LEONARDO ELECTRONICS

V-FIDES

Wire-guidable vehicle for underwater identification and detection

The name V-Fides means ‘Veicolo Filoguidabile per l’Identificazione e la DEtezione Subacquea’ (Wire-guidable vehicle for underwater identification and detection).

V-Fides is a Research Project whose purpose is to develop an innovative underwater vehicle which can be used both as ROV (Remote Operated Vehicle) and AUV (Autonomous Underwater Vehicle). In its ‘basic’ configuration, tested at sea in the second half of 2014, V-Fides was able to demonstrate high stability and precision during the motion.

This allows to carry out, in several points and different water depths, the measurement of mercury pollution.

This function is particularly important for the reduction of health risks for the population.
In fact, mercury (quite often produced by coal-fired power plants), ends up in the sea, where, at the top of the food chain, is accumulated in the fish which arrive on our table.

When eating contaminated fish that lived in an environment with high mercury concentration, we increasingly accumulate mercury in our bodies, hence the importance of this type of mission.

The measurement of mercury concentration will take advantage of an advanced system of sampling and chemical analysis of seawater, specifically developed by “Scuola Superiore Sant’Anna” (University of Pisa, Italy).

Thanks to its flexible configuration, the vehicle, fitted with proper payloads, can also be used for other types of environmental protection missions such as:

- Measurement of chemical / physical water parameters (salinity, temperature, oxygen concentration, presence of heavy metals, etc.)
- Exploration of the sea bottom by means of video-camera and/or acoustic sensors
- “In situ” protection/conservation of submerged archaeological sites
- Check of the structural integrity of off-shore plants and underwater pipelines
- Search of localised spills of polluting material.

The design of the V-Fides vehicle has been carried out by using the most advanced techniques available in the field of finite elements structural analysis.

LEONARDO

V-Fides employs a set of innovative technologies contained in the hull which is made of carbon fiber / glass fiber and is flooded with sea-water in order to withstand very high external pressures.

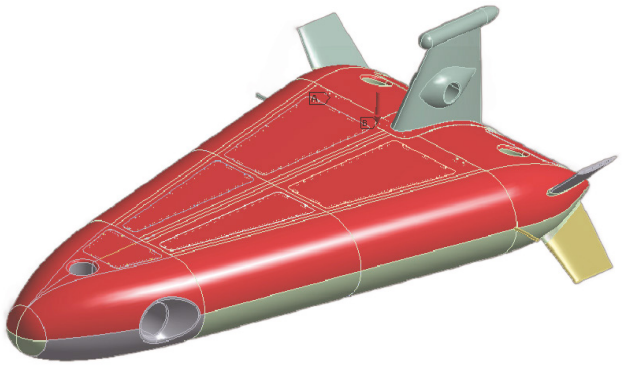
The energy needed by the vehicle is supplied by a powerful Lithium Polymer Battery (Max. 60 kWh) which provides the power to the 7 thrusters used for the propulsion and the attitude control of the vehicle.

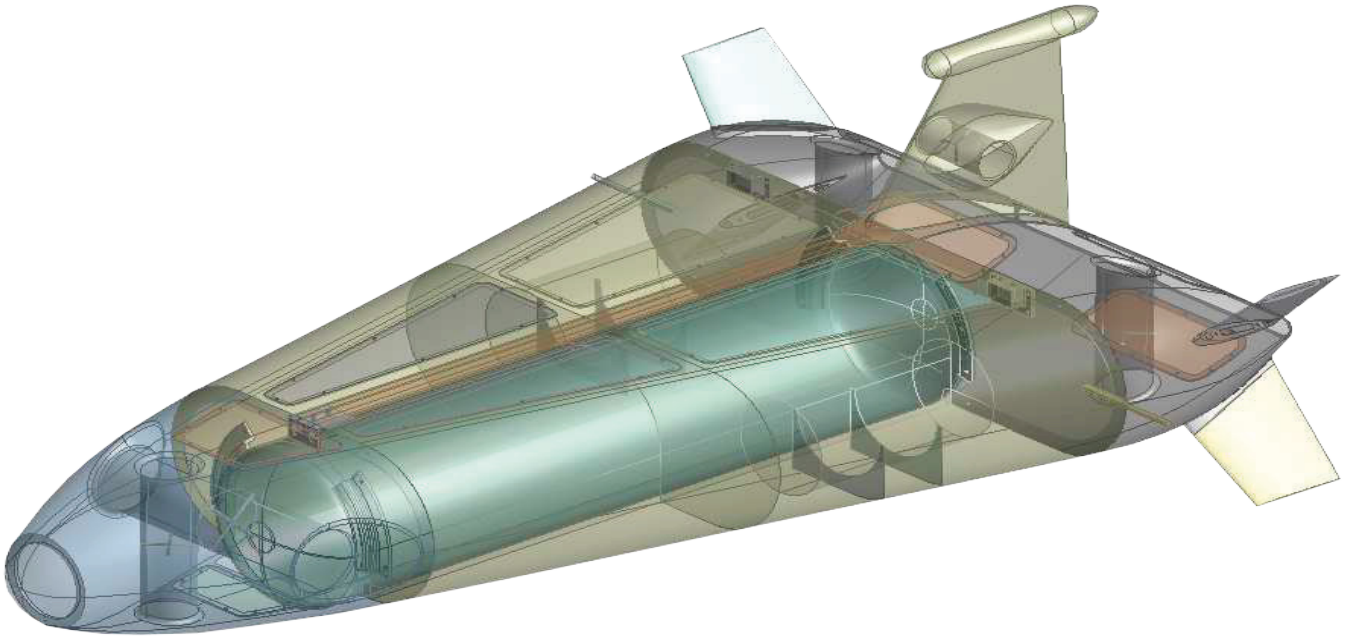
The vehicle is also equipped with a suite of GNC (Guidance, Navigation & Control) sensors, which, thanks to the redundancy of the information, is able to ensure a high precision both in hovering and during prolonged submerged navigation.

To ensure a continuous and reliable data exchange between vehicle and remote control station, V-Fides uses redundant communication systems: Radio Modem (when the Vehicle is surfaced), Acoustic modem, Fibre-Optic link ('Wire-guidance cable') and GPS Receiver.

The system is also fitted for satellite communication link. The vehicle completed the laboratory integration phase in 2014.

Preliminary dynamic pool tests were executed in September/ October 2014. First sea trials performed in November 2014. Last pool tests in final configuration (with reusable fibre optic wire guidance) completed in April/May 2015.





For more information:
infomarketing@leonardo.com

Electronics Division
Via di Levante 48
57124 Livorno-Italy
T +39 0586 840111
F +39 0586 854060

leonardo.com

MM08740 5-23

LEONARDO