



EMSA's contribution to Task 2- Surveillance Services Remotely piloted aircraft systems

Closing Workshop of the Pilot Project 'Creation of a European Coastguard Function'

Leendert Bal
Head of Operations
Department C

Lisbon, 2 June 2017

Activities under the article

Task	Topics	Activities	Coordination:
TASK 1	Sharing information	<ul style="list-style-type: none">Fusing and analysing data	EMSA
TASK 2	Surveillance services	<ul style="list-style-type: none">Remotely Piloted Aircraft SystemsMaritime Patrol Aircraft etc	EMSA Frontex
TASK 3	Capacity building	<ul style="list-style-type: none">Guidelines, recommendations & best practices	EFCA
TASK 4	Capacity sharing	<ul style="list-style-type: none">Multipurpose operations	Frontex





**RPAS Demonstration
to test the CONOPS
(Concept of
Operations) for
multipurpose
missions, developed
by the three Agencies**

Background: Bridging the gap ...

Remotely Piloted Aircraft Systems



Limited
availability

How can
RPAS complement
maritime
surveillance?



Limited
range





(Depending on Type of RPAS)

Technical Characteristics

- Rapid on site launch
 - Runway
 - Catapult
 - Small take-off footprint for VTOL
- Long endurance
- Wide range:
 - Radio Line Of Sight (RLOS)
 - Beyond Radio Line of Sight (BRLOS)
- Operate in a range of conditions i.e. variable temperature, high humidity
- No human pilot onboard, potentially dangerous environments.
- Safety: Aviation Transponder

Operational Advantages

- Availability High (24/7)
- Day / night operations
- Can cover large sea areas
- Can be directed to a specific location
- Can stay at a specific location
- Can track a specific vessel
- Can detect people, vessels, pollution, “lost” containers
- Can monitor activity

- ✓ **Test Concept of Operations** for multipurpose missions/operations addressing needs stemming from all Coast Guard functions
- ✓ **Real time testing of technical capabilities** of State-of-the-art PRAS services in the civil domain (maritime surveillance)
- ✓ **Demonstrate real-time decision making process** in maritime surveillance missions based on dissemination and exploitation of data collected and provided by RPAS



Organisation of the Demo and Partners



- 7 days, 8 RPAS flights, >24 flight hours
- In partnership with EFCA and FRONTEX
- Location :INTA- Instituto Nacional de Técnica Aeroespacial, Huelva, Spain
- Support for set-up by Spanish Ministry of Public Works
- Spanish Customs and SASEMAR provided the maritime means at sea to perform the scenarios



- Representatives of 10 EU Member States:
BE, FI, FR, DE, IT, LT, MT, PL, SK, ES
- EMSA, Frontex, EFCA
- EDA, MAOC-N, EU SatCen
- Spain as host country: Ministry of Mercantile Marine, INTA, Sasemar, Aduanas (customs), Guardia Civil



RPAS systems, launch and recovery



- **TEKEVER (runway based)**

AR5 evolution

- Runway
- High res. Electro optical
- Dual thermal IR
- AIS



- **InSitu Scaneagle (catapult take off and hook recovery)**

ViDAR

- Scanning electro optical
- High res. electro optical
- AIS

EO900

- High res. electro optical with extreme optical and digital zoom

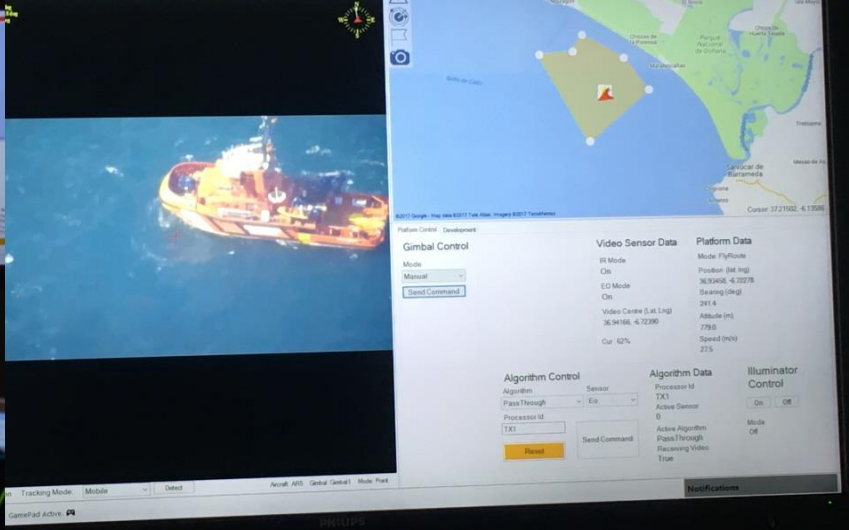
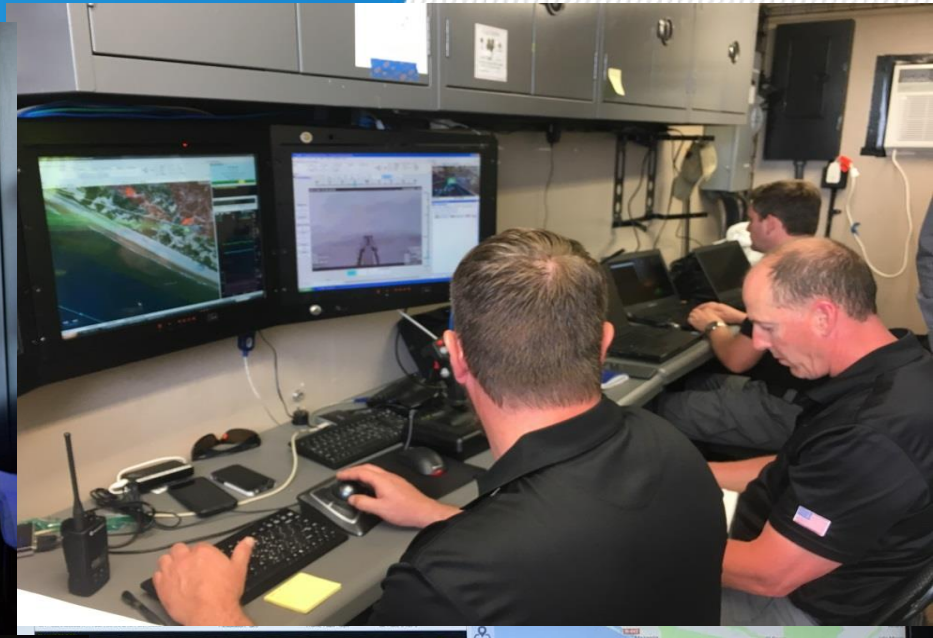
- AIS

MWIR

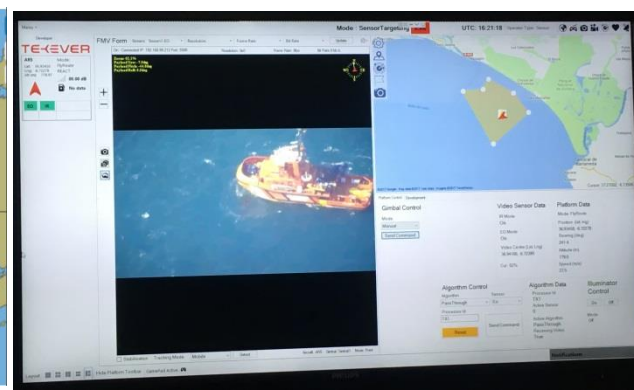
- High sensitivity mid range IR
- Electro optical
- AIS



Real time Visualisation in Ground Control room and in Control Centre



- ✓ CONOPS A Maritime patrol and general surveillance
- ✓ CONOPS B Marine pollution (monitoring and response support)
- ✓ CONOPS C Vessel identification and tracking
- ✓ CONOPS D Search and rescue
- ✓ CONOPS E Monitoring illegal fishing, anti-drug trafficking or other illegal activities

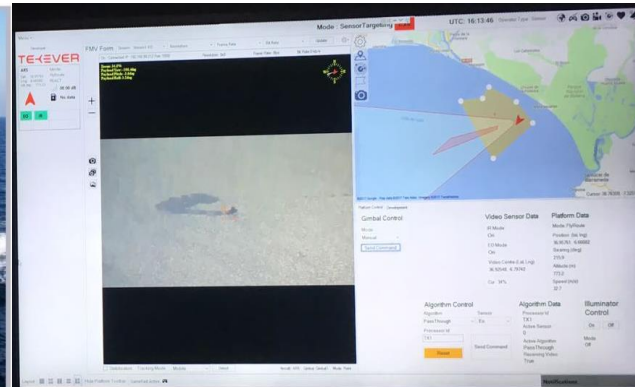


- ✓ The 5 CONOPS were covered through the following scenarios during the flights:
 - ✓ One 4 or 6 hour day flights covering the following:
 - Phase 1: generic surveillance, included also identifying (name /IMO) & tracking a slow medium size vessel
 - Phase 2: Identify/track a fast rib: sailing at high speed, dropping packages in water. RPAS tracked back sailed path to identify number of packages & follow rib.
 - Phase 3: Identify/monitor fishing activities: included identifying fishing vessels & identifying static fishing gear



Flight scenarios (2)

- ✓ One 4 or 6 hour day flight covering the following:
 - ✓ Phase 1: Locating a vessel with a distress signal (EPIRB) using search pattern to locate (SAR)
 - ✓ Phase 2: Locating a man over board (SAR)
 - ✓ Phase 3: Locating a liferaft (SAR)
 - ✓ Phase 4a: Detection of an Oil spill
 - ✓ Phase 4b : Assisting for an Oil spill response operation, orienting the vessels
 - ✓ Phase 4c: Identifying/monitoring Illegal Fishing and/or anti-drug trafficking: identify suspicious behaviour including a transshipment of goods/fish/drugs/packages



- ✓ One 4 hour **night** flight covering the following:
 - ✓ Phase 1:Generic surveillance including identifying vessels by name and IMO number
 - ✓ Phase 2:identifying behaviour of people on board including seeing people on deck, flares that may be used and also a possible transshipment between two vessels.



EP Coast Guard Pilot Project: RPAS demo



5 – 13 May at INTA, Huelva, Spain
Multipurpose CONOPS
with FRONTEX and EFCA

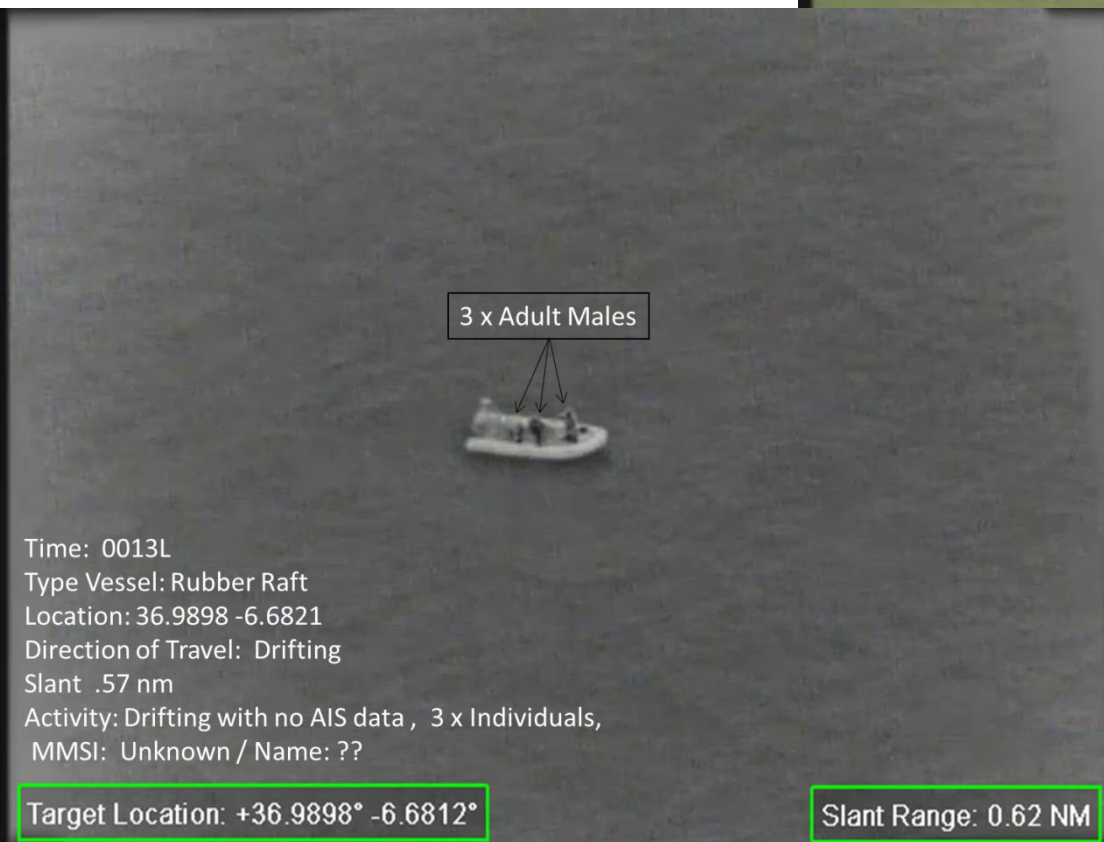


8 flights
>24 flight hours

- ✓ EO sensors give good resolution and images of targets. They were successful in detecting and zooming into vessels to identify them.
- ✓ Locking on targets to be able to track them needs to be improved.
- ✓ Some RPAS systems can fly undetected (acoustically or visually) based on the scenarios flown during the demo
- ✓ Communication channels and procedures between the end user and the Mission commander need to be improved.

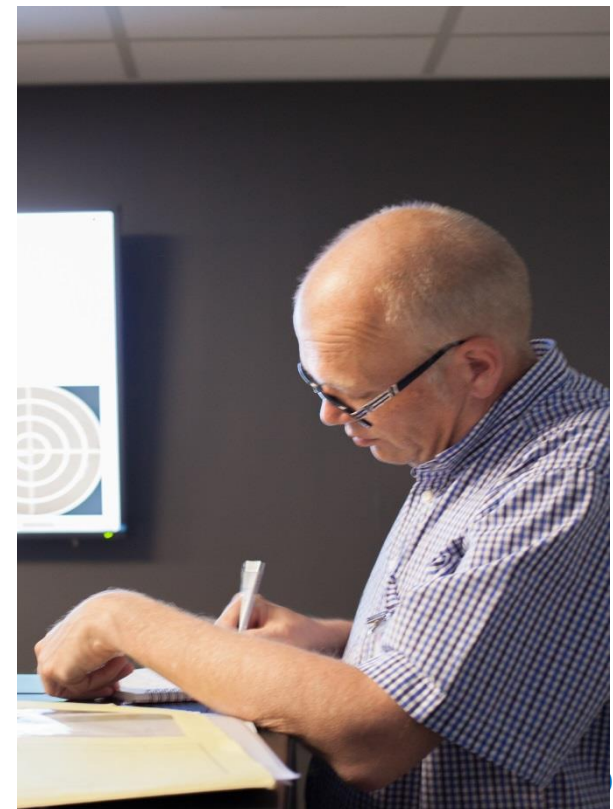
EO 900
1.5 nm Slant Range

- Image in the visible spectral range
- 2.7 km slant range



- Image in the Infrared
- 1.2 km slant range
- Night operation

- ✓ The need for EMSA and EFCA/FRONTEX staff to be on site was crucial to guide operations. At least several EMSA staff on shift were necessary to cover the hours of operations. The relevant agency should also be present the week before an operation starts to ensure relevant set-up and safety flights.
- ✓ Operational experience, including good guidance during operations, is important to get the maximum out of the RPAS systems/sensors.



Task 2 (RPAS): outcome

- Inter agency cooperation was very good and provided considerable training for EFCA/FRONTEX/EMSA
- The demo could not have been done without the assistance of INTA, Spanish Customs and SASEMAR: many thanks! (only possible in segregated airspace)
- Joint use/multiple purpose RPAS missions were demonstrated and were successful
- RPAS data (video and still images) greatly increase the maritime picture for a wide variety of maritime surveillance operations
- The response from the Participants in the Open Day was very positive, led to increased understanding
- RPAS demo was a valuable contribution, as part of the learning process, to better understand the operational behaviour and benefits of RPAS in the maritime domain



emsa.europa.eu

twitter.com/emsa_lisbon

facebook.com/emsa.lisbon