UNMANNED PORT SECURITY VEHICLE

MARITIME AND PORT SECURITY

Identification of port and harbor threats and response to catastrophic natural or man-made events are often difficult due to submerged debris and turbid water conditions. The Unmanned Port Security Vehicle (UPSV) provides first responders with a low-cost, easily deployed, rapid inspection capability in shallow water and port environments. The UPSV was developed by the University of Hawaii with funding support from the Department of Homeland Security and transition support from Battelle.

APPLICATIONS

The UPSV gives the United States Coast Guard (USCG) and other maritime first responders a tool to safely and efficiently assess security risks, identify chemical threats and make data-driven decisions concerning port security management. Its modular, reconfigurable and customizable design supports multiple missions, including inspection of infrastructure above and below the water line, expedited recovery of port operations in response to natural and man-made threats, and facilitation of underwater change detection and threat assessment for piers, pilings and harbor seafloors.

FEATURES

The UPSV utilizes GPS-enabled navigation with both autonomous and manual command and control options. Preprogrammed surveys ensure complete coverage, while manual control allows operators to direct surveys from a safe distance while viewing multi-faceted datasets from standard interfaces in real time. For reduced response time, the vehicle is designed for transport by helicopter and rapid deployment by a small, 2-3 person support team, with one hour breakdown and setup time. The UPSV includes multiple interchangeable sensors that can be quickly integrated to meet specific mission needs.

IMPACT

The UPSV improves maritime domain awareness by quickly providing actionable information to federal, state and local first responders. For routine subsurface survey of ports and harbors as well as visual examination of infrastructure using video, low-light and infrared cameras, the UPSV's automated navigation system minimizes boat expenses and on-water personnel time required to obtain highresolution data. Using the UPSV's sensors, harbor managers can more efficiently direct the use of maintenance personnel and commercial divers by identifying specific areas that need closer inspection. Two field-tested units are currently in use and the system is available for trial deployments through lease or purchase.



- Low cost
- Easy deployment
- Modular
- Reconfigurable
- Customizable









In a disaster response scenario, the rapid deployment of a locally based UPSV after a hurricane, tsunami or other event can assist the United States Coast Guard and other first responders in bringing ports back on line quickly. The low cost, easily deployed UPSV can survey a port or waterway and provide crucial subsurface information within minutes to hours.



Physical Platform and Performance Specifications

PLATFORM CONFIGURATION

Twin-hull catamaran Length: 2 m (6.6 ft) Width: 1.5 m (4.9 ft) Weight: 73 kg (160 lbs)

PROPULSION

Electrical thrusters (12 V DC) Li-Ion batteries

SPEED

Top speed: 5 kts Survey speed: 3—4 kts

COMMAND, CONTROL AND COMMUNICATION

Autonomous (hands-off) survey Remote control with real-time navigation and video Real-time communication via 900 MHz wireless (range > 5 miles)

NAVIGATION

INU Aided GPS **Precision:** < 10 cm **Accuracy:** < 2.0 m

TRANSPORTATION

Air-shippable (after break-down)

DEPLOYMENT

Break-down and setup in 1 hour Two-person deployable from shore, from pier/dock or from ship

ENDURANC

Hotel (computer, sensors and comms): > 12 hours **Propulsion:** 6 hours continuous survey at 3 kts Hot-swappable propulsion batteries

STANDARD PAYLOADS

Multibeam Sonar (260 kHz) Sidescan Sonar (1 MHz) In-Situ Chemical Sensors: Temperature, salinity, dissolved oxygen Wireless Video: Standard video and infared video

ADDITIONAL PAYLOAD

Over 100 kg (220 lbs) payload capacity Payload Power (12 or 24 Vdc) Payload Comms (Serial, USB, Ethernet)

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