Automated Behaviour Monitoring and Advanced Analytics - Workshop 7

Meeting Minutes

Held via Videoconference on 14 December 2021

Final Version
Date: 22 February 2022

EMSA

List of Abbreviations

AI	Artificial Intelligence
AIS	Automatic Identification System
ABM	Automated Behaviour Monitoring
AOI	Area of Interest
CSD	Central Ship Database
EC	European Community
EFCA	European Fisheries Control Agency
EMAT	EMSA's Maritime Analytics Tool
EMSA	European Maritime Safety Agency
EBCGA	European Boarder and Coast Guard Agency (Frontex)
EU	European Union
IMS	Integrated Maritime Services
LRIT	Long Range Identification and Tracking (vessel position data based on telecommunication satellites)
IUU	Illegal Unreported and Unregulated Fishing
MAOC-N	Maritime Analysis and Operations Centre – Narcotics
ML	Machine Learning
MRS	Mandatory Reporting System
MSS	EMSA's Maritime Support Services
MS	Member States (European Union)
SADV	Statistical anomaly detection
SAT-AIS	Satellite Automatic Identification System (AIS data transmitted by satellite)
SSN-EIS	SafeSeaNet European Index Server
S2S	System-To-System
VDS	Vessel detection system (vessels detected on SAR satellite images)
VHF	Very high frequency (radio signals)
VMS	Vessel Monitoring System (tracking of commercial fishing vessels based on communications satellites)
VOI/ TOI	Vessel (Targets) of Interest
VTMIS	Vessel Traffic Monitoring and Information System

Background

Following the amendment of Annex III of Directive 2002/59/EC, and the revision of the SSN Interface and Functionalities Control Document (IFCD), Integrated Maritime Services (IMS) are provided to EU Member States and EU bodies on an operational basis. IMS are offered to all EU Member State authorities executing coast guard functions in the maritime domain. Several "thematic" IMS services have been set-up over the years to better meet the needs of specific user communities in the areas of fisheries monitoring and control, border control and surveillance, law enforcement, and anti-piracy.

The aim of the Automated Behaviour Monitoring (ABM) algorithms developed within IMS is to support the maritime surveillance operators and to reduce their workload by providing an increased maritime situation awareness and automated alerting. ABMs are based on the computer systems analysing various position reports for the detection of specific or anomalous ships' behaviours.

Although ABMs derived originally from the IMS for Member States, focusing on the maritime safety and VTMIS, they are now used horizontally across various services by EU Member States and EU Bodies executing various functions in the maritime domain (e.g. marine traffic monitoring, environmental protection, fisheries control, border control and surveillance and security). The EU Agencies and EU Bodies continue providing ideas as well as financial and human resources to support further developments of ABMs.

On request of the IMS Member States the ABM Workshop has been organized annually, since 2015. It responds to the growing usage of the ABM tools and provides a 'forum' for exchanging operational experiences, defining future development priorities, and reflecting on the usage of new technologies. Because ABMs are actively used within coast guard cooperation, the EU Agencies and EU Bodies are invited to participate in the WS. Their participation adds value in several ways, especially as regards sharing operational best practices, defining new use case scenarios and requirements for the future evolution of ABMs.

The European Maritime Safety Agency (EMSA) held the 7th Workshop on Automated Behaviour Monitoring (ABM) and Advanced Analytics on 14 December 2021. Due to the 'COVID-19' situation and the related travel restrictions, the workshop took place via videoconference only.

1. Opening and welcome

The 7th Workshop was chaired by Mr Lukša Čičovački, Head of Unit 3.1 Maritime Digital Services. Thirty-nine participants attended from: **Belgium, Croatia, Finland, France, Germany, Iceland, Ireland, the Netherlands, Poland, Portugal, Spain, Sweden,** as well as from the **European Commission (DG-MOVE), European Border and Coast Guard Agency** (**Frontex)**, **Maritime Analysis Operation Centre – Narcotics (MAOC-N), EUROPOL** and **the European Fisheries Control Agency (EFCA).** EMSA's contractor conducting consultancy services and preparing a study on the potential usage of artificial Intelligence (AI) and Machine Learning (ML) in IMS and ABMs, was introduced and participated in the Workshop.

The Chair welcomed all participants and opened the event, outlining the main topics, and referring to the growing number of ABM algorithms, the related alerting and the opportunities brought by the new technologies and the Big Data.

The main objectives of this Workshop were:

1) To share best practices in operational usage of ABMs by various communities, Member States and EU Bodies.
2) To reflect on the recent ABM-related developments, including the recently introduced historical capabilities as well as the new Near Real Time (NRT) ABM algorithms.
3) To continue work on the scenarios for the potential usage of Artificial Intelligence (AI) and Machine Learning (ML) in IMS and ABMs.
4) To discuss the potential future evolution of the EMSA's Maritime Analytics Tool (EMAT) prototype.

The agenda (see **Annex 1**) was approved. The list of participants is presented in **Annex 2** and the meeting action points are summarized in **Annex 3**.

The presentations shown during the Workshop will be made available at: http://emsa.europa.eu/workshops-a-events/188-workshops.html, provided that the participants agreed to share them. Otherwise, they may be requested by the participants from the authors.

2. Executive summary of the Workshop

The ABM and Advanced Analytics Workshop 7 meeting's outcome can be summarized with the following points.

- Several **Member States and EU Bodies** provided feedback on ABMs. ABM operational usage in the context of maritime safety, law-enforcement, traffic monitoring, pollution prevention, fisheries control, border control and cross-border crime, were presented by **NL, FR, IE, DE, EFCA, Frontex**. All these presentations included practical examples, outlined main challenges, and suggested changes in the ABM services. New requirements will be considered in the future ABM developments planned by **EMSA (Action WS7.1).**
- **EMSA** presented the status of ABM operations and the planned future developments. The evolution of the ABM services over the years was described together with the recently provided, new Historical ABM capabilities. ABM users were encouraged to start using the new services.
- **New technologies** were discussed with the participants. The 'Cloud' and 'Big Data' solutions based on High Performance Integrated Maritime Services (HP-IMS) platform were described by **EMSA**.
- Previously identified **Artificial Intelligence (AI) and Machine Learning (ML) business scenarios** were discussed in the context of their VTMIS supporting objectives, looking into practical aspects of their implementation, such as: the data, presentation aspects and the expected outcomes **(Action WS7.2)**.
- **EMAT – EMSA Maritime Analytics Tool** prototype status was presented by **EMSA** in collaboration with **Frontex**. This presentation and demo focused on recently developed new dashboards for 'at sea encounters' and 'sudden change of heading' outside ports. Workshop participants were also consulted on their specific needs for new types of advanced analytics **(Action WS7.3).**
- **ABM related trainings** were discussed with participants. **EMSA** recalled the online trainings conducted during 2021 as well as the learning outcomes expected from the new ABM training courses that EMSA is planning to develop in cooperation between IMS and 'Capacity Building' teams. EMSA provided to Member States a new version of the ABM User's Guide, updated in collaboration with Frontex **(Action WS7.4).**

3. Details of the WS discussions

IMS ABM operations (Agenda items 2-3)

ABM operational usage in the context of law-enforcement, maritime safety, traffic monitoring, pollution prevention, fisheries control, border control and cross-border crime, were presented by **NL, FR, IE, DE, EFCA, Frontex**.

The Netherlands (NL) - Dutch Police shared experience on ABMs and other EMSA's IMS and SafeSeaNet systems in the context of investigations on oil recycling and waste oil used in marine fuel. Following the presentations some questions were received from the audience, as regards this 'law- enforcement' use case and the context of 'privacy' and 'data protection'. These were answered by the **NL**. Additionally **EMSA** clarified that the processing of personal data in the Community institutions and bodies like agencies is regulated by Regulation (EU) 2018/1725 of the European Parliament and of the Council of 23 October 2018[1].

France (FR) gave a presentation on the usage of ABMs for maritime safety. **FR** representative suggested that it was needed to ensure more confidence as regards the ABM, as they were providing a key information for time critical applications, especially when used by the MRCCs in various areas in the EU and in French overseas territories. Referring to a recent incident, when ABM alerting had been affected, a proposal was made for the monitoring of ABMs **(Action WS7.5). FR** also provided feedback on the operational usage of ABMs, and

---

[1] On the protection of natural persons with regard to the processing of personal data by the Union institutions, bodies, offices and agencies and on the free movement of such data.

underlined importance of solving the issue of the delayed 'Start and Stop' operations in the SEG ABM admin console. It was followed by discussion on the usage of ABMs between **NL, FR** for a use case related to the detection of vessels leaving anchorage. In this context **EMSA** also suggested speed anomaly for drifting and anchoring **(Action WS7.6)**.

Ireland (IE) shared their experience in using ABMs for a Traffic Separation Scheme (TSS) monitoring where vessels were unlawfully utilizing the inshore traffic zone (ITZ). In this case Automatic Behaviour Monitoring was used as a dangerous behaviour detector. It was based on the combination of Near Real Time (NRT) and Historical (H) ABM algorithms, where the first capability allowed to quickly identify a vessel not following TSS and the latter was used for the identification of other similar cases in the past (based on 24 months' analysis with an algorithm to identify general cargo type vessels over 20 metres, above a certain speed). **IE** described practical usage of ABMs during 2021, where specific algorithms were used for guarding sensitive zones and for detecting undesignated anchoring. **IE** intended to commence operationally validating various ABM algorithms to detect cases of the fishing vessels with power outages. **IE** indicated the importance of the 'underreporting' algorithm for such cases. It was also suggested to analyse the usage of AI for: advanced analysis on ABM alerts, e.g. in terms of frequency per type of the detected behaviour; as well as for an early warning **(Action WS7.2)**.

Germany (DE) described the usage of ABM algorithms by the Federal Police in the Maritime Security and Safety Centre. The use referred to the MARPOL-related scenario i.e., detection of the tank-washing operations. **DE** also shared ABM operational experience for the general surveillance or security evaluation. The most important aspect of the usage of ABMs in combination with other VTMIS data (AIS, SSN enrichments) was the provision of the early warning and necessary data for investigations. This allowed authorities to react in time, use aerial surveillance assets and gather necessary evidence while the situation was still on-going. The related investigations based on ABMs and IMS resulted in fines imposed by the responsible authorities and had deterrent effect **(Action WS7.6)**.

EBCGA (Frontex) provided the audience with the description of their experience in the context of surveillance operations. This very active ABM user was extensively utilizing the related services for the 'anomaly' detection services provided to the border control communities, as part of EUROSUR Fusion Services supported by the EMSA-Frontex SLA. **Frontex** was using the EMSA developed SEG-based ABM admin console for configuring relevant algorithms and s2s webservices for ABM alerts. The services were primarily used by the Vessel Tracking team to identify cases of cross-border crime, for instance linked to the smuggling of illegal substances or irregular migration. **Frontex** presented the existing s2s implementation of the ABMs and shared information on the graphical aspect of their own services, where symbols were decoded as per type of ABM algorithm. Additionally, the Frontex SLA team described their s2s development plans, to allow their end-users to configure ABMs via webservices.

Frontex has been consistently advocating for the combination of the anomalies and underlined their continuous interest in such developments. **EMSA** confirmed limitations of the current technologies. At the time it was only possible to combine two pre-defined algorithm types, with scenarios in different areas of interests (e.g. for the Area-to-Area passage). The related developments of additional, combined ABMs were planned to start during 2022. **EMSA** would also continue analysing how to better address requirements for the unrestricted combinations of multiple algorithms **(Action WS7.7)**.

As regards the technical aspects of ABM operations, **Frontex** has faced some issues with the 'at start policy'. **EMSA** is working on the identified bug resolution, that might be resolved following subsequent updates of the ABM technical platform. **Frontex** made some suggestions for the improvement of the STAR ABM technical module. As regards the release notes, it was suggested to clearly identify and describe bugs. A horizontal problem was also highlighted, as regards a long resolution time for some identified bugs. From the end-user's perspective it was taking considerable time to solve issues, while some operational constraints were linked to 'small' bugs **(Action WS7.8)**.

EFCA described their ABM Usage in the operational framework and for JDP (Joint Deployment Plans). EFCA was satisfied with ABMs and gave positive feedback on how they organized their operation. At EFCA, ABMs were managed centrally for Member States through an EFCA ABM Admin account. Over 280 ABMs were configured in support of operational coordination and for detection of potential non-compliance. At the end of 2021, over 116 of these ABMs were active ('running'). EFCA provided comments on the configuration of the ABMs. In terms of the priorities a new Near Real Time (NRT) ABM was requested to detect the speed anomaly parameter within a defined range 'from' – 'to' **(Action WS7.1)**.

The following additional changes to the configurations were also important for EFCA: allowing to create ABMs with repetitive timeslots or multiple start/end dates, including selection of certain time ranges (by days or months) when the ABM becomes either active or deactivated. It was also suggested to increase the flexibility of the distribution

lists with selection of alert outputs (email and/or display marker) per individual user from the distribution list. EFCA would also expect a new possibility to set the frequency of alert reports. EFCA suggested changes on the display part of the ABMs e.g. the active VOI list and the location of the ABM alert that should overlay the actual position report(s) to avoid misunderstanding **(Action WS7.1).**

Following the operational feedback session, **EMSA** summarized the **status of ABMs** and provided metrics on the usage of services and its evolution over years (see Figure 1).
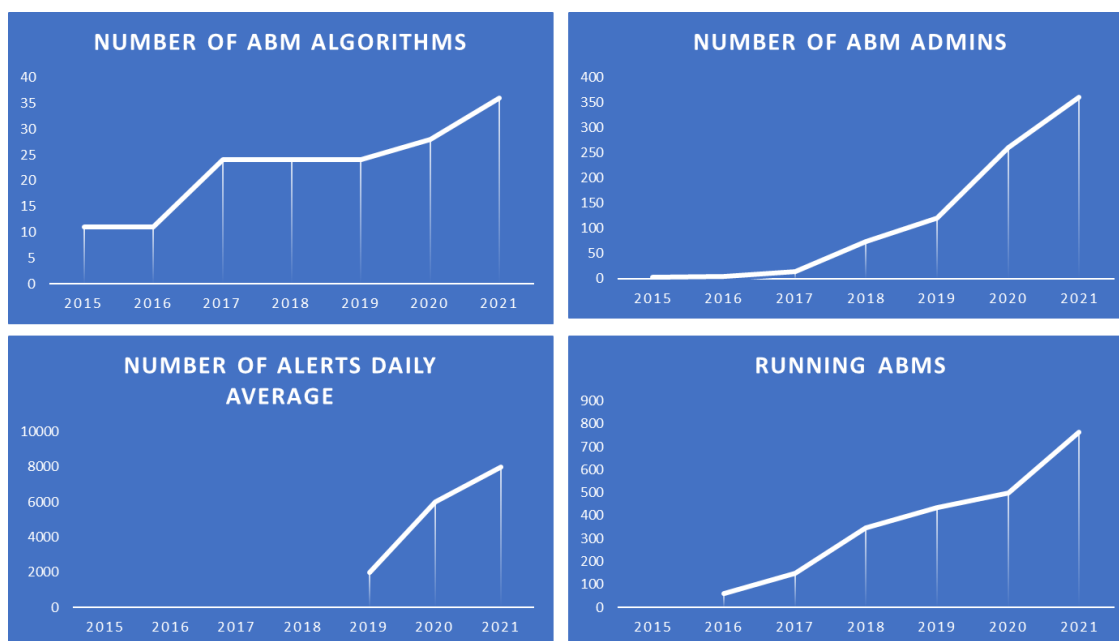

Figure 1 – Key indicators of the ABM operational usage over the years

Additionally, the main 2021 deliveries were described by **EMSA** (including new ABM algorithms and interfaces improvements). Plans for the 2022 were also outlined, covering combined ABM algorithms and further improvements related to the configuration of the NRT ABMs.

New technologies/ developments in ABMs (Agenda item 4)

This session was followed by a presentation on **new technologies** used for ABMs and advanced analytics. Participants learnt about the status of the Long-Term Storage (LTS); raw archive of ships positions, as well as the Historical-ABM (H-ABMs) including global detection of port calls. Practical, operational examples of the usage of the new technologies were presented by EMSA. The existing and available system-to-system (s2s) ABM webservices were described in the context of operational use case scenarios. Finally EMSA described the potential of the Enhanced Central Ship Database (CSD) and future planning for the related services.

Artificial Intelligence and Machine Learning (Agenda item 5)

In the area of **Artificial Intelligence (AI) and Machine Learning (ML)**, the overall strategy was reminded to the audience. Based on EMSA's single programming document 2020-2022 and EMSA's 5-years strategy it covers: *'[…] further development of the ABM tools and the analysis of which "big-data" analytics techniques and products can support the IMS community […]'*; and *'[…] development of machine learning and artificial intelligence applications in order to improve risk assessment, vessel position predictability, statistics and innovation*'**.**

It was confirmed that EMSA signed a contract for consultancy services to define how to implement AI and ML in IMS. The expected outcome of the work with EMSA and IMS users will be a study (document) containing feasibility analysis, summary of the AI and ML application in other transport modes, business requirements, and evolution of the use cases. Among many advantages, the study will support development of the pilot and operational AI and ML services in IMS.

The Chair recalled the high priority business scenarios derived from the previous ABM and Advanced Analytics Workshops and IMS User Consultations:

Scenario 1. Inconsistency between the destination declared and detected (or predicted).
Scenario 2. Identification of vessels that were following similar (trading/routing) patterns.
Scenario 3. Identification of the ships conducting unsustainable/ not viable economic activities.
Scenario 4. Aggregated list of vessels with detected anomalous or specific situations focusing on potential incidents (e.g. fires on board of ships), close-quarter situations, discrepancies ETA, analysis of the draught, filtering per destination or last port of call.

A 'brain-storming' was suggested by the chair for the definition of the end-users' requirements, fine-tuning of the objectives and data sets. To support the discussion, an interactive dialogue with the audience was launched using a 'Q&A and polling' platform. Participants could rank their operational objectives, select proposed data sets, or propose new inputs. They could also mark their preferences for AI and ML products display or usage. The outcome of this exercise would be referred to in the earlier mentioned study **(Action WS7.2**). It can be summarized with the following points.

- To the question: 'What shall be the **operational objectives** of the AI and ML?':
  o 93% of the participants indicated the option: 'Reduce the workload by automatizing certain analysis'; while 69% indicated the 'display aspects' i.e. that the related data shall be presented in a user-friendly and aggregated form supporting ad-hoc analysis.
- In terms of the **most important data sets** used to address specific scenarios, participants indicated the following most important data sets:
  o 92% 'AIS position message' - for Scenario 2.
  o 85% 'AIS Static and voyage related data' - for Scenario 1.
  o 58% 'AIS Static and voyage related data' - for Scenario 3.
  o 74% of the participants indicted the 'Detected Port Calls' as an important data set for Scenario 1.
  o 91% indicated 'ABMs' as a key data set for Scenario 4.
- As regards the **Presentation / Display preferences**, the poll indicated that ABM active users have a clear preference for displaying the results in SEG ('Flag in SEG'), 64% for Scenario 1; 65% for Scenario 2; 59% for Scenario 3; and 74% for Scenario 4.
  Consequently, the 'Separate Dashboard / analytics' remains a second option chosen by the participants.

The detailed outcome of the consultations with the usage of the polling platform will be published with the ABM WS7 report documents.

EMSA Advanced Analytics Tool prototype (Agenda item 6)

The next topic in the agenda covered **EMSA's Maritime Analysis Tool (EMAT) prototype. I**nformation on the state of play was given by **EMSA** and followed by the presentation and demo by the **Frontex** SLA team, focusing on new dashboards for 'at sea encounters' and 'sudden change of heading' outside ports.
NL CG-gave feedback on EMAT, seeing potential for future dashboards, facilitating work of the authorities, and focusing on deviation from normal behaviours and movements of vessels of interest between ports.

Workshop participants were subsequently consulted on their specific needs for the new types of advanced analysis and the related dashboards. The polling platform was used again. The outcome of this discussion can be summarized with the following points, covering VTMIS scenarios:
- The audience expressed main interest in the dashboards supporting the monitoring of AIS compliance (48% of the votes).
- This preference was closely followed by a scenario for monitoring SafeSeaNet reporting obligations – indicating lack of SSN Port Plus.

Additional thirteen proposals for new dashboards were indicated by the audience and will be analysed by **EMSA**. The top voted dashboards will be considered in the future evolution of the EMAT prototype **(Action WS7.3).** The detailed outcome of these consultations will be also published with the ABM WS7 report documents.

ABM related trainings, support to the users (Agenda item 7)

At the end of the Workshop **EMSA** recalled the **ABM related training activities.** They covered various online presentations and webinars for Member States and EU Bodies and where either solely focused on ABM topics or as a part of the IMS/SEG online one-day webinar. It was recalled that EMSA was working on a 'new approach' to training and capacity building. The focus of such activities would be on schemes and qualification paths to support professional development and training for the staff of MS competent authorities. The new approach is called the 'EMSA Academy'.

EMSA confirmed that the IMS and ABM related training course was to be developed under this new framework. The advantage of this new online course would be that users could follow it part -time, and at their own pace. They would also be able to flexibly adapt their progress, for instance to 'shift' work **(Action WS7.9).** Additionally, following the event **EMSA** sent the revised ABM user guide (version 1.3) to the participants for their use, and requested comments and suggestions on the document's content **(Action WS7.4).**

4. Closing remarks

Following the last session on ABM training activities, **EMSA** thanked all representatives for their contributions and closed the meeting.

Annexes

Annex 1 – Meeting Agenda

Annex 2 – Participants List

Annex 3 – Action points ABM WS7

Annex 1: Meeting Agenda

EMSA
European Maritime Safety Agency

7th Automated Behaviour Monitoring and Advanced Analytics (ABM) Workshop – Agenda;

(via teleconference)

Tuesday, 14 December 2021

Time	Agenda Item	Speakers/Comments
08:45 – 09:00	**Registration**	
09:00 – 09:15	**1. Welcome, opening, introduction**	EMSA
09:15 – 10:15	**2. IMS ABM operations** ■ Sharing operational experience by MS ■ Sharing operational experience EU Bodies ■ EMSA's inputs	EMSA / MS / EU Bodies
10:15- 10:30	**Break**	
10:30 – 11:30	**3. Cont. IMS ABM operations** ■ Sharing operational experience by MS ■ Sharing operational experience EU Bodies ■ EMSA's inputs **4. New technologies/ developments in ABMs** ■ ABM existing and new capabilities, future developments – HP – IMS, LTS, HABMs ■ S2S access options – NRT ABMs, H-ABMs with Port Call detection **5. Artificial Intelligence and Machine Learning** ■ Fine tuning of the scenarios for the potential usage of AI and ML in IMS ■ Evolution of the initially identified business scenarios	EMSA / MS / EU Bodies
11:30 – 13:00	**Lunch break**	
13:00 - 14:00	**6. EMSA Advanced Analytics Tool prototype, analytical capabilities** ■ Existing and new scenarios ■ Discussion on future needs	EMSA / MS / EU Bodies
14:00 – 14:15	**Break**	
14:15 – 14:45	**7. ABM related trainings, support to the users** ■ Manuals – state of play ■ Trainings ■ Demo of the new configurations and options	MS / EU Bodies / EMSA
14:45 – 15:15	**8. AOB and summary of the WS** ■ Conclusions	MS / EU Bodies / EMSA

Annex 2: Participants List

Country/EU Body	Name	Surname	Organization/Authority
Belgium	Yves	Maekelberg	Agency for maritime & coastal services - shipping assistance division
Belgium	Katrien	Van Meerbeeck	Federal Government - DG Shipping
Belgium	Alexander	Hoffmann	EC - DG MOVE
Belgium	Guido	Fidlers	FPS Health, Food Chain Safety and Environment.
Belgium	Rik	Maes	FPS Health and Environment
Croatia	Niko	Hrdalo	MSTI
Croatia	Mihajlo	Vojvodic	Republic Croatia Ministry of the Sea, Transport and Infrastructure, Safety Maritime Directorate VTS
Croatia	Mihajlo	Vojvodic	MMPI
Finland	Toni	Pehkonen	Finnish Border Guard
Finland	Maria	Ilus	Border Guard
France, Metropolitan	Katell	Marcillaud	DAM/PNDG SISM
Germany	Frank	Jung	Federal Office for Agriculture and Food/ FMC
Germany	Torsten	Witt	Federal Police
Germany	Arne	Zilles	German Waterways Police Reporting and Coordination Centre
Iceland	Snorre	Greil	Icelandic Coast Guard
Iceland	Jón Árni	Árnason	Icelandic Coast Guard
Ireland	Derek	Flanagan	The Irish Coast Guard
Ireland	Alan	Osborne	Irish coast guard
Netherlands	Bob	Van Den Hoek	Dutch Police
Netherlands	Natasja	Jones	Dutch Coastguard
Netherlands	Ron	Mellema	Dutch Coastguard
Netherlands	Stefanie	Utzinger-Mollnau	EUROPOL
Poland	Radosław	Hinca	Maritime Office in Gdynia
Portugal	Rui	Tavares	DGRM - Directorate-General for Maritime Resources
Portugal	Paulo	Lourenco	MRCC Delgada, PRT NAVY
Portugal	Miguel	Olivares	MAOC (N)
Portugal	Carlos	Ferreira	DGRM
Portugal	Ana	Faneca	DGRM
Portugal	Ana Paula	Simão	DGRM
Spain	Hernán	Del Frade	DGMM/MITMA
Spain	Juan	Gonzalez	Spanish Navy
EBCGA/Frontex	David	Herrera Gonzalez	FRONTEX
EFCA	Sven	Tahon	EFCA
Spain	CARLOS	Lopez Carrera	Spanish CUSTOMS
Spain	JORGE	Bardaji	Spanish CUSTOMS
Spain	Manuel	B Cáceres	SASEMAR
Sweden	Filip	De Geer	Swedish Maritime Administration
EMSA	Lukasz	Bibik	EMSA
EMSA's contractor	Nuria	Alsina Pujol	ALG

EMSA	Rui Miguel	Sequeira	EMSA
EMSA	Gustavo	Tomas	EMSA
EMSA	Jaime	Mayordomo	EMSA
EMSA	Miguel	Terra Homem	EMSA
EMSA	Javier	Garcia Canton	EMSA
EMSA	Marta	Espinos Palenque	EMSA
EMSA	Amaia	Arrieta Rey	EMSA
EMSA	David	Lopez Nunez	EMSA
EMSA	Matilde	Ortigao Delgado	EMSA
EMSA	Aristeidis	Oikonomou	EMSA
EMSA	Andres	Garcia Laruelo	EMSA
EMSA	Lorena	Amigo Lopez	EMSA
EMSA	Luksa	Cicovacki	EMSA
EMSA	Yann	Le Moan	EMSA
EMSA	Lukasz	Ziolkowski	EMSA
EMSA	Michael	Risley	EMSA
EMSA	Justino	De Sousa	EMSA
EMSA	Enrico	Gironella	EMSA
EMSA	Marc	Journel	EMSA

Annex 3 - Action points ABM WS7

No	Action	Responsible	Status/ Target date
WS7.1	Include new NRT ABM requirements from the WS7 in the planned developments. These should cover: - New ABM algorithm detecting vessels with speed withing threshold (from: X to: Y). - ABM configurations with repetitive timeslots or multiple start/end dates, including selection of certain time ranges (by days or months) when the ABM becomes either active or deactivated. - Flexibility of distribution lists with selection of alert outputs (email and/or display marker) per individual user. - Display the active VOI list. - Location of the ABM should overlay the actual position reports.	EMSA	During 2022-2023 – depending on the scope of new ABM and SEG contracts.
WS7.2	Reflect feedback from the ABM WS7 participants in the study on potential AI and ML solutions in IMS. Contact interested MS for further discussion on the business requirements and scenarios for AI and ML.	EMSA	By June 2022
WS7.3	Reflect feedback from the ABM WS7 participants in the new developments of the EMAT prototype.	EMSA	By June 2022
WS7.4	ABM admins and active users to provide feedback on the new ABM User Guide.	MS	By the end of February 2022
WS7.5	EMSA to implement new monitoring of ABM services and share information on new setups with FR and other ABM users.	EMSA, FR	Before and during the ABM WS8
WS7.6	Amend next version of the ABM User Guide with MS feedback on operational usage of ABMs e.g. information on the potential usage of 'speed anomaly' for detection of vessels drifting or anchoring; usage of ABMs in the context of preventing environmental crime (MARPOL scenarios).	EMSA	During 2022, for the new version of the ABM User Guide
WS7.7	EMSA to continue analysing how to provide improved or unrestricted ABM algorithms configurations and combinations options.	EMSA	During 2022-2023 – depending on the scope of new ABM contracts

WS7.8	EMSA to analyse and implement improvements in the ABM release notes as well as the timing for technical problems and issues ('bugs') resolution.	EMSA	During 2022-2023 – depending on the scope of new ABM contracts
WS7.9	Introduce new online training course to the ABM and IMS users.	EMSA	At the ABM WS8

Pending actions from ABM WS6

No	Action	Responsible	Status/ Target date
WS6.5	EMSA to analyse technical options for implementing multiple parameters selection.	EMSA	To be continued during 2022. Outcome of the analysis to be presented during one of the next ABM and Advanced Analytics Workshops.
WS6.6	EMSA, FR and IT – jointly investigate a possibility of using IMO GISIS accident information for the early warning scenarios on developing dangerous/distress situations	EMSA, FR, IT	To be continued during 2022. This data set will be also analysed during the AI and ML study. Outcome of the analysis to be presented during one of the next ABM and Advanced Analytics Workshops.
WS6.7	EMSA and MS to evaluate the best source of information for the cargo data from non-EU ports	EMSA, MS	During 2022. This data set will be also analysed during the AI and ML study. Outcome of the analysis to be presented during one of the next ABM and Advanced Analytics Workshops.