

OCEAN2020 PROJECT

A Technological Demonstrator of Enhanced Situation Awareness in Naval Environment with the Use of Unmanned Systems



This project has received funding from the European Union's Preparatory Action on Defence Research under grant agreement No 801697

OCEAN2020 Project Context

- PADR is the 1st step of a European Defense Research and Capability Development Programme
- PADR is launched and funded by the European Commission
- European Defense Agency is the implementing agency for the PADR



10 National MoDs/Navies supporting OCEAN2020

- Italian Navy
- Hellenic Navy
- Spanish Navy
- Portuguese Navy
- Lithuanian Navy
- German MoD
- Swedish Navy
- French Navy
- Polish Navy
- Royal Dutch Navy

OCEAN2020: the PADR Project with highest budget (35.5 M€ out of 90 M€ of PADR Budget)



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OCEAN2020 Project Objectives



Operational objectives

- Significant improvement of **maritime Situation Awareness** through the integration of **UXS** (Unmanned Systems) with **ISTAR** (Intelligence Surveillance Target Acquisition and Reconnaissance) payload capabilities
- Interoperability by use of open architecture and recognised standards

Technical objectives

- High integration among EU countries and heterogeneous systems, demonstrated in full-scale live trials
 - Mediterranean Sea demonstration in 2019
 - Baltic Sea demonstration in 2021
- Development of EU C4ISR open architecture
- Integration of EU/NATO/civil data framework
- Advanced **data and information fusion** techniques for shorter decision time at **CMS** (Combat Management System) and **MOC** (Maritime Operations Centre) levels
- Increased autonomy for UXS, swarm operations, cooperation of assets

Cooperation objectives

- Diverse EU wide consortium to demonstrate large military R&T effort
- Improve market position of European defence industry in UXS
- Involve End-Users in design choices

Expected impact :

- demonstrate the potential of EU-funded research for defense applications
- boost the European industrial capacity in the military unmanned systems market



OCEAN2020 Unmanned Systems





Activity Flow Diagram





Project Ambitions (1/2)

UxS Capabilities and Integration

- UAS taking-off and recovery on Naval Platform
- Simultaneous deployment of multiple complex UxS Sensors
- Detections of Small Maritime Targets from high Grazing Angles
- UxS Autonomous and Swarming Behaviours

Sensor Data Processing for Situation Awareness

- Video Processing
- Sensor Data Fusion
- Satellite Sensing

Building Recognised Maritime Picture

- Information Fusion
- Integration of Multi-Source Information into RMP
- Behaviour Analysis
- Resource and Asset Planning









Project Ambitions (2/2)



Interoperability

- Video/Data Reporting from UxS Payload
- Information Sharing between CMSs, MOCs and NATO Nodes

System Resilience

- Secure Communications
- Secure Data Processing
- Cyber Protection
- Electromagnetic Protection
- Human Factor
 - Operator Interface
 - Pilot Training Means





OCEAN2020 System Architecture Managing the complexity



Sonar

Torp



System Configuration for Med Sea Demo





OCEAN2020 Mediterranean Sea Demo

20 - 21 November 2019

- NAVAL UNITS

Italian Frigate 1 (Martinengo, FREMM) Italian Frigate 2 (Fasan, FREMM) Spanish Frigate (Santa Maria) Hellenic Frigate (Limnos) French BCR (Var, Durance class) Italian MTC (Gorgona Class) - suspect vessel

MANNED AIRCRAFT

Italian NH90 Helicopter 🦉





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SEADRONE SEAD-23



LOCATIONS:

AREA OF OPERATIONS: Gulf of Taranto: SEA AREA Taranto: NAVAL BASE (Italian Navy) Grottaglie: MILITARY AIRPORT MARITIME OPERATION CENTRES: Bruxelles (EDA): EU MOC prototype Rome: Italian MOC Cartagena: Spanish MOC Athens: Hellenic MOC Lisbon: Portuguese MOC

UUV UNMANNED UNDERWATER VEHICLES





Ships and MOCs Networking

Valle

Frigate Martinengo



OCEAN2020 MED SEA DEMO

Maritime Situation Awareness and ISTAR capabilities at Sea





ROV SEASCAN Control Station on board French BCR Var



UAV AW HERO Control Station on board Italian Frigate Fasan



USV SEARIDER Control Station on board Hellenic Frigate Limnos





Tactical Situation with 3D view and videos from Unmanned Systems, on board Italian Frigate Martinengo

OCEAN2020 MED SEA DEMO

Maritime Situation Awareness and ISTAR capabilities Ashore



BK180-ISP Ground Station at Grottaglie Military Airport



Boarding phase of Scenario 2 displayed at IT MOC in Rome



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Tactical Situation displayed at EU MOC Prototype in Bruxelles



Tactical Situation and videos from Unmanned Systems displayed at Hellenic MOC in Athens



Tactical Situation and Video Wall with videos from Unmanned Systems displayed at Spanish MOC in Cartagena

OCEAN2020 MED SEA DEMO - Achievements



- Improvement of maritime situational awareness
 - Surveillance information generated by UxVs
 - Integration with CMS and MOC
- Extending range and performance of maritime ISTAR capability
 - UxS Payload (EO/IR, Radar, AIS, Sonar, etc.)
- Achieving EU-NATO interoperability
 - Adoption of NATO interoperability standards
- Technical Innovation
 - Integration of EU multi-countries, multi-producers, multi-domain manned and unmanned systems in real operational environment
 - Effectiveness of an interoperable system-of-systems
- Impact Making
 - Effective model of pan-European Cooperation
 - Efficient and Effective Defence Investments
 - Future joint R&T and post R&T Activities
- Effective Engagement of End-Users

System Configuration for Baltic Sea Demo







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