



ARSx2

A marine area surveillance system using UAS, assisting anti-piracy measures and contributing to hostages and / or vessels recovery

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**12th NATO MARITIME INTERDICTION
OPERATIONAL TRAINING CENTER (NMIOTC)
ANNUAL CONFERENCE**

Opportunities and Threats from
Innovative and Disruptive
Technologies: Shaping the Future
of Security in the Maritime Domain

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NMIOTC premises
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A MARINE AREA SURVEILLANCE SYSTEM USING **UAS**, ASSISTING ANTI-PIRACY MEASURES AND CONTRIBUTING TO HOSTAGES AND / OR VESSELS RECOVERY

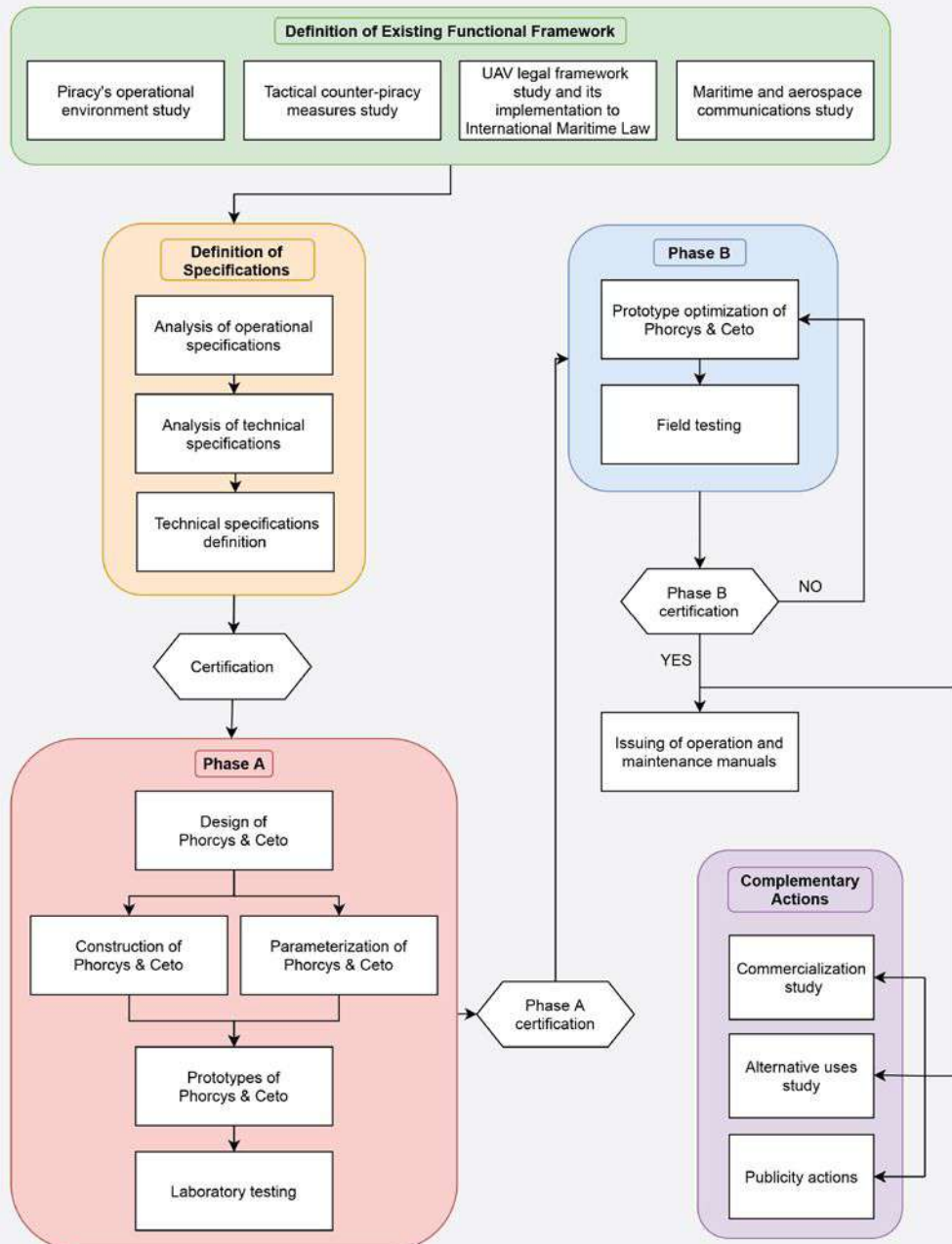
The innovative project ARSx2 deals with the development of a maritime surveillance system, consisting of two UAVs, for the prevention of piracy or other illegal activities as well as the monitoring of pirate incidents in progress, and search and rescue cases at sea.

The first UAV, called "**Phorcys**", is a small and flexible VTOL hexacopter on a Y6 configuration. Its compact and stocky structure enables it to operate in tropical, oceanic weather environments. Equipped with a powerful hybrid EO/IR stabilized camera with object tracking capabilities, humans and items such as guns, canisters, etc. can be identified from a safe distance. Phorcys will act as the "long arm" of the private guards and/or the crew aboard merchant ships.

The second, easy to use by non-specialists fixed-wing UAV, called "**Ceto**", is used in emergency cases as a "rescue beacon". It is deployed when a vessel is already or will be occupied by pirates, while real-time position, images or video are transmitted to the patrolling authorities and rescue organizations. Its purpose is, either to follow the vessel captured by the pirates or the ship of the pirates with hostages, at an appropriate height and distance for the significant period of ongoing piracy action by transmitting at appropriate frequencies Mayday (SOS) signals as well as critical information, such as images, of the ship it follows.



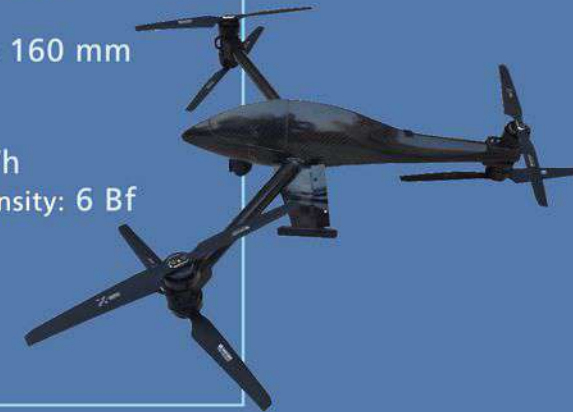
METHODOLOGY



SYSTEM'S SPECS

PHORCYS' MAIN FEATURES

- Vehicle type: VTOL hexacopter Y6
- Weight: 2.500 gr
- Dimensions LWH: 640 x 730 x 160 mm
- Maximum flight time: 32 min
- Maximum flight range: 12 km
- Maximum flight speed: 68 km/h
- Flight in air with maximum intensity: 6 Bf
- Waterproofing: IP55
- Hybrid recording sensor
- Camera model: DragonEYE 2
- Automated functions



CETO's MAIN FEATURES

- Vehicle type: fixed wing
- Weight: 1.050 gr
- Dimensions LWH: 540 x 1000 x 72 mm
- Maximum flight time: 60 min
- Maximum flight range: 64 km
- Maximum flight speed: 187 km/h
- Flight in air with maximum intensity: 6 Bf
- Waterproofing: IP55
- Optical and IR recording sensor
- Camera model: Raspberry Pi NoIR v2
- Automated functions



SYSTEM'S ADVANTAGES

BOTH **UAS** ARE **INTEROPERABLE**,
CUSTOMIZABLE & **READILY ACCESSIBLE**
TO ANY INTERESTED PARTY, **PROVIDING:**

- Increased maritime surveillance ability
- Early warning of potential pirate threats
- Capture, process and analysis of data
- Real-time high precision intelligence to control stations and rescue authorities
- Remote operation with mission management and autonomous commands
- Reliable network protocols for fast, safe and robust data transmission
- Assistance to search and rescue operations
- Monitoring of a pirate attack or hostage situation
- Recognition and monitoring of marine hazards
- Alleviation of risk of injury or death of humans during or after a pirate attack
- Reduced insurance costs for crews, ships, and freights
- Reduced economic loss of countries adjacent to high-risk areas
- Optimization of ship routes
- Fuel saving
- Ship rental time saving
- Security of the movement of humans and goods



A. S. PROTE MARITIME LTD

was founded in 2013 in Cyprus with the sole purpose of providing armed and unarmed security services to merchant ships, against piracy.

The corresponding branch in Greece was founded in the same year.

From 2017 our activities have expanded, apart from the above mentioned, to the use of new digital technologies, primarily but not exclusively, in merchant shipping, and in general in the maritime environment and relevant market, providing the following services:

Research, study, design, consultancy, development and production of any kind of analogue and/or digital, interactive and/or non-interactive, real-time and/or linear content for the wider area of culture and entertainment, World Wide Web (WWW), education and advertising such as Virtual and Augmented Reality, 2D and 3D representations, content for Dome Theatres, electronic platforms and marketplaces etc.

Research and experimental development services in geosciences and environmental sciences.

Interactive multimedia product research and development services.

Geoinformatics research, development and mapping services in the terrestrial and marine environment.

Remote sensing and photogrammetry.

Consulting services and research, design, development and production of applications and software on the Internet

Services of organizing, promoting and updating research projects and disseminating the final results to the general public

Introducing digital technologies to the merchant shipping industry.

AT PRESENT, OUR MAIN ONGOING PROJECTS ARE SUMMARIZED AT THE FOLLOWING:

Completion of the development/construction of a maritime surveillance system, consisting of two Unmanned Aircraft Systems (UAS), for the prevention of piracy on merchant ships, as well as the monitoring of a pirate incident in progress (research project, co-financed by Greece and the European Union with acronym: ARSx2).

Detection and monitoring of artificial plastic targets with satellite imagery and UAV (research project, funded by the European Space Agency, under the name "Plastic Litter Project 2020").

Being facilitated and supported by the GALATEA Project Consortium with services to carry out our company's innovation activities, financed by the European Union's Horizon 2020 Program.

Creation of an integrated geoinformatics system for remote monitoring and early warning in aquaculture (research project, co-financed by Greece and the European Union with acronym: Aquasafe).

Security consultancy at Tatoi Club.

General management of the PMSC Argonautis Maritime Services Ltd.

* A. S. Prote Maritime Ltd will be present at the next Posidonia 2022 Exhibition (stand no. 2151 - 30,25 sqm, in Hall 2) and will also held a presentation on the 9th of June 2022, at 14:45 hrs., at the Seminar Room 2A, in Hall 2)

Main Partner



The **Department of Oceanography and Marine Life Sciences of the University of the Aegean** conducts research in various areas related to the marine environment, such as climate change, function, and health of the ecosystem, fishing, aquaculture. It performs research in marine resources, coastal zone problems e.g., coastal erosion and pollution as well as integrated management of coastal and marine areas, based on an ecosystem approach. **Marine Remote Sensing Group** (MRSNG, <https://mrsng.aegean.gr/>) in the University of the Aegean conducts research for the exploration, analysis and visualization of the satellite and UAV data in the coastal environment.

Subcontractors



The research project **ARSx2 (AeRial System and Anti piRacy System) Marine area surveillance system, using Unmanned Aircraft Systems (UAS) to avoid and prevent merchant ships from piracy** is co-financed by Greece and the European Union (project code T1EDK-04993) through the Operational Program Competitiveness, Entrepreneurship and Innovation, under the call RESEARCH – CREATE – INNOVATE”.

* This research project has been selected as one of 20 good practices cases, out of 900 projects in total, by the Directorate-General for Defence Industry and Space (DGDEFIS) of the European Commission, under the call “Study on the contribution of the defence sector to Regional Development through the European Structural and Investment Funds”, via Ecorys a research consultancy company!



Co-financed by Greece and the European Union

