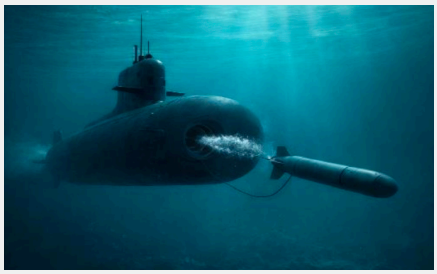
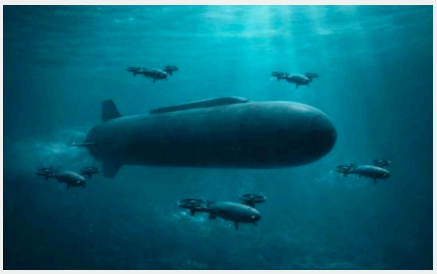
EUROPEAN UNION

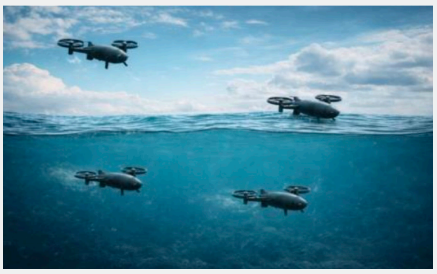
PLEIADES

EUROPEAN DEFENCE FUND

HYBRID AUTONOMOUS UNMANNED VEHICLES SWARM FOR SUBMARINE SPECIAL OPERATIONS







The PLEIADES project develops an innovative system allowing a submarine to deploy a swarm of Hybrid Autonomous Unmanned Vehicles (HAUVs) via an underwater carrier.

This enables covert deployment, persistent monitoring and multi-domain missions such as Intelligence, Surveillance and Reconnaissance, Mine Counter Measures and target tracking and identification.

By operating covertly, the HAUV swarm minimises the adversary's early warning window, enabling intelligence collection and mission execution while the submarine maintains a secure stand-off distance.

A fibre-optic link ensures real-time communication and situational awareness, enhancing stealth, operational reach and mission effectiveness in contested environments.

Recent naval operations have shown that swarms of unmanned systems significantly enhance mission effectiveness. When integrated into operations, autonomous drones provide asymmetric advantages, enabling cost-effective intelligence, surveillance and operational capabilities while reducing human risk.

PLEIADES CAPABILITIES

The project's core innovation lies in the seamless integration of aerial and underwater operations, allowing the swarm to operate in multiple domains and adapt to various mission requirements.

This approach enhances the survivability and effectiveness of naval forces in contested environments, enabling missions such as Intelligence, Surveillance and Reconnaissance (ISR) while ensuring the PLEIADES system offers both technological novelty and real-world applicability.

Funded by the European Union

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THE KEY TECHNOLOGIES

Swarm Carrier Unit

A swarm carrier unit suitable for launch from a submarine's torpedo tube and transiting to the operational area and upon arrival at the designated location, deploying the swarm of HAUVs under the sea surface.

Hybrid Autonomous Unmanned Vehicles (HAUVs)

HAUVs capable of moving seamlessly in both domains air and sea within specific design constraints from an underwater carrier as a swarm.

Integrated C4I Architecture

A system that provides efficient C4I architecture that integrates the C3 sub-systems between the submarine, the carrier, and the swarm. This will enable seamless communication for real-time data exchange between the aerial and underwater components of the swarm, ensuring reliable operation across multiple domains.

Multi-Domain Swarm Operations

The capability of the swarm to conduct parallel operations simultaneously in both air and underwater domains.

Artificial Intelligence Protocols

Advanced AI protocols to enable the swarm to effectively perform tasks even in case of communication loss, while taking care to respect Ethical issues associated with AI systems/ technologies in the research work.

Health Monitoring Technology

Innovative sensing technology will be employed through the integration of Fiber Bragg Grating (FBG) optical sensors within structural elements, enabling continuous, real-time monitoring of structural health and performance.

Submarine Onboard Control Station

The growing use of swarm technology in unmanned operations requires secure, reliable communication systems. The Submarine Onboard Control Station (SOCS), integrated into the submarine's TS or as a standalone system, will use optical communication wires to maintain connectivity between the submarine, carrier, and swarm units, enabling missions such as Intelligence, Surveillance, and Reconnaissance (ISR).

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