

# **Automated Behaviour Monitoring Workshop 3**

**Meeting Minutes**  
**Held in Lisbon on**  
**12 September 2017**



## List of Abbreviations

AIS	Automatic Identification System
ABM	Automated Behaviour Monitoring
AOI	Area of Interest
CSD	Central Ship Database
EC	European Community
EFCA	European Fisheries Control Agency
EMSA	European Maritime Safety Agency
EU	European Union
FRONTEX	European Agency for the Management of Operational Cooperation at the External Borders of the Member States of the European Union
IMDatE	Integrated Maritime Data Environment
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
MRS	Mandatory Reporting System
MSS	EMSA's Maritime Support Services
SADV	Statistical anomaly detection
SAT-AIS	Satellite Automatic Identification System (AIS data transmitted by satellite)
SSN-EIS	SafeSeaNet European Index Server
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
WUP	Web User Portal, also referred to as web user interface

## Background

On the 12<sup>th</sup> of September 2017 the European Maritime Safety Agency (EMSA) hosted the 3rd Operational Workshop on Automated Behaviour Monitoring (ABM). ABMs are Integrated Maritime Services (IMS) tools analysing position reports for the detection and alerting on specific ships' behaviours. They are in use by an ever-growing number of EU member states and EU Bodies in various operational contexts, like: fisheries control, border control, security, safety of marine traffic, coastal protection, and environmental protection.

### 1. Opening and welcome

The meeting was opened and chaired by Mr Ivo Kupsky, Chairman of the Integrated Maritime Services (IMS) Group.

The EU Member States (MS) and the EU Bodies actively using ABMs for surveillance purposes were invited to attend the workshop. Delegations attended from: **Belgium, Croatia, Germany, Ireland, Italy, Poland, Spain, Sweden, The Netherlands, and United Kingdom** as well as from the **European Border and Coast Guard Agency (Frontex)** and **Maritime Analysis Operation Centre – Narcotics (MAOC-N)**. ABM users from the **EU NAVFOR** and the **European Fisheries Control Agency (EFCA)** were represented by their respective service managers from **EMSA**. Following the opening, and tour-de-table introduction of the participants the chairman introduced the main objectives of the meeting, which were to:

- 1) gather operational feedback on the use of the existing and newly introduced ABMs;
- 2) share the best practices in the ABM use by different communities; and
- 3) discuss and prioritize the mid and long-term ABM-related developments.

The agenda (see **Annex 1**) was adopted without changes. The list of participants is presented in **Annex 2**. All the meeting presentations are available at: <http://emsa.europa.eu/workshops-a-events/188-workshops.html>.

An update on the current status of ABMs was presented by **EMSA**.

- ABMs are used by 11 EU MS and 4 EU Bodies. Ten of them have been granted with the ABM admin functions for various users.
- As of September 2017, there are 147 active ABMs.
- Following recent developments, a total of 24 different ABM algorithms are available for operational user.

Plans for the further improvement of the ship reference database were outlined. Status of the actions from the ABM WS2 followed; a summary is provided in **Annex 3**.

### 2. Executive summary of the Workshop

ABM algorithms are used by various communities with positive operational outcomes. The operational validation of the new ABMs is still on-going. ABM related training needs are addressed via regular modules incorporated into the IMS training sessions and ad-hoc webinars, as well as the updates of the ABM User Guide.

Participants identified the following topics as regards to ABM algorithms changes and developments in a short to mid-term time frame, as well as specific improvements for the existing operational service:

- ABM admin/ configuration tool should be improved as follows (**Action 1**):
  - o implement ABM admin tool in the new graphical interface (SEG);
  - o change units and apply default configurations for specific ABM algorithms;
  - o modify visual aspects for the ABM with status 'blocked';
  - o consider connection to the Central Geographical Database (CGD) for the reference of the Areas of Interest (AOI);
  - o revise ABM email alerts (HTML files) contents to make them more user-friendly and readable
- Increase a number of ABM admin accounts available to the MS IMS users (**Action 2**);

- Consider new vessel attributes and elements (GT, Owner information, year built, fishing vessels identifiers etc.) in the ship reference database for the filtering of vessel of interest (VOI) in ABM configuration (**Action 3**);
- Further improvement of the ship reference database for ABMs is needed, in order to avoid false-positive alerting (**Action 4**);
- In the future ABM developments EMSA should consider change of the existing system limitation, as regards repetition of the alerts after defined period of time - currently set to 12 hours. (**Action 5**);
- More flexibility for the ABM admins to create their email distribution lists is needed. A procedure for the quick/ fast-track creation of the distribution list will be proposed by EMSA (**Action 6**);
- An increase of the T-AIS rate in some areas could be considered to improve accuracy and timeliness of the ABM-related alerts (**Action 7**);
- Graphical layers with the T-AIS theoretical ranges are needed in the graphical interface, to support setting of specific algorithms (e.g. not reporting) (**Action 8**);

For the future developments, so called ABM version 2 (v.2), the workshop participants identified the following three top priorities (Action 9):

1. Implementation of the ABMs based on the historical data analysis.
2. Increase of the rate of the T-AIS.
3. Use of the EO data – VDS.

Other, lower-priority requirements/needs were also discussed (see **section 4** ).

### 3. Agenda items in details

The following agenda items (refer to **Annex 1** for the full Agenda) were discussed after 'Opening and intro' (1) session:

- **IMS ABM operations:**
  - o **(2)** New ABMs and their application, Operational use of the ABMs;
  - o **(3)** Administrative module; User manual and training requirements;
  - o **(4)** IMS ABM administrator/ configuration module; Future interface;
- **(5) ABM mid and long term:**
  - o Planned developments;
  - o Basic performance requirements, S2S interfaces;
  - o Prioritization of the requirements.

As per agenda **item 2** users actively contributed to the discussions. The agenda was modified to allow all participants to provide their operational feedback, experience or to discuss new ABM-related requirements. The following discussion points were noted:

- **Operational Vessel Registry (OVR) in the IMS** – The quality of the vessel reference database requires further work to resolve the issues of the outdated identifiers. **NL** and **IT** representatives will be points of contact for the verification of the applied solutions (**Action 4**).
- **IT** - presented the operational feedback as regards the use of the 'encounter at sea' ABM, making reference and providing examples from operational cases. A positive experience was shared as regards to the webinar training session solution.
- **EFCA**, represented by the **EMSA** service manager, provided examples of the use of ABMs. As for the future developments, **EFCA** would like to run the ABMs on the historical data to detect specific situations. There was also a strong desire for moving the ABM admin panel to the new graphical interface (SEG) and for improving the process of the ABM distribution list creation.
- **BE**, as a new user of the ABMs, requested information on the protection of the ABM data (**Action 10**). **BE** presented use of the ABMs by the PSC community and provided input on aspects related to the Vessels of Interest (VOI) selection. **BE** commented on the need of future development for the S2S ABM alerting to

their national system and requested the inclusion of the operational use cases in the ABM user manual/guide.

- **Frontex** used its own graphical interface JORA visualization to demonstrate how ABM's are used and displayed and provided input/feedback on the most commonly used ABM algorithms. Operational validations of the ABMs are ongoing and highly appreciated, as commented by the **EMSA's** chairman of the UCM group. As for the identified limitations, some of the elements used in the configuration of the ABMs may be missing for the vessels using AIS Class B devices, and consequently specific behaviour may go undetected. **Frontex** suggested to add a reference to such cases in the ABM manual together with the operational use cases (**Action 11**). **Frontex** would also need the maps of the AIS coverage for reference.
- **HR** provided input on the use of the built-in ABM alike functionalities in their national VTS.
- **MAOC-N** provided input on requirements for future ABM-related developments: VDS (Vessel Detection Service) for the detection of encounters at sea, as well as the possibility to combine algorithms sequentially.
- **DE** presented the state-of-play, on-going validation and the operational scenarios of the use of ABMs for Germany's high risk area monitoring and administrative tasks (reporting of notifications, verifying reporting obligations, etc.).
- **IE** provided feedback related to the use of ABMs for the vessel monitoring scenarios in the TSS; and expressed interest in further operational validation of new ABM algorithms. IE provided a positive feedback on the presentation of the alerts in the new interface (SEG) as well as the user manual.
- **EU NAVFOR**, a new ABM user, was represented by the **EMSA** service manager- provided a positive feedback on the use of the "In-area" algorithm off the Eastern coast of Africa. **EU NAVFOR** described the ABM functionality as a 'game changer' in relation to the previous commercial vessels' monitoring capabilities.
- **UK** provided a feedback on the use of the IMS at the National Maritime Information Centre and in cooperation with the other organizations on the national level (UK Border force). A clarification was provided as regards the use of the specific ABM algorithms – Under reporting and Switching Off the AIS, with the clarification that 'potential' situations are detected in this context.
- **PL**, another new ABM user, provided input on the ongoing operational validation of the ABM at national level. **PL** will revert with additional requests for the ABM distribution lists.
- **ES** commented on the successful ABMs operation and explained to the audience their application for the Customs use cases, where local Customs' branches are alerted for their vessels of interest.
- **SE**, also a new ABM user, provided feedback on similar functionalities currently available in their national system. From their perspective ABM is a useful complementary tool. **SE** plans to request additional ABM admin accounts for different services. **SE** commented on the process of creating ABM distribution lists, which may be cumbersome and long (**Action 6**).
- **NL** provided feedback on the use of the 'flag' filtering, and the related issues, as well as the operational use cases for the wrecks monitoring and the detection of potential dropping of illegal shipments.
- **MT** and **FR**, not present at the meeting, provided their operational feedback in written form that will be made available to other participants together with the workshop materials (documents and Power Point presentations).

As regards to agenda **item 3**, EMSA presented additional ABM operations related updates.

- Information was presented on the changes in the ABM admin module including the new 'exact match' option;
- An outline of the information paper on the protection of the data inserted by the ABM users was provided;
- The 'ABM User Guide' and training requirements were summarized by **EMSA** and the operational experience on the provided training was commented by the **EU NAVFOR** as and **IT** representatives. As for 'ABM User Guide' update, feedback from the MS will be incorporated to the new version of the document (**Action 11**). As regards to training, the ABM training module is included in the regular IMS training sessions and the webinars. Ad-hoc sessions can be requested by the MS or EU Bodies.

Under agenda **item 4** a discussion on the ABM administrator/ configuration module and its implementation in the new graphical interface (SEG) took place. EMSA referred to the Action UCM-09/03 of the last IMS User

Consultation Meeting setting, among the others, this particular requirement. A discussion took place on a number of improvements and new requirements that could be implemented together with the relocation of the ABM admin console to SEG. These will be examined by EMSA and can be summarized as follows (**Action 1**):

- Addition of the 'default' configurations (pre-configuration) for some ABMs;
- Option to change units for the ABM configurations (e.g. from m/s to kts, etc.);
- Display of ABMs with 'blocked' status and associated user alert (on-the-screen and/or by e-mail);
- Connection to the Central Geographical Database (CGD);
- Email/ HTML report content changes (reorganization of the data, possibility of adding a link to SEG or a miniature map overview of the alert location).

The outcome of the aforementioned discussions is reflected in the summary as well as in **Annex 4**.

## 4. Prioritization of the next developments

During agenda **item 5**, **EMSA** presented the list of the new ABM-related requirements. This was followed by an open discussion and a 'live' exercise on the prioritization of the specific topics. As an outcome, the following top three priorities were identified by the participants:

1. Implementation of the ABMs based on the historical data analysis i.e. alerting when specific behaviours are detected on the historical track of the vessel of interest.
2. Increase of the rate of the T-AIS for the improvement of the ABM related detection and alerting.
3. Use of the EO data – VDS – in the future ABMs.

Other, lower-priority requirements/needs covered the topics presented below (in their order of prioritisation):

- Use of SSN EIS data in ABMs;
- Combination of multiple ABM algorithms by the user.
- Provision of the ABM alerting via S2S.
- Improvements of the ABM distribution list creation; and additional vessel filtering (selection) options.
- Use of the regional server data (low power input of the on-board AIS antenna).
- Setting of ABMs via Mobile App.
- Setting of the ABMs via S2S interface.

## 5. Closing remarks

Participants were requested to provide feedback on the meeting structure and content. All participants underlined the importance of the ABM Workshop highlighting the added value of coming together to share operational experiences and best practices. Participants were very pleased with the information sharing and discussions that took place all of which allowed to raise the awareness of the planned ABM-related developments. The Chairman thereafter thanked all participants for their active roles and subsequently closed the meeting.

## Annexes

Annex 1 – Meeting Agenda

Annex 2 – Participants List

Annex 3 – Summary of the action points from ABM WS2

Annex 4 - Action points ABM WS3

## Annex 1: Agenda



### Annex: Agenda for the 3<sup>rd</sup> ABM Workshop

**Tuesday, 12 September 2017**

Time	Agenda Item	Speakers/Comments
09:00 – 09:30	<b>Registration and coffee</b>	
09:30 – 09:45	1. Welcome, opening, introduction	EMSA
09:45 – 11:00	2. IMS ABM operations <ul style="list-style-type: none"> <li>■ New ABMs and their application</li> <li>■ Operational use of the ABMs</li> </ul>	EMSA / MS / EU Bodies
11:00 – 11:15	<b>Coffee break</b>	
11:15 – 12:30	3. IMS ABM operations – cont. <ul style="list-style-type: none"> <li>■ Administrative module</li> <li>■ User manual and training requirements</li> </ul>	EMSA / MS / EU Bodies
12:30 – 13:30	<b>Lunch break</b>	
13:30 - 14:00	4. IMS ABM operations – cont. <ul style="list-style-type: none"> <li>■ IMS ABM administrator/ configuration module</li> <li>■ Future interface</li> </ul>	EMSA / MS / EU Bodies
14:00 – 15:00	5. ABM mid and long term <ul style="list-style-type: none"> <li>■ Planned developments</li> <li>■ Basic performance requirements, S2S interfaces</li> <li>■ Prioritization of the requirements</li> </ul>	EMSA / MS / EU Bodies
15:00 – 15:15	<b>Coffee break</b>	
15:15 – 15:30	6. Summary of the WS	MS / EU Bodies / EMSA
15:30 – 16:30	7. AOB, summary, conclusions	All



## Annex 2: Participants List

Ivo Santic, Ministry Of Sea, Traffic and Infrastructure, Croatia  
Shane Cormac Dillon, Irish Coast Guard, Ireland  
Ralf-Dieter Preuss, BSH, Germany  
Dario Cau Italian Coast Guard, Italy  
Andrzej Kalata, Maritime Office Gdynia, Poland  
Ana Carreira, MAOC-N,  
Paulo Silva, MAOC-N,  
Carlos Lopez Carrera, AEAT, Spain  
Lennart Dreier, Swedish Coast Guard, Sweden  
Tom Kleinen, NLCG, the Netherlands  
Heidi Clevett, Maritime and Coastguard Agency, United Kingdom  
Marcin Pempus, Frontex  
Steve Deighton, EMSA  
Ivo Kupsky, EMSA  
Yann Le Moan, EMSA  
Lukasz Bibik, EMSA  
Andrea Pelizzari, EMSA  
Marc Journal, EMSA  
Fionn Molloy, EMSA

## Annex 3 – Summary of the action points from ABM WS2

No	Action	Responsible	Status
1	There is a need for the common dictionary and harmonized terminology in the ABM context (ABM naming convention, parameters etc.).	ABM users and EMSA	<b>Pending</b> Proposal is to involve ABM users once EMSA executes the review of the configuration (ABM admin) under new contract.
2	ABM operational user manual to be drafted	EMSA and IE	Version 1.0 <b>Done</b> Version 1.1. - final version expected October 2017
3	Include the best practices and parameters setting	ABM users and EMSA	<b>Done</b> Best practices in the Manual, pre-setting as per action 1.
4	Confirm how the MS data is protected	EMSA	<b>Done</b> Information paper sent to the MS
5	Continue with the ABM capacities definition	ABM users and EMSA	<b>Done</b> Some ABM users responded to the questionnaires – their inputs are reflected in the new requirements doc.
6	Send the list of action points and requirements following ABM WS1	EMSA	<b>Done</b> with the ABM WS2 report.
7	Improve the quality of the IMDatE OVR by synchronizing it with the CSD	EMSA	<b>Partially Done</b> (import of Ships from CSD to OVR done in July 2017) To be completed before end 2017 with the Identity Resolution Temporary Solution
8	Prepare the ABM WS2 MoM (report) and distribute to MS and publish together with the WS presentations	EMSA	<b>Done</b>

## Annex 4 – Action points ABM WS3

No	Action	Responsible	Target date
1	Improve the ABM admin/ configuration tool by completing the following topics: <ul style="list-style-type: none"> <li>- implement ABM admin tool in the new graphical interface (SEG);</li> <li>- change units and apply default configurations for specific ABM algorithms;</li> <li>- modify visual aspects for the ABM with status 'blocked';</li> <li>- consider connection to the Central Geographical Database (CGD) for the reference of the Areas of Interest (AOI);</li> <li>- revise ABM email alerts (HTML files) contents to make them more user-friendly and readable</li> </ul>	EMSA	By 3Q 2018
2	Increase a number of ABM admin accounts available to the MS IMS users – and ensure the processing/ computing power, if needed.	MS and EMSA	As requested
3	Consider new vessel attributes and elements (GT, Owner information, year built, fishing vessels identifiers etc.) in the ship reference database for the filtering of vessel of interest (VOI) in ABM configuration.	EMSA	During CSD and ABM related future developments
4	Improve further the ship reference database for ABMs. Validate it with MS (NL, IT).	EMSA, NL + IT	a.a.
5	In the future ABM developments EMSA should consider change of the existing system limitation, as regards repetition of the alerts after defined period of time (currently set to 12 hours).	EMSA	a.a.
6	Propose and agree a procedure for the quick/ fast-track creation of the distribution list for ABMs.	EMSA	By the end of 2017
7	Consider increase of the T-AIS rate in some cases.	EMSA in cooperation with MS hosting regional servers and providing T-AIS	Evaluation during 2018
8	Provide Graphical layers with the T-AIS theoretical ranges.	a.a.	a.a.
9	Reflect in the ABM version 2 (v.2), the prioritized topics: <ol style="list-style-type: none"> <li>1. Implementation of the ABMs based on the historical data analysis.</li> <li>2. Increase of the rate of the T-AIS.</li> <li>3. Use of the EO data – VDS.</li> </ol>	EMSA	During ABM v2 developments
10	Provide information paper on the protection of the ABM to Belgium.	EMSA	Following ABM WS 3
11	Reflect use case scenarios, typical configurations, as well as the feedback from MS and EU Bodies, for specific ABMs in the new version of the ABM User Guide / manual.	EMSA + MS + EU Bodies	By the end of 2018

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