



# Analysis and technical functional modelling for the improvement of the vessel traffic management in the Adriatic Region

## 4.1.b\_ Annex

### Assessment of the vessel traffic monitoring systems functionalities in the Adriatic Region

*Version 1.1*



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#	FUNCTIONALITY AIMS	ITALY	Slovenia	Croatia	Montenegro	Albania
1	Authorization management by the Administrator of the VSC system, and by the Administrator of the VTSA / VTSL	-VTS- <b>System administrator</b> : Definition of the roles of the system, add / edit / delete users in the system, loading of applications in the system, definition of the Policy, the definition of the user profile				
2	Setting of equipment	-VTS- <b>Equipment Setting</b> : the setting operation of the radar parameters, extractor and plotter. The setting function consists in finding the best compromise between the need for a better view and see those far away				
3	Merger of the tracks	-VTS- <b>Merger of the tracks</b> : The Merger function collects the measurements obtained by the sensors, the reports in a single space-time (so that the various coordinates can be compared) and searches the one falling under the predefined merger windows				
4	Transition of Control for the procedure of entering or leaving the territorial waters or a port	-VTS- <b>Transition of Control</b> : During the handover process, the system carries data identifying of the track of the receiving VTS. Once entered into the area of competence, the operator of the receiving VTS must accept the track so that it becomes controlled by him. When a ship enters into an area of competence, coming from international waters or port areas, the system processes a First Report. When the ship leaves the area of competence or enters the port, the system processes a Final Report				
5	Controls anti-collision, for monitoring buoys and ships at anchor, for the transit and anchoring in prohibited areas, for the control of the respect of speed limits, the channel areas and areas of standard, as well as for the control of maneuvering processes and the control of the position of specific boats	-VTS- <b>Navigation controls</b> : Automatic anti-collision controls carried out periodically by the Central Computer on all tracks. In collision monitoring are calculated the values of DCPA and TCPA compared to each track.				-VTMIS-VTS: Real time automatic targets collision detection
6	Generation and distribution of maps and channel maps	-VTS- <b>Map management</b> :Construction and distribution to all of geographical maps sites identical and homogeneous between them. Alternatively individual VTS can create their own maps. Through the command "Scenario Remote Copy" maps are transferred to the recipient site. The channel map is made up of the following groups of submaps: Map of Branches of the Channel and the Area channel map, in which to activate the channel controls				
7	Registration, management of historical files of the recordings, reproduction, import / export of recordings	-VTS- <b>Registration management</b> : Registration is done automatically startup system and allows for contiguous data. The recording files are accumulated continuously on a mass storage (SAN) connected to the mainframe computers. This provides a total memory capacity divided into three levels: depletion of the second oldest data are automatically deleted and overcoming of the third is no longer possible to store more recordings. Recordings can be played back and exported to removable media to preserve them				-VTMIS-VTS: Recording and Playback management of VTS scenario
8	Remote access	-VTS- <b>Interoperability</b> : Possible to act in Monitoring mode (some features are disabled in this case) or Control (are allowed in this case commands that act on the system)				
9	Infraction Management and Emergencies	-VTS- <b>Infraction Management and Emergencies</b> : Infringements are notes concerning illegal conduct. Emergencies are handled through the inclusion of the event in the DB Emergencies, indicating the type				-VTMIS-VTS: Radio Direction Finder emergency target localization
10	Fall of a central node, communication Radar, AIS communication, audio communication and a PO	-VTS- <b>Fault and redundancy management</b> :The VTS system is designed to maintain the operational integrity even following fault of apparatus in different modes and forms depending on the event of failure. In the apparatus of failure conditions, for which there is a redundancy, the system presents the degraded condition on Modia system. In case of a double fault of a redundant system, the system loses functionality tied to that apparatus.				
11	Sending and receiving of information contained in AIS (also AIS SART), for monitoring of the ships by base station and for security	-PELAGUS- <b>Receiving information from the Base Station</b> : Function that allows the reception of information contained in AIS messages, as provided by law				-VTMIS-AIS: Safety Related Messages Ship communication  <b>Receiving information from the Base Station</b> - Collecting of AIS data. Function that allows the reception of information contained in AIS messages, as provided by law

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12	Decoding / Encoding of received / transmitted information	-PELAGUS- <b>Decoding / Encoding</b> : Function that allows the encoding / decoding of transmitted / received information contained in AIS messages, as provided by law and communication standards			-VTMIS- <b>Decoding / Encoding</b> : Function that allows the encoding / decoding of transmitted / received information contained in AIS messages, as provided by law and communication standards	
13	Removal of duplicates AIS data	-PELAGUS- <b>Duplicates removal</b> : Function that removes any duplication of AIS data generated from a contemporary survey of ship from two base stations promiscuous			-VTMIS- <b>Duplicates removal</b> : Function that removes any duplication of AIS data generated from a contemporary survey of ship from two base stations promiscuous	
14	Archiving	-PELAGUS- <b>Archiving</b> Functionality that allows the storage of AIS data			-VTMIS- <b>Archiving</b> Functionality that allows the storage of AIS data+G10	
15	Information sharing with Public Authority	-PELAGUS- <b>Distribution</b> : Function that allows the distribution of AIS information to Public Authority, as provided by law			-VTMIS- <b>Distribution</b> : Function that allows the distribution of AIS information to Public Authority, as provided by law	
16	Correlation between the AIS data received in different systems	-PELAGUS- <b>Correlation</b> : It arrives an information both from AIS that from LRIT for the same ship, in such cases it's made the correlation of the data of the same vessel received from the two systems			-VTMIS- <b>Correlation</b> : It arrives an information both from AIS that from LRIT for the same ship, in such cases it's made the correlation of the data of the same vessel received from the two systems	
17	Pre-clearing vessel monitoring	-PELAGUS- <b>Pre-Clearing</b> : Experimentation functionality which allows the selection of the ship that required the pre-clearing, allowing the operator to make the ship monitoring				
18	Signal manual entry	-PELAGUS- <b>NRT</b> : Function that allows the manual entry of ships not registered in the monitoring system (eg. port captaincy ships, migrant ships)			-VTMIS- <b>NRT</b> : Function that allows the manual entry of ships not registered in the monitoring system (eg. port captaincy ships, migrant ships)	
19	Signaling to ships	-PELAGUS- <b>Sending message</b> : Function that allows to send warnings / alerts messages to ships. Messages can be sent to ships, entering the MMSI, or broadcasting to the base stations		- Coast Watch - <b>AIS Messaging</b> : THE OPTIONS IN THE SEND MENU OPEN DIFFERENT SEND MESSAGE WINDOWS THAT ARE USED TO SEND MESSAGES TO THE SELECTED TRACK / STATION (MMSI NUMBER, DSC CALL), TYPES OF MESSAGES ARE: AIS SAFETY RELATED MESSAGE, AIS ASSIGN REPORT RATE MESSAGE AND AIS INTERROGATION MESSAGE.	-VTMIS- <b>Sending message</b> : Function that allows to send warnings / alerts messages to ships. Messages can be sent to ships, entering the MMSI, or broadcasting to the base stations	
20	Lighthouses signaling to ships	-PELAGUS- <b>AtoN</b> : Function through which information to signal lighthouses is sent to the ships. AtoNs may be true (if on lighthouses are AIS devices), virtual (if the signaled areas are not defined by physical objects), or synthetic (if the signal of the lighthouse is made by Base Station)	-Transas NH 4.55- <b>Controllo of AtoN</b> : Management and remote control of virtual and syntetic ATONs.		-VTMIS- <b>AtoN</b> : Function through which information to signal lighthouses is sent to the ships. AtoNs may be true (if on lighthouses are AIS devices), virtual (if the signaled areas are not defined by physical objects), or synthetic (if the signal of the lighthouse is made by Base Station)	
21	Validation of AIS data received from ships	-PELAGUS- <b>Data Quality</b> : Function that allows the validation of AIS data, sent from the vessel through a cross check, based on the IMO number and with the use of the Pelagus database, that contains all the noticed vessels which transmitted AIS data at least once				
22	Encryption of the ship placement	-PELAGUS- <b>Encryption</b> : Function that allows the not-display of the CP ships to users that are outside CP				
23	Control panel for the display of the base station functionality	-PELAGUS- <b>Base station operating status</b> : Function that enables all operators to monitor and control the operating status of the different base station. On the panel are specified: user name, description, status, last AIS received time, disconnection time, AIS msg / s to Pelagus, AIS msg / s from Pelagus, connected			-VTMIS- <b>Base station operating status</b> : Function that enables all operators to monitor and control the operating status of the different base station. On the panel are specified: user name, description, status, last AIS received time, disconnection time, AIS msg / s to Pelagus, AIS msg / s from Pelagus, connected	
24	Visualization of ship data collected in the CoGe DB	-PELAGUS- <b>Visualization of report DB CoGe</b> : Function that allows the operator to view the ship data of the monitored vessel registered in DB of CoGe. Vessels shall be classed in the DB as Valid (all of the ship's data fields are filled in), or Invalid (some fields are not filled in). The internal DB to the CoGe is based on Thetis				
25	Visualization of naval unit track	-PELAGUS- <b>Ship visualisation/ Track History</b> : Function that allows the display of monitored vessels, the ship track in the last 24-26 h, its route, and static and dynamic information, by clicking on the selected unit. History can also be extracted in .xls format, showing the detailed static and dynamic data of the vessel	-Transas NH 4.55- <b>Vessel Tracking</b> : Primary tracking of vessels by AIS, supported by RADAR and CCTV tracking. Tracks are displayed in real time and historic data/tracks may be displayed on demand.	- CoastWatch - <b>Track History</b> :THE TRACK HISTORY SHOWS THE PREVIOUS COURSE OF THE TRACK FOR A SET NUMBER OF MINUTES (CAN BE EDITED IN THE TRACK OPTION), IN ADDITION TRACK REAL TIME PREDICTION (CURRENT COURSE AND SPEED) AND DEFULT TRACK-PREDICTION TIME IS AS OPTION.	-VTMIS- <b>VTS</b> : Real time vessel traffic monitoring	<b>Ship visualization</b> - Function that allows the display of monitored vessels, the ship track, its route, and static and dynamic information, by clicking on the selected unit.
26	Searching for a specific vessel	-PELAGUS- <b>Target research</b> : Function that allows the research of a naval unit by the definition of ship parameters (preferably the IMO Number), viewing the target in real-time. The function also displays the dynamic information of the vessel	-Transas NH 4.55- <b>Target Info</b> : Display of target data, searching targets and simulating targets,...		-VTMIS- <b>Target research</b> : Function that allows the research of a naval unit by the definition of ship parameters (preferably the IMO Number), viewing the target in real-time. The function also displays the dynamic information of the vessel	

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27	Selection of the map topography	-PELAGUS-Layer - <b>Cartography</b> : Function that allows to select the type of map on which display monitored units (open sea map or local map)	-Transas NH 4.55- <b>Cartography</b> : Use of ECDIS charts with all overlays		-VTMIS-Layer - <b>Cartography</b> : Function that allows to select the type of map on which display monitored units (open sea map or local map)	
28	Visualization of specific information or areas of interest on the selected layer	-PELAGUS-Layer – <b>Selection georeferenced points</b> : Function that allows the display of specific information on the cartographic map. This function can visualize areas like sea areas for exercises, SAR areas, VTS areas, marine protected areas (Boundaries) or even weather information such as wind direction and speed, temperature and wave height (Weaher)	-Transas NH 4.55- <b>Cartography</b> : Use of ECDIS charts with all overlays		-VTMIS-Layer – <b>Selection georeferenced points</b> : Function that allows the display of specific information on the cartographic map. This function can visualize areas like sea areas for exercises, SAR areas, VTS areas, marine protected areas (Boundaries) or even weather information such as wind direction and speed, temperature and wave height (Weaher)	
29	Physical measurements on the cartography	-PELAGUS- <b>Phisycs Measures</b> : Function that allows the execution of kinematic calculations as CPA and distance between two points. The calculated values can be displayed on the map or exported.	-Transas NH 4.55- <b>Measurements</b> : Allowing to perform needed measurements	-CoastWatch - <b>Route Measurement</b> : ROUTE MEASUREMENT CALCULATE TOTAL LENGH OF ALL DISTANCES BETWEEN THE MEASURED POINTS. MEASURE POINTS IS THE SUM OF ALL THE MEASURED POINTS. CALCULATE ESTIMATED TIME OF ARRIVAL GIVEN IN HOURS , MINUTES AND SECONDS TO THE MEASURED POINTS BASED ON OBJECTS SPEED -CoastWatch - <b>CPA/TCPA</b> : TOOL CALCULATE MINIMUM PASSING DISTANCE BETWEEN TWO TRACKED OBJECTS AND DURING TIME TO THIS DISTANCE -CoastWatch - <b>Distance Measurement</b> : DISTANCE MEASUREMENT TOOL - DISTENCE / BEARING WINDOW SHOWS DIFFERENT DATA ABOUT A MEASURED DISTANCE. THE DATA SHOWN INCLUDES: START AND END POSITION (MEASURES ARE LATITUDE AND LONGITUDE), BEARING, SOG FOR SELECTED TRACK / OBJECT IN THE REAL TIME PRESENTATION, ETA (GIVEN IN HOURS, MINUTES AND SECONDS).	-VTMIS- <b>Phisycs Measures</b> : Function that allows the execution of kinematic calculations as CPA and distance between two points. The calculated values can be displayed on the map or exported.	
30	Instantaneous measurements on maps	-PELAGUS- <b>Express Measures</b> : Function that allows the calculation of Area / Distance measures	-Transas NH 4.55- <b>Measurements</b> : Allowing to perform needed measurements	-CoastWatch - <b>Route Measurement</b> : ROUTE MEASUREMENT CALCULATE TOTAL LENGH OF ALL DISTANCES BETWEEN THE MEASURED POINTS. MEASURE POINTS IS THE SUM OF ALL THE MEASURED POINTS. CALCULATE ESTIMATED TIME OF ARRIVAL GIVEN IN HOURS , MINUTES AND SECONDS TO THE MEASURED POINTS BASED ON OBJECTS SPEED -CoastWatch - <b>CPA/TCPA</b> : TOOL CALCULATE MINIMUM PASSING DISTANCE BETWEEN TWO TRACKED OBJECTS AND DURING TIME TO THIS DISTANCE -CoastWatch - <b>Distance Measurement</b> : DISTANCE MEASUREMENT TOOL - DISTENCE / BEARING WINDOW SHOWS DIFFERENT DATA ABOUT A MEASURED DISTANCE. THE DATA SHOWN INCLUDES: START AND END POSITION (MEASURES ARE LATITUDE AND LONGITUDE), BEARING, SOG FOR SELECTED TRACK / OBJECT IN THE REAL TIME PRESENTATION, ETA (GIVEN IN HOURS, MINUTES AND SECONDS).	-VTMIS- <b>Express Measures</b> : Function that allows the calculation of Area / Distance measures	
31	Insertion of a specific point on the map	-PELAGUS- <b>Reference Points</b> : Function that allows manual entry of a point in the map, selecting the users that allow visualization.			-VTMIS- <b>Reference Points</b> : Function that allows manual entry of a point in the map, selecting the users that allow visualization.	
32	Definition of areas on maps	-PELAGUS- <b>Draw Geometry</b> : Function that allows manual entry of demarcated areas in maps, using coordinates	-Transas NH 4.55- <b>Drawing options</b> : Allowing manual entry of areas, lines and points on charts.		-VTMIS- <b>Draw Geometry</b> : Function that allows manual entry of demarcated areas in maps, using coordinates	
33	Coordinates conversion	-PELAGUS- <b>Coordinates Converter</b> :Function that allows the conversion of latitude and longitude of a point in different formats: DD (decimal degrees), DM (decimal minutes degrees) and DMS (minutes seconds degrees)			-VTMIS- <b>Coordinates Converter</b> :Function that allows the conversion of latitude and longitude of a point in different formats: DD (decimal degrees), DM (decimal minutes degrees) and DMS (minutes seconds degrees)	
34	Sending / Receiving of general communications to system users	-PELAGUS- <b>Inbox</b> : Function that allows the system users to send and receive general information, alert message and to access to the received messages list, to optimize communication			-VTMIS- <b>Inbox</b> : Function that allows the system users to send and receive general information, alert message and to access to the received messages list, to optimize communication	
35	Invio richieste con segnale LRIT	-PELAGUS- <b>Interrogazione LRIT</b> : Funzione che consente di inviare una richiesta ad una nave che trasmette con segnale satellitare LRIT			-VTMIS- <b>LRIT</b> : Long Range Identification and Tracking integration	
36	Visualization of the vessel movement in an area	-PELAGUS- <b>Playback</b> : Function that allows to view the movement of ships in a specific area and time period via video. The unit's movements can also be extrapolated using .xls		-CoastWatch - <b>RECORD&amp;REPLAY</b> : RECORDS THE MARITIME SITUATION PICTURE,SENSOR DATA AND OTHER EVENTS OF IMPORTANCE WHICH OCCUR WITHIN THE SYSTEM. THE RECORDED DATA CAN LATER BE REPLAYED . MULTIPLE DIFFERENT SCENARIOS CAN BE REPLAYED SIMULTANEOUSLY.	-VTMIS- <b>Playback</b> : Function that allows to view the movement of ships in a specific area and time period via video. The unit's movements can also be extrapolated using .xls	
37	Visualization of SAR Scheme	-PELAGUS- <b>SAR Scheme</b> : Function that allows to view SAR schemes (Search and Rescue)				

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38	To receive and display the information sent by ships in compliance with the Decree of 22 July 1987 from the Minister of Merchant Marine	-PELAGUS- <b>ARES</b> : Feature that allows the reception and display of information sent by ships. The inclusion of the route plan, required by INI of ARES message, allows the operator to check, in real time, on Pelagys that the ship does not deviate from the announced route.				
39	Displaying weather data (wind speed and direction, visibility)		-Transas NH 4.55- <b>Weather data display</b> : Displaying weather data (3 different locations where wind speed and direction is measured, 1 visibility sensor)	- Coast Watch- <b>Weather Sensors</b> : THE WIND DIRECTION AND SPEED CAN BE SELECTED TO BE SHOWN WITH THE CHART LAYER DROP-DOWN MENU. THE WEATHER DATA IS SHOWN AS AN AROW (WIND DIRECTION AND SPEED) FOR EACH BASE STATION. ADDITIONAL DATA ARE: PRESSURE, RAIN INTENSITY, RELATIVE HUMIDITY.	-VTMIS- <b>VTS</b> : Weather data management for safety purpose	
40	Radio communication over VHF Ch. 16, 12, 8, 7 and any other Maritime VHF Ch		-SITRAC- <b>VHF voice radio communication</b> : Radio communication over VHF Ch. 16, 12, 8, 7 and any other Maritime VHF Ch		-VTMIS- <b>VHF</b> : Remote VoIP VHF Radio communication management	
41	Communication and collecting information about the monitoring of ships by DSC (Digital Selective Calling)	-PELAGUS- <b>DSC Notifications</b> : Function that allows reception of information contained in AIS messages by using DSC (Digital Selective Calling) in emergency situations	-SITRAC- <b>VHF DSC radio communication</b> : Radio communication over VHF DSC		-GMDSS- <b>DSC</b> : Digital Service Calling receiver for operational, emergency and distress localization	
42	Replay of Voice radio communication and display of DSC communication logs.		-SITRAC- <b>Communication logs and replay</b> : Replay of Voice radio communication and display of DSC communication logs			
43	Exchange of FAL documentation received form ships with other authorities (Police, Customs,...)		-SI SSN- <b>Exchange of FAL documentation received form ships</b> : Exchange of ship, persons on board, cargo and any other relevant data between authorities			
44	Exchange of notifications with EMSA (72H, Hazmat, Waste, Security, Port+,...)		-SI SSN- <b>Exchange of notifications with EMSA</b> : Sending notifications to EMSA SSN EIS			
45	Exchange of ADRIREP data with oter participating Countries and EMSA		-SI SSN- <b>Exchange of ADRIREP data</b> : Exchange of mandatory ship reporting data in the Adriatic Sea between participating countries		-VTMIS- <b>ADRIREP</b> : Assisted ADRIREP Reporting system	
46	Exchange of data about notifications of Ship arrivals with other authorities (Police, Customs,...)		-SI SSN- <b>Exchange of data about notifications of Ship departures</b> : Exchange of ship, persons on board, cargo and any other relevant data between authorities			
47	Exchange of data about notifications of Ship departures with other authorities (Police, Customs,...)		-SI SSN- <b>Exchange of FAL documentation received form ships</b> : Exchange of ship, persons on board, cargo and any other relevant data between authorities			
48	Navigational warnings				-VTMIS- <b>VHF</b> : Weather and navigational warning VHF Broadcast announcement	
49	Training				-VTMIS- <b>VTS</b> : VTS Training and simulator system	
50	VISUALIZATION OF NAVAL TRACK by Camera and control panel			- Coast Watch - <b>CAMERAS</b> : CONTROL THE PAN, TILT AND ZOOM LEVEL OF THE CAMERA, CREATE, EDIT AND DELATE CAMERAS BOOKMARKS, SELECTION AND VIEW OF A TRACK, CAMERA FOLLOW FUNCTION		