aircraft is rapidly configurable to meet a wide range of missions, including troop transport/ insertion (up to 19 troops), cargo re-supply/external lift, CASEVAC/MEDEVAC, SAR/Combat-SAR, Special Forces operations, Command and Control (C2), close air support and public utility tasks.
  The AW189 is also designed to operate in confined areas under hostile environments and from vessels; tailored payload and specific military solutions are available thanks to the modern open architecture design.

- **AW169**
  The AW169 is the new light intermediate (4.8 tonne) multi-role twin-engine utility helicopter designed to meet the most stringent operational requirements for civil, military, homeland security and government users to carry out a wide range of tasks, including EMS, utility, surveillance, special operations, maritime patrol, reconnaissance, training, SAR and firefighting. Thanks to its advanced technologies and flexibility, the AW169 ensures a rapid emergency response, even for long-distance transport or for EMS/SAR missions at high altitude.
  The largest cabin in its class features accommodation for 2 stretchers, either longitudinally or transversely, and space for a full suite of the most advanced life-support equipment. The cabin can also accommodate up to 10 passengers / troops and/or an advanced mission console. Wide sliding doors allow easy loading/unloading of the patient, as well as rapid ingress / egress passengers / troops.
  The AW169's power, agility, manoeuvrability and excellent handling qualities enable a wide range of missions, day and night, in challenging "hot and high", austere and urban

environments. Unique-in-class Auxiliary Power Unit (APU) "mode" ensures mission-readiness with rotors stopped and enhanced ground safety. The Full Ice Protection System (FIPS) will allow the AW169 to fly even in icing conditions.

- **AWHERO**
  AWHERO is the state of the art 200 kg class Rotary Unmanned Aerial System (RUAS) leveraging on Leonardo's strength and extensive experience in rotorcraft development and system integration.
  The AWHERO is a dual-use platform able to perform military and civil missions. AWHERO, taking advantage of two separate high capacity payload bays is capable of carrying modular sensor suites according to application requirements. It represents the perfect solution for a wide range of tactical battlefield and maritime missions. It can integrate a high performance maritime RADAR (Leonardo Gabbiano TS Ultra-Light) in order to extend ship's detection horizon and effectively enhance situational awareness even in adverse weather conditions. Leonardo Gabbiano is a family of radar currently installed and in use on fixed and rotary wing manned aircraft.
  AWHERO is the best choice to enhance Maritime Operations: Modular and Multiple Payload Capability, Full Automatic Deck Take-off & Landing (no man on deck required), Heavy Fuel Engine, Easy handling on the deck, Minimum Time from Alert to Launch, Foldable blades to expedite deck operations and to minimize footprint in the hangar.

Land Systems

Leonardo has a long experience in the development and deployment of **Soldier Modernisation Programs**, having started its activities almost two decades ago. More recently Leonardo Spa has established a consortium with Beretta Spa for the implementation of the new "Soldato Sicuro" Program in Italy.

The system addresses all the Operational capabilities as recognised within NATO:

- ✓ Lethality (new weapons and targeting systems)
- ✓ Command and Control, Reconnaissance, Intelligence, Surveillance, Target Acquisition & Situation Awareness
- ✓ Survivability (integration of bulletproof jackets, NBC masks etc within the system)
- ✓ Mobility (night vision, navigation, dead reckoning)
- ✓ Sustainability (up to 24 hours target including power supply for all electronic equipment)

In this framework, Leonardo is tasked to C4ISTAR, survivability and mobility systems. The main building blocks of such systems are the following.

C4I and Target Acquisition System, including:

- The Swave® SDR Hand Held Radio, the Selfnet® WB and NB Waveforms and audio accessories;
- The Rugged Tablet supporting the Soldier Command and Control and Navigation applications (available for Windows and Android platforms);
- The Nox, a multifunctional Target Acquisition handheld terminal including a TV camera, an IR uncooled camera, a laser range finder and a digital compass.

The C4I system can be further integrated with the MINISIGHT 640, a Miniature Thermal Weapon Sight with Situational Awareness capability and C4I interfaces. Different levels of integration amongst C4I devices and sensors can be achieved on Customer's requirements.

Survivability and Protections System, including:

- Combat vest with ballistic protections
- Helmet with Picatinny mounting devices for night vision devices
- CBRN pack, including protective vesting, mask, camel back.

The survivability and protections system can be tailored to specific needs in terms of ergonomics and body mapping. Conformal batteries and antennas do contribute to all operational areas.

Leonardo offers an integrated, system-of-systems solution for the full detect-to-engage spectrum of threats, or to complement existing assets, responding to threat diversity with a multi-layer defence system.

Air Defence

Our air defence systems can leverage a number of proprietary key sub-systems and components, long range radar, multi-mission AESA radar, command and control centres, fully integrated, interoperable and secure communications networks, and electronic warfare suites. We also seamlessly integrate with existing assets.

The Fixed Air Defence radar (FADR) RAT31 DL and the Deployable version (DADR) RAT31 DL/M he RAT comply with the most challenging operational requirements, and are extensively used around the world. They support decision-making with accurate, responsive and complete solutions.

With the KRONOS family of latest generation multi-mission AESA radar operated by smart remote KRONOS Control Centres we can deliver unprecedented benefits. They perform effectively, simultaneously, and with fewer resources, multiple critical missions, ranging from airspace control to ground-based air defence, protection of forces and critical assets, and air traffic control.

Naval Systems

Leonardo is the design authority of the most advanced Integrated Naval Combat Systems which may be installed on board of any kind of vessel, from small patrol boats to large aircraft carriers as well as mine-hunters and submarines providing total solutions for Navy needs through the Whole Warship lifecycle.

Today, all modern Navies face an evolving mission scenario which includes peacekeeping operations, patrolling, anti-piracy, economic exclusive zones surveillance, oil platform protection as well as search and rescue activities. To meet these requirements we have developed and deliver integrated naval systems and state-of-the-art technology equipment capable of high operational flexibility and modularity. Our solutions have been selected by 40 navies around the world. Our expertise and wide range of products can adapt to any requirement. We integrate our naval communications, navigation systems, radar, fire control systems, electro-optics, unmanned systems, different calibre guns, missiles, torpedoes, sonars and electronic warfare suites, all developed in-house and we can just as easily integrate third party subsystems.

We are well positioned to support the early definition of customer requirements, translating them into system specifications for combat system and combat management systems, sub-systems and advanced combat-proven products. With our ATHENA modular and scalable Combat management system we can address any evolving threat.

Our net-centric operation combat systems enhance co-operation between surface naval, aircraft

and submarine assets, under the supervision of land-based operation centres. The ommunications network that enables this net-centric operation integrates L, H, V and UHF wavebands as well as SATCOM in military and civil bands.
Leonardo has embraced a high-level strategy for ensuring continued advancement in our core technology areas. This process, underpinned by constant activity by our in-house laboratories devoted to specific areas of applied research, promotes the effective integration of new, innovative components within our existing capability portfolio. A key element of this strategy is the design and development of the most advanced **AESA Kronos family radar**, fixed faces, staring and rotating – X, C and L band, based on the Finmeccanica fully-owned GaAs and GaN technologies. A key element of our development strategy is the design of the most advanced fully AESA Kronos family radar. Our portfolio includes a new generation of IFF, passive sensors and missile/gun fire control sensors.
We have over 30 years of experience in the development of multifunction naval radar systems began the need to increase the safety of Armed Forces during demanding operations characterised by emerging threats. Our in-house laboratories promote the effective integration of new, innovative components within our existing radar portfolio and the new developments.

Leonardo offers leading-edge capabilities in the field of electro-optical (EO) technologies and systems. We have a proven track record of providing high performance EO products to meet the demanding requirements of both domestic and international customers.

Observation, tracking and target acquisition at all times is paramount to the success of a naval mission. In poor visibility and high seas, stabilized, accurate optronics are an essential asset. We offer cutting-edge capabilities in electro-optical (EO) technologies and systems. The performance and efficiency of our systems are recognized by our customers worldwide.
As stand-alone or supporting a complex Fire control suite, our optronic systems ensure high precision engagement capability against sea and low altitude targets.

As a leader in Infrared search and track and electro-optical (EO) surveillance technologies, we provide reliable, high performance systems meeting the most demanding requirements of our customers.

We have designed a family of multi-band and multi-function transceivers for both long-range communications and Line of Sight ship-to-ship or ship-to-aircraft military communications.

To ensure efficient interaction between command, control, communications and surveillance in a network centric environment, naval communications must ensure stable and secure connectivity. We have a unique experience built over more than 35 years, in designing and developing capable networks for voice and data transmissions.
We have developed a wide range of solutions delivering internal and external communications for naval applications. We deliver effective and secure long range 'Beyond Line of Sight' (BLOS) radio links, tactical Voice Distribution System (VDS), and the purpose built low-cost naval Tactical Voice Terminal (TVT).
A pioneer in the development of **Software Defined Radios,** we have developed a complete family of SWave® Software Defined Radios, which provide access to different frequencies and can implement multiple protocols for voice, data and command and control applications.

Based on our knowledge in advanced satellite technology, we provide tailored satcom solutions, including tri-band multi-channel terminals to access domestic and international satellites for data,

voice and trunking applications, as well as X-band for military satellites. Our systems ensure stable and constant connectivity across all platforms.

Guns and launchers
In service with more than 70 Navies. We are world leaders in the design, development and manufacture of naval guns and rule the category of medium calibre guns due to the excellent balance of range, firepower and rate of fire.

Together with DART and 4AP we have developed the guided and unguided family of VULCANO shells that increases the range of naval guns giving greater accuracy from a standoff distance. Vulcano delivers the ability to engage surface targets at long ranges using only guns, thus saving cruise missiles for other targets beyond the gun's reach.
Torpedoes and Torpedo Countermeasures
Inventors of the very first torpedo, we have developed a range of stealthy, virtually silent underwater systems.
Designing, developing and producing a new generation of underwater defence systems and solutions. We offer a wide range of underwater defence solutions, complemented by sonar systems for submarine surveillance.

Integrated surveillance for EEZ and border control
24/7, all-weather operations of surveillance and protection of seas and borders against illegal activities, requires maritime patrol aircraft and UAS, multi sensor systems, communication networks, people, goods and vehicle identification systems, control and management centres, all of which are part of our range of products.

EEZ Security & Protection Systems
We provide enhanced situational awareness with advanced sensor data fusion, using our sensors or integrating existing systems, and delivering increased efficiency cutting response time through secure, flexible, cyber protected systems.

Border Control And Management
Border Management for civil solutions include: mobile or fixed automated border check points and crossing points (including self-service kiosks) for the (biometrical) identification and recognition or enrolment of transit people with or without their own access travel documentation at all ports of entry, whether air, land, or sea.

CONCLUSION
As one of the world's major players in Aerospace, Defence and Security and global solutions provider we would be a trusted long-term partner of choice for the Irish government and its institutions. With our cutting-edge and dual-use technologies (for both military and civil requirements) we are able to strengthen the country's security, protect people, territories, infrastructures and the cyber networks.

The above mentioned capabilities are just some preliminary examples of what Leonardo is able to provide enabling the continuous improvement in safe management of air, sea, land, and cyber space domains. With the aim to support any internal cost-effectiveness analysis processes, if

requested, Leonardo Spa is willing to provide a dedicated presentation of any of them and the related potential plan of insertion/integration with the existing ones.

For any additional information or request of clarification, please contact the following point of contact:

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