

LIGHTWEIGHT RPAS SERVICES

SUPPORTING POLLUTION RESPONSE



GENERAL DESCRIPTION

Lightweight Remotely Piloted Aircraft Systems (RPAS) are installed on board most of the EMSA oil spill response vessels (OSRV). These RPAS are maintained and ready to be deployed in case of emergencies, exercises or drills undertaken by the EMSA OSRV, where a certified RPAS pilot can be on board within 24 hours. The RPAS installed is a lightweight vertical take-off and landing (VTOL) system that can operate from relatively small areas on the vessels' deck, and which features an extended hover and fast forward flight capability to provide an aerial picture of the situation and support to the response operations. The RPAS can be operated on the high seas and for the operation in territorial waters, the RPAS operator holds a Light UAS Operator Certificate (LUC), meaning that flights are authorised for operations in the EU and EFTA, under certain airspace conditions. During emergencies, when national authorities are in charge of emergency response, the airspace is directly coordinated by them to allow RPAS operations.



KEY CHARACTERISTICS

In an emergency mobilisation, an RPAS pilot is available on location within 24 hours to pilot the drone and to stay on board the vessel for the duration of the operation. The use of the RPAS on board is directed by the OSRV On-Scene Commander, at the behest of the national authorities in charge of the response. The RPAS can be used to support oil spill response operations in a number of ways, including:

- Identifying source of pollution/location of surfacing pollution;
- Location of surfacing pollution;
- Providing overview of geographical extent and thickness of pollution;
- Supporting real-time pollution monitoring through provision of high resolution, live video footage from the RPAS;
- Increasing the efficiency of clean-up operations by guiding the vessel to areas where the oil is thickest and by monitoring the efficiency of oil collection and dispersant spraying;
- Support to operational on-scene coordination of multiple resources;
- Complementing data acquired by other means (e.g. aircraft, satellite).



OPERATION

The on-board oil spill coordinator is responsible for liaising with the pilot and with the Member State on-scene coordinator to make best use of the RPAS, in accordance with the needs of the operation. The pilot, with support from the RPAS operator's headquarters, is responsible for the mission operation, e.g. planning activities together with the OSRV oil spill coordinator and/or MS's liaison officer, performing safety briefs with vessel crew and ensuring they understand upcoming activities, performing inspections and maintenance to ensure equipment is operational, checking authorisations and airspace, performing flights, collecting and distributing data.

MAIN COMPONENTS

The RPA and the handheld ground control station are compact and lightweight, and designed to be operated by one RPAS Pilot. The RPAS system is composed of the following components:

- 1 x Lockheed Martin Indago drone
- 1 x Ground Control Station, a lightweight hand-controller
- 1 x Ground Data Terminal (laptop), providing a visualisation tool to show live all video and associated data to the operational staff on the vessel
- Batteries and battery charger
- 4 x interchangeable payloads:
 - ION 30: ELECTRO OPTICAL (EO) SENSOR FOR THE VISIBLE SPECTRUM
A camera for use in daylight conditions with a 30x optical zoom that will allow the operator to collect high-quality video and stills from a distance. It is useful for mapping of the spread, approximating the relative and absolute oil layer thickness during the spill response, as well as classification of the type of oil.
 - NOCTIS: INFRARED (IR) SENSOR
The NOCTIS payload is an infrared (IR) payload with two IR cameras of different focal lengths, which enables the operator to get detailed views of targets. Used during oil spill emergencies throughout the day and in particular for missions at night.
 - DUO+: EO/IR GENERAL PURPOSE PAYLOAD
The DUO+ adds flexibility to a flight, as it can deliver both visible and IR imagery at the same time, and is useful when both types of imagery are required during a single flight.
 - DROP
Transportation of items of up to 900g that can be dropped from the RPAS when at low altitude, for example for probe taking or between two ships involved in an operation.



TECHNICAL SPECIFICATIONS

MAXIMUM TAKE OFF WEIGHT	2.8 kg
FLIGHT ENDURANCE	> 35 minutes
TYPICAL OPERATION ALTITUDE	200-400 feet
MAXIMUM CRUISE SPEED	15.6 M/S (manual flight mode)
MAXIMUM WIND (GUSTS)	13.4 M/S (26 knots)
RAIN PERFORMANCE	Moderate Rain (<7mm/h)
PROPULSION SYSTEM	4 electrical motors with propellers, powered by a single battery
DATA SHARING	Locally to the on board user via visualisation tool (laptop on bridge of vessel) or streaming over internet and the RPAS data centre, in case internet connection is available.