



Press release
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CMRE demonstrates robotic solutions to accelerate mine countermeasures operations

Experimentation is ongoing on board the NRV Alliance as part of the French-led exercise Olives Noires 2016

From 15 to 28 September 2016, the NATO Research Vessel Alliance, operated by the Italian Navy for the NATO Centre for Maritime Research and Experimentation (CMRE) based in La Spezia (Italy), is taking part for the first time in exercise Olives Noires 2016 in the Mediterranean sea, off the French coast. Olives Noires 2016 (ON16) is a live exercise involving NATO, French, Italian, Spanish, Greek and Slovenian naval units. The aim of the exercise is to enhance operational readiness levels and multinational cooperation training between NATO and French maritime forces in tactics and procedures in the littoral environment.

The primary purpose of the CMRE experiment in Olives Noires 2016 is to test solutions and advance methods for using robotics in mine countermeasures (MCM). Conventionally, the different phases of MCM (search, detect, classify, reacquire and identify) are performed in sequence making this a time-consuming effort. For the first time, CMRE is conducting specific experiments in which multiple robots tasked with different goals work in the same water space simultaneously to demonstrate an accelerated MCM timeline. In practice, experimental autonomous underwater vehicles (AUVs), including the MUSCLE prototype developed by CMRE, are being deployed together to detect, classify and identify simulated naval mines on the seafloor, using their automatic behaviour capabilities. As part of this work, new methods for allowing the vehicles to localise themselves better and new types of sensors are also tested.

In the future, these robots will not only be intelligent and able to take autonomous decisions, but also capable to coordinate actions in groups by simultaneously carrying out different multiple complex tasks and thus resulting in quicker surveying solutions. The ongoing initial experiments to support the research and operational analysis include close collaboration with universities from Girona (Spain) and Heriot-Watt (UK). Additionally, experiments are being conducted in conjunction with the conventional MCM vessels from multiple nations participating in ON16, to compare the performance of robots with legacy systems and assess practices for joint operations.

The outcome of this research will ultimately result in increasing the capabilities of the NATO Alliance in the MCM field. CMRE also aims to demonstrate that having more localised and specialised autonomous equipment the overall mission performance of a system-of-systems will increase.

About CMRE. The STO CMRE (Science and Technology Organization – Centre for Maritime Research and Experimentation) is located in La Spezia, Italy. The Centre focuses on research, innovation and technology in areas such as defence of maritime forces and installations against terrorism and piracy, secure networks, development of the common operational picture, the maritime component of expeditionary operations, mine countermeasure systems, non-lethal protection for ports and harbours, anti-submarine warfare, modelling and simulation, and marine mammal risk mitigation. CMRE operates two ships, NATO Research Vessel *Alliance*, a 93-meter 3,180-ton open-ocean research vessel, and Coastal Research Vessel *Leonardo*, a smaller ship designed for coastal operations. In addition to its laboratories the Centre is equipped with a fleet of autonomous underwater and surface vehicles and a world-class inventory of seagoing sensors.

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