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LIST OF ACRONYMS

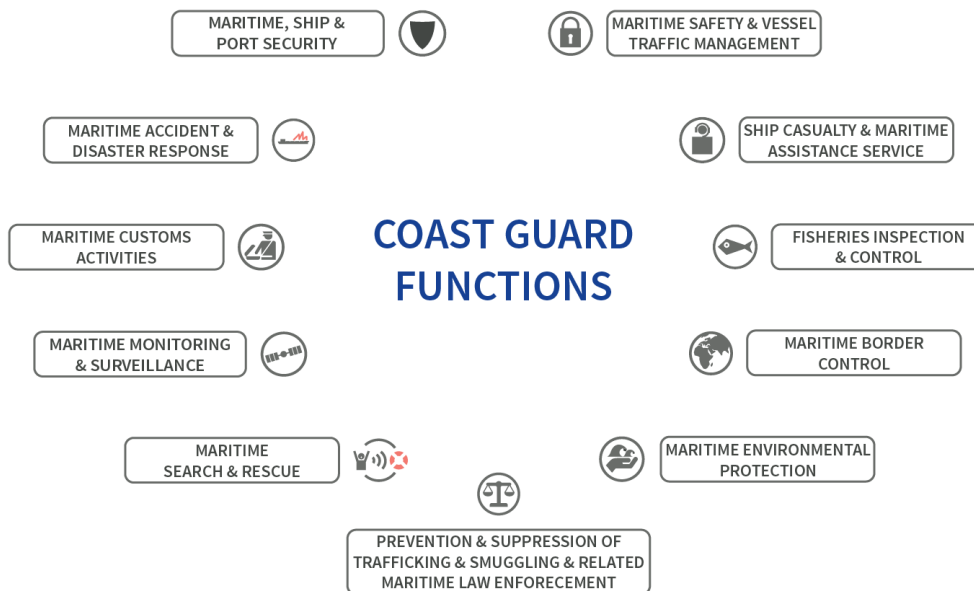
ABM	Automated Behaviour Monitoring
AIS	[ship's] Automatic Identification System
BFT	Bluefin tuna
BLOS	Beyond line of sight
CMS	Copernicus Maritime Surveillance Services
CONOPS	Concepts of Operations
COP	Common Operational Procedures
ECGFF	European Coast Guard Functions Forum
EFCA	European Fisheries Control Agency
EMSA	European Maritime Safety Agency
EMT	European Monitoring Team
EO	Electro-optical
EPN	European Patrols Network
ESF	EUROSUR Fusion Services
EU	European Union
EUNAVFOR-MED	European Union Naval Force Mediterranean
EU SatCen	European Union Satellite Centre
EUROSUR	European Border Surveillance System
FASS	Framework Contract for Aerial Surveillance
FMV	Full motion video
FOC	Focal Contact Point
Frontex	European Border and Coast Guard Agency
FWA	Fixed Wings Aircraft
DG HOME	Directorate-General for Migration and Home Affairs
DG MARE	Directorate-General for Maritime Affairs and Fisheries
DG MOVE	Directorate-General for Mobility and Transport
GT	Gross Tonnage [of ship]
HQ	Headquarters
ICC	International Coordination Centre
IMS	Integrated Maritime System
IR	Infrared
IUU	Illegal, Unreported and Unregulated [fishing activities]
JDP	Joint Deployment Plan
JMIT	Joint Maritime Interagency Team
JO	Joint Operation
JORA	Joint Operations Reporting Application of Frontex

LO	Liaison Officer
LOS	Line of sight
LRIT	Long-range Identification and Tracking of Ships
MAOC (N)	Maritime Analysis and Operations Centre – Narcotics
MARSURV	EFCA’s operational fisheries control coordination tool
MAS	Multipurpose Aerial Surveillance
MMSI	Maritime Mobile Service Identity
MPOs	Multipurpose Operations
MRCC	Maritime Rescue Co-ordination Centre
MS	Member State(s)
NAFO	North Atlantic Fisheries Organization
NCC	National Coordination Centre
NEAFC	North East Atlantic Fisheries Commission
RPA	Remotely Piloted Aircraft
RPAS	Remotely Piloted Aircraft Systems
SAR	Search and Rescue or Synthetic Aperture Radar
SAR SURPIC	Search and Rescue Surface Picture
SAT-AIS	AIS data detected by Satellites
SITREP	Situation Report
SLA	Service Level Agreement
SOA	Scene of Action
SOP	Standard Operating Procedures
T-AIS	AIS data detected by terrestrial AIS stations
VDS	Vessel Detection Service
VHR	Very high resolution [optical images]
VMS	Vessel Monitoring System [for fishing vessels]
WG	Working group

1. INTRODUCTION AND BACKGROUND

The waters surrounding Europe are a busy place, accommodating a wide range of human activities that contribute to our wellbeing and prosperity - international and domestic freight and passenger transport, fishing and aquaculture, oil and gas production, tourism and recreational activities to name a few. At the same time the maritime domain is exposed to a number of risks - incidents and accidents, marine pollution (both accidental and operational), various illegal and criminal activities like illegal, unreported and unregulated fishing, irregular migration, terrorism, piracy and armed robbery, human and drug-trafficking, smuggling and other cross-border crimes.

More than 300 civilian and military authorities in the Member States oversee this busy domain to ensure that the activities taking place there are lawful, safe, secure and environmentally sustainable. Day and night these authorities carry out a number of tasks that are jointly referred to as Coast Guard Functions.



Three European Agencies support the national authorities in performing their coast guard tasks:

- the European Maritime Safety Agency (EMSA), based in Lisbon, Portugal
- the European Border and Coast Guard Agency (Frontex), based in Warsaw, Poland, and
- the European Fisheries Control Agency (EFCA), based in Vigo, Spain

Each of them has a specific area of competence and the user communities they serve have different objectives and responsibilities.

Frontex aims at improving the management of the external borders in order to ensure a high level of internal security in the EU and to tackle cross-border crime.

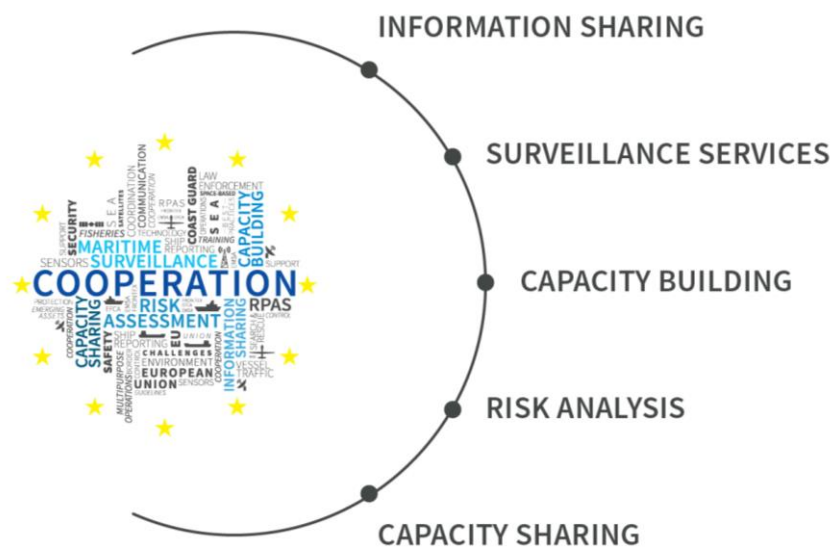
EFCA focuses on operational coordination of fisheries control and inspection activities by the Member States and endeavours to ensure level playing field for the fishing industry and sustainable approach to fisheries.

EMSA focuses on enhancing maritime safety, security and prevention of ship-source pollution. It also supports response operations to marine pollution caused by ships and by oil and gas installations.

While the three Agencies have quite diverse tasks, the common domain in which they operate naturally drives them to team up and search for synergies. The need and added value for such collaboration has been acknowledged and called for in the EU Integrated Maritime Policy adopted back in 2007.

The cooperation between the Agencies dates back to 2009 and was based on bilateral and trilateral agreements. The migrant crisis of 2015 when more than a million migrants and refugees crossed into Europe, mostly by sea, triggered the Commission to propose the Border Package - a set of measures to manage migration more effectively and improve the internal security of the Union.

As part of the Border package, adopted by the European Parliament and the Council, the mandates of Frontex, EFCA and EMSA were amended. A new cooperation article was introduced in their Founding regulations, requiring them to work together in 5 areas in order to provide more efficient and cost-effective support to the MS authorities carrying out coast guard functions. These areas are: information sharing, surveillance and communication services, capacity building, risk analysis and capacity sharing.



In parallel to the adoption of the Border Package the European Parliament launched a pilot project “Creation of a European Coast Guard Function” to provide a test bed for the enhanced cooperation amongst the three Agencies and the Member States authorities.

2. PILOT PROJECT SCOPE

The pilot project aimed at creating operational and technical synergies between different Coast Guard functions at EU level particularly between EMSA, EFCA, and Frontex. The project activities were clustered into four tasks:

- Task 1: Sharing Information – coordinator EMSA
- Task 2: Surveillance Services – coordinators EMSA (for Remotely Piloted Aircraft Systems) and Frontex (for Fixed Wings Aircrafts)
- Task 3: Capacity Building – coordinator EFCA
- Task 4: Capacity Sharing (multipurpose operations) – coordinator Frontex and EFCA

3. TASK 1 INFORMATION SHARING

3.1. Objective

Sharing of information available in ship reporting and other information systems hosted by or accessible to EMSA, EFCA and Frontex is one of the areas in which the new cooperation article foresees enhanced interagency cooperation.

The objective of Task 1 of the Pilot Project, coordinated by EMSA, was to explore and demonstrate how this can be addressed. More specifically the objectives of Task 1 were:

- to list the services used for the purposes of maritime surveillance for which the three Agencies are already cooperating and sharing data and
- to extend and intensify the sharing of information services in the framework of the project.

3.2. Activities under Task 1

Under Task 1 the three Agencies jointly carried out a comprehensive analysis of the services currently provided by EMSA to EFCA and Frontex and the services provided by those Agencies to their users, taking into consideration the users' expanded needs and the increased surveillance capabilities of EMSA¹ in order to define better synergies and develop new enhanced functionalities of the services.

The services that were tested and further developed comprise of:

- EFCA Integrated Maritime Service for Fisheries Monitoring and Control of EU Regulated and/or Related Activities (EFCA IMS).
- The 5 services provided by EMSA to Frontex in support of the EUROSUR Fusion Services (EFS).

Below is a brief outline of these services which EMSA provides to EFCA and Frontex pursuant to Service Level Agreements, concluded between the relevant Agencies. Information of new functionalities developed in the framework of the Pilot Project is also provided.

¹ With the delegation agreement signed on 3 December 2015, the European Commission entrusted EMSA with the operation of the maritime surveillance component of the Copernicus Security Service. Under the agreement, EMSA uses space data from Copernicus Sentinel 1 satellites combined with other sources of maritime information to effectively monitor maritime areas of interest.

Further, on 1 September 2016 EMSA concluded a Framework service contract for provision of a global feed of real-time Satellite-AIS data.

Finally, Vessel Monitoring data from EFCA was added as an additional data type.

3.2.1. EMSA Services to EFCA

EFCA's IMS delivers a real time maritime awareness operational picture to users that have been granted the relevant access rights by EFCA. It provides:

- access to a wide selection of maritime information mainly related to vessel position, voyage, port calls and characteristics;
- data fusion and correlation services based on T-AIS, SAT-AIS, LRIT, VDS and VMS, the latter coming via EFCA from EU MS and the Regional Fisheries Management Organisations;
- a tool to display earth observation images acquired through Copernicus Maritime Surveillance services;
- a tool, based on Automated Behaviour Monitoring algorithms (ABMs) that can be used for vessel behaviour analysis, risk assessment and classification of possible non-compliance. Examples include monitoring for specific types of maritime behaviour including at-sea encounters, fishing patterns, and detection of IUU blacklisted vessels in specific areas. 23 ABMs are currently operational and EMSA will continue to develop, in consultation with users, new ones;
- a tool to enter additional information on specific ships, events, etc., for visualisation on the EFCA IMS service web interface;
- an Area Centric Query service that generates reports for vessels identified based on certain criteria applied for specific areas of interest.

In 2016 EMSA developed mobile application (iOS and Android for phone and tablet) through which users can access EFCA's IMS. This tool is very useful e.g. when inspecting a vessel in port or at sea. The mobile app was rolled out and tested with EFCA as Beta users. It is now fully operational and access will be extended to all users of the EFCA IMS service.

During the Pilot project, since September 2016, EMSA has been providing an Earth Observation component to EFCA services through Copernicus Maritime Surveillance (CMS). It reinforces the integrated service to EFCA by correlating existing data e.g. vessel position with increased satellite detection and monitoring data. This new functionality has added value for:

- detection of vessels of different sizes (from 8 m to >100 m) with high reliability;
- detection of non-reporting vessels (correlation with vessel reporting data);
- monitoring of fishing activity and associated vessels movements;
- monitoring of vessel movements inside restricted fishing areas;
- vessel classification;
- detection of fixed structures (e.g. fish farms, fish cages, icebergs);
- monitoring of compliance with the landing obligations through detection of illegal discards.

Fisheries control support was provided on request of EFCA to operations in the Atlantic Ocean (NAFO and NEAFC areas), North-East Atlantic (Western Waters), Mediterranean Sea and the Baltic/North Sea.

Another up-grade of the EFCA IMS relates to development of tools and services to support Member State authorities and the Union in their fight against Illegal, Unreported, and Unregulated (IUU) fishing. EMSA is contributing to this project by setting up a worldwide IUU IMS service open to users at DG MARE, EFCA and in the Member States. To that end EMSA is developing, with the financial

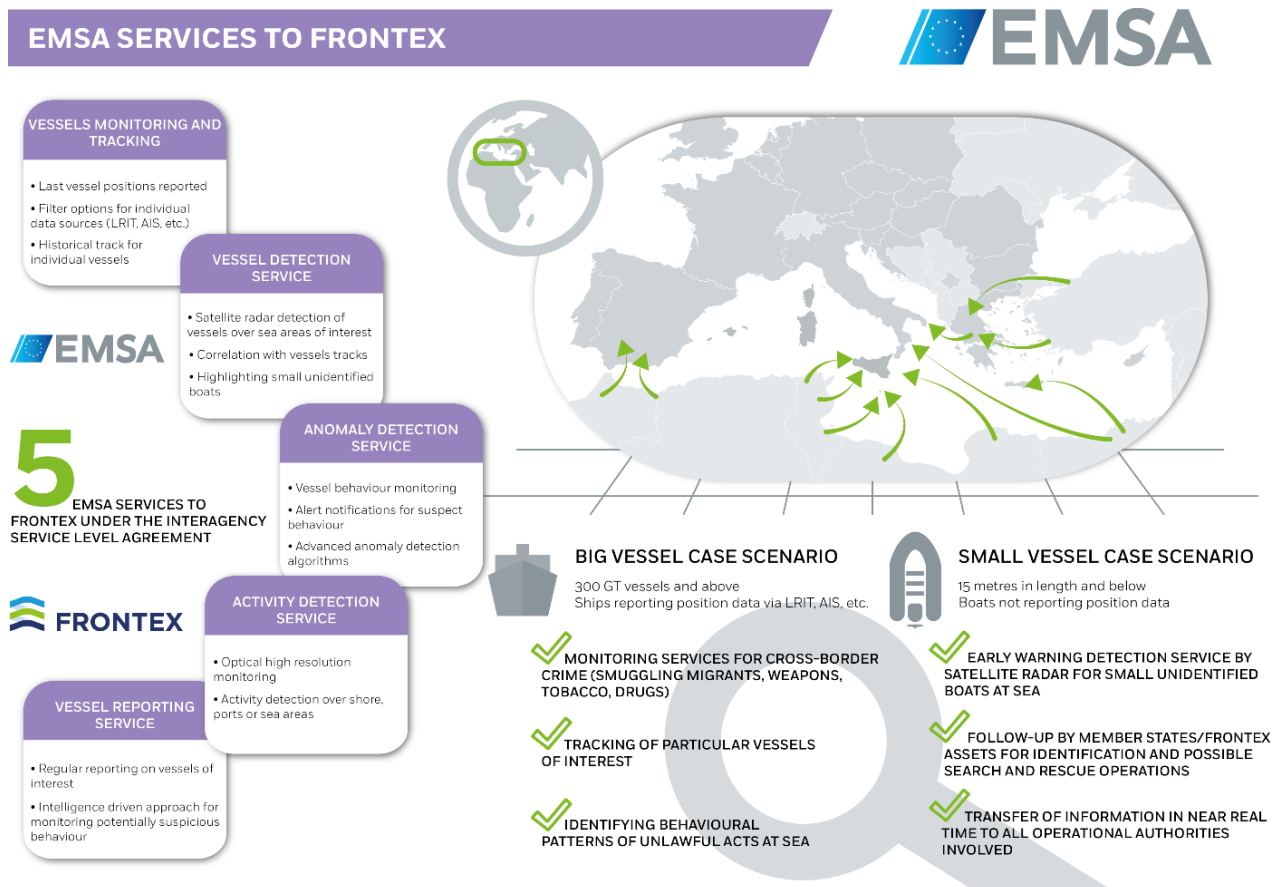
contribution by EFCA through a grant provided by DG MARE, new functionalities of EFCA’s IMS that were specifically identified for users of the IUU IMS service.

The table below provides an overview of the data delivered to EFCA in the period January 2016 - June 2017

Data/Service	Terrestrial AIS	LRIT	Satellite AIS	Earth Observation Products ADS	Earth Observation Products VDS	Anomaly Alerts
Deliverables	No. of Messages	No. of Messages	No. of Messages	No. of Optical VHR images	No. of SAR images	No. of Alerts
Jan -Dec 2016	1 563 257 040	1 792 800	117 238 418	1	276	122
Jan - June 2017	1 176 843 849	3 927 344	65 028 409	0	296	0
Jan 2016 - June 2017	2 740 100 889	5 720 144	182 266 827	1	572	122

3.2.2. EMSA services to Frontex

Based on a Service Level Agreement, EMSA currently provides the following 5 services to Frontex, which were specifically tailored to meet Frontex’s needs for supporting the Member States border control activities:



The table below provides an overview of the data delivered to Frontex in the period January 2016 - June 2017

Data/Service	Terrestrial AIS	LRIT	Satellite AIS	Earth Observation Products ADS	Earth Observation Products VDS	Anomaly Alerts
Deliverables	No. of Messages	No. of Messages	No. of Messages	No. of Optical VHR images	No. of SAR images	No. of Alerts
Jan -Dec 2016	1 563 257 040	5 942 787	586 192 093	395	636	205 740
Jan - June 2017	997 914 763	1 348 870	325 142 046	388	442	115 153
Jan 2016 - June 2017	2 561 171 803	7 291 657	911 334 139	783	1 078	320 893

The table below provides an overview of the scope and status of the services to Frontex in the period January 2016 - June 2017

SLA Services	1 - Activity Detection Service		2 - Anomaly Detection Service		3 - Vessel Detection Service		4 - Vessel Monitoring & Tracking		5 - Vessel Reporting Service		
Monthly Performance Indicators	Number of delivered optical satellite images	Percentage delivered versus ordered	Number of sea areas activated	Number of anomaly types activated (configurations)	Number of alerts delivered	Number of delivered radar satellite images	Percentage delivered versus ordered	-	Percentage delivered weekly reports	Average of vessels in weekly report	Number of vessels of interest activated
Monthly average (2016)	33	95,57%	3	8	18704	53	92,34 %	Operational 24/7	100	132	1
Monthly average (2017)	65	97 %	6	21	19192	74	98 %	Operational 24/7	100	118	3

Below is a summary of the actions carried out under Task 1 of the Pilot Project, the involvement of the Agencies and the status:

- Identification of the services which can be better shared between the Agencies – all three Agencies were involved in this activity which was completed
- Testing and validation of these services within and outside Joint Maritime Operations – Frontex and EFCA were involved in this activity which will continue in the future
- Further development of these and/or other services in consultation with the Agencies and hosting/interested MSs, where applicable– all three Agencies were involved in this activity which was completed

3.3. Outcomes

The Pilot Project served as a platform where the three Agencies worked very closely to deepen their collaboration on sharing of information in the context of the European Coast Guard initiative. It

provided additional and valuable operational experience that helped EMSA to improve further the services it renders to EFCA and Frontex through the existing Service Level Agreements.

The up-graded services were further tested in multipurpose operations under Task 4 and had a positive impact on the operational framework of Frontex and EFCA and of Member States within the context of the Pilot Project.

The data sharing between the Agencies proved to be exceptionally important for Frontex's activities and EFCA's Integrated Maritime Service (IMS). Frontex and EFCA benefited, from both operational and cost-efficiency perspectives, from utilising the Earth Observation capacity and expertise established at EMSA under the Copernicus Maritime Surveillance component.

Also, the sharing of data benefited all Agencies with EFCA transmitting Vessel Monitoring System (VMS) data (position of fishing vessels) that were provided to Frontex in support of the EUROSUR Fusion Services and to EMSA in support of the Enhanced SAR SURPIC (Search and Rescue Surface Picture) service.

The Agencies felt the need of sharing information in a coherent manner. This resulted in the development of a draft framework for a Data Sharing Policy for the main data that is currently being collected, visualised, and used by the respective Agencies and their Member States. The Agencies will continue to collaborate for its development and finalisation following the completion of the project.

In summary, the Pilot Project, through:

- the 5 EMSA services provided to Frontex in support of the EUROSUR Fusion Services;
- the EMSA Integrated Maritime Services provided to EFCA;
- the integration of VMS data by EFCA into the services;
- the integration of Earth Observation component to the services through Copernicus Maritime Surveillance (CMS);
- the testing and validation of the services in real operational scenarios during the Multi-Purpose Operations carried out under Task 4,

clearly demonstrated:

- the benefits of sharing information between the three Agencies;
- the added value of such interagency cooperation.

3.3.1. *Specific outcomes related to EMSA services to Frontex*

The two Agencies developed a number of supporting documents to facilitate the implementation of the Service Level Agreement (SLA) between EMSA and Frontex for the provision of surveillance tools and services in support of Frontex activities, which were up-dated as a result of the activities under Task 1.

The data provided by EMSA to Frontex has been optimised and was stable during the project life span. In 2017, VMS from EFCA was added as an additional data type. The five services under the EMSA-Frontex Service Level Agreement (SLA) have been running on a routine basis.

Under the EMSA- Frontex SLA, there is close collaboration with the Member State National Coordination Centres regarding the follow-up of the results of the Vessel Detection Service, aiming at detecting migrants at sea based upon radar satellite imagery. During January-May 2017, the Vessel Detection Service (VDS) delivered images on 111 days. The National Coordination Centres (NCC)

organised the follow-up activities by surveillance assets in 30% of the cases (33 times). Additionally, National Coordination Centres forwarded VDS information to EUNAVFOR-MED: Operation Sophia for follow-up actions 45 times between January-May 2017.

In summary, the level of cooperation between EMSA and Frontex is well established and services have already an operational maturity that can be further rolled out to the Member States involved in border surveillance. Daily communication exists between the Frontex Situation Centre team and the dedicated staff working for Frontex at EMSA (under the Service Level Agreement) to ensure a continuous and rapid follow-up of data sharing and service needs. The daily interagency collaboration is defined through Common Operational Procedures (COP).

3.3.2. *Specific outcomes related to EMSA services to EFCA*

The EFCA IMS service is now available to more than 350 users in the Member States and at EFCA. It has been tested and used in several Joint Fisheries Campaigns and proved to be very useful. The number of its users is expected to grow in parallel with the development of functionalities related to the fight against Illegal, Unregulated and Unreported fishing. EFCA provided extensive user feedback with regards to possible enhancements and future functionality user needs in view of using the application in an operational environment.

EFCA IMS is further supplemented by Vessel Detection System (VDS) reports in the framework of dedicated Copernicus services, which provides an additional data layer for the purposes of fisheries control.

4. TASK 2 SURVEILLANCE SERVICES

4.1. Objective

Provision of surveillance and communication services based on state-of-the-art technologies is one of the areas for enhanced cooperation foreseen by the Border Package. In line with this the Pilot Project included two activities in that area:

1. EMSA led a demonstration of Remotely Piloted Aircraft Systems (RPAS)
2. Frontex tested its Aerial Surveillance based on fixed wing aircrafts (FWA)

The main objective of the RPAS demonstration was to test the capabilities of RPAS and to establish whether they could effectively support multipurpose missions relevant to the mandates of the three Agencies e.g. marine pollution monitoring and detection, search and rescue, border control, fisheries control, etc.

More specifically the objectives of the demonstration were to:

- test the jointly developed concept of operations for multipurpose missions addressing the tasks of the three Agencies but focussing on cooperation in the Central Mediterranean Sea;
- prepare flight scenarios and real time testing with different state-of-the-art platforms from different contractors, measuring their effectiveness for typical maritime surveillance operations;

- demonstrate the technical capabilities of the RPAS, together with the related sensor and communication equipment to address these kinds of multipurpose missions;
- demonstrate the real-time decision making process in maritime surveillance missions based on dissemination and exploitation of data collected and provided by RPAS;
- test the process of obtaining the permits to fly;
- organise debriefing regarding the demonstration results and findings and related presentations.

4.2. Activities under Task 2

4.2.1. RPAS Demonstration

As an initial step, in December 2016, EMSA launched a public open tender in order to select the companies for the RPAS demonstration. The requirements were jointly defined by EMSA, Frontex and EFCA.

Two companies were chosen to perform the RPAS demonstration:

- Tekever/CLS - a joint Portuguese and French consortium (termed REACT) and
- Babcock - a Spanish company working with the American company Insitu (a Boeing company).

The REACT aircraft was the AR5 Evolution (6.4m wingspan), equipped with a high resolution electro optical (EO) camera, a dual thermal infrared (IR) camera for night flying, and an AIS receiver. The Insitu aircraft was smaller (2.5 m wingspan), furnished with VIDAR software to be able to have 180-degree electro optical (EO) scanning of targets. It was equipped with high resolution electro optical camera with a very high optical and digital zoom enabling close-up on targets, AIS receiver and a medium wave infrared camera for night flying.



The demonstration took place in the period 8-13 May 2017 at Instituto Nacional de Técnica Aeroespacial Centro de Experimentación de El Arenosillo (INTA-CEDEA) in Mazagón, Huelva, Spain. Beforehand several coordination meetings with the Spanish authorities and INTA as well as meetings and site surveys with the contractors at INTA premises were organised.

Five concepts of operations (CONOPS) for multipurpose missions were tested during the demonstration:

- Maritime patrol and general surveillance;

- Marine pollution (monitoring and response support);
- Vessel identification and tracking;
- Search and rescue;
- Monitoring of illegal fishing, anti-drug trafficking and other illegal activities.

The five CONOPS were covered through a number of scenarios:

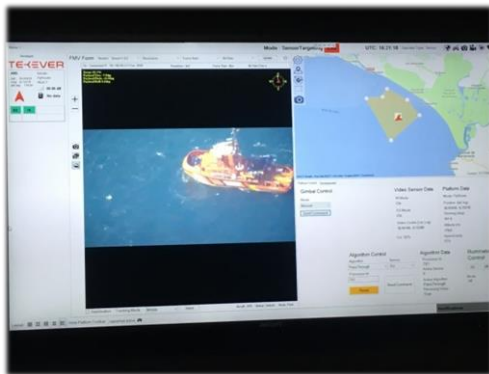
- generic surveillance to identify vessels and the on-board behaviour;
- tracking a slow vessel;
- tracking a fast vessel/rib which was dropping packages in the water;
- identifying fishing vessels and illegal fishing activities;
- identifying illegal activities on board a vessel including the simulation of a transshipment of goods/fish/drugs between two vessels;
- measuring the distance between two buoys for fixed fishing gear;
- locating a vessel in distress using a search pattern to locate it or with an EPIRB;
- locating a vessel in distress at night with flares;
- locating a man over board and a liferaft;
- detection of an oil spill and assisting in an oil spill response operation by orienting vessels.

These scenarios were covered through several flights of 4 or 6 hours in duration and one night flight, resulting in a total of about 15 flight hours per company. The flights took place in temporary segregated airspace. They were coordinated by EMSA in the operations room and data visualised on a user interface with the video and map location. EFCA and Frontex were involved in line with their mandate based on the individual scenario.



The following data was provided:

- Live video stream from the image sensors on the RPA;
- Metadata to build the maritime awareness picture e.g. aircraft position, executed flight path, moving deployment map, sensor footprint, sensor images, identified objects in the sensor images/video streams such as an oil spill or vessel, AIS information and track (position, MMSI, etc.) of the vessels, etc.



An “Open Day” was hosted on 11 May, which was attended by representatives of 10 EU Member States and from other organisations including the European Defence Agency, EU SatCen and MAOC-N. Attendees could observe the take-off and landing as well as the video from the RPA cameras in the conference centre.



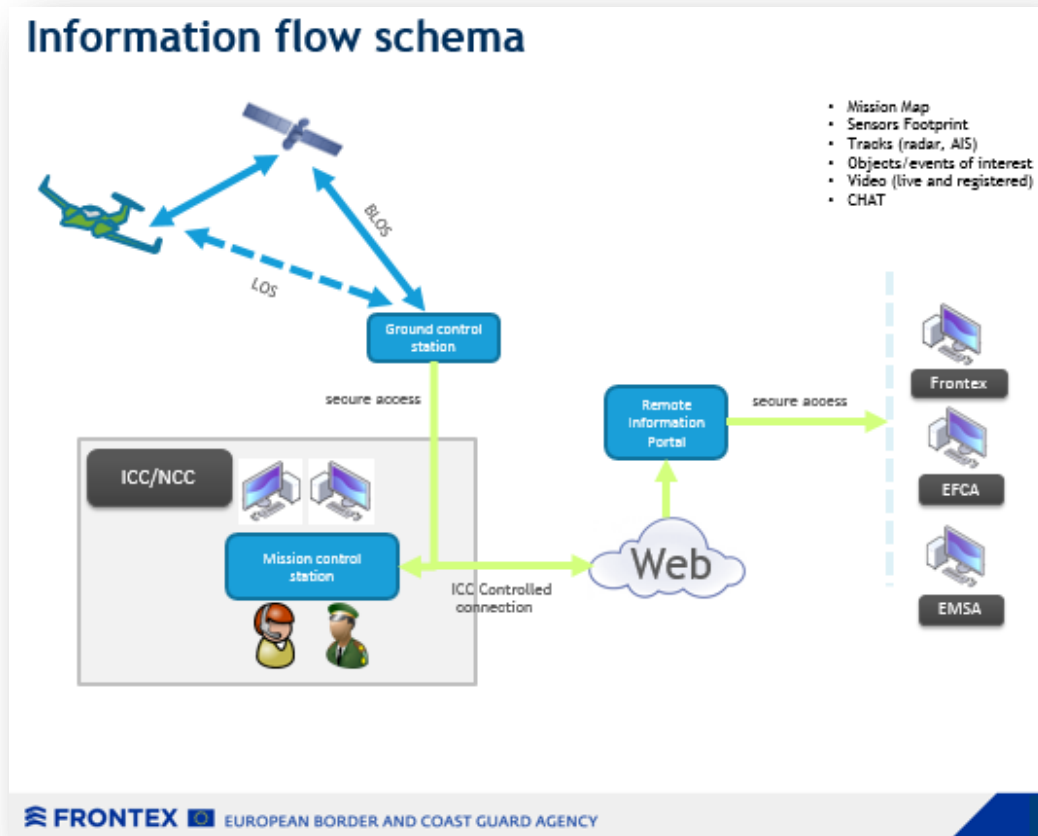
There were also visits to see the aircrafts on the ground and the ground control centres. Finally, a video on the Demonstration and Open Day was produced and shown at the Pilot Project Closing Conference on 2 June 2017. A video from the RPAS demonstration is available at the following link: <http://www.emsa.europa.eu/news-a-press-centre/emsa-video-gallery/item/3030-potential-of-remotely-piloted-aircraft-systems-rpas-for-multipurpose-maritime-surveillance.html>

4.2.2. *Aerial Surveillance based on fixed wing aircrafts*

Frontex has a Framework Contract for Aerial Surveillance (FASS) using fixed wing aircrafts provided by private companies in place since 2015. So far 15 surveillance services have been implemented under which more than 2500 hours of persistent surveillance were flown.

During 2016, under the umbrella of the Pilot Project “Creation of a European Coast Guard function”, Task 2 Surveillance Services, Frontex launched and finalized 3 Specific contracts for multipurpose flights, using the above mentioned Framework Contract for Aerial Surveillance, in Frontex EPN Joint

Operation (JO) Indalo in August, EPN JO Triton in August/September 2016 and in Frontex EPN JO Poseidon November-December 2016.



For all multipurpose missions Frontex put in place a web portal, which granted access to the information collected by the aircraft (figure above), to the Host Member State Coordination Centre, EFCA, EMSA and Frontex HQs.

During 2017 Frontex launched and finalised one Specific contract under the Framework Contract for Aerial Surveillance for multipurpose flights, in Frontex EPN Poseidon, but in addition to the previous mentioned set-up, an EFCA Liaison Officer was on board of the plane during some of the flights.

Also, starting from March 2017 Frontex continued to support the European Fisheries Control Agency (EFCA) in the pre-frontier area, in the Central Mediterranean Sea, through Multipurpose Aerial Surveillance (MAS) services, under the Frontex Framework Contract for Aerial Surveillance. The operations were coordinated by the European Monitoring Team (EMT) established in Frontex, mirroring the structure of a EUROSUR National Coordination Centre by aggregating multiple authorities and coordinating their decision-making capability. The Monitoring Team consisted of experts with different backgrounds (i.e. law enforcement, search and rescue, fisheries control) and is responsible for the collection, assessment, and dissemination of information to relevant authorities for their follow-up (e.g. in case of Search and Rescue to the competent MRCC authority).

MAS collected a variety of data, such as Full Motion Video (FMV), AIS and Radar by using sensors installed on aerial assets and which stream in real-time. The Full Motion Video was streamed in real-time to coast guard functions situational centres located in different places (Warsaw, Vigo, and Rome) fostering a new generation of surveillance operations, where a real-time coordinated response is present. In addition, it allowed to enhance the surveillance capabilities by the integration and fusion of various data complementing different EUROSUR Fusion Services (i.e. Vessel Detection, Anomaly Detection, etc) and produces inputs to several organisations' proprietary systems (JORA, Fishnet, VMS, IMS, ERS, Member States databases, etc.).

4.3. Outcomes

4.3.1. RPAS Demonstration

Under Task 2, EMSA successfully carried out a week long demonstration and tested RPAS in multipurpose missions based on operational concepts (CONOPS) developed by the three Agencies.

The close collaboration between EMSA, EFCA and Frontex during the development of the CONOPS and scenarios resulted in relevant and rounded CONOPS and operationally realistic scenarios which provided a solid model to prove the capabilities, characteristics and shortfalls of each of the RPAS and sensor combinations. Furthermore, EMSA worked alongside EFCA and Frontex during the RPAS flight operations which ensured appropriate guidance during operations to get the maximum out of the RPAS systems/sensors.

All parties involved in the demonstration gained operational experience of the technical capabilities and limitations of the RPAS and their sensors to assist in various multipurpose Coast Guard operations /missions. EMSA, Frontex, and EFCA were able to obtain real time maritime situational awareness and archive data for further analysis.

The Demonstration proved that RPAS data (video and still images) greatly increase the maritime picture for a wide variety of maritime surveillance operations. It revealed a number of advantages of the RPAS:

- They can effectively complement maritime surveillance by offsetting the limited range of patrol vessels and the limited availability of satellite based surveillance systems;
- RPAS require limited infrastructure to operate, can be rapidly launched, have high availability (24/7), long endurance, wide range, can operate in a range of conditions, can be used in day and night operations, can be directed to and stay at a specific location, can monitor activity, can track a specific vessel, can detect people, vessels, pollution and objects at sea;
- They do not have a pilot on board which is particularly relevant in dangerous environments.

Technical findings and lessons learnt:

- EO sensors give good resolution and images of targets. They were successful in detecting and zooming into vessels to identify them;
- data collected during RPAS missions can be used as forensic evidence required to prove illegal activities and could be used for prosecution;
- some RPAS systems can fly undetected (acoustically or visually) based on the scenarios flown during the demo;
- locking on targets to be able to track them needs to be improved;

- communication channels and procedures between the end user and the Mission commander need to be improved;
- operational experience and good guidance during operations is important to get the maximum benefit from the RPAS and the sensors.

The improved understanding of the operational behaviour, benefits and limitations of RPAS gained during the demonstration is particularly important and relevant for new RPAS based operational services.

Finally, the response from the participants during the Open Day was very positive and indicated an increased awareness of Member States on how RPAS can be used for maritime surveillance and coast guard function operations.

4.3.1. *Aerial Surveillance based on fixed wing aircrafts*

Some results of the FWA deployment under the MAS, during the implementation of the specific contract under the Pilot Project, in the Central Mediterranean can be highlighted:

- In June, during a Maritime Surveillance Flight two vessels with atypical behaviour were spotted and monitored. The Spanish authorities were informed about the arrival of one of these Vessels of Interest which led to Spanish Custom Services seizing 6 containers of cigarettes, worth 12 million €.
- In September, 15 boats were detected with over 600 migrants on board.
- In October over 20 boats with approx. 600 people on board were detected and located. The detections were made in various locations in the Central Mediterranean.
- From June to September, MAS supported EFCA's fisheries control campaign in the Central Med with 32 sorties for a total of 128 flight hours.

The Host Member States (Spain, Italy and Greece) appreciated the surveillance services delivered and moreover Frontex and EFCA agreed that the best way forward for future cooperation between Agencies might be a new framework contract for aerial surveillance which Frontex will launch as an inter-institutional tender in accordance with the EU Financial Regulation, in November 2017.

5. TASK 3 CAPACITY BUILDING

5.1. Objective

The general objective of Task 3 coordinated by EFCA was to support national authorities carrying out coast guard functions at national, Union and international level by elaborating guidelines, recommendations and best practice with a view to enhancing the exchange of information and cooperation on coast guard functions.

More specifically the objectives under Task 3 were to:

- develop an outline of Guidelines on inter-EU Agencies cooperation, including practical information, contact details, operational setup, best practices and expertise available in the three Agencies

- to assess the feasibility of voluntary staff exchange and
- to assess the added-value of attending training courses provided by other parties and of organising joint training courses for various stakeholders.

5.2. Activities under Task 3

As a first step, the relevant background material for the drafting of the outline of Guidelines available in the three Agencies was collected and systematised in:

- Table indicating who/which organizational unit in the three Agencies (EFCA, EMSA and Frontex) is supporting/involved in which coast guard functions;
- List and texts of the current Service Level Agreements (SLAs) on collaboration between the three Agencies and
- List of already available or ongoing coastguard function handbooks or guidelines relevant to the three Agencies Guidelines on inter-EU collaboration.

In April 2016, EFCA organised with EMSA and Frontex an inter-Agency workshop on capacity building related activities. Discussions were organised through four specific Working Groups (WG):

- WG1. Operational collaboration (joint operations) including inspections;
- WG2. Training activities;
- WG3. Research and development;
- WG4. Situational awareness.

Discussions with the European Coast Guard Functions Forum (ECGFF) representatives also took place. In addition, common areas of interest for training for the three Agencies as well as voluntary staff exchange were explored.

The outline of Guidelines was drafted under the supervision of the three Agencies by internal and external experts with relevant experience in various coast guard functions.

Three “development workshop” meetings were held, two at EMSA premises (Lisbon) and one at the Swedish Coast Guard Headquarter (Stockholm). The background material collected by the three Agencies was made available to the internal and external experts involved in the drafting the outline.

During the first workshop (October 2016) EFCA and EMSA experts had a first opportunity to exchange on the project and work on draft terms of references.

During the second workshop (November 2016) EFCA, EMSA and Frontex experts agreed on the final version of the terms of reference and drafted a first version of the outline.










During the third workshop (March 2017) EFCA, EMSA and Frontex experts reviewed the second draft version of the outline. This version had a more detailed structure in each area of existing and possible inter-agency cooperation and following some up-dates of the Annexes was approved by EFCA, EMSA and Frontex as final in April 2017.

5.3. Outcomes

The major outcome of the work carried out under Task 3 is the outline of Guidelines on inter-EU Agencies cooperation. It foresees that once developed the Guidelines will provide comprehensive

information on the legal basis for the interagency cooperation, its scope and framework, the areas and modalities for the cooperation with regard to operational cooperation, training, situational awareness and research and development. It further foresees that the systematized background information collected during the Pilot Project is annexed to the Guidelines to serve as reference material.

Outline Guidelines

   OUTLINE OF GUIDELINES FOR INTER-EU AGENCIES COOPERATION ON COAST GUARD MATTERS 1. INTRODUCTION 1.1 Subject matter 1.2 Scope 1.3 Definitions 1.4 Cooperation framework 2. LEGAL REFERENCES 3. AREAS AND MODALITIES FOR COOPERATION 3.1. Operational Cooperation <ul style="list-style-type: none"> • Overview and description of areas for possible operational cooperation between EU Agencies • Coordination structures • Operational communications • Multipurpose operations • Exchange of operational information 3.2 Training <ul style="list-style-type: none"> • Overview and description of existing courses of mutual interest organised by the three Agencies • Review and updating of the list of existing courses organised by the 3 Agencies • Implementation of inter-Agency mutual attendance to courses • Evaluation and follow-up 3.3 Situational Awareness (Overview and description of existing tools and services for situational awareness) <th data-bbox="831 586 1458 1433">    3.4 Research and Development (Overview and description of existing areas of cooperation in research and development between EU Agencies, evaluation and follow-up) 4. ANNEXES 4.1 List of existing Service Level Agreement (SLA), by 16 March 2017 4.2 List of existing Guidelines and Handbooks, by 16 March 2017 4.3. Tables of identified areas for cooperation with comments <ul style="list-style-type: none"> • Operational collaboration (joint operations) including inspections – list of possible areas for cooperation • Training activities – possible agencies' courses of mutual interest • Situational awareness – list of ongoing and possible new cooperation • Research and development areas – subject for inclusion in the guidelines 4.4. Summary table of the three EU Agencies units involved in Coast Guard Functions </th>	   3.4 Research and Development (Overview and description of existing areas of cooperation in research and development between EU Agencies, evaluation and follow-up) 4. ANNEXES 4.1 List of existing Service Level Agreement (SLA), by 16 March 2017 4.2 List of existing Guidelines and Handbooks, by 16 March 2017 4.3. Tables of identified areas for cooperation with comments <ul style="list-style-type: none"> • Operational collaboration (joint operations) including inspections – list of possible areas for cooperation • Training activities – possible agencies' courses of mutual interest • Situational awareness – list of ongoing and possible new cooperation • Research and development areas – subject for inclusion in the guidelines 4.4. Summary table of the three EU Agencies units involved in Coast Guard Functions
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Another outcome relates to training. In addition to identifying courses of mutual interest for the three Agencies, EFCA staff and EFCA Member States end-users participated in two training events organised at EMSA on using the Copernicus Maritime Surveillance Service and Integrated Maritime Services and on the development of a worldwide EFCA MARSURV Service. EFCA included EMSA and Frontex staff as possible beneficiaries of a selection of its courses and further made available its e-learning platform to staff of the other Agencies.

6. TASK 4 CAPACITY SHARING (MULTIPURPOSE OPERATIONS)

6.1. Objective

Another area in which the Border Package foresees enhanced interagency cooperation is sharing of capacity, assets and other capabilities across sectors and borders in support of coast guard functions. To that end, Task 4 of the Pilot Project, coordinated by Frontex and EFCA, provided the test bed for the planning and implementation of multipurpose operations (MPOs).

The objectives of this task were:

- to test as many platforms, procedures and information protocols as possible in the framework of the project;
- to gain operational experience in order to refine and enhance future activities;
- to validate multipurpose operations concepts namely chain of command, tasking and reporting and cooperation on the scene of action (SOA).

6.2. Activities under Task 4

6.2.1. Organisational structure

All activities, including exchange of personnel and deployment within multipurpose operations and exchange of information/data were implemented within existing operational frameworks, namely EPN JOs for Frontex and JDPs for EFCA.

The activities were steered by an Implementation Group composing of MS communities from Frontex and EFCA. During the implementation of the project three meetings were hosted by Frontex and EFCA involving representatives from both communities:

- 30 March 2016 for planning and priority setting;
- 25 October 2016 for evaluation purposes and
- 27 April 2017 for updating stakeholders on ongoing interagency cooperation activities and general planning on overarching activities in 2017. EMSA and DG MARE were invited to join all meetings.

In addition, in order to brainstorm on interagency cooperation on 31 May 2016 Frontex organised a tailored panel discussion as part of the EPN General Meeting hosted by Sweden and Finland. The panel discussion was structured in line with the mandates of three agencies (Frontex, EMSA and EFCA). DG MARE, DG HOME, EMSA, EFCA and Frontex took part in the panel and an opportunity was also provided to MS representatives to interact and exchange views. The event provided valuable guidance and input for the MPOs.

Additional panel discussions were arranged by Frontex on 8 November 2016 during the 1st European Coast Guard Cooperation Network meeting organized by Frontex. DG MARE, DG MOVE, EFCA, Frontex took part in the panels which were structured along the four tasks of the Pilot Project. The outcomes of the discussions were also considered during the implementation of the activities under Task 4.

The regular meetings with MSs within the frameworks of EPN JOs for Frontex and JDPs for EFCA were used to report on project activities.

At operational level, a Joint Maritime Interagency Team (JMIT) was set up to coordinate the multipurpose operations composed of liaison officers (LO) by Frontex, EFCA deployed physically or virtually, and participating national Coast Guard authorities at the operational Centres.

In order to maximize the effectiveness and security of the activities implemented it was fundamental to define the precise terms and conditions of the operational cooperation and MPOs. In this regard, Standard Operating Procedures (SOPs) were developed by both Agencies and relevant MSs, containing operational procedures and data exchange protocols and channels, both existing within each agency and such developed and agreed specifically for MPOs implemented under the Pilot Project and in the future. In the course of the multipurpose operations SOPs have been further tailored and discussed during the stakeholder group meeting on 27 April 2017 in Catania and disseminated to MSs for their adoption and implementation. The SOPs also contained a sighting report template for relaying information by Frontex deployed airborne and seaborne assets with fisheries utility directly from the assets to EFCA and Frontex coordination centres.

6.2.2. *Planning and logistics*

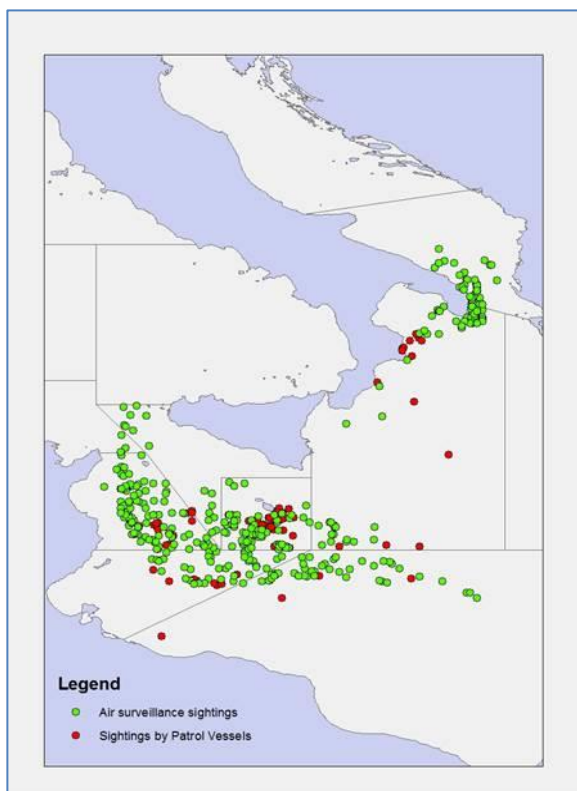
To facilitate planning and deployment, weekly Situation reports (SITREP) were exchanged between EFCA and Frontex coordination centres containing the planning of all assets for the following week(s). Based on feasibility, location, personnel available and respective areas/targets of interest, staff were subsequently deployed and relevant security and administrative procedures implemented. Support provided to EFCA by the Frontex International Coordination Centre (ICC) and Focal contact point (FOC) is well appreciated in this respect.

All deployment procedures followed the relevant SOP and were elaborated in regular technical meetings between Frontex and EFCA, also through established communication protocols and channels. Overall, the level of communications throughout the project was excellent with all Agencies maintaining open channels throughout all activities. Backstopping and support were afforded to all operations in the framework of existing operations and respective agency normal operational procedures.

6.2.3. *Multipurpose Operations*

All operations implemented under Frontex JOs or EFCA JDP for which information was exchanged between the Agencies, regardless if human resources were deployed at sea/air/coordination centres were considered MPOs in the framework of the Pilot Project. All were planned and implemented using existing consultation procedures and with MS authorities using existing operational platforms and structures including in the Eastern Mediterranean (JO Poseidon); Central Mediterranean (JO Triton); Western Mediterranean (JO Indalo) (see map below) and finally a common exploratory interagency multipurpose activity was launched in the Black Sea.

Frontex and EFCA considered it paramount to establish an effective and workable cooperation in order to avoid potential overlaps and conflicts as well as to successfully contribute to and enhance each other's activities. The collection of information during MPOs and the procedures for its exchanging were fundamental in this regard.



In addition to the physical deployment and exchange of personnel within each Agency's operation, cooperation largely focused on the exchange of information, namely information on sightings with a fisheries utility collected in the operational area of EPN JOs, conversely sighting information with a cross-border crime utility and/or marine pollution utility collected in JDP operations. The following direct arrangements were undertaken as support to multi-purpose operations:

- Deployment of EFCA officials on Frontex assets (vessels and aircraft);
- Exchange of operational and other related data (e.g. sightings information, intelligence, photos, etc.);
- Deployment of Frontex LO to EFCA's operational centre during the Bluefin tuna (BFT) fishing campaign;
- Deployment of EFCA's inspector to Frontex operational structures and centres.

6.2.4. Missions on-board Frontex assets

In accordance with the deployment procedures and framework EFCA officials were deployed both on Frontex aerial and sea assets, including:

- 5 sea missions (from January 2016 to November 2016 in Triton, Indalo and Poseidon areas);
- 8 air missions (from January 2016 to November 2016 in Triton, Indalo and Poseidon areas).

Sea missions included fisheries control activities and apprehension of potential illegal fishing operations as well as responding to SAR requests and other tasks as requested by the relevant ICC.

6.2.5. Operational Briefings



Interagency operational briefings at ICC Rome (JO EPN Triton)

To reinforce and support MPOs EFCA officials have undertaken 15 Operational briefings to ICC (Frontex) staff (TRITON 7; INDALO 3, POSEIDON 5).

Such briefings were reported to be well received and valuable by the officials concerned. The content of the briefings included the following aspects:

- General presentation of the fisheries situation in Mediterranean;

- Organisation of Joint Deployment Plan (JDP);
- Overview of legal framework for fisheries control activities;
- Presentation completing/transmitting sightings/information to EFCA and related procedures (SOP).

6.2.6. *Information exchange and reporting*

All information was exchanged in accordance with the agreed procedures laid down in the respective SOPs. In addition to the use of conventional reporting procedures, electronic procedures were used where possible in order to expedite the data exchange and hence potential utility of the information.

In addition, other types of incidents (possible sea pollution) were detected and reported by Frontex assets within the framework of the Pilot Project. In 2016 nine incidents of possible sea pollution were detected by Frontex deployed assets in EPN Triton. Frontex's template for reporting of possible pollution was used for informing the competent Italian and/or Maltese authorities and inserted in JORA.

All information was processed, treated and subjected to follow up procedures. In 2016 during the Pilot Project two cases of potential IUU activities were identified inside Italian territorial waters as well as other cases NW of Lampedusa. Analysis and follow-up are ongoing in the context of the relevant international and national frameworks although evidence strongly suggests that the vessels have been operating in contravention of relevant fisheries rules. Other cases of common interest such as fishing vessel used for migrant or drug smuggling were also identified.

In the period 1 January 2016 - 26 May 2017 a total of 870 sightings sent by Frontex coordinated means were received by EFCA. The main bulk were received up to the end of October 2016 (510), of which 382 were submitted on the same day as they were recorded. The quality of the data reported in the sighting forms varies from excellent to incomplete.

6.2.7. *Operational multipurpose activity in the Black Sea*

While operational multipurpose activities were mainly focused in the Mediterranean Sea, EFCA and Frontex also used the opportunity of the Pilot Project to explore cooperation with national authorities carrying out coast guard functions in other sea basins. To that end multipurpose operational activities



Boarding a fishing vessel in the Black Sea

were carried out in the Black Sea in the period 16-18 May 2017. Frontex and EFCA participated *in situ* while EMSA was involved via provision of the Vessel Detection Service (VDS), channelled via Frontex FSC. The participating MS - Bulgaria and Romania involved their national authorities performing border and fisheries control.

The activities included:

- workshops for the crews of Bulgarian and Romanian vessels;
- real 24 hrs border surveillance mission and fisheries control activities in the Black Sea performed according to the activity plan approved on Frontex level.

The MPOs were based on the Frontex Handbook on Boarding in Frontex-coordinated Joint Maritime Operations: Best practices & Guidelines. This activity enhanced interoperability between Frontex, EFCA, EMSA, Bulgarian and Romanian national authorities. During the debriefing, all stakeholders involved gave a very positive feedback with proposal to repeat frequently such type of multipurpose actions at sea.

6.3. Outcomes

Practical experience gained during the project shows that often incidents in EFCA's field of interest (aerial and at sea sightings of fishing vessels) and in Frontex's field of interest (illegal migration incidents) often occur in the same geographical areas. This demonstrates that as a result of common planning and coordination, means dedicated to border surveillance can support other Agencies (EFCA and EMSA) as well as MSs carrying out coast guard functions by reporting information in their respective field of interest. Nevertheless, Frontex deployed assets performing multipurpose missions always treat as a priority requests from dedicated MRCC's (e.g. IMRCC Rome) on assistance in SAR operations. Over 90% of vessels detected in the Central Mediterranean have requested SAR assistance with the cases being subsequently managed by the respective MRCC, thus for the majority of the time Frontex assets needed to suspend border and/or fisheries surveillance activities pending conclusion of the SAR operations.

The main conclusions can be summarized as follows:

- In the framework of Task 4 of the Pilot Project, interagency cooperation has been tested in real operational scenarios and enhanced, in full consultation with MS end-users.
- While priority was given to the Central Mediterranean, operations have been tested and explored in other areas (e.g. Western, Eastern Mediterranean Sea and the Black Sea), cooperation with third countries has also been promoted.
- On the basis of the activities implemented to date, multipurpose operations, from agencies and from MS perspective, clearly provide added value including but not limited to, surveillance systems generated data and related tailored services, information exchange platforms, training, best practices and operational platform(s) for multifunctional operations.
- At a more technical level, a timely and direct reporting of sighting/inspection information Frontex and EFCA is both appreciated and valuable. Photos and precise intelligence collected in the framework of JO/JDP operations directly reported by aerial and sea assets are extremely useful for a useful and timely follow-up.
- Training and operational briefings are well appreciated and received by ICC and other operational staff and are essential for reinforcing and supporting MPOs including the improvement of data exchange and follow-up and ultimately value added of MPOs.
- SOPs have been successfully discussed and agreed between the agencies in full consultation with the MSs and will continue to form the basis for MPOs operational procedures in future cooperation.
- As there are many actors operating, especially in the Central Mediterranean, it was beneficial to de-conflict multipurpose activities (patrolling schedules of seaborne assets) in order to have a more cost effective approach.

- EU Agencies and MSs will significantly benefit from closer cooperation on planning and implementation of agencies activities related to multipurpose operations implemented under coastguard functions. Therefore, Agencies could ensure a constant link with end users at MS level.

7. CLOSING WORKSHOP

7.1. Objective

In addition, EMSA was entrusted to organise a Closing Workshop upon the completion of the Pilot Project where the three Agencies could jointly present the activities carried out in the framework of the project and the corresponding outcomes to a wide group of European coast guard function stakeholders.

7.2. Scope and outcome

The Workshop was held at EMSA's premises in Lisbon on 2 June 2017. It gathered some 110 participants, including representatives of the European Parliament and relevant Commission services, members of the governing bodies of the three Agencies, representatives from the European Coast Guard Functions Forum (ECGFF).

Representatives from the three Agencies presented the outcome of the respective tasks. The presentations were well received and were followed by an open discussion by the participants, moderated by the Executive Directors of the three Agencies. The overall feedback on the outcome of the Pilot Project and the arrangement of the Closing Workshop was positive. Comments addressed for example the future collaboration between all stakeholders involved, including not least the Member States. The presentations were also published on EMSA's website.²

Promotional material related to the Pilot Project "Creation of European Coast Guard Function" was developed and disseminated to the workshop participants, Frontex and EFCA.

During the final discussions, led by the Commission and the European Parliament, it was reiterated that the outcomes of the Pilot Project had proved that enhanced cooperation gives excellent results and added value to the stakeholders. The sharing of information, combined use of surveillance capabilities and multipurpose operations provide pertinent support to the national authorities of the EU Member States implementing coast guard functions.

² <http://www.emsa.europa.eu/workshops-a-events/188-workshops/3032-closing-workshop-of-the-pilot-project-creation-of-a-european-coastguard-function-lisbon-2-june-2017.html>



Executive Directors Pascal Savouret (EFCA), Fabrice Leggeri (Frontex) and Markku Mylly (EMSA) during the Closing Workshop



Pilot Project Closing Workshop, EMSA, Lisbon, 2 June 2017

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