



Automated Behaviour Monitoring (ABM) algorithms

Workshop 2
Actions from Workshop 1 and
future plans

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Actions ABM Workshop 1

No	Action	Responsible	When	Status
1	Consider and propose a generic framework and architecture for anomaly detection in maritime surveillance systems.	EMSA	Proposal to be presented during 2016	Completed <ul style="list-style-type: none"> General Framework for IMS via IFCD IMS Group Terms of Ref to be discussed at next HLSCG
2	Examine options for supporting the cooperation and developments in the area of the expanded anomaly detection and ABMs.	EMSA	To be consulted with the COM and MS before/during one of the SSN HLSCG meetings in 2016	Completed <ul style="list-style-type: none"> General Framework for IMS via IFCD ABM included in IMSTraining

N	Action	Responsible	When	Status
3	Explore and reflect the MARNIS project experience as a reference for the future developments in the anomaly detection and ABMs.	EMSA and UK	To be presented at the next meeting in 2016	Pending
4	Examine possibility 'open source' approach for ABMs, (outcomes of the projects and developments could be shared).	EMSA and MS	Results to be presented at the next meeting in 2016	Pending – awaiting feedback
5	Agree on the next meeting of the active Anomaly Detection Systems and Automated Behaviour Monitoring users.	EMSA and MS	/	Completed

N	Action	Responsible	When	Status
6	Modification of existing + new requirements should be analysed + Feasibility and implementation	EMSA	To be presented at the next meeting in 2016	<ul style="list-style-type: none"> Completed (see following slides)
7	To implement some of the high-priority Use Cases identified during the workshop using the existing ABM framework and perform a validation campaign with a few MS users	EMSA	During 2016	Completed (8 new ABMs planned for 2017) Validation campaign to be performed.
8	Prepare and distribute MoM ABM WS1.	EMSA	During January 2016	Completed

ABMs requirements from WS1

– Analysis and Status

Actions from ABM 1

N°	community	requirement	Comment/additional elements or improvements	Status
1	All	<p>ABMs should cater for both:</p> <ul style="list-style-type: none"> back-office, less regular, off-line users, and the users accessing the system via on-line interfaces. 	<p>New</p> <p>Availability, timeliness and alert policies should reflect different kind of users</p>	<p>Pending</p> <p>- Detailed requirements to be discussed at ABM WS2 Agenda point 5.</p>
2	All	<p>Specific data set access rights should be reflected in ABMs</p>	<p>Existing e.g. as per access right set by each MS (access to VMS, LRIT, etc.)</p>	<p>Completed</p>
3	All	<p>ABMs users should be divided into:</p> <ul style="list-style-type: none"> administrators, setting specific anomaly detections (e.g. Member State or EU level) and clearly defined end-users who are entitled to receive specific alerts. 	<p>New</p>	<p>Completed</p> <ul style="list-style-type: none"> ADMIN functions are being transferred to the MS and EU bodies to be discussed at ABM WS2 Agenda point 4.

N°	community	requirement	Comment/additional elements or improvements	Status
4	All	There shall be a high quality of data ensured in the reference sources of information linked to ABMs (to avoid false detection/alerting and unnecessary burden to the system.)	New Additional validation of data, quality, related monitoring and checks should be applied to the reference sources of data.	Pending - Link to the Central databases e.g. CSD
5	Environment, All	Monitoring vessels entering and exiting Marine Protected Areas (MPA)	Modification of the existing ABM Allow upload of the MPA areas by the ABM admin.	Pending – may require update of the MPAs by the National authorities to the CGD
6	Environment, All	Monitoring traffic in the vicinity of pipe lines/underwater cable lines	Modification of the existing ABM Consider feasibility of the modelling of the areas of interest in the vicinity of the pipe lines/underwater cable lines	Pending – may require update of the to the CGD by the National authorities

Actions from ABM 1

N°	community	requirement	Comment/additional elements or improvements	Status
7	Fisheries, All	Add another filter level for the definition of the vessels of interest: Length Over All (LOA) in all surveillances	New	Pending - require connection to the relevant databases (registry files from EFCA) and/or CSD
8	Fisheries, All	Improve the speed anomaly detection ABM to detect the temporary change of speed to a certain value (e.g. 5 knts)	Bug-fixing of the existing ABMs	Completed – to be operationally validated with the <i>'change of speed above or below a limit set'</i> ABM
9	Fisheries, All	Combine the existing ABM to reflect new types of behaviours e.g. change of speed with at sea encounter or 'InArea' - leaving one area of interest and entering another specified area of interest.	New	Pending - current implementation does not allow combination of the ABMs. Under Development - Vessel leaves Area of Interest X and enters Area of Interest Y Planned IMDatE 2.1

N°	community	requirement	Comment/additional elements or improvements	Status
10	Security, All	Add exclusion criteria in the existing ABM i.e. alert for all vessels but exclude specific identification or vessel type	New	Under Development: - Use of negative criteria Planned IMDatE 2.1
11	Security, All	<ul style="list-style-type: none"> • Alerting for ship coming from a particular port/area and entering areas of interest • Ship heading to a particular port/area and passing areas of interest; • Ship leaving one specific port/Area and entering in a another area/port 	New	Under Development: - Vessel leaves Area of Interest X and enters Area of Interest Y – Planned IMDatE 2.1
12	Security, All	Include the Terrestrial AIS coverage area	Modification of the existing ABM The Terrestrial AIS coverage areas needs to be provided by MS.	Pending - may require update of the coverage areas by the National authorities to the CGD

N°	community	requirement	Comment/additional elements or improvements	Status
13	Security, Safety, All	<p>Detect when AIS transponder has been switched off.</p> <p>Additional attributes to be considered for the detection are:</p> <ul style="list-style-type: none"> • T-AIS coverage area and • No-reporting duration 	New	<p>Under Development</p> <p>- new ABM: Vessel is switching off transponder – Expected IMDatE 2.1</p>
14	Security, All	<p>Improve the detection of the change of heading and speed</p>	Improvement of the existing ABM	<p>Completed</p> <p>- to be tested operationally by the end-users</p>
15	Security, All	<p>Detection of the identity spoofing</p>	New	<p>Pending</p> <p>- may require connection to reference databases , (e.g. CSD)</p>

N°	community	requirement	Comment/ additional elements, improvements	Status
16	Security, All	Detection of the geographical position spoofing	New	Under development - linear distance between consecutive positions > than a threshold distance value (calculated using the max. speed). Planned in IMDatE 2.1
17	Security, Safety All	Ship Profile changes alerting E.g.for the selected vessel alert when vessel related attributes changes are detected (e.g. owner, flag, PSC report/ data changes, deficiencies, crew, vessel with a certain age, etc.)	New	Pending - may require a connection to the reference databases
18	Security, All	Detect the deviation of the most used/economic route	New	Pending - may require a connection to reference services containing the calculated routes

N°	community	requirement	Comment/additional elements or improvements	Status
19	Security, All	Vessel stationed / idle in the AOI (e.g. close to Port) without entering port for a long time	New	Pending - under assessment
20	Security, All	Change of the voyage related data: ETA, destination,	New	Pending - may require a connection to the reference services - SSN EIS, for example. Reference databases have to be defined for the non-EU ports
21	Security, All	Improve detection of the at sea encounter, exclude specific vessels/ criteria	Improvement of the existing ABM	Under Development – negative selection

N°	community	requirement	Comment/additional elements or improvements	Status
22	Safety, All	Lost target – lack of position reports of any kind	New	Under Development <ul style="list-style-type: none"> - new ABM: Vessel is switching off transponder
23	Safety, All	Public media monitoring for the detection of the unreported incidents/accidents	New	Pending <ul style="list-style-type: none"> - under assessment
24	Safety, All	Change of the specific AIS attributes in the transmission	New	Pending <ul style="list-style-type: none"> - under assessment, lack of the available services at this moment

N°	community	requirement	Comment/additional elements or improvements	Status
25	Security	<p>Apply a combination of several algorithms e.g. sudden change of heading with rendezvous at Sea and</p> <p>apply a set of algorithms for vessels of interest.</p>	New	<p>Pending</p> <p>- current ABM implementation does not allow combination.</p>
26	Security	<p>Discrepancies between declared voyage and track of a ship e.g. the vessel track and its current location does not match its destination.</p>	New	<p>Pending</p> <p>- may require a connection to the reference services containing the calculated routes</p>



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