



## **EUROSATORY 2024**

### **LEOPARD 1HEL by EODH**

EODH in collaboration with KNDS (OEM) and the Belgian-Spanish DUMA, has completed the design of a comprehensive upgrade package of the Leopard 1A5 Battle Tank to the Leopard 1HEL level and offers it for the modernization of the tanks of the Greek Army, which is the largest user of the type worldwide but and the other users internationally. The fully costed and technically sound proposal of EODH was recently presented to the Greek Army where it received a positive reception while other countries have already also shown interest.

The holistic proposal includes the complete modernization of the tank both at the turret and hull level with the most advanced technological components and subsystems. These transform a highly successful design of the past - but technologically outdated - into a state-of-the-art platform capable of meeting the modern and the future battlefield.

The Leopard 1HEL is an cost efficient solution that uses the upgraded hull and turret of the Leopard 1A5 and turns it into a tank on par or even better in some areas than new generation tanks at a higher cost in procurement and life cycle support. The use of the highly successful 105mm gun (combined with the new generation of ammunition a very high penetrating performance is achieved) as well as the utilization of the very large existing stock of ammunition is a particularly crucial factor that makes the supply and logistics with this solution particularly attractive.

The LEOPARD 1HEL is designed as a next-generation upgrade package incorporating state-of-the-art technologies and developed to provide superior tactical capabilities on the battlefield, combining enhanced Mobility, Survivability, Firepower and Interoperability, in all types of terrain, high altitude, under all weather and visibility conditions. It was developed as a "system-of-systems" platform, and is designed for collective combat at the Squad, Tactical Combined Arms Group, and Brigade or Division levels, integrating Ground, Air and Robotic elements, through multi-layered Data Networks.

The main interface backbone is fully digital via dual Data bus and dual Ethernet, with a modular design, fully scalable and with an upgradable open architecture. All functions are integrated in software, while thanks to the latest generation of hardware, high-performance calculations are implemented in real time, while there is service availability throughout the high-speed data network.

### **IMPROVED MOBILITY**

- New 1,000 HP high-performance Powerpack resulting in high on- and off-road speed and excellent obstacle-crossing capabilities
- Improved drivetrain and suspension systems
- Designed for operation in extreme environments: ambient temperature -25°C / +45°C

- Air filtration with automatic cleaning
- The powertrain is strengthened and upgraded to match the higher torque and combat weight of the LEOPARD 1HEL
- The Final Drives are reinforced and adapted to mate with the new gearbox
- The suspension consists of new hydro-pneumatic arms that offer better performance and do not take up interior space
- Automatic track tensioning mechanism that can be controlled from the driving position
- New battery and power management system

## **FIRE POWER**

- The proposed upgrade package concerns the FCS (Fire Control System) and the GCS (Gun Control System)
- It is specifically designed to be retrofitted to legacy Tanks equipped with the original manual FCS or newer stabilized hydraulics
- The FCS is based on a fully stabilized 2-axis main sight for the Gunner parallel to the Gun and
- Fully stabilized 2-axis independent Panoramic Periscope for the Commander, which uses the same optical sensors and integrated 12.7mm RCWS
- The Gunner's sight, like the Commander, incorporates a long-range thermal imaging camera, a day camera with a continuous zoom lens, a digital laser rangefinder and a laser pointer (for alignment with the gun barrel).
- In addition, Dynamic barrel Reference System, Automatic Target Tracking, Web Weather Data and Positioning System (GPS/compass) are available.
- The Automatic Target Tracking Unit is responsible for the advanced processing of the digital video image coming from the Gunner's or Commander's Day camera or thermal sight
- Fire Control Circuits allow the Commander to enable or disable each weapon system (SAFE/NO SAFE)
- The Commander has a Gunner Override capability which allows him to take control of the main or coaxial Armament
- The Commander can continuously scan for new targets and automatically pass them to the Gunner for attack (Hunter-Killer)
- The moment the Gunner engages a target the Commander can engage a suddenly appearing threat with the 12.7mm M2 heavy machine gun built into the Independent Panoramic Sight (Killer - Killer)
- Turret crew positions have been optimized to provide the best ergonomics, comfort and survivability
- Human-machine interfaces use multi-function LCD touch screens and wired control panels that allow easy role switching and data sharing
- The GCS (Gun Control System) is based on high voltage BLDC servo motors connected to high power drivers and controlled by a stabilization computer, which provides stabilization to the turret and oscillating mass via fiber optic gyroscopes (FOGs) and accelerometers
- A peripheral vision system based on 8x cameras providing full tactical situational awareness to the crew
- The upgrade package is designed in such a way that it can be easily integrated into existing turrets by replacing all old subsystems with new digital technology

- Addition of a Remote Weapon Station (RWS) for Anti-aircraft and Anti-drone use built into the Commander's Independent Panoramic Periscope (AA RCWS)
- Ability to integrate A/T guided missiles from the barrel and/or side-mounted missiles (ATGM)
- Ability to integrate Loitering Ammunition
- Ability to integrate organic Drone for detection/targeting

## **COOPERATIVE COMBAT CAPABILITIES**

- LEOPARD 1HEL is designed on the basis of fully digitized Network Centric Battle Platform with widespread use/fusion of sensors and actuators, assisted by Artificial Intelligence and capable of acting as a force multiplier in the modern battlefield
- It has multi-level connectivity that includes echelons of Command, ground and air force departments, control of robotic systems such as UAVs, LMs and UGVs, using secure high-speed data communications links
- Achieves sharing and sharing of real-time tactical situational imaging data to conduct combined operations from the individual soldier to the Tactical Battle Group and Brigade level
- The C5I (Command, Control, Communications, Computers, Collaboration and Intelligence) architecture of LEOPARD 1HEL is designed to provide modular, scalable, highly integrated connectivity, service access and real-time data sharing with command systems, ground units, airborne and remotely operated systems
- C5I combat systems capabilities are combined with combat communications networks, V-UHF data networks, LTE, data mesh networks and SATCOM with advanced data transmission for remote systems control and highly integrated collective combat
- Next generation Battlefield Management System (BMS) with operator support through Artificial Intelligence (AI) to reduce cognitive load and decision making

The Multiple Communications System consists of:

- Digital intercom system with noise canceling headsets that interface with up to 3 Combat Network (CNR) R/Ds
- External communications:
  - SATCOM transceiver
  - Software-defined V/UHF transceiver for voice and C2 communications with ground and air assets
  - Secure high speed radio data capture for controlling drones and robots
  - Communication Server that enables seamless C5I services by automatically selecting the best communication channel

## **IMPROVED PROTECTION – SURVIVABILITY**

- Comprehensive package of Passive/Active protection capable of dealing with modern threats (graded). The weight of the modernized vehicle is now 46 tons

- Active protection sensor suite
- Self-defense Remote Weapon Station (RWS) with built-in EW (Anti-Drone) system

#### **IMPROVED RELIABILITY & MAINTAINABILITY**

- Systems of high reliability, low consumption, with limited maintenance requirements and a long time between failures
- Technology sustainable for the next 25 years
- Obsolescence management

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