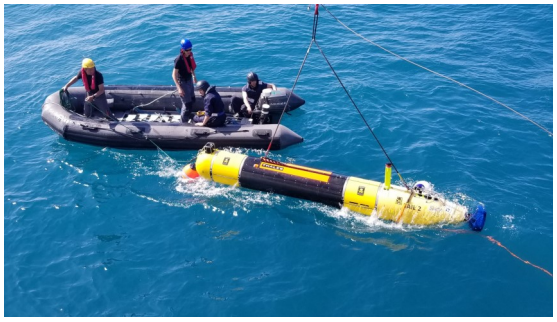
Programme: Autonomous Naval Mine Countermeasures

Mission in Brief

Develop an integrated mine countermeasures squad of system that accomplishes an end-to-end missions from search to disposal using autonomous vehicles and reports back on the estimated performance of individual systems and the overall residual risk.

Overview

The use of autonomous systems to detect, identify and dispose of mines has the potential to transform mine countermeasures from a Cold War legacy focused on time-consuming clearance of mines using a surface ship to a quickly deployable, cost-effective system that is faster and keeps NATO personnel out of harm's way. This transformation is underway today. Autonomous underwater vehicles are routinely used for mine detection; however, the more complex and time-consuming tasks of mine identification and disposal are still conducted by expert personnel, who are either diving or controlling ROVs from a ship.



This programme is organized into three main projects:

- **Collaborative Autonomous Mine countermeasures,** including detection, classification, and localization of the mine, with processing and decision making capabilities on-board the vehicle and construction of a framework for interoperable and standardised fleet of UxVs for autonomous multi-phase MCM
- **High-resolution low-frequency synthetic aperture sonar,** which investigates new sensing modalities to improve mine hunting capabilities in conditions that are difficult for conventional systems and addresses the issue of buried targets
- **Planning and Evaluation for Mine Countermeasures** including: the development of methods for in-situ mission evaluation, the development of the necessary algorithms for future implementation into in-service vehicles, and for operator tools for planning and evaluation of MCM in a wide context (individual phases and multi-phase planning).

This programme relies on the Centre's core capabilities in sonar technology (acoustics, signal/image processing, and automatic target recognition), machine intelligence, operational analysis, undersea communications, and autonomous vehicle command and control.

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