Workshop: Copernicus and unmanned aerial platforms

SESSION 2:
Downstream – Existing use of aerial observations applications

RPAS services at the European Maritime Safety Agency-EMSA

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Unit C.3 Maritime Surveillance

Section C.3.3 RPAS services

EMSA
European Maritime Safety Agency

EMSA's Tasks in the Maritime domain

Assist the Commission

Work with Member States

Cooperation MSs-COM- EFCA-FRONTEX

- Traffic Monitoring (SSN)
- IMS Integrated maritime Surveillance
- CleanSeaNet
- Copernicus maritime Surveillance Services
- SLAs FRONTEX /EFCA/EMSA

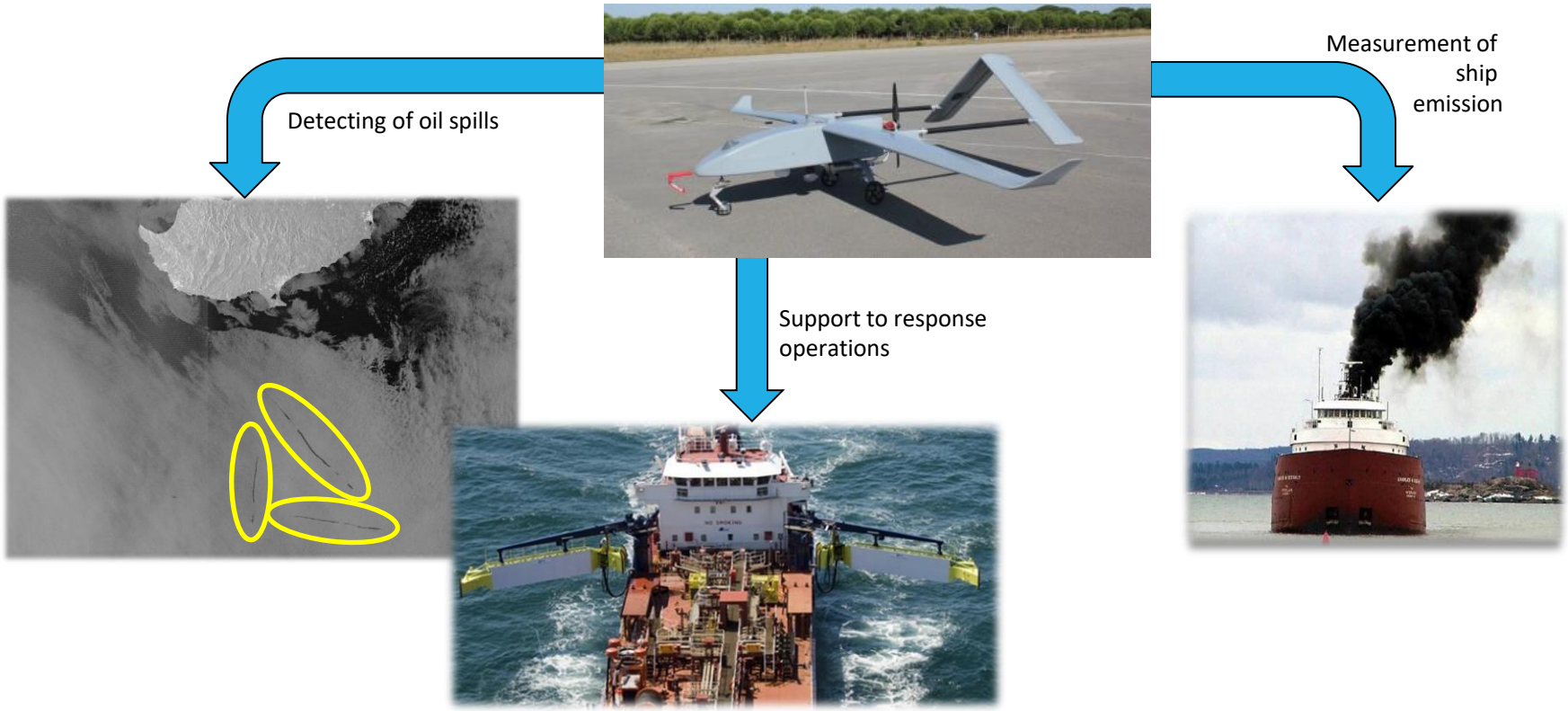
EMSA in view of Maritime Challenges

- **Safety of Navigation**
  - Traffic separation schemes
  - Search & Rescue (SAR)
  - Maritime accidents & disasters
- **Logistics & Customs**
- **Pollution:**
  - Oil Spills
  - Air Emissions (Sox)
- **Security & threat of terrorism**
- **Piracy & armed robbery**
- **Migration & people trafficking**
- **Trafficking of contraband, weapons, or narcotics**
- **Fishing:**
  - Illegal, Unreported, Unregulated

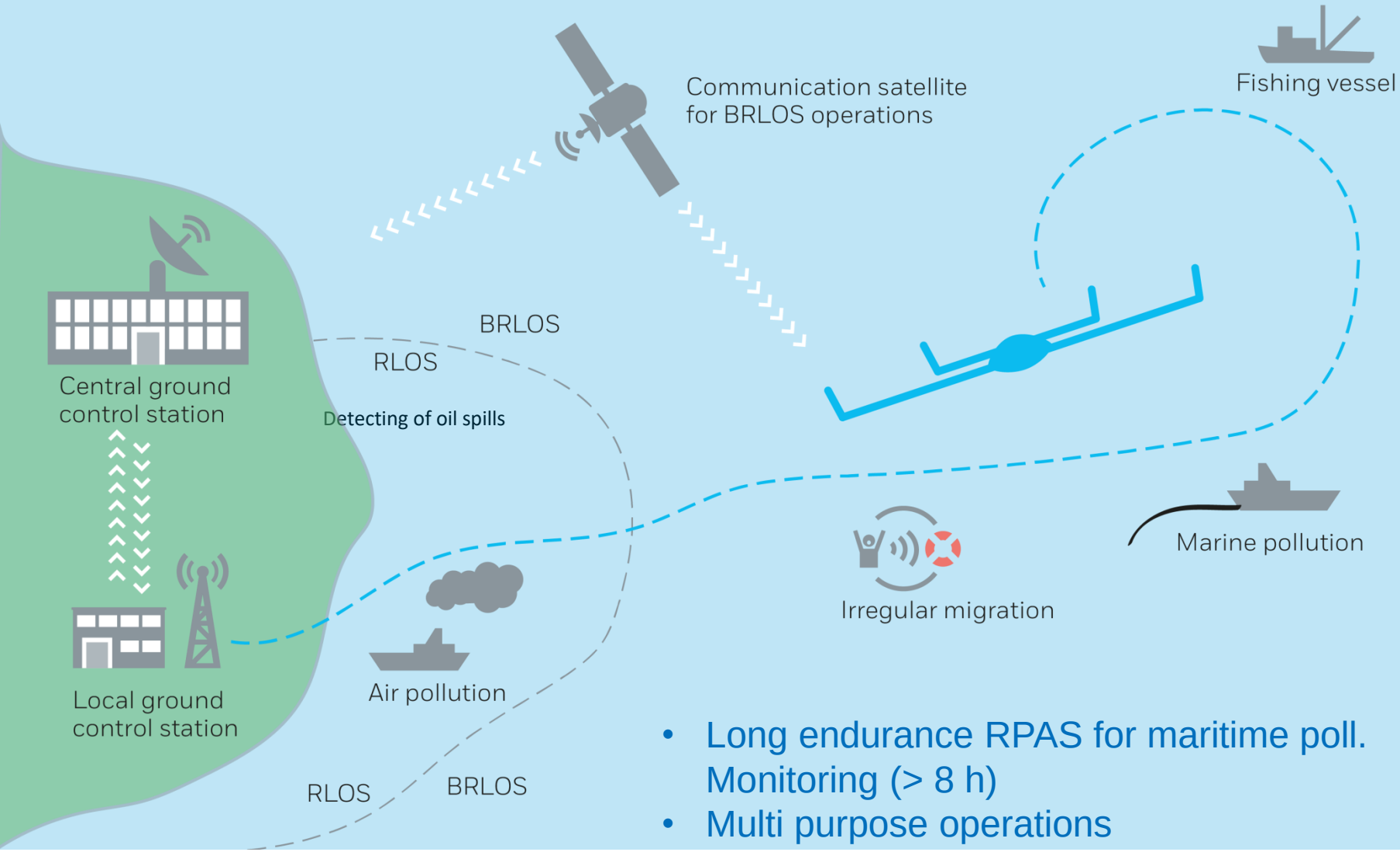
MEMBER STATES

RPAS applications in the maritime domain

- **Pollution Detection and Monitoring**: complementing CleanSeaNet
- **Emission monitoring**: support to enforce the Sulphur directive
- **Maritime surveillance**: Search and Rescue, border control, fishery control, anti piracy, safety of navigation, customs, anti drug trafficking, …

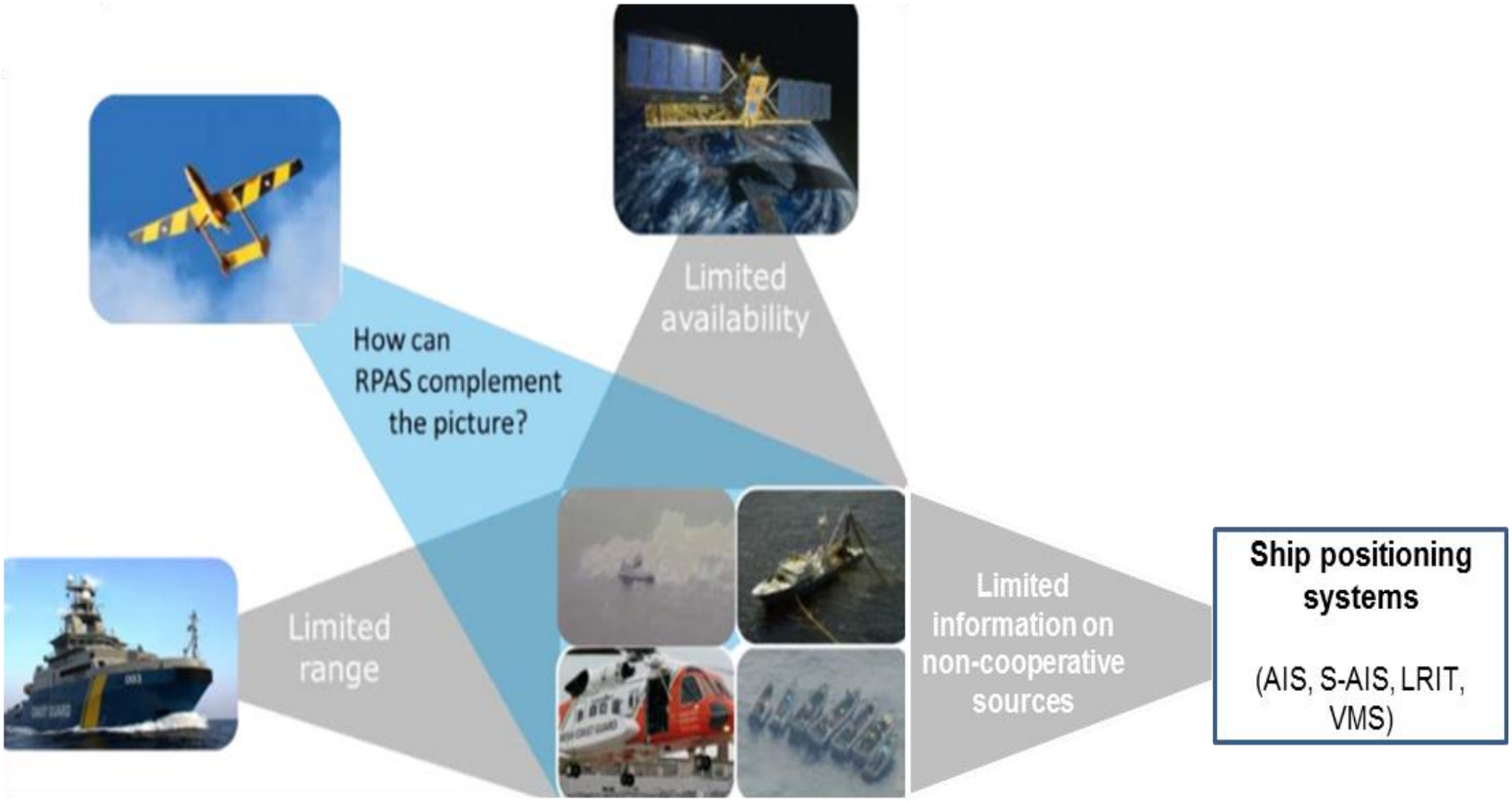


EMSA RPAS: Multi-Mission Capability



- Long endurance RPAS for maritime poll. Monitoring (> 8 h)
- Multi purpose operations
- Beyond radio line of sight operations
- RPAS capable to resist harsh environments

Bridging the gap …



Key Characteristics and Advantages:
- Aircraft -

(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 safely operate
- Can monitor activity

Key Characteristics and Advantages:
- Payload -

(Depending on configuration)

Sensor Payload

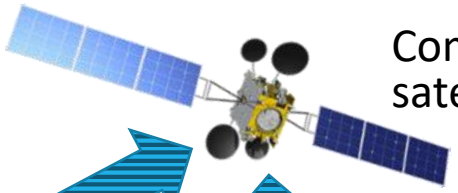
- Maritime radar
- Electro-optical cameras

- Thermal infrared cameras
- SOx (and CO2) sniffers
- Distress signal transponder
- AIS transponder

Operational Advantages

- **Real Time Data**
- Medium range detection of vessels and oil slicks.
- "Streaming the maritime scene"
  e.g. photographic evidence and/or observing vessel activities.
- Fire analysis, locating people, general observation at night or in poor visibility.
- Estimate Sulphur concentration in ship fuel
- Determine location of person/object in distress.
- Identify vessels and positon

Goal: Integrated multi purposes services



Communication satellite

RPAS

Common integrated services:
- in real time
- mapping of data
- alerting

Additional EO data; allows directing RPAS

RPAS operators

EMSA maritime application

Registries
Maps

In-situ data:
(Sat-)AIS, LRIT

User communities

Oil spill response

Emission monitoring

Anti Piracy

Fishery control

Search and rescue

Border control

Trafficking

EMSA RPAS contracts provide …

- Heavy lifters with maritime radar for maritime pollution detection

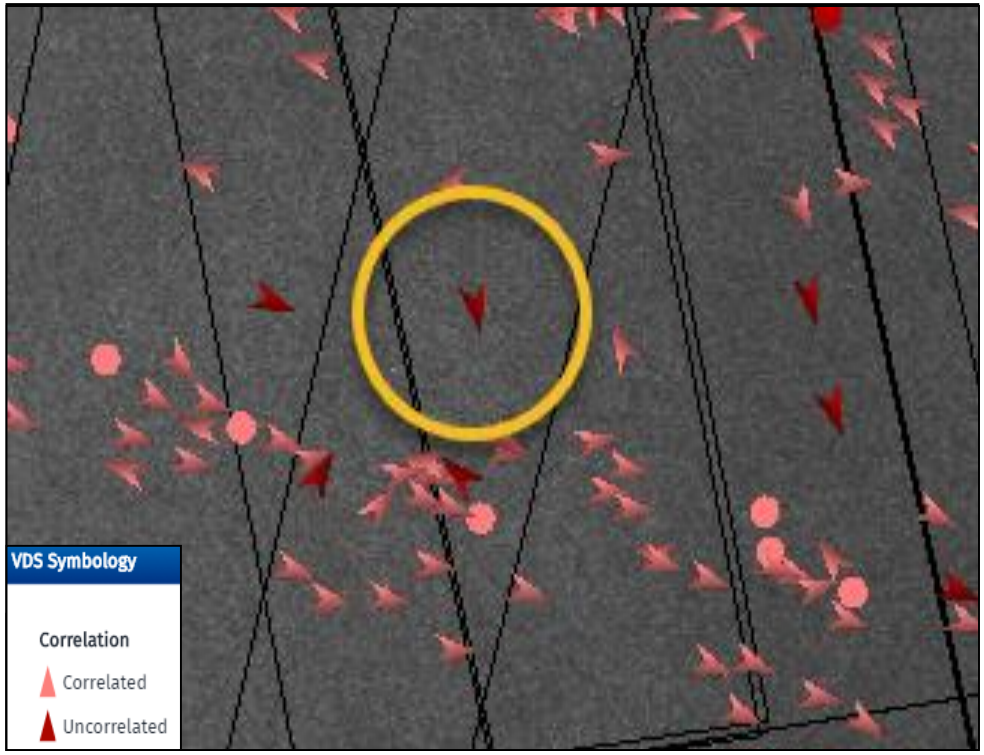
- Emission monitoring

- Maritime surveillance (additional capacity under procurement)

- Vertical-take-off-and-landing (VTOL) (Procurement ongoing)

Example of RPAS and satellite services

Support to combined operations – RPAS



CMS EO planned acquisitions over the RPAS AOI © Google Earth, 2018.

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- Objective: Support to law enforcement operations
- CMS EO products used to activate RPAS for further investigation
- Period of operations: 2 months
- User: (confidential while operation is on-going)
- Location (confidential)

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Required capabilities and Payload

Requests from more than 20 MS users pending….

Long range target detection (day and night)	Range (km)
Large vessel (metallic, bigger 100m)	120
Small boat (metallic, 10m to 30m)	40
Non-metallic small craft (e.g. rubber boat)	12

SATCOM	
Maritime Radar	
EO Sensor	
IR Sensor	
Digital Camera	
Laser Illuminator	
AIS Receiver	
EPIRB Receiver	

Thank you – Questions?

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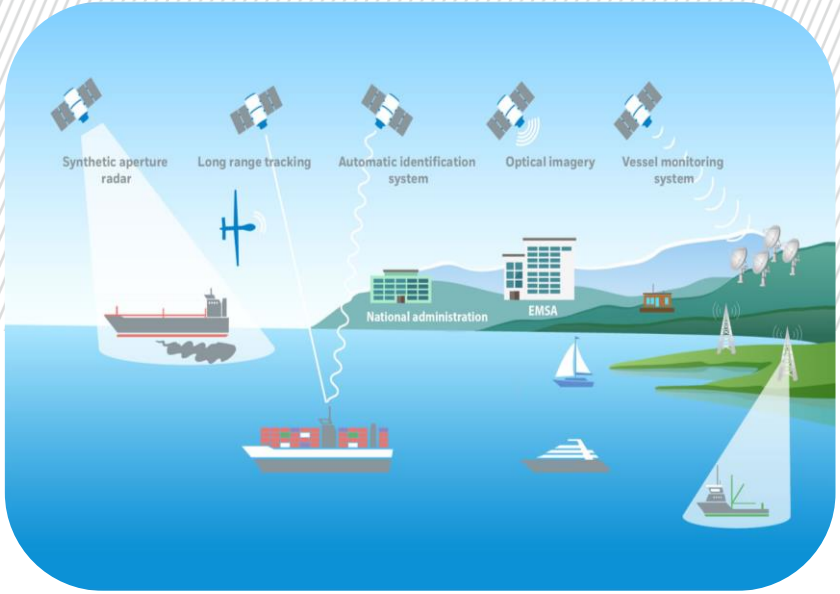

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