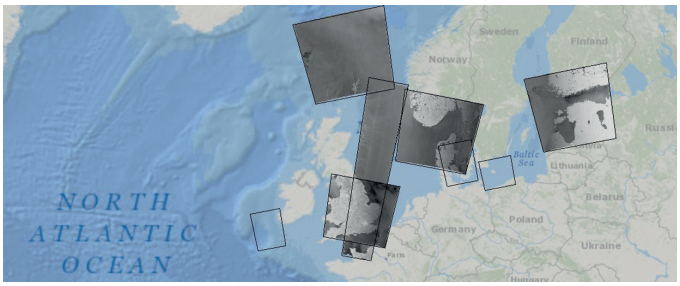
RPAS SERVICE PORTFOLIO

MARINE POLLUTION MONITORING AND DETECTION

EMSA
European Maritime Safety Agency

THE MARITIME CHALLENGE

Marine pollution, in particular oil spills at sea, and the associated impact on the coastline can cause extensive socio-economic and environmental damage e.g. polluting tourist beaches and/or contaminating fishery facilities. The impact of such pollution can be reduced through prompt response actions by Member States and/or deterring their occurrence. Using a combination of platforms and sensors, these objectives can be supported through a structured monitoring and detection programme integrated into national response chains. There are currently a range of tools available with different operational advantages.



Satellite images offer valuable data for the detection of marine pollution

Aerial view of oil spill leaking from ship at sea

THE EMSA SERVICE – OIL SPILLS

Remotely Piloted Aircraft Systems (RPAS) can be used as aerial platforms for sensors can provide complementary operational information on the size and shape of a slick to that gathered by CleanSeaNet, the satellite based state-of-the-art oil spill monitoring and detection service provided by EMSA to Member States. The RPAS also carry sensors to assist in the identification of the source of the slick, e.g. SAR and IR sensors for slick detection and volume estimation as well optical/IR cameras to identify potential polluters.

The combination of the Near-Real-Time delivery of satellite radar images to a Member State authority with subsequent RPAS overflight can provide real time on site operational information i.e. confirmation of an oil spill and/or identification of a potential polluter. This is a cost effective solution to efficient marine pollution monitoring. Within the context of supporting at-sea response operations, RPAS can identify “hot spot” areas as well as providing real time feedback on the efficiency of the clean-up activities.

The data flows generated by the service are provided free of charge to European Union Member States, Iceland, Norway and the European Commission i.e. there are no contractual costs for the user. It is expected that each deployment will be for a minimum of 2 months. During each deployment, the RPAS will be under the operational command of the relevant Member State authority. Actual flight control / management will be undertaken by qualified pilots from the service provider. In order to facilitate operational efficiency and effectiveness, the relevant Member State authority should provide an appropriate take-off / landing area, onsite facilities (e.g. internet, water, etc.) as well as support in obtaining the RPAS permit to fly from the national aviation authority for the deployment concerned.

It should be highlighted that the RPAS (platform and sensor payload) is multi-purpose in nature and can, in reality, be used for a range of alternative activities. These include the monitoring and detection of maritime litter, vessels and people in distress as well as the general identification and tracking of vessels and their activities. The EMSA service is scalable so allowing support to different Member States at the same time. This is possible as the service is based on mobile units being set-up in the area of operation.

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KEY CHARACTERISTICS

Advantages of using RPAS include:

- Wide range, long endurance, and rapid flight activation e.g. applicable for regular monitoring of a maritime zone for an extended period or targeting a specific area or as triggered by a CleanSeaNet alert
- Designed to operate in a broad range of conditions i.e. variable environmental temperature, high humidity, rain and (as there is no human pilot onboard) potentially dangerous environments
- Invisible to vessels
- Transponder for aircraft-to-aircraft notification to increase aviation safety.

The sensor payload provides:

- Maritime radar for initial long range detection of vessels and oil slicks
- Electro-optical cameras to record the maritime scene e.g. photographic evidence linking spill to vessel and/or general observing of vessel activities
- Thermal infrared cameras for slick thickness detection, vessel identification, fire analysis, locating people in distress, general observation of vessel activities at night or in poor visibility conditions
- Distress signal transponder to determine the location of the person/object in distress
- AIS transponder to identify vessels and determine their positon.

GENERAL TECHNICAL SPECIFICATIONS

WING SPAN/ ROTOR DIAMETER	UP TO 6.5 M (APPROXIMATELY)
TAKE-OFF WEIGHT / MASS	UP TO 150 KG (MAXIMUM)
ENDURANCE	> 10 HOURS
RANGE	UP TO 800 KM
CRUISE SPEED	UP TO 140 KM/H
ALTITUDE	UP TO 15,000 FEET
COMMUNICATION	RLOS / BRLOS (SATCOM)
MAX PAYLOAD WEIGHT	UP TO 50 KG
SENSORS	ELECTRO OPTICAL & THERMAL INFRARED CAMERAS, MARITIME RADAR, AIS TRANSPONDER, DISTRESS SIGNAL TRANSPONDER

EMSA RPAS PORTFOLIO AND OPERATIONAL USAGE


Emission Monitoring


Maritime Surveillance


Emission Monitoring


Maritime Surveillance


Emission Monitoring & Maritime Surveillance


Marine Pollution Monitoring & Maritime Surveillance

Depending on the mission, RPAS fly close to shore, i.e. within Radio Line of Sight (RLOS) or further offshore, i.e. Beyond Radio Line of Sight (BRLOS). BRLOS operations require specialised equipment on board to communicate via satellite. All aircraft control communications are via a Local Ground Station. Depending on the payload configuration, RPAS can undertake a wide range of mission types. The marine pollution payload configuration is multi-purpose in nature, e.g. It is also suitable for other vessel monitoring and detection activities.