D6.1 System Test Report

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1 Table of Contents

1. Introduction

The subject of the study is the summary of works related to testing the conducted integration of the MarSSIES with functionalities offered by the "Retrospective Analysis of Historical AIS Data for Navigational Safety Through Recommended Routes (HANSA)" project. The document contains a summary of information on the results of the tests of integrating the MarSSIES system with HANSA services, referred to the Work Package 5 of the project.

This is report from internal system tests. Next step will be tests in production environment and assess by operators and maritime authority.

1.1 Document purpose

This document summarizes testing activities and their results. It also contains an evaluation of the corresponding test items.

1.2 Expectations

The testing phase was aimed at detecting and removing errors in communication between systems and assessing the reliability of the data received.

1.3 Attachments

The attachments contain images of new functionalities in the system as well as sample visualizations of the results of their operation.

Attachment 9.1 Displaying the effects of the HANSA services in the MarSSIES system.

Attachment 9.2 Displaying the effects of the HANSA services in the dedicated Web application.

2 Summary of the MarSSIES tests

The MarSSIES testing strategy was based on manual tests. Components involving user interaction has been tested manually by the developers and testers. The system components that did not required user interaction, it has been checked by analysis of system logs.

The tests were carried out in accordance with prepared individual test procedures. During their duration all occurring irregularities or confirmed correct actions of the tested module were recorded.

The correctness and usefulness of the generated information will be described in document D6.3 Quality assessment report, where comments and assessment of the actual usefulness of the proposed solution by maritime administration users will be included.

2.1 Scope of tests

The scope of the tests was to check the correctness of cooperation between the HANSA services and the SPRINT applications.

The main system functionalities that were the subject of tests concerned:

- sending requests for recommended corridors for ships;
- visualization on the map of the results obtained from the HANSA server;
- monitoring the progress of the ship's voyage;
- the deviation from the recommended corridor and the official route reported for the ship;
- obtaining information on the sea corridors of vessels;
- creating reports and statistics for ships.

The detailed scope of the tests and how they were performed is described in document D6.1.1 Test plan. That document describes the testing concept and strategy. Detailed tests execution and expected results were described in the prepared tests scenarios contained in mentioned test plan.

2.1.1 Requirements

Project requirements for SPRINT according to D1.1 document.

Req. No.	Name	Requirement description
R16	A global mesh network of routes/legs from start port to destination port is generated. This can be sorted by vessel classes.	A global mesh network of routes/legs will be visualized on the electronic maritime chart (ENC). Recommended corridors for particular ship at a given moment will be visualized on the electronic maritime chart.
R17	It is possible to display and analyze a recommended corridor within an Official Passage Plan.	The operator will be able to observe, whether the selected ship moves within recommended corridor or whether there are deviations that may endanger navigation safety or cause excessive traffic in certain sea areas. The VTS operator will be able to compare if the ship's route matches the one entered into VTS iMARE systems. The vessel's mandatory pre-voyage Official Passage Plan can be cross-checked against the recommended corridors for improved confidence in the safety of the passage.
R18	It is possible to generate and display reports about most frequently selected corridor	The operator will be able to generate reports - ship-specific statistics – by sending a query specifying the type and size of the ship, port of entry and exit, as well as time range. In response, the operator will get information on the most frequently selected corridor and on ships which sailed to the same destination but using different corridor. The operator will be able to obtain information on the corridors used by particular ships on that day.

2.1.2 Traceability Matrix

Each test has a unique identifier that allows you to track changes and visualize coverage of design requirements on the traceability matrix.

Map of project requirements coverage:

Use case / Requirement	16.UC.01. A global mesh network of routes/legs from start port to destination port is generated. This can be sorted by vessel classes.	R17. It is possible to display and analyse a recommended corridor within an Official Passage Plan.	R18. It is possible to generate and display reports about most frequently selected corridor
Show ship	x		
Show Recommended Corridor (RC)	x		
Show Route Plan		x	
Show Report			x

Use cases:

UC No.	Use case name	Use case description
16.UC.01	Show ship	Module showing ships data collected from AIS streams and new options for HANSA services.
16.UC.02	Show Recommended Corridor (RC)	Showing the options used for recommended corridors requests and visualizations.
17.UC.03	Show Route Plan	Showing the modules using for routes planning and monitoring/control.
18.UC.04	Show Report	Showing the reports module (report generator/export data). Data based on HANSA archive AIS, Mesh and previous RCs.

2.2 Functional tests

Use case coverage map.

Test Scenario / Test Case	Use case	16.UC.01 Show ship	16.UC.02 Show Recommended Corridor (RC)	17.UC.03 Show Route Plan	18.UC.04 Show Report
16UC01.TS.SHIP.SELECTION Ship selection		**x**			
SHIPPOSITION.TC.POSITION.01 Ship position.		x			
SHIPSELECTION.TC.SELECTION.01 Ship selection from map.		x			
SHIPSELECTION.TC.SELECTION.02 Ship selection from the AIS ships list.		x			
SHIPSELECTION.TC.SELECTION.03 Ship selection from the WEB map application.		x			
16UC02.TS.SEND.REQUEST Send request			**x**		
REQUEST.TC.CORRIDOR.01 Request for corridor from map.			x		
REQUEST.TC.CORRIDOR.02 Request for corridor from ship list.			x		
REQUEST.TC.MESH.01 Request for Mesh.			x		
REQUEST.TC.CORRIDOR.03 Request for corridor from WEB module.			x		
REQUEST.TC.MESH.02 Request for Mesh from Web module.			x		
16UC02.TS.DISPLAY.RC Display the corridor			**x**		
DISPLAYRC.TC.VISUALISATION.01 Fastest cargo corridor visualisation.			x		
DISPLAYRC.TC.VISUALISATION.02 Shortest cargo corridor visualisation.			x		
DISPLAYRC.TC.VISUALISATION.03 Fastest tanker corridor visualisation.			x		
DISPLAYRC.TC.VISUALISATION.04 Shortest tanker corridor visualisation.			x		
DISPLAYRC.TC.VISUALISATION.05 Fastest passenger corridor visualisation.			x		
DISPLAYRC.TC.VISUALISATION.06 Shortest passenger corridor visualisation.			x		
DISPLAYRC.TC.VISUALISATION.07 Fastest all corridor visualisation.			x		
DISPLAYRC.TC.VISUALISATION.08 Shortest all corridor visualisation.			x		
DISPLAYRC.TC.VISUALISATION.09 Layer management.			x		

16UC02.TS.WEBDISPLAY.RC Display the corridor on the Web map		**x**		
WEBDISPLAYRC.TC.VISUALISATION.01 'Fastest cargo' web corridor visualisation.		x		
WEBDISPLAYRC.TC.VISUALISATION.02 'Shortest cargo' web corridor visualisation.		x		
WEBDISPLAYRC.TC.VISUALISATION.03 'Fastest tanker' web corridor visualisation.		x		
WEBDISPLAYRC.TC.VISUALISATION.04 'Shortest tanker' web corridor visualisation.		x		
WEBDISPLAYRC.TC.VISUALISATION.05 'Fastest passenger' web corridor visualisation.		x		
WEBDISPLAYRC.TC.VISUALISATION.06 'Shortest passenger' web corridor visualisation.		x		
WEBDISPLAYRC.TC.VISUALISATION.07 'Fastest all' web corridor visualisation.		x		
WEBDISPLAYRC.TC.VISUALISATION.08 'Shortest all' web corridor visualisation.		x		
WEBDISPLAYRC.TC.VISUALISATION.09 Web layer management.		x		
16UC02.TS.DISPLAY.MESH Display the mesh		**x**		
DISPLAY.TC.MESH.01 Cargo Mesh visualisation.		x		
DISPLAY.TC.MESH.02 Tanker Mesh visualisation.		x		
DISPLAY.TC.MESH.03 Passenger Mesh visualisation.		x		
DISPLAY.TC.MESH.04 All Mesh visualisation.				
16UC02.TS.WEBDISPLAY.MESH Display the mesh from Web		**x**		
WEBDISPLAY.TC.MESH.01 Cargo Mesh visualisation on Web.		x		
WEBDISPLAY.TC.MESH.02 Tanker Mesh visualisation on Web.		x		
WEBDISPLAY.TC.MESH.03 Passenger Mesh visualisation on Web.		x		
WEBDISPLAY.TC.MESH.04 All Mesh visualisation on Web.		x		
17UC03.TS.ROUTE.PLAN Route planning			**x**	
ROUTEPLAN.TC.PLANNING.01 Manual route planning.			x	
ROUTEPLAN.TC.PLANNING.02 Route planning from RC.			x	
17UC03.TS.ROUTE.DISPLAY Display route			**x**	
ROUTEDISPLAY.TC.VIEW.01 Preview of RC and ship position.			x	
ROUTEDISPLAY.TC.VIEW.02 Preview of RC and ship position on web.			x	
17UC03.TS.ROUTE.TRACKING Tracking			**x**	
TRACKING.TC.CONTROL.01 Route control by VTS operator.			x	
TRACKING.TC.CONTROL.02 Ship tracking.			x	
TRACKING.TC.CONTROL.03 A few ships tracking.			x	
TRACKING.TC.CONTROL.04 Deviations.			x	
TRACKING.TC.CONTROL.05 Route update (new corridor).			x	

17UC03.TS.MONITORING.DEVIATIONS Monitoring			**x**	
MONITORING.TC.CORRIDOR.01 Warnings for operator.			x	
18UC04.REPORTS Reports				**x**
REPORTS.TC.MOST.FREQUENTLY.01				x
REPORTS.TC.MOST.FREQUENTLY.02				x
REPORTS.TC.MOST.FREQUENTLY.03				x
REPORTS.TC.MOST.FREQUENTLY.04				x
18UC04.EXPORT.REPORT Export report				**x**
EXPORTREPORT.TC.FILE.01 Export to file.				x
EXPORTREPORT.TC.PRINTER.02 Export to printer.				x

Test scenarios.

ID	Scenario name	Description
16UC01.TS.SHIP.SELECTION	Ship selection	Selecting a ship according to specific attributes.
16UC02.TS.SEND.REQUEST	Send request	Request for corridor for a ship according to specific attributes or sending a request for mesh.
16UC02.TS.DISPLAY.RC	Display the corridor	Visualization of recommended corridors, for particular ship at a given moment, on the electronic maritime chart (ENC).
16UC02.TS.WEBDISPLAY.RC	Display the corridor on the Web map	Visualization of recommended corridors, for particular ship at a given moment, on the Web application map.
16UC02.TS.DISPLAY.MESH	Display the mesh	Visualization of mesh on the electronic maritime chart (ENC).
16UC02.TS.WEBDISPLAY.MESH	Display the mesh from Web	Visualization of mesh on the Web application map.
17UC03.TS.ROUTE.PLAN	Route planning	The vessel's voyage planning.
17UC03.TS.ROUTE.DISPLAY	Display route	Simultaneously display of actual the ship position, recommended corridor and route plan (Official Passage Plan).
17UC03.TS.ROUTE.TRACKING	Tracking	Monitoring the progress of the trip, its safety and deviations from the

		standard approach - anomalies.
17UC03.TS.MONITORING.DEVIATIONS	Monitoring	Warning of the operator of detected anomalies and irregularities in the behavior of the ship.
18UC04.REPORTS	Reports	Use of internal stored data and HANSA archive and statistics.
18UC04.EXPORT.REPORT	Export report	Export of generated reports as screen, file or to printer.

2.3 Non-functional tests

Non-functional tests included checking of:

- Correct and stable communication between applications;
- Hansa server response time to send queries (for one user and up to 100 users);
- Correctness of submitted answers.

2.3.1 Integration tests

As part of integration tests, scenarios has been performed that will define the relationships between individual system modules and external systems. During tests, the correctness of operation and cooperation between the modules was checked. The transmission of necessary input data to ensure the correct operation of a given module was analyzed. Test scenarios were part of the scenarios included in functional tests.

2.3.2 Reliability and availability tests

Reliability and availability tests were not necessary at this stage of the project. The developed demonstrator served as a platform to check the adopted design assumptions. The modifications introduced did not affect the stability of the system. System overload and module failures were not simulated.

2.3.3 Performance tests

Measured system parameters:

- simultaneous online system users - 100;
- number of queries to the HANSA server - 30 / minutes (with simultaneous query from 100 users);

- waiting time for an answer from HANSA – 3 seconds (with simultaneous query from 100 users);
- waiting time for the layer, form to load, result of the operation – 3 seconds (with simultaneous query from 100 users).

2.3.4 Security tests

Security tests were not necessary at this stage of the project. The MarSSIES uses transmission standards defined in the SOAP standard. The encrypted HTTPS protocol (secured by SSL) was used for data transmission and document circulation.

2.3.5 Unit tests

Unit test is a piece of code which tests behavior of a function or class. Each programmer performed unit tests before submitting the code to update the system.

2.3.6 Automated testing

Due to the need to check the quality of the results obtained, no automatic tests were carried out. Testers, while manually checking the operation of the interfaces and their functionality, simultaneously assessed the correctness of the data received.

2.4 Summary of testing process activities

System tests were carried out on 22-28.04.2020 at the Contractor's headquarters by a team composed of:

- Krzysztof Mendalka – tests manager
- Grzegorz Gajewski – programmer
- Michał Wąworek – programmer
- Wojciech Piwakowski – programmer
- Tomasz Lipiński – programmer
- Janusz Hajdel – tester
- Grzegorz Cyrzan – tester

All scheduled tests have been carried out.

Conducted Tests cases:

Test scenario	Case ID	Test name / Test case	Description
16UC01.TS.SHIP.SELECTION Ship selection	SHIPPOSITION.TC.POSITION.01	Ship position.	Viewing of ship position based on AIS data.
	SHIPSELECTION.TC.SELECTION.01	Ship selection from map.	Functionality of selection ship data for RC request from map view.
	SHIPSELECTION.TC.SELECTION.02	Ship selection from the AIS ships list.	Functionality of selection ship data for RC request from the AIS ships list.
	SHIPSELECTION.TC.SELECTION.03	Ship selection from the WEB map application.	Functionality of selection ship data for RC request from the dedicated WEB application.
16UC02.TS.SEND.REQUEST Send request	REQUEST.TC.CORRIDOR.01	Request for corridor from map.	Sending request for recommended corridor from map level (after selection, sending button).
	REQUEST.TC.CORRIDOR.02	Request for corridor from ship list.	Sending request for recommended corridor from ship list level (after selection, sending button).
	REQUEST.TC.MESH.01	Request for Mesh.	Sending request for mesh network.
	REQUEST.TC.CORRIDOR.03	Request for corridor from WEB module.	Sending request for recommended corridor from WEB module.
	REQUEST.TC.MESH.02	Request for Mesh from Web module.	Sending request for mesh from WEB module.
16UC02.TS.DISPLAY.RC Display the corridor	DISPLAYRC.TC.VISUALISATION.01	Fastest cargo corridor visualization.	A new layer with fastest recommended corridor for cargo ship is display in the MarSSIES.
	DISPLAYRC.TC.VISUALISATION.02	Shortest cargo corridor visualization.	A new layer with shortest recommended corridor for cargo ship is display in the MarSSIES.
	DISPLAYRC.TC.VISUALISATION.03	Fastest tanker corridor visualization.	A new layer with fastest recommended corridor for tanker ship is display in the MarSSIES.
	DISPLAYRC.TC.VISUALISATION.04	Shortest tanker corridor visualization.	A new layer with shortest recommended corridor for tanker ship is display in the MarSSIES.
	DISPLAYRC.TC.VISUALISATION.05	Fastest passenger corridor visualization.	A new layer with fastest recommended corridor for passenger ship is display in the MarSSIES.

	DISPLAYRC.TC.VISUALISATION.06 DISPLAYRC.TC.VISUALISATION.07 DISPLAYRC.TC.VISUALISATION.08 DISPLAYRC.TC.VISUALISATION.09	Shortest passenger corridor visualization. Fastest all corridor visualization. Shortest all corridor visualization. Layer management.	A new layer with shortest recommended corridor for passenger ship is display in the MarSSIES. A new layer with fastest recommended corridor for all types of ship is display in the MarSSIES. A new layer with shortest recommended corridor for all types of ship is display in the MarSSIES. On/off functions for corridor layer on map.
16UC02.TS.WEBDISPLAY.RC Display the corridor on the Web map	WEBDISPLAYRC.TC.VISUALISATION.01 WEBDISPLAYRC.TC.VISUALISATION.02 WEBDISPLAYRC.TC.VISUALISATION.03 WEBDISPLAYRC.TC.VISUALISATION.04 WEBDISPLAYRC.TC.VISUALISATION.05 WEBDISPLAYRC.TC.VISUALISATION.06 WEBDISPLAYRC.TC.VISUALISATION.07 WEBDISPLAYRC.TC.VISUALISATION.08 WEBDISPLAYRC.TC.VISUALISATION.09	'Fastest cargo' web corridor visualization. 'Shortest cargo' web corridor visualization. 'Fastest tanker' web corridor visualization. 'Shortest tanker' web corridor visualization. 'Fastest passenger' web corridor visualization. 'Shortest passenger' web corridor visualization. 'Fastest all' web corridor visualization. 'Shortest all' web corridor visualization. Web layer management.	A new layer with fastest recommended corridor for cargo ship is display in the Web application. A new layer with shortest recommended corridor for cargo ship is display in the Web application. A new layer with fastest recommended corridor for tanker ship is display in the Web application. A new layer with shortest recommended corridor for tanker ship is display in the Web application. A new layer with fastest recommended corridor for passenger ship is display in the Web application. A new layer with shortest recommended corridor for passenger ship is display in the Web application. A new layer with fastest recommended corridor for all ships is display in the Web application. A new layer with shortest recommended corridor for all ships is display in the Web application. On/off functions for corridor layer on web map.
16UC02.TS.DISPLAY.MESH Display the mesh	DISPLAY.TC.MESH.01	Cargo Mesh visualisation.	A new mesh layer for cargo ships is displayed in the MarSSIES.

	DISPLAY.TC.MESH.02 DISPLAY.TC.MESH.03 DISPLAY.TC.MESH.04	Tanker Mesh visualization. Passenger Mesh visualization. All Mesh visualisation.	A new mesh layer for tanker ships is displayed in the MarSSIES. A new mesh layer for passenger ships is displayed in the MarSSIES. A new mesh layer for all types of ships is displayed in the MarSSIES.
16UC02.TS.WEBDISPLAY.MESH Display the mesh from Web	WEBDISPLAY.TC.MESH.01 WEBDISPLAY.TC.MESH.02 WEBDISPLAY.TC.MESH.03 WEBDISPLAY.TC.MESH.04	Cargo Mesh visualization on Web. Tanker Mesh visualization on Web. Passenger Mesh visualization on Web. All Mesh visualization on Web.	A new mesh layer for cargo ships is displayed in the Web application. A new mesh layer for tanker ships is displayed in the Web application. A new mesh layer for passenger ships is displayed in the Web application. A new mesh layer for all types of ships is displayed in the Web application.
17UC03.TS.ROUTE.PLAN Route planning	ROUTEPLAN.TC.PLANNING.01 ROUTEPLAN.TC.PLANNING.02	Manual route planning. Route planning from RC.	The vessel's voyage manual planning. The vessel's voyage plan adopted from Hansa RC response.
17UC03.TS.ROUTE.DISPLAY Display route	ROUTEDISPLAY.TC.VIEW.01 ROUTEDISPLAY.TC.VIEW.02	Preview of RC and ship position. Preview of RC and ship position on web.	Simultaneous display of ship's current position, recommended corridor and route plan (Official Passage Plan). Simultaneous display of ship's current position, recommended corridor and mesh.
17UC03.TS.ROUTE.TRACKING Tracking	TRACKING.TC.CONTROL.01 TRACKING.TC.CONTROL.02	Route control by VTS operator. Ship tracking.	Manual and visual comparison of route and corridor data. Tracking module takes into account AIS, RC and VTS data.

	TRACKING.TC.CONTROL.03 TRACKING.TC.CONTROL.04 TRACKING.TC.CONTROL.05	A few ships tracking. Deviations. Route update (new corridor).	Routes control for a few ships (observe ships list defined by operator). Monitoring whether there are deviations that may endanger navigation safety. Update route and control params.
17UC03.TS.MONITORING.DEVIATIONS Monitoring	MONITORING.TC.CORRIDOR.01	Warnings for operator.	Warning of the operator of detected anomalies and irregularities in the behavior of the ship.
18UC04.REPORTS Reports	REPORTS.TC.MOST.FREQUENTLY.01 REPORTS.TC.MOST.FREQUENTLY.02 REPORTS.TC.MOST.FREQUENTLY.03 REPORTS.TC.MOST.FREQUENTLY.04	Cargo ships report. Tanker ships report. Passenger ships report. Ships report from web.	The information of the corridors used by cargo ships on the area. The information of the corridors used by tanker ships on the area. The information of the corridors used by passenger ships on the area. The information of the corridors used by ships on the area in web application.
18UC04.EXPORT.REPORT Export report	EXPORTREPORT.TC.FILE.01 EXPORTREPORT.TC.FILE.02	Export to file. Export to printer.	Export of generated reports to file. Export of generated reports to printer.

2.4.1 Preparatory activities

Preparatory activities included:

- developing a test plan;

- preparation of test scenarios;

- preparation of the test environment;

- familiarization with new functionalities by testers;

- providing 'clean' test scenarios to testers;

2.4.2 Testing environment

Preparation of the test environment included equipment, installation and configuration of software, preparation of source data, provision of access to services, preparation of users accounts with appropriate permissions to conduct tests, scripts, monitoring and administrative tools.

Two servers with a working the MarSSIES modified system and two workstations for testing has been prepared.

The web part of the test environment was available at: : https://10.66.4.192/tmsWms

2.4.3 Testing scenarios

Test scenarios are attached in document D6.1.1 Test plan and were provided to testers for review prior to testing.

2.4.4 Final actions

After the testing process, no additional actions were required to delete the generated data, user accounts or other sensitive information.

2.5 Criteria

In the testing process, no category 1 errors were found that would eliminate the application from further use. The testing process did not require pausing. The test environment was working properly and the results obtained were correspond to the assumptions.

Identified deviations are listed in the error report, point 4.1.

2.5.1 Error classification

Category 1 - critical errors

- functional or technical errors blocking the possibility of using the system and preventing the implementation of basic business functionalities of the application.

Category 2 - high priority errors

- functional or technical errors that have a significant impact on the implementation of the basic business functionalities of the application. These are errors related to the incorrect implementation of certain important functions (e.g. calculation errors, errors resulting from the failure to implement certain functions of business rules), as well as errors in application logic, e.g. errors in reports, not causing system locks.

Category 3 - medium priority errors

- functional or technical errors that do not affect the standard business procedures and functionalities of the application.

Category 4 - low priority errors

- functional or technical errors with minimal impact on the business functionality of the application (eg language errors, messages, hints).

Categories of errors that may occur during non-functional tests:

Category 1 - nonfunctional critical errors

- failure of the tested elements to meet performance criteria, security requirements, reliability and availability preventing the implementation of basic business functionalities of the application (also non-compliance with legal requirements).

Category 2 - nonfunctional non-critical errors

- failure of the tested elements to meet performance criteria, security requirements, reliability and availability that do not prevent the implementation of basic business functionalities of the application (also non-compliance with legal requirements).

2.5.2 Testing products

The performance of the tests was documented by a prepared statement of tests and tests log based on previously planned test scenarios, point 3.1.

3 Summary of the MarSSIES tests results

100% of the functional tests has been carried for implemented system functionalities. No category 1 critical errors disqualifying the application were detected.

A total of 51 test cases were designed to carried out to check the correct operation of new system functionalities. Positive results were obtained in 45 test cases. Due to the abandonment of the 'all' option for ship types, in 6 cases the previously planned test cases were omitted.

Report summarizing internal tests:

Report summarizing internal tests

Full and short name of the entity to which the report is addressed	**Retrospective Analysis of Historical AIS Data for Navigational Safety Through Recommended Routes - HANSA**		
Testing team			
Full and short name of the system being tested	**Maritime Safety and Security Information Exchange System - MarSSIES**	Version of the system being tested	**1.0**
Full and short name of the System Contractor	**Sprint S.A.**		
List of test cases carried out			
Test number	Test Case ID	Positive test result	Negative test result
1	SHIPPOSITION.TC.POSITION.01	x	
2	SHIPSELECTION.TC.SELECTION.01	x	
3	SHIPSELECTION.TC.SELECTION.02	x	
4	SHIPSELECTION.TC.SELECTION.03	x	
5	REQUEST.TC.CORRIDOR.01	x	
6	REQUEST.TC.CORRIDOR.02	x	
7	REQUEST.TC.MESH.01	x	
8	REQUEST.TC.CORRIDOR.03	x	
9	REQUEST.TC.MESH.02	x	
10	DISPLAYRC.TC.VISUALISATION.01	x	
11	DISPLAYRC.TC.VISUALISATION.02	x	
12	DISPLAYRC.TC.VISUALISATION.03	x	
13	DISPLAYRC.TC.VISUALISATION.04	x	

14	DISPLAYRC.TC.VISUALISATION.05	x	
15	DISPLAYRC.TC.VISUALISATION.06	x	
16	DISPLAYRC.TC.VISUALISATION.07	Deprecated	
17	DISPLAYRC.TC.VISUALISATION.08	Deprecated	
18	DISPLAYRC.TC.VISUALISATION.09	x	
19	WEBDISPLAYRC.TC.VISUALISATION.01	x	
20	WEBDISPLAYRC.TC.VISUALISATION.02	x	
21	WEBDISPLAYRC.TC.VISUALISATION.03	x	
22	WEBDISPLAYRC.TC.VISUALISATION.04	x	
23	WEBDISPLAYRC.TC.VISUALISATION.05	x	
24	WEBDISPLAYRC.TC.VISUALISATION.06	x	
25	WEBDISPLAYRC.TC.VISUALISATION.07	Deprecated	
26	WEBDISPLAYRC.TC.VISUALISATION.08	Deprecated	
27	WEBDISPLAYRC.TC.VISUALISATION.09	x	
28	DISPLAY.TC.MESH.01	x	
29	DISPLAY.TC.MESH.02	x	
30	DISPLAY.TC.MESH.03	x	
31	DISPLAY.TC.MESH.04	Deprecated	
32	WEBDISPLAY.TC.MESH.01	x	
33	WEBDISPLAY.TC.MESH.02	x	
34	WEBDISPLAY.TC.MESH.03	x	
35	WEBDISPLAY.TC.MESH.04	Deprecated	
36	ROUTEPLAN.TC.PLANNING.01	x	
37	ROUTEPLAN.TC.PLANNING.02	x	
38	ROUTEDISPLAY.TC.VIEW.01	x	
39	ROUTEDISPLAY.TC.VIEW.02	x	
40	TRACKING.TC.CONTROL.01	x	
41	TRACKING.TC.CONTROL.02	x	
42	TRACKING.TC.CONTROL.03	x	
43	TRACKING.TC.CONTROL.04	x	
44	TRACKING.TC.CONTROL.05	x	
45	MONITORING.TC.CORRIDOR.01	x	
46	REPORTS.TC.MOST.FREQUENTLY.01	x	
47	REPORTS.TC.MOST.FREQUENTLY.02	x	
48	REPORTS.TC.MOST.FREQUENTLY.03	x	
49	REPORTS.TC.MOST.FREQUENTLY.04	x	
50	EXPORTREPORT.TC.FILE.01	x	
51	EXPORTREPORT.TC.PRINTER.02	x	
List of test scenarios carried out			

Test number	Test scenario ID	Positive test result	Negative test result
1	16UC01.TS.SHIP.SELECTION	x	
2	16UC02.TS.SEND.REQUEST	x	
3	16UC02.TS.DISPLAY.RC	x	
4	16UC02.TS.WEBDISPLAY.RC	x	
5	16UC02.TS.DISPLAY.MESH	x	
6	16UC02.TS.WEBDISPLAY.MESH	x	
7	17UC03.TS.ROUTE.PLAN	x	
8	17UC03.TS.ROUTE.DISPLAY	x	
9	17UC03.TS.ROUTE.TRACKING	x	
10	17UC03.TS.MONITORING.DEVIATIONS	x	
11	18UC04.REPORTS	x	
12	18UC04.EXPORT.REPORT	x	
Comments on the report	Deprecated test cases were omitted. The 'all' parameter no longer exists in updated HANSA services.		
Test results	**possitive**		
Test completion date	23.04.2020		

Functional tests:

The user interface is working properly. Data visualization was presented as expected. Downloading archive data to the report takes place properly.

Non-Functional tests:

All assumed parameters have been met. Service response time is within established ranges. The time of response / waiting for the result does not exceed 3 seconds.

3.1 Test log

Below are the forms / logs from internal tests carried out.

16UC01.TS.SHIP.SELECTION Ship selection

NAME	**Ship position.**
ID	SHIPPOSITION.TC.POSITION.01
Refers to	16UC01.TS.SHIP.SELECTION Ship selection
Description	Viewing of actual ship position based on AIS data.
Tester	tester
Date	22.04.2020
Preconditions	User logged to the system.
Overall Pass Criteria	Ships list and icons on the map are shown.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	Press 'AIS' button on the bottom bar to activate AIS/Radar module.		New window with ships list and AIS/Radar functions is shown. Ships icons are visible on the map.	Pass	

NAME	**Ship selection from map.**
ID	SHIPSELECTION.TC.SELECTION.01
Refers to	16UC01.TS.SHIP.SELECTION Ship selection
Description	Functionality of selection ship data for RC request from map view.
Tester	tester
Date	22.04.2020
Preconditions	AIS/Radar module active.

Overall Pass Criteria	New menu window for ship is shown.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	Select a ship on the map by right-click its icon.	SHIPPOSITION.TC.POSITION.01	New menu window for ship with *Hansa Corridor* option is shown.	Pass	

NAME	**Ship selection from the AIS ships list.**
ID	SHIPSELECTION.TC.SELECTION.02
Refers to	16UC01.TS.SHIP.SELECTION Ship selection
Description	Functionality of selection ship data for RC request from the AIS ships list.
Tester	tester
Date	22.04.2020
Preconditions	AIS/Radar module active.
Overall Pass Criteria	New menu window for ship is shown.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	Select a ship on the AIS ships list by right-click its icon.	SHIPPOSITION.TC.POSITION.01	New menu window for ship with *Hansa Corridor* option is shown.	Pass	

NAME	**Ship selection from the WEB map application.**
ID	SHIPSELECTION.TC.SELECTION.03
Refers to	16UC01.TS.SHIP.SELECTION Ship selection
Description	Functionality of selection ship data for RC request from the dedicated WEB application.
Tester	yano
Date	22.04.2020
Preconditions	A web browser with a working Hansa application.
Overall Pass Criteria	The selected ship is marked on the map.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	Click on a ship icon on the web map.		The ship's symbol is marked on the map with a colored rectangle envelope. The selected ship Name, IMO and MMSI numbers are in the 'Selected vessel' node.	Pass	

16UC02.TS.SEND.REQUEST Send request

NAME	**Request for corridor from map.**
ID	REQUEST.TC.CORRIDOR.01
Refers to	16UC02.TS.SEND.REQUEST Send request
Description	Sending request for recommended corridor from map level (after selection, sending button).
Tester	tester
Date	22.04.2020
Preconditions	AIS/Radar module active. Ship selected.
Overall Pass Criteria	Request for corridor is sent.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	From a ship menu on the map choose and click *Hansa Corridor* options.	SHIPSELECTION.TC.SELECTION.01	New window with *Hansa Corridor* interface is shown. Selected the ship MMSI number is filled.	Pass	Ship's MMSI, length, width and draught data are taken from AIS source.
2 A	In 'Parameters' tab fill out request form with necessary information regarding: **Start and end route:** In '*Current position*' node change Latitude and Longitude manually if necessary.		Position of selected ship is provided in form.	Pass	The start point by default is filled by the system from actual ship location.

		In '*Destination*' node set route's end point by cliking LOCODE button and providing port name or Locode. Destination coordinates can be change manually (latitude and longitude fields).		Destination coordinates are provided in form.	Pass	
	B	**Ship's dimensions:** Provide ship's: Length Provide ship's: Width Provide ship's: Draught		 Length is provided in form. Width is provided in form. Draught is provided in form.	 Pass Pass Pass	Ship's data by default are taken from AIS source.
	C	**Route type:** Set one of the defined route types: Fastest Shortest		 Route type is provided in form. Fastest' type is set. Shortest' type is set.	 Pass	
	D	**Ship type:** Set one of the defined ship types: Cargo Tanker Passenger All		 Ship type is provided in form. Cargo' type is set. Tanker' type is set. Passenger' type is set. All' type is set.	 Pass	 Deprecated.
3		In 'View' tab change visualization information regarding RC: Set Color. Set Opacity. Select 'Point'. Select 'Width'. Select 'Route'.		Visualization parameters are set. Color of drawn corridor is set. Opacity of drawn corridor is set. Visibility of the corridor points is set. Visibility of the corridor width is set. Visibility of the corridor is set.	Pass Pass Pass Pass Pass Pass	The visualization parameters by default are filled by the system.

4	Accept data by OK.		Request for recommended corridor is sent.	Pass	

NAME	**Request for corridor from ship list.**
ID	REQUEST.TC.CORRIDOR.02
Refers to	16UC02.TS.SEND.REQUEST Send request
Description	Sending request for recommended corridor from ship list level (after selection, sending button).
Tester	tester
Date	22.04.2020
Preconditions	AIS/Radar module active. Ship selected.
Overall Pass Criteria	Request for corridor is sent.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	From a ship menu on the list choose and click *Hansa Corridor* options.	SHIPSELECTION.TC.SELECTION.02	New window with *Hansa Corridor* interface is shown. Selected the ship MMSI number is filled.	Pass	Ship's MMSI, length, width and draught data are taken from AIS source.
2 A	In 'Parameters' tab fill out request form with necessary information regarding: **Start and end route:** In '*Current position*' node change Latitude and Longitude manually if necessary.		Position of selected ship is provided in form.	Pass	The start point by default is filled by the system from

					actual ship location.
	In '*Destination*' node set route's end point by cliking LOCODE button and providing port name or Locode. Destination coordinates can be change manually (latitude and longitude fields).		Destination coordinates are provided in form.	Pass	
B	**Ship's dimensions:** Provide ship's: Length Provide ship's: Width Provide ship's: Draught		 Length is provided in form. Width is provided in form. Draught is provided in form.	 Pass Pass Pass	Ship's data by default are taken from AIS source.
C	**Route type:** Set one of the defined route types: Fastest Shortest		 Route type is provided in form. Fastest' type is set. Shortest' type is set.	 Pass	
D	**Ship type:** Set one of the defined ship types: Cargo Tanker Passenger All		 Ship type is provided in form. Cargo' type is set. Tanker' type is set. Passenger' type is set. All' type is set.	 Pass	 Deprecated.
3	In 'View' tab change visualization information regarding RC: Set Color. Set Opacity. Select 'Point'.		Visualization parameters are set. Color of drawn corridor is set. Opacity of drawn corridor is set. Visibility of the corridor points is set.	Pass Pass Pass Pass	The visualization parameters by default are filled by the system.

	Select 'Width'. Select 'Route'.		Visibility of the corridor width is set. Visibility of the corridor is set.	Pass Pass	
4	Accept data by OK.		Request for recommended corridor is sent.	Pass	

NAME	**Request for mesh.**
ID	REQUEST.TC.MESH.01
Refers to	16UC02.TS.SEND.REQUEST Send request
Description	Sending request for mesh network.
Tester	tester
Date	22.04.2020
Preconditions	Route planning module active.
Overall Pass Criteria	Request for corridor is sent.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	From 'Route planning' interface run *Hansa* tab.		*Hansa* route interface is shown.	Pass	
2	Click on drop-down menu next to *Mesh* button.		Submenu with mesh types is shown.	Pass	
3	Set one of the defined mesh types:		Selected mesh type is provided in field.	Pass	
	Cargo		Cargo' type is set.		
	Tanker		Tanker' type is set.		
	Passenger		Passenger' type is set.		
	All		All' type is set.		Deprecated.
4	Click on *Mesh* button at the bottom of the 'Route planning' window.		Request for mesh is sent.	Pass	

NAME	**Request for corridor from WEB module.**
ID	REQUEST.TC.CORRIDOR.03
Refers to	16UC02.TS.SEND.REQUEST Send request
Description	Sending request for recommended corridor from WEB module.
Tester	yano
Date	22.04.2020
Preconditions	A web browser with a working Hansa application.
Overall Pass Criteria	Request for corridor is sent.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	**Click on a ship on map to select it.**	SHIPSELECTION.TC.SELECTION.03	The ship's symbol is marked on the map with a colored rectangle envelope. The selected ship Name, IMO and MMSI numbers are in the 'Selected vessel' node.	Pass	
2	**Click on 'Create corridor' button.**		The new request window is open on the chart.	Pass	
3	**Set Longitude and Latitude in the 'start position' node.**		The coordinates of starting point are provided in the form.	Pass	By default, the current position of the selected ship is set.
A	If necessary, change the coordinates manually by clicking in fields and typing new digits or use one of the additional options:		The new coordinates of starting point are provided in the form.	Pass	

	B	Click on 'pick coordinates from map' button. Click on the map. or		The map is shown. The new coordinates of starting point are provided in the form.	Pass Pass	
	C	Click on 'find coordinates by name' button. Enter the port name or its Locode. Click on the 'Choose' button to select the port.		The new window with 'find coordinates' option is shown. A list of matching ports is displayed in the table. The new coordinates of starting point are provided in the form.	Pass Pass Pass	
4	A	**Set Longitude and Latitude in the 'stop position' node.** Enter the coordinates values manually by clicking in fields and typing new digits. or		The coordinates of endpoint are provided in the form. The coordinates of endpoint are provided in the form.	Pass Pass	
	B	Click on 'pick coordinates from map' button. Click on the map. or		The map is shown. The new endpoint coordinates are provided in the form.	Pass Pass	
	C	Click on 'find coordinates by name' button. Enter the destination port name or its Locode. Click on the 'Choose' button to select the port.		The new window with 'find coordinates' option is shown. A list of matching ports is displayed in the table. The new endpoint coordinates are provided in the form.	Pass Pass Pass	
5		**Enter ship's dimensions:** Provide ship's: Length Provide ship's: Width Provide ship's: Draught		Ship's dimensions are provided in the form. Length is provided in form. Width is provided in form. Draught is provided in form.	Pass Pass Pass Pass	Ship's data by default are taken from AIS source.

6	**Corridor type** Set one of the defined corridor types: Fastest Shortest		Corridor type is provided in the form. Fastest' type is set. Shortest' type is set.	Pass	
7	**Vessel type** Set one of the defined ship types: Cargo Tanker Passenger All		Ship type is provided in the form. Cargo' type is set. Tanker' type is set. Passenger' type is set. All' type is set.	Pass	Deprecated.
8	**Click on the colored box.** Choose a color, set the transparency and accept the selection.		A new window with a color palette is presented. The corridor color is set.	Pass Pass	
9	**Click on 'Create corridor' button.**		Request for recommended corridor is sent.	Pass	

NAME	**Request for mesh from WEB module.**
ID	REQUEST.TC.MESH.02
Refers to	16UC02.TS.SEND.REQUEST Send request
Description	Sending request for mesh from WEB module.
Tester	yano
Date	
Preconditions	A web browser with a working Hansa application.
Overall Pass Criteria	Request for mesh is sent.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	**Click on 'Create mesh' button.**		The new request window is open on the chart.	Pass	
2	**Set Longitude and Latitude in the 'south-west point' node.**		The coordinates of starting point are provided in the form.	Pass	By default, the coordinates of Baltic Sea are provided.
A	If necessary, change the coordinates manually by clicking in fields and typing new digits		The new coordinates of point are provided in the form.	Pass	
B	Click on 'pick coordinates from map' button.		The map is shown.	Pass	
	Click on the map.		The new coordinates of point are provided in the form.	Pass	
3	**Set Longitude and Latitude in the 'north-east point' node.**		The coordinates of endpoint are provided in the form.	Pass	
A	If necessary, enter the coordinates values manually by clicking in fields and typing new digits.		The new coordinates of point are provided in the form.	Pass	
B	Click on 'pick coordinates from map' button.		The map is shown.	Pass	
	Click on the map.		The new coordinates of point are provided in the form.	Pass	
4	**Vessel type** Set one of the defined ship types: Cargo Tanker Passenger All		Ship type is provided in the form. Cargo' type is set. Tanker' type is set. Passenger' type is set. All' type is set.	Pass	Deprecated.
5	**Click on the colored box.**		A new window with a color palette is presented.	Pass	

	Choose a color, set the transparency and accept the selection.		The mesh color is set.	Pass	
6	**Click on 'Create mesh' button.**		Request for recommended corridor is sent.	Pass	

16UC02.TS.DISPLAY.RC Display the corridor

NAME	**Fastest cargo' corridor visualisation.**
ID	DISPLAYRC.TC.VISUALISATION.01
Refers to	16UC02.TS.DISPLAY.RC Display the corridor
Description	A new layer with fastest recommended corridor for cargo ship is display in the MarSSIES.
Tester	tester
Date	22.04.2020
Preconditions	The ship selected. Hansa corridor menu open.
Overall Pass Criteria	The corridor is shown on the map.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	Send request with parameters:	REQUEST.TC.CORRIDOR.01 REQUEST.TC.CORRIDOR.02	Received response from HANSA service.	Pass	

A	In the Parameters/'Current position' node, coordinates are filled by the system from actual ship location.		Actual ship coordinates are set.	Pass	
B	In the Parameters/'Destination' node, set coordinates of destination port by use LOCODE button.		Destination coordinates are set.	Pass	
C	The ship's dimensions are filled from AIS source.		The ship Length, Width and Draught are set.	Pass	
D	Set *Type of route* to 'fastest'.		The 'fastest' type is shown.	Pass	
E	Set *Type of ship* to 'cargo'.		The 'cargo' type is shown.	Pass	
F	In 'View' tab visualization data are filled by the system..		Visualization parameters are set.	Pass	
G	Accept data by OK.		Request is sent without errors.	Pass	
2	System gets response.		New corridor line is created and shown on the map.	Pass	
3	Check the results: The corridor is displayed. The route does not go over land. The route goes through the navigations corridors.		The calculated route meets the basic requirements.	Pass Pass Pass Pass	

NAME	**Shortest cargo' corridor visualisation.**
ID	DISPLAYRC.TC.VISUALISATION.02
Refers to	16UC02.TS.DISPLAY.RC Display the corridor
Description	A new layer with shortest recommended corridor for cargo ship is display in the MarSSIES.
Tester	tester

Date	22.04.2020
Preconditions	The ship selected. Hansa corridor menu open.
Overall Pass Criteria	The corridor is shown on the map.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	Send request with parameters:	REQUEST.TC.CORRIDOR.01 REQUEST.TC.CORRIDOR.02	Received response from HANSA service.	Pass	
A	In the 'Current position' node, coordinates are filled by the system from actual ship location.		Actual ship coordinates are set.	Pass	
B	In the 'Destination' node, set coordinates of destination port by use LOCODE button.		Destination coordinates are set.	Pass	
C	The ship's dimensions are filled from AIS source.		The ship Length, Width and Draught are set.	Pass	
D	Set *Type of route* to 'shortest'.		The 'shortest' type is shown.	Pass	
E	Set *Type of ship* to 'cargo'.		The 'cargo' type is shown.	Pass	
F	In 'View' tab visualization data are filled by the system..		Visualization parameters are set.	Pass	
G	Accept data by OK.		Request is sent without errors.	Pass	
2	System gets response.		New corridor line is created and shown on the map.	Pass	
3	Check the results:		The calculated route meets the basic requirements.	Pass	
	The corridor is displayed.			Pass	
	The route does not go over land.			Pass	

	The route goes through the navigations corridors.			Pass	

NAME	**Fastest tanker' corridor visualisation.**
ID	DISPLAYRC.TC.VISUALISATION.03
Refers to	16UC02.TS.DISPLAY.RC Display the corridor
Description	A new layer with fastest recommended corridor for tanker ship is display in the MarSSIES.
Tester	tester
Date	22.04.2020
Preconditions	The ship selected. Hansa corridor menu open.
Overall Pass Criteria	The corridor is shown on the map.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	Send request with parameters:	REQUEST.TC.CORRIDOR.01 REQUEST.TC.CORRIDOR.02	Received response from HANSA service.	Pass	
A	In the 'Current position' node, coordinates are filled by the system from actual ship location.		Actual ship coordinates are set.	Pass	
B	In the 'Destination' node, set coordinates of destination port by use LOCODE button.		Destination coordinates are set.	Pass	
C	The ship's dimensions are filled from AIS source.		The ship Length, Width and Draught are set.	Pass	

D E F G	Set *Type of route* to 'fastest'. Set *Type of ship* to 'tanker'. In 'View' tab visualization data are filled by the system.. Accept data by OK.		The 'fastest' type is shown. The 'tanker' type is shown. Visualization parameters are set. Request is sent without errors.	Pass Pass Pass Pass	
2	System gets response.		New corridor line is created and shown on the map.	Pass	
3	Check the results: The corridor is displayed. The route does not go over land. The route goes through the navigations corridors.		The calculated route meets the basic requirements.	Pass Pass Pass Pass	

NAME	**Shortest tanker' corridor visualisation.**
ID	DISPLAYRC.TC.VISUALISATION.04
Refers to	16UC02.TS.DISPLAY.RC Display the corridor
Description	A new layer with shortest recommended corridor for tanker ship is display in the MarSSIES.
Tester	tester
Date	22.04.2020
Preconditions	The ship selected. Hansa corridor menu open.
Overall Pass Criteria	The corridor is shown on the map.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments

1	Send request with parameters:	REQUEST.TC.CORRIDOR.01 REQUEST.TC.CORRIDOR.02	Received response from HANSA service.	Pass	
A	In the 'Current position' node, coordinates are filled by the system from actual ship location.		Actual ship coordinates are set.	Pass	
B	In the 'Destination' node, set coordinates of destination port by use LOCODE button.		Destination coordinates are set.	Pass	
C	The ship's dimensions are filled from AIS source.		The ship Length, Width and Draught are set.	Pass	
D	Set *Type of route* to 'shortest'.		The 'shortest' type is shown.	Pass	
E	Set *Type of ship* to 'tanker'.		The 'tanker' type is shown.	Pass	
F	In 'View' tab visualization data are filled by the system..		Visualization parameters are set.	Pass	
G	Accept data by OK.		Request is sent without errors.	Pass	
2	System gets response.		New corridor line is created and shown on the map.	Pass	
3	Check the results: The corridor is displayed. The route does not go over land. The route goes through the navigations corridors.		The calculated route meets the basic requirements.	Pass Pass Pass Pass	

NAME	**Fastest passenger corridor visualisation.**
ID	DISPLAYRC.TC.VISUALISATION.05
Refers to	16UC02.TS.DISPLAY.RC Display the corridor

Description	A new layer with fastest recommended corridor for passenger ship is display in the MarSSIES.
Tester	tester
Date	22.04.2020
Preconditions	The ship selected. Hansa corridor menu open.
Overall Pass Criteria	The corridor is shown on the map.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	Send request with parameters:	REQUEST.TC.CORRIDOR.01 REQUEST.TC.CORRIDOR.02	Received response from HANSA service.	Pass	
A	In the 'Current position' node, coordinates are filled by the system from actual ship location.		Actual ship coordinates are set.	Pass	
B	In the 'Destination' node, set coordinates of destination port by use LOCODE button.		Destination coordinates are set.	Pass	
C	The ship's dimensions are filled from AIS source.		The ship Length, Width and Draught are set.	Pass	
D	Set *Type of route* to 'fastest'.		The 'fastest' type is shown.	Pass	
E	Set *Type of ship* to 'passenger'.		The 'passenger' type is shown.	Pass	
F	In 'View' tab visualization data are filled by the system..		Visualization parameters are set.	Pass	
G	Accept data by OK.		Request is sent without errors.	Pass	
2	System gets response.		New corridor line is created and shown on the map.	Pass	

3	Check the results: The corridor is displayed. The route does not go over land. The route goes through the navigations corridors.		The calculated route meets the basic requirements.	Pass Pass Pass Pass	

NAME	**Shortest passenger corridor visualisation.**
ID	DISPLAYRC.TC.VISUALISATION.06
Refers to	16UC02.TS.DISPLAY.RC Display the corridor
Description	A new layer with shortest recommended corridor for passenger ship is display in the MarSSIES.
Tester	tester
Date	22.04.2020
Preconditions	The ship selected. Hansa corridor menu open.
Overall Pass Criteria	The corridor is shown on the map.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	Send request with parameters:	REQUEST.TC.CORRIDOR.01 REQUEST.TC.CORRIDOR.02	Received response from HANSA service.	Pass	
A	In the 'Current position' node, coordinates are filled by the system from actual ship location.		Actual ship coordinates are set.	Pass	

B	In the 'Destination' node, set coordinates of destination port by use LOCODE button.		Destination coordinates are set.	Pass	
C	The ship's dimensions are filled from AIS source.		The ship Length, Width and Draught are set.	Pass	
D	Set *Type of route* to 'shortest'.		The 'shortest' type is shown.	Pass	
E	Set *Type of ship* to 'passenger'.		The 'passenger' type is shown.	Pass	
F	In 'View' tab visualization data are filled by the system..		Visualization parameters are set.	Pass	
G	Accept data by OK.		Request is sent without errors.	Pass	
2	System gets response.		New corridor line is created and shown on the map.	Pass	
3	Check the results: The corridor is displayed. The route does not go over land. The route goes through the navigations corridors.		The calculated route meets the basic requirements.	Pass Pass Pass Pass	

NAME	**Layer management.**
ID	DISPLAYRC.TC.VISUALISATION.09
Refers to	10UC05.TS.DISPLAY.RC Display the corridor
Description	On/off functions for corridor layer on map.
Tester	tester
Date	23.04.2020
Preconditions	Request for a ship is sent and response displayed on the map.
Overall Pass Criteria	Visualization on the map is changed.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	In the 'Route planning' module click on 'Hansa' tab.		List of corridors is shown.	Pass	
2	Select a corridor from the list and click on it.		The corridor is selected.	Pass	
3	Click on '*Properties*' icon.		New window with corridor parameters is shown.	Pass	
4	Click on 'View' tab in the request window.		Visualization options are shown.	Pass	The visualization parameters by default are filled by the system.
5	Change all necessary options by clicking on them: A. Color from palette. B. Set the opacity with the slider.		Color of drawn corridor is set. Opacity of drawn corridor is set.	Pass Pass	
6	On/off corridor layer on the map. A. Turn the 'Point' option on or off. B. Turn the 'Width' option on or off. C. Turn the 'Route' option on or off.		Visibility of the corridor points is set. Visibility of the corridor width is set. Visibility of the corridor is set.	Pass Pass Pass	
7	Accept data by OK.		Request with new parameters is sent. Visualization on the map is changed.	Pass	
8	Delete corridor. A. Choose a corridor to delete from the list in 'Hansa' tab. B. Click on '*Delete route*' icon. C. Click OK.		Corridor is selected. Warning is displayed. Corridor disappeared from map and list.	Pass Pass Pass	

16UC02.TS.WEBDISPLAY.RC Display the corridor on the Web map

NAME	**Fastest cargo' web corridor visualisation.**
ID	WEBDISPLAYRC.TC.VISUALISATION.01
Refers to	16UC02.TS.WEBDISPLAY.RC Display the corridor on the Web map
Description	A new layer with fastest recommended corridor for cargo ship is display in the Web application.
Tester	yano
Date	23.04.2020
Preconditions	A web browser with a working Hansa application. The ship selected. 'Create corridor' menu open.
Overall Pass Criteria	The corridor is shown on the map.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	Send request with parameters:	REQUEST.TC.CORRIDOR.03 SHIPSELECTION.TC.SELECTION.03	Received response from HANSA service.	Pass	
A	In the 'Start position' node, coordinates are filled by the system from actual ship location.		Actual ship coordinates are set.	Pass	

B	In the 'Stop position' node, set coordinates of destination port by use 'find coordinates by name' button.		Destination coordinates are set.	Pass	
C	The ship's dimensions are filled from AIS source.		The ship Length, Width and Draught are set.	Pass	
D	Set *Corridor type* to 'fastest'.		The 'fastest' type is shown.	Pass	
E	Set *Vessel type* to 'cargo'.		The 'cargo' type is shown.	Pass	
F	Set route color in the colored box.		The route color is shown.	Pass	
G	Accept data by *Create corridor*.		Request is sent without errors.	Pass	
2	System gets response.		New corridor line is created and shown on the map.	Pass	
3	Check the results: The corridor is displayed. The route does not go over land. The route goes through the navigations corridors.		The calculated route meets the basic requirements.	Pass Pass Pass Pass	

NAME	**Shortest cargo' web corridor visualisation.**
ID	WEBDISPLAYRC.TC.VISUALISATION.02
Refers to	16UC02.TS.WEBDISPLAY.RC Display the corridor on the Web map
Description	A new layer with shortest recommended corridor for cargo ship is display in the Web application.
Tester	yano
Date	23.04.2020

Preconditions	A web browser with a working Hansa application. The ship selected. 'Create corridor' menu open.
Overall Pass Criteria	The corridor is shown on the map.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	Send request with parameters:	REQUEST.TC.CORRIDOR.03 SHIPSELECTION.TC.SELECTION.03	Received response from HANSA service.	Pass	
A	In the 'Start position' node, coordinates are filled by the system from actual ship location.		Actual ship coordinates are set.	Pass	
B	In the 'Stop position' node, set coordinates of destination port by use 'find coordinates by name' button.		Destination coordinates are set.	Pass	
C	The ship's dimensions are filled from AIS source.		The ship Length, Width and Draught are set.	Pass	
D	Set *Corridor type* to 'shortest'.		The 'shortest' type is shown.	Pass	
E	Set *Vessel type* to 'cargo'.		The 'cargo' type is shown.	Pass	
F	Set route color in the colored box.		The route color is shown.	Pass	
G	Accept data by *Create corridor*.		Request is sent without errors.	Pass	
2	System gets response.		New corridor line is created and shown on the map.	Pass	
3	Check the results:		The calculated route meets the basic requirements.	Pass	
	The corridor is displayed.			Pass	
	The route does not go over land.			Pass	

	The route goes through the navigations corridors.			Pass	

NAME	**Fastest tanker' web corridor visualisation.**
ID	WEBDISPLAYRC.TC.VISUALISATION.03
Refers to	16UC02.TS.WEBDISPLAY.RC Display the corridor on the Web map
Description	A new layer with fastest recommended corridor for tanker ship is display in the Web application.
Tester	yano
Date	23.04.2020
Preconditions	A web browser with a working Hansa application. The ship selected. 'Create corridor' menu open.
Overall Pass Criteria	The corridor is shown on the map.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	Send request with parameters:	REQUEST.TC.CORRIDOR.03 SHIPSELECTION.TC.SELECTION.03	Received response from HANSA service.	Pass	
A	In the 'Start position' node, coordinates are filled by the system from actual ship location.		Actual ship coordinates are set.	Pass	
B	In the 'Stop position' node, set coordinates of destination port by use 'find coordinates by name' button.		Destination coordinates are set.	Pass	

C D E F G	The ship's dimensions are filled from AIS source. Set *Corridor type* to 'fastest'. Set *Vessel type* to 'tanker'. Set route color in the colored box. Accept data by *Create corridor*.		The ship Length, Width and Draught are set. The 'fastest' type is shown. The 'tanker' type is shown. The route color is shown. Request is sent without errors.	Pass Pass Pass Pass Pass	
2	System gets response.		New corridor line is created and shown on the map.	Pass	
3	Check the results: The corridor is displayed. The route does not go over land. The route goes through the navigations corridors.		The calculated route meets the basic requirements.	Pass Pass Pass Pass	

NAME	**Shortest tanker' web corridor visualisation.**
ID	WEBDISPLAYRC.TC.VISUALISATION.04
Refers to	16UC02.TS.WEBDISPLAY.RC Display the corridor on the Web map
Description	A new layer with shortest recommended corridor for tanker ship is display in the Web application.
Tester	yano
Date	23.04.2020
Preconditions	A web browser with a working Hansa application. The ship selected. 'Create corridor' menu open.

Overall Pass Criteria	The corridor is shown on the map.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	Send request with parameters:	REQUEST.TC.CORRIDOR.03 SHIPSELECTION.TC.SELECTION.03	Received response from HANSA service.	Pass	
A	In the 'Start position' node, coordinates are filled by the system from actual ship location.		Actual ship coordinates are set.	Pass	
B	In the 'Stop position' node, set coordinates of destination port by use 'find coordinates by name' button.		Destination coordinates are set.	Pass	
C	The ship's dimensions are filled from AIS source.		The ship Length, Width and Draught are set.	Pass	
D	Set *Corridor type* to 'shortest'.		The 'shortest' type is shown.	Pass	
E	Set *Vessel type* to 'tanker'.		The 'tanker' type is shown.	Pass	
F	Set route color in the colored box.		The route color is shown.	Pass	
G	Accept data by *Create corridor*.		Request is sent without errors.	Pass	
2	System gets response.		New corridor line is created and shown on the map.	Pass	
3	Check the results:		The calculated route meets the basic requirements.	Pass	
	The corridor is displayed.			Pass	
	The route does not go over land.			Pass	
	The route goes through the navigations corridors.			Pass	

NAME	**Fastest passenger' web corridor visualisation.**
ID	WEBDISPLAYRC.TC.VISUALISATION.05
Refers to	16UC02.TS.WEBDISPLAY.RC Display the corridor on the Web map
Description	A new layer with fastest recommended corridor for passenger ship is display in the Web application.
Tester	yano
Date	23.04.2020
Preconditions	A web browser with a working Hansa application. The ship selected. 'Create corridor' menu open.
Overall Pass Criteria	The corridor is shown on the map.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	Send request with parameters:	REQUEST.TC.CORRIDOR.03 SHIPSELECTION.TC.SELECTION.03	Received response from HANSA service.	Pass	
A	In the 'Start position' node, coordinates are filled by the system from actual ship location.		Actual ship coordinates are set.	Pass	
B	In the 'Stop position' node, set coordinates of destination port by use 'find coordinates by name' button.		Destination coordinates are set.	Pass	
C	The ship's dimensions are filled from AIS source.		The ship Length, Width and Draught are set.	Pass	
D	Set *Corridor type* to 'fastest'.		The 'fastest' type is shown.	Pass	

E F G	Set *Vessel type* to 'passenger'. Set route color in the colored box. Accept data by *Create corridor*.		The 'passenger' type is shown. The route color is shown. Request is sent without errors.	Pass Pass Pass	
2	System gets response.		New corridor line is created and shown on the map.	Pass	
3	Check the results: The corridor is displayed. The route does not go over land. The route goes through the navigations corridors.		The calculated route meets the basic requirements.	Pass Pass Pass Pass	

NAME	**Shortest passenger' web corridor visualisation.**
ID	WEBDISPLAYRC.TC.VISUALISATION.06
Refers to	16UC02.TS.WEBDISPLAY.RC Display the corridor on the Web map
Description	A new layer with shortest recommended corridor for passenger ship is display in the Web application.
Tester	yano
Date	23.04.2020
Preconditions	A web browser with a working Hansa application. The ship selected. 'Create corridor' menu open.
Overall Pass Criteria	The corridor is shown on the map.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	Send request with parameters:	REQUEST.TC.CORRIDOR.03 SHIPSELECTION.TC.SELECTION.03	Received response from HANSA service.	Pass	
A	In the 'Start position' node, coordinates are filled by the system from actual ship location.		Actual ship coordinates are set.	Pass	
B	In the 'Stop position' node, set coordinates of destination port by use 'find coordinates by name' button.		Destination coordinates are set.	Pass	
C	The ship's dimensions are filled from AIS source.		The ship Length, Width and Draught are set.	Pass	
D	Set *Corridor type* to 'shortest'.		The 'shortest' type is shown.	Pass	
E	Set *Vessel type* to 'passenger'.		The 'passenger' type is shown.	Pass	
F	Set route color in the colored box.		The route color is shown.	Pass	
G	Accept data by *Create corridor*.		Request is sent without errors.	Pass	
2	System gets response.		New corridor line is created and shown on the map.	Pass	
3	Check the results:		The calculated route meets the basic requirements.	Pass	
	The corridor is displayed.			Pass	
	The route does not go over land.			Pass	
	The route goes through the navigations corridors.			Pass	

NAME	**Web layer management.**
ID	WEBDISPLAYRC.TC.VISUALISATION.09
Refers to	10UC05.TS.DISPLAY.RC Display the corridor

Description	On/off functions for corridor layer on web map.
Tester	yano
Date	23.04.2020
Preconditions	Request for a ship is sent and response displayed on the map.
Overall Pass Criteria	Visualization on the map is changed.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	In the 'Corridors' module select a corridor from the list.		The corridor layer is selected.	Pass	
2	Click on 'edit corridor' icon.		New window with corridor parameters is shown.	Pass	
3	Change all necessary options and accept by 'Create corridor'.		Request with new parameters is sent. Visualization on the map is changed.	Pass	
4	Click on color box in the 'Corridors' module.		Visualization options are shown.	Pass	The visualization parameters by default are filled by the system.
5	Change all necessary options by clicking on them: A. Color from palette. B. Set the opacity with the slider. C. Click 'Choose'.		Color of drawn corridor is set. Opacity of drawn corridor is set. Visualization on the map is changed.	Pass Pass Pass	
6	In the 'Corridors' module turn the 'toggle visibility' option on or off.		The corridor layer on the map is shown/hide.	Pass	

7 A. B.	Delete corridor. Choose a corridor to delete from the list in 'Corridoes' module. Click on '*Delete corridor*' icon.		Corridor is selected. Corridor disappeared from map and list.	Pass Pass	

17UC03.TS.ROUTE.PLAN Route planning

NAME	**Manual route planning.**
ID	ROUTEPLAN.TC.PLANNING.01
Refers to	17UC03.TS.ROUTE.PLAN Route planning
Description	The vessel's voyage manual planning.
Tester	tester
Date	22.04.2020
Preconditions	ROUTE module active.
Overall Pass Criteria	New route is on the list.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	In 'Routes' tab click on '*New route*' icon.		New route window is shown.	Pass	
2	Provide route parameters:				
A	Route name		Route name is set.	Pass	
B	Default velocity		Default ship velocity is set.	Pass	
C	drag first point to ship		Option is marked.	Pass	
D	Click OK button.		Parameters window is closed.	Pass	

3	Use left 'Ctrl' +mouse to provide route way points.		The new route and waypoints are created and shown on the map. The new route name is on the list.	Pass	
4	Click on the route name on the list.		The list of waypoints with calculated data of their achievements is shown.	Pass	

NAME	**Route planning from RC.**
ID	ROUTEPLAN.TC.PLANNING.02
Refers to	17UC03.TS.ROUTE.PLAN Route planning
Description	The vessel's voyage plan adopted from Hansa RC response.
Tester	tester
Date	22.04.2020
Preconditions	ROUTE module active.
Overall Pass Criteria	New route is on the list.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	Send request for corridor.	REQUEST.TC.CORRIDOR.01 REQUEST.TC.CORRIDOR.02	New corridor line is created and shown on the map.	Pass	
2	In 'Route planning' module click on '*Hansa*' tab.		The new recommended corridor name is on the list.	Pass	
3	Double click on the corridor name.		The list of corridor waypoints is shown.	Pass	
4	Click on '*Properties*' icon.	16UC02.TS.DISPLAY.RC	New window with request parameters is shown.	Pass	

17UC03.TS.ROUTE.DISPLAY Display route

NAME	**Preview of RC and ship position.**
ID	ROUTEDISPLAY.TC.VIEW.01
Refers to	17UC03.TS.ROUTE.DISPLAY Display route
Description	Simultaneous display of ship's current position, recommended corridor and route plan (Official Passage Plan).
Tester	tester
Date	22.04.2020
Preconditions	AIS module active. Corridor for ship created. Official route exist in VTS system.
Overall Pass Criteria	Actual ship position and recommended corridor displayed on one map.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	Focus on the selected ship in AIS module. Click on '*Show on chart*' icon.	16UC02.TS.SEND.REQUEST	Actual ship position is shown on the map.	Pass	
2	Run the 'Route planning' module and click on 'Hansa' tab.		The ROUTE window with corridors is shown.	Pass	
3	Click on the corridor name and then click on 'Show on chart' icon.	16UC02.TS.DISPLAY.RC	The corridor line for ship is shown on the map.	Pass	
4	In the AIS module, hover your mouse over the ship name on the list.		The official route plan is shown on the map.	Pass	
5	In the 'Route planning' module select the mesh type and click on 'Mesh' button.	16UC02.TS.DISPLAY.MESH	The mesh for the type of ship is shown on the map.	Pass	
6	Change to other modules.		The corridor is always visible.	Pass	

NAME	**Preview of RC and ship position on web.**
ID	ROUTEDISPLAY.TC.VIEW.02
Refers to	17UC03.TS.ROUTE.DISPLAY Display route
Description	Simultaneous display of ship's current position, recommended corridor and mesh.
Tester	tester
Date	22.04.2020
Preconditions	A web browser with a working Hansa application.
Overall Pass Criteria	Actual ship position and recommended corridor displayed on one map.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	Select a ship.	SHIPSELECTION.TC.SELECTION.03	Actual ship position is shown on the map.	Pass	
2	Send RC request for the ship.	REQUEST.TC.CORRIDOR.03	The corridor line for ship is shown on the map.	Pass	
3	Send mesh request for the ship.	REQUEST.TC.MESH.02	The mesh for the type of ship is shown on the map.	Pass	
4	Compare manual and visual data.	16UC02.TS.WEBDISPLAY.RC 16UC02.TS.WEBDISPLAY.MESH	The corridor is always visible.	Pass	

17UC03.TS.ROUTE.TRACKING Tracking

NAME	**Route control by VTS operator.**
ID	TRACKING.TC.CONTROL.01
Refers to	17UC03.TS.ROUTE.TRACKING Tracking

Description	Manual and visual comparison of route and corridor data.
Tester	tester
Date	22.04.2020
Preconditions	User logged to the MarSSIES. Corridor for a ship created. Official route exist in VTS system.
Overall Pass Criteria	The operator observes, whether the selected ship moves within recommended corridor.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	Display all necessary information from modules (AIS, Route, Risk, recommended corridor, VTS and others).	ROUTEDISPLAY.TC.VIEW.01	All the necessary data is on the map. The operator observes, whether the selected ship moves within recommended corridor. Manual and visual comparison of route and corridor data.	Pass	

NAME	**Ship tracking.**
ID	TRACKING.TC.CONTROL.02
Refers to	17UC03.TS.ROUTE.TRACKING Tracking
Description	Tracking module takes into account AIS, RC and VTS data.
Tester	tester
Date	22.04.2020
Preconditions	User logged to the MarSSIES. Corridor for a ship created. Official route exist in VTS system.

Overall Pass Criteria	The system observes, whether the selected ship moves within recommended corridor.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	In 'Risk management' module click on '*Route control*' tab.		The 'Risk management' interface is open and a list of controlled routes is shown.	Pass	Ships and routes to tracking and control.
2	Click on '*New route control*' icon.		New window with route control parameters is shown.	Pass	
3	In 'Route' node click on '*Select Hansa Corridor*' button.		New window with active corridors is shown.	Pass	Chosen corridor way points coordinates from 'Route planning' module is send by the system to RISK module.
4	Select a corridor by clicking its name and OK.		The ship's name and MMSI number are filled in on the form. The permissible deviation is filled in with default value.	Pass	
5	Accept data by OK.		The new route control is added to the 'User routes' list. The system begins monitoring the ship coordinates with corridor and waypoints data.	Pass	

NAME	**A few ships tracking.**
ID	TRACKING.TC.CONTROL.03
Refers to	17UC03.TS.ROUTE.TRACKING Tracking

Description	Routes control for a few ships (observe ships list defined by operator).
Tester	tester
Date	22.04.2020
Preconditions	User logged to the MarSSIES. Corridors for ships created. Official routes exist in VTS system.
Overall Pass Criteria	The system observes, whether the selected ships moves within recommended corridor.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	In 'Risk management' module click on '*Route control*' tab.	TRACKING.TC.CONTROL.02	The 'Risk management' interface is open and a list of controlled routes is shown.	Pass	
2	Click on '*New route control*' icon.		New window with route control parameters is shown.	Pass	
3	In 'Route' node click on '*Select Hansa Corridor*' button.		New window with active corridors is shown.	Pass	
4	Select a corridor by clicking its name and OK.		The ship's name and MMSI number are filled in on the form. The permissible deviation is filled in with default value.	Pass	
5	Accept data by OK.		The new route control is added to the 'User routes' list. The system begins monitoring the ship coordinates with corridor and waypoints data.	Pass	
6	Repeat steps 2 to 5 to add several ships.		The system monitors the location and routes of several ships.	Pass	

NAME	**Deviations.**
ID	TRACKING.TC.CONTROL.04
Refers to	17UC03.TS.ROUTE.TRACKING Tracking
Description	Monitoring whether there are deviations that may endanger navigation safety.
Tester	tester
Date	22.04.2020
Preconditions	User logged to the MarSSIES. Corridors for ships created. Route control exist in the system.
Overall Pass Criteria	Positional anomaly detected.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	Set all necessary data for the system route control:				
A	Ship position.	SHIPPOSITION.TC.POSITION.01	Ship position is displayed.	Pass	
B	Recommended corridor.	16UC02.TS.DISPLAY.RC	Recommended corridor is displayed.	Pass	
C	Route control.	TRACKING.TC.CONTROL.02 TRACKING.TC.CONTROL.03	Route control' is set.	Pass	
2	Automatic route control checking out of corridor ship position, lateness on waypoints and planned route:			Pass	
A	The ship is outside of the recommended corridor.		Anomaly is detected. A ship's position has been detected outside the Recommended Corridor.	Pass	

B	The ship return on route.		A ship's position has been detected inside the Recommended Corridor.	Pass	

NAME	**Route update (new corridor).**
ID	TRACKING.TC.CONTROL.05
Refers to	17UC03.TS.ROUTE.TRACKING Tracking
Description	Update route and control params.
Tester	tester
Date	22.04.2020
Preconditions	User logged to the MarSSIES. Corridors for ships created. Route control exist in the system.
Overall Pass Criteria	New ccorridor line is displayed.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	In 'Route planning' module click on '*Hansa*' tab.		The list of recommended corridors names is shown.	Pass	
2	Double click on the corridor name.		The list of corridor waypoints is shown.	Pass	
3	Click on '*Properties*' icon.	16UC02.TS.DISPLAY.RC	New window with request parameters is shown.	Pass	
4	Send new request for the ship.	REQUEST.TC.CORRIDOR.01	New corridor line is displayed.	Pass	
5	Set new 'Route control' in 'Risk management' module.	TRACKING.TC.CONTROL.02	New corridor data is taken into account and tracking by the system.	Pass	

17UC03.TS.MONITORING.DEVIATIONS Monitoring

NAME	**Warnings for operator.**
ID	MONITORING.TC.CORRIDOR.01
Refers to	17UC03.TS.MONITORING.DEVIATIONS Monitoring
Description	Warning of the operator of detected anomalies and irregularities in the behavior of the ship.
Tester	tester
Date	22.04.2020
Preconditions	Route control active. Anomalies detected.
Overall Pass Criteria	Notifications of detected deviations warn the operator.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	In main system window check modules tabs.		New notifications are marked with '!' (symbol next to module name).	Pass	
2	In main system window click on triangle icon of system alerts.		The list of system alerts is displayed. Route control notification is on the list.	Pass	
3	Click on message from 'Risk management' module.		Description of the warning is shown.	Pass	
4	In 'Risk management' module click on '*Route control*' tab.	TRACKING.TC.CONTROL.02 TRACKING.TC.CONTROL.03 TRACKING.TC.CONTROL.04	If the system has detected an anomaly, there is a warning triangle icon in front of 'User routes'.	Pass	

5	Click on 'User routes' name.		The list of defined routes under control is shown. Alerted route is marked by triangle icon.	Pass	If the ship return on route, the triangle icon disappeared.
6	Click on the route name and next on the 'Show on chart' icon.		The map range is focused on the alerting ship.	Pass	

18UC04.REPORTS Reports

NAME	**Cargo ships report.**
ID	REPORTS.TC.MOST.FREQUENTLY.01
Refers to	18UC04.REPORTS Reports
Description	The information of the corridors used by cargo ships on the area.
Tester	tester
Date	22.04.2020
Preconditions	User logged to the system.
Overall Pass Criteria	Mesh for cargo ships is displayed.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	Send request for cargo mesh.	REQUEST.TC.MESH.01 16UC02.TS.DISPLAY.MESH	Cargo mesh is displayed.	Pass	

NAME	**Tanker ships report.**
ID	REPORTS.TC.MOST.FREQUENTLY.02
Refers to	18UC04.REPORTS Reports
Description	The information of the corridors used by tanker ships on the area.
Tester	tester
Date	22.04.2020
Preconditions	User logged to the system.
Overall Pass Criteria	Mesh for tanker ships is displayed.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	Send request for tanker mesh.	REQUEST.TC.MESH.01 16UC02.TS.DISPLAY.MESH	Tanker mesh is displayed.	Pass	

NAME	**Passenger ships report.**
ID	REPORTS.TC.MOST.FREQUENTLY.03
Refers to	18UC04.REPORTS Reports
Description	The information of the corridors used by passenger ships on the area.
Tester	tester
Date	22.04.2020
Preconditions	User logged to the system.
Overall Pass Criteria	Mesh for passenger ships is displayed.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	Send request for passenger mesh.	REQUEST.TC.MESH.01 16UC02.TS.DISPLAY.MESH	Passenger mesh is displayed.	Pass	

NAME	**Ships report from web.**
ID	REPORTS.TC.MOST.FREQUENTLY.04
Refers to	18UC04.REPORTS Reports
Description	The information of the corridors used by ships on the area in web application.
Tester	yano
Date	22.04.2020
Preconditions	A web browser with a working Hansa application.
Overall Pass Criteria	Mesh for filtered ships type is displayed.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1	Send request for mesh.	REQUEST.TC.MESH.02 16UC02.TS.WEBDISPLAY.MESH	Selected ship type mesh is displayed.	Pass	

18UC04.EXPORT.REPORT Export report

NAME	**Export to file.**
ID	EXPORTREPORT.TC.FILE.01
Refers to	18UC04.EXPORT.REPORT Export report
Description	Export of generated reports to file.
Tester	tester
Date	22.04.2020
Preconditions	Generated report.
Overall Pass Criteria	The report has been sent to a file.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1 A B C	Set all necessary elements of the report: Mesh Recommended corridor AIS history	18UC04.REPORTS Reports	All necessary report items are visible on the map.	Pass	
2	In main the system window click on MarSSIES tab.		The system menu is shown.	Pass	
3	Click on 'Print' option.		New window for print chart is displayed.	Pass	
4	Set: print area frame size print option on 'file' view option		Print parameters of report are set.	Pass	
5	Click Print button.		The report has been sent to a file.	Pass	

NAME	**Export to printer.**
ID	EXPORTREPORT.TC.PRINTER.02
Refers to	18UC04.EXPORT.REPORT Export report
Description	Export of generated reports to printer.
Tester	tester
Date	22.04.2020
Preconditions	Generated report.
Overall Pass Criteria	The report has been sent to a printer.
Status	Pass

Step/Activity	Action/Description of steps	Related scenarios	Expected result	PASS/FAIL	Comments
1 A B C	Set all necessary elements of the report: Mesh Recommended corridor AIS history	18UC04.REPORTS Reports	All necessary report items are visible on the map.	Pass	
2	In main the system window click on MarSSIES tab.		The system menu is shown.	Pass	
3	Click on 'Print' option.		New window for print chart is displayed.	Pass	
4	Set: print area frame size print option on 'Printer' view option		Print parameters of report are set.	Pass	
5	Click Print button.		The report has been sent to a printer.	Pass	

3.2 Fault reports

During internal tests, no irregularities were found in the operation of the system. There are currently no reported bugs that need to be corrected and checked through re-testing and regression testing.

All elements of the application worked correctly. Test cases completed have resulted in the expected results.

Error list and fix activities:

- The 'all' option for ship types is not working - has been deprecated; no scheduled test cases for mesh and corridors for these options have been performed.
- Quality elements have been omitted, they will be in a separate document.
- Due to new data upload, interruption in the operation of websites on 23-27.04.2020 has been detected ('Internal Server error 500' message). After completing the data entry on the server, communication was restored and all modules worked correctly.

The differences in planned and conducted tests result from the change of query parameters from the early and final phase of the project, modernization works and improvements of the adopted solutions are still ongoing.

4 Conclusions

This testing phase involved interoperability of applications and services, data exchange and graphic presentation. Qualitative assessment of the results obtained will take place in the next stage, where users dealing with ship traffic administration will check the reliability of the information received and their usefulness in everyday use.

4.1 Reported errors

After completing the tests, the following technical remarks appear:

- There are still lines over the land.
- The 'fastest' route option contains unnecessary points that often extend the route. The generated corridor has numerous bends / rapid course changes.

These comments did not affect the technical functioning of the MarSSIES system, but only the image of the quality of the presented data.

4.2 List of necessary corrections

In connection with the above-mentioned remarks, the following actions are proposed that should be taken to eliminate them or minimize adverse effects:

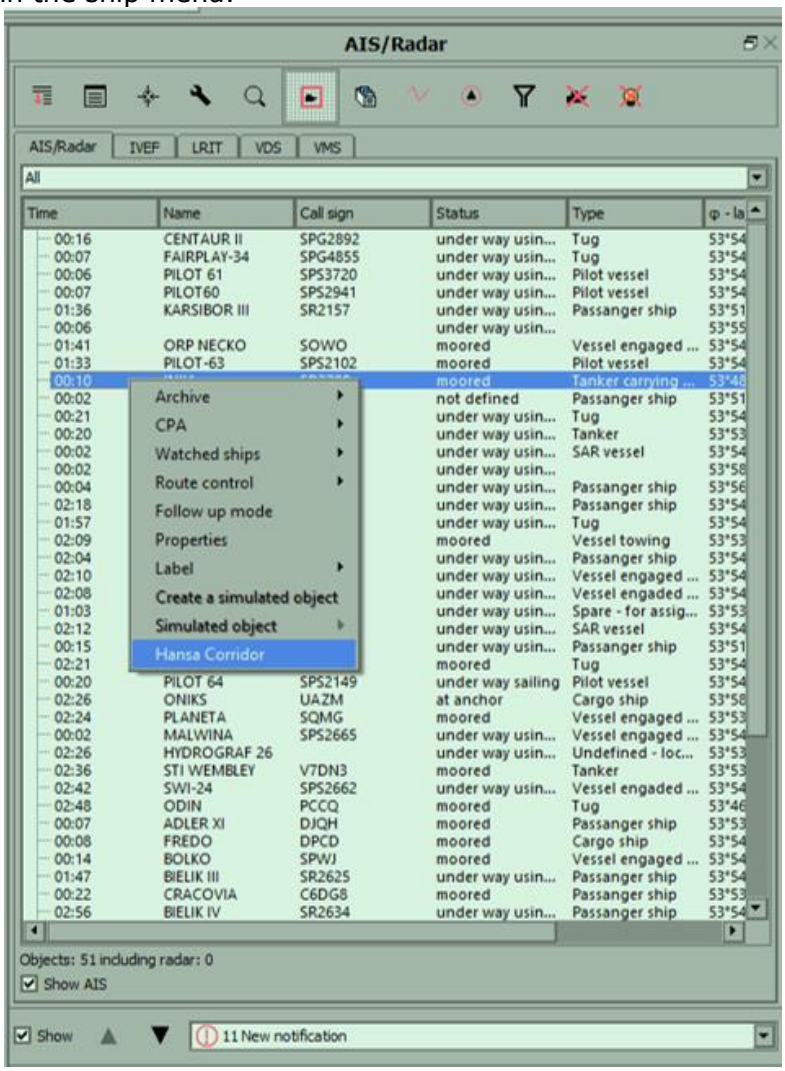
- The knots network of the mesh should be even more dense. This will eliminate unnecessary route points and bring the starting points of the route closer to the ship.
- The algorithm choosing the fastest route should be modify (this option contains lots of unnecessary waypoints).

5 Attachments

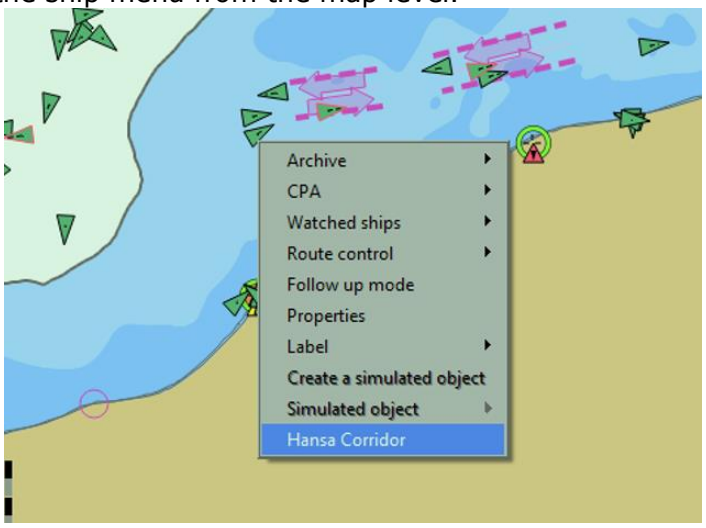
5.1 The MarSSIES system

Screens from the production MarSSIES system with working new modules.

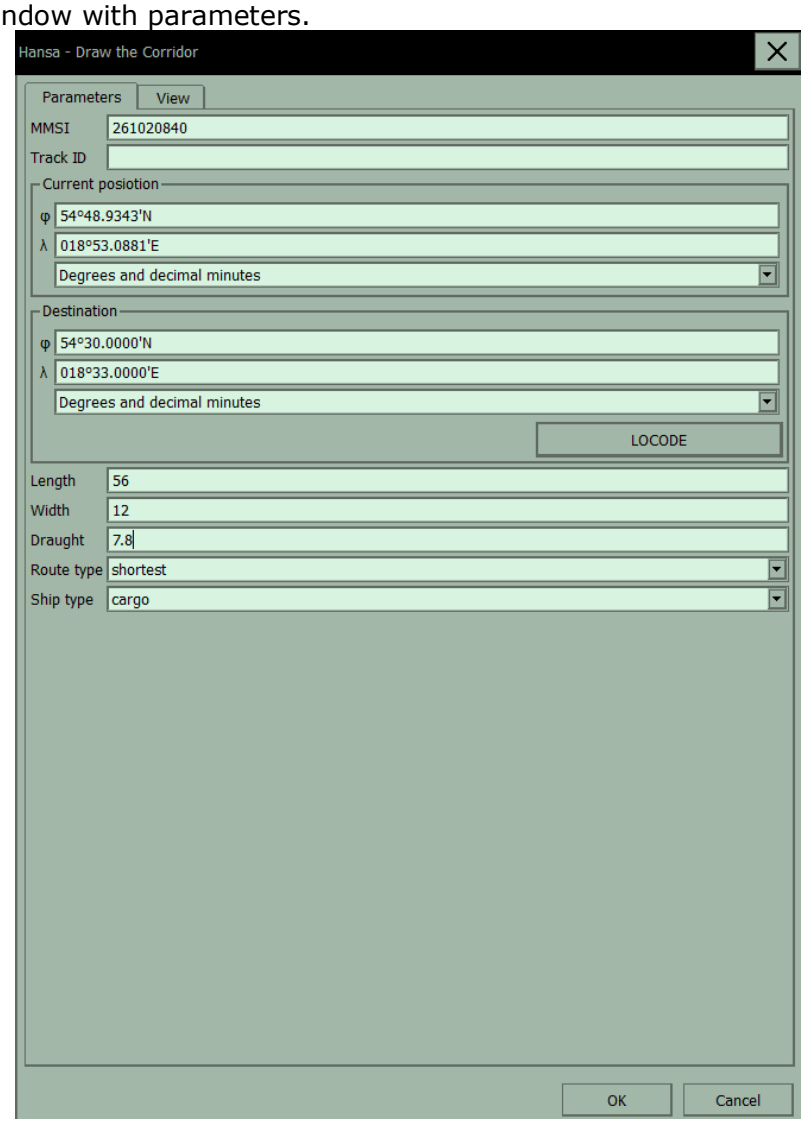
A. New option in the ship menu.



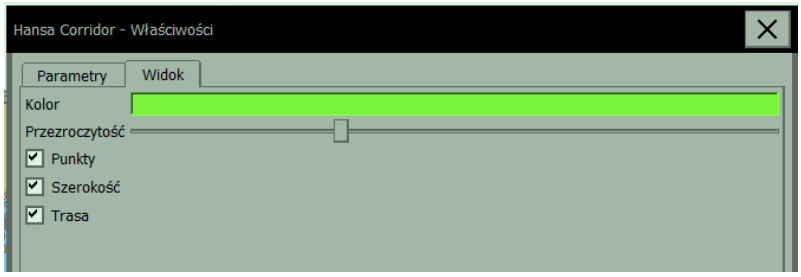
B. New option in the ship menu from the map level.



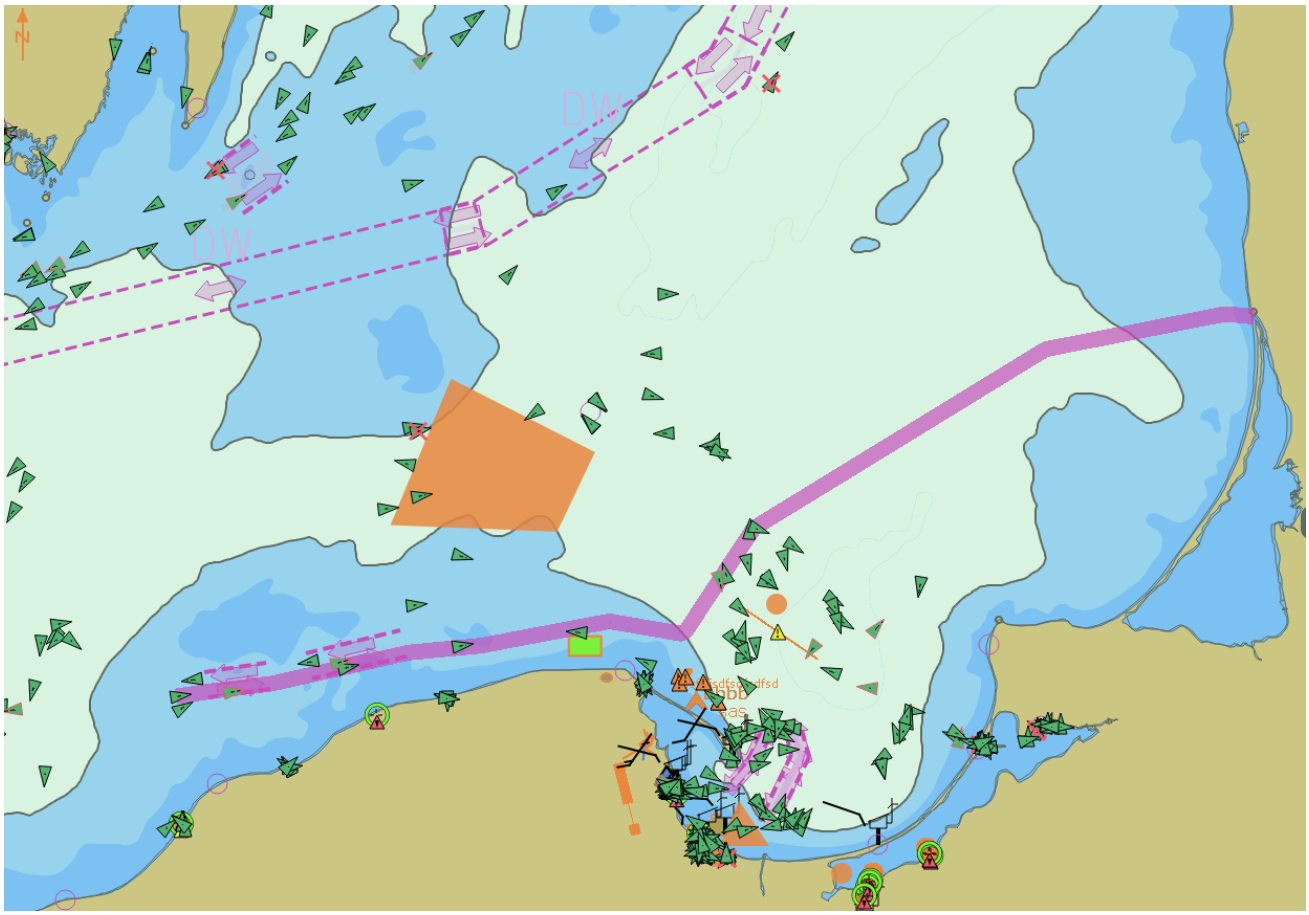
C. Request window with parameters.

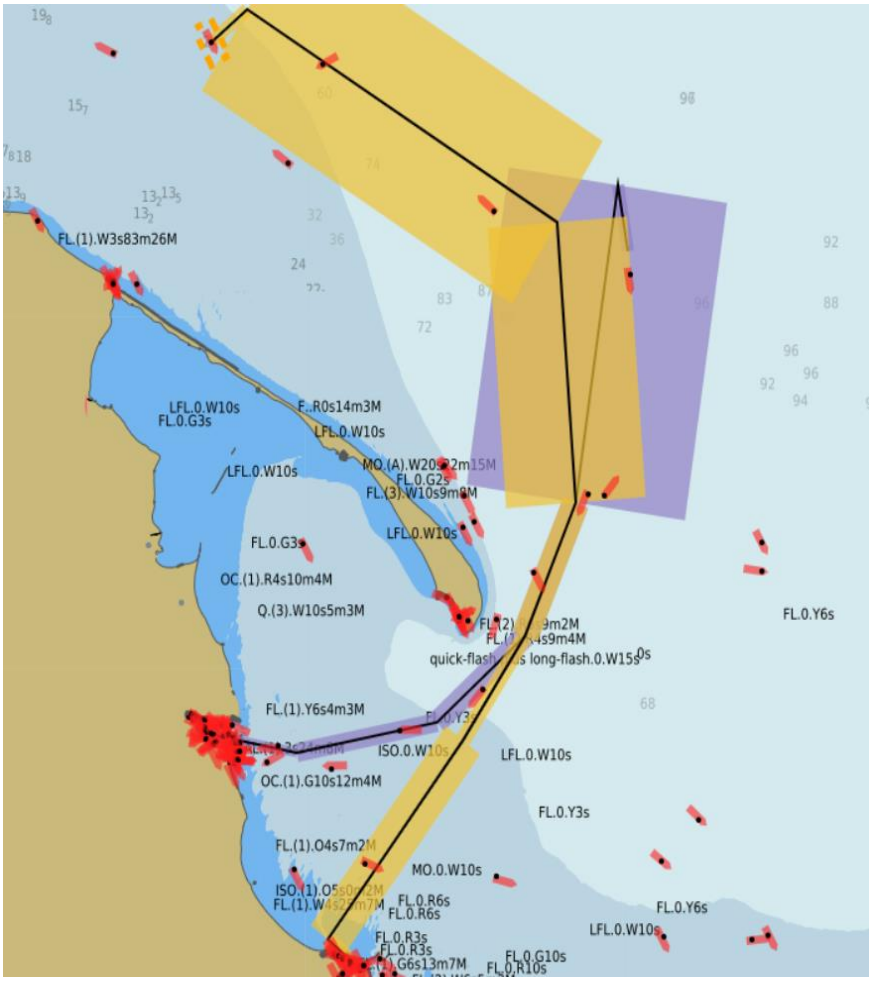


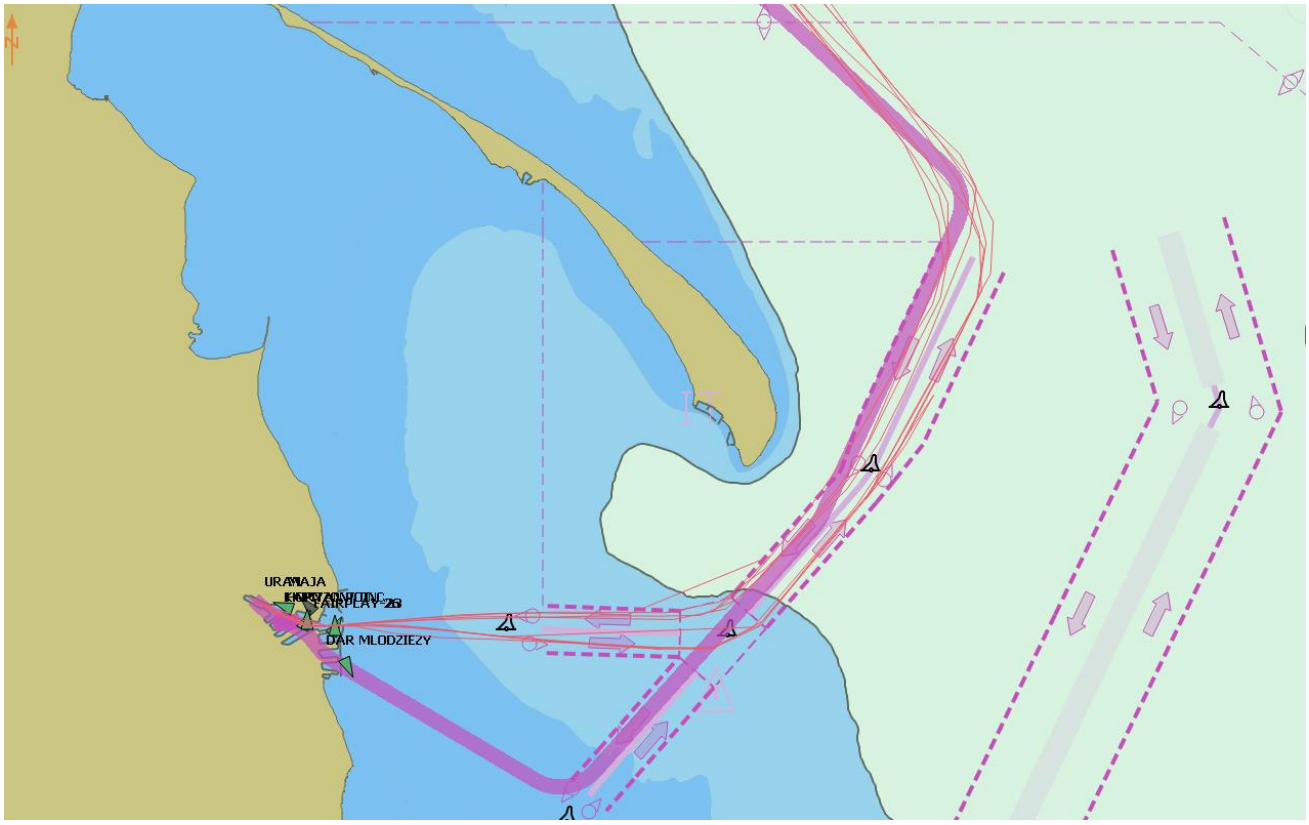
D. Request window with View options.



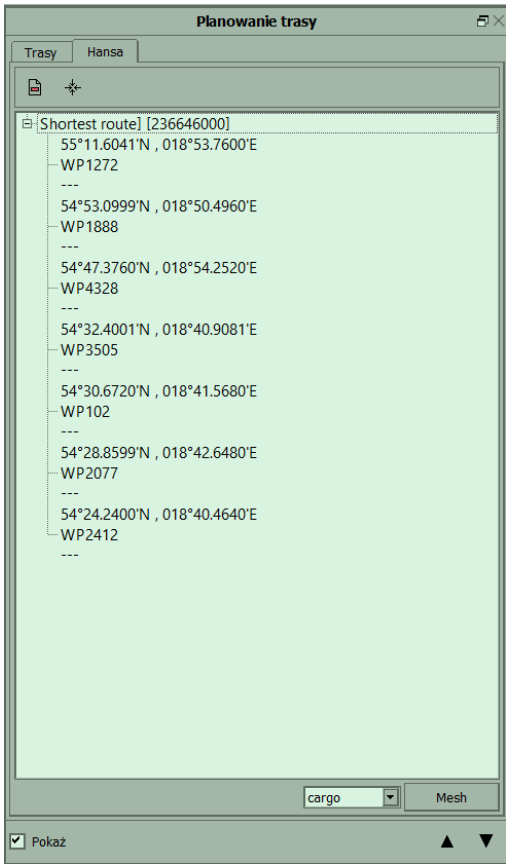
E. Sample of corridors.



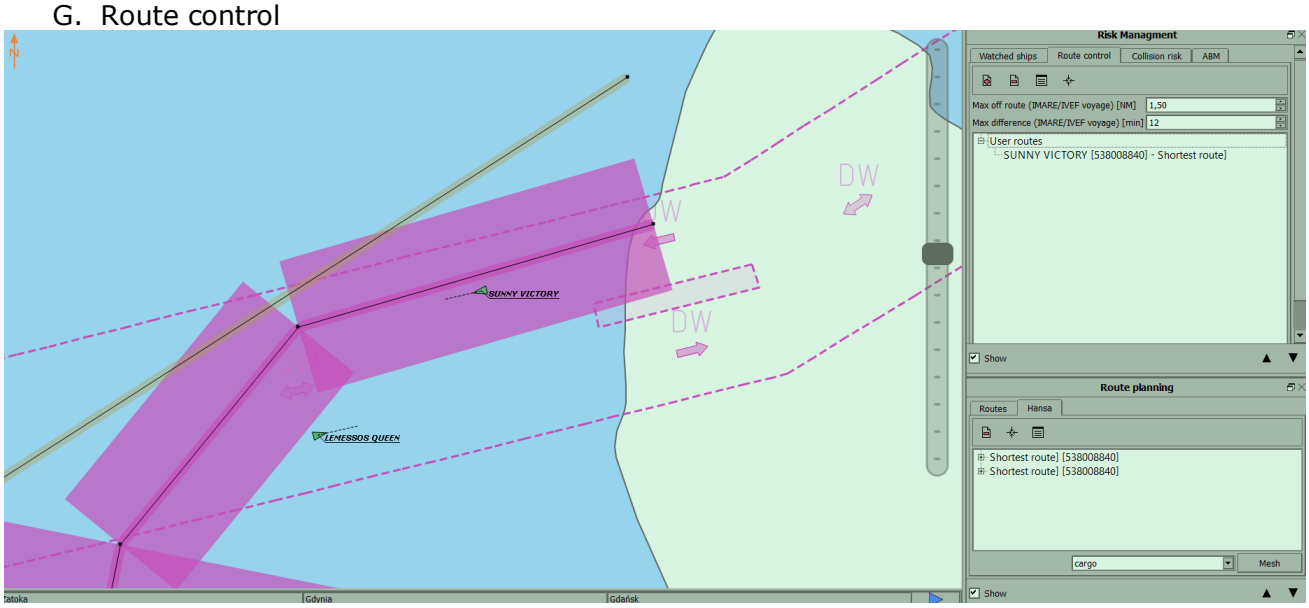

FL.(1).W3s83m26M
LFL.0.W10s
FL.0.G3s
F..R0s14m3M
LFL.0.W10s
LFL.0.W10s
MO.(A).W20s
FL.0.G2s
FL.(3).W10s9m
LFL.0.W10s
FL.0.G3s
OC.(1).R4s10m4M
Q.(3).W10s5m3M
FL.0.Y6s
quick-flash long-flash.0.W15s
FL.(1).Y6s4m3M
ISO.0.W10s
LFL.0.W10s
OC.(1).G10s12m4M
FL.0.Y3s
FL.(1).O4s7m2M
MO.0.W10s
FL.0.R6s
FL.0.R6s
FL.0.Y6s
LFL.0.W10s
FL.0.R3s
FL.0.R3s
FL.0.G10s
FL.0.R10s

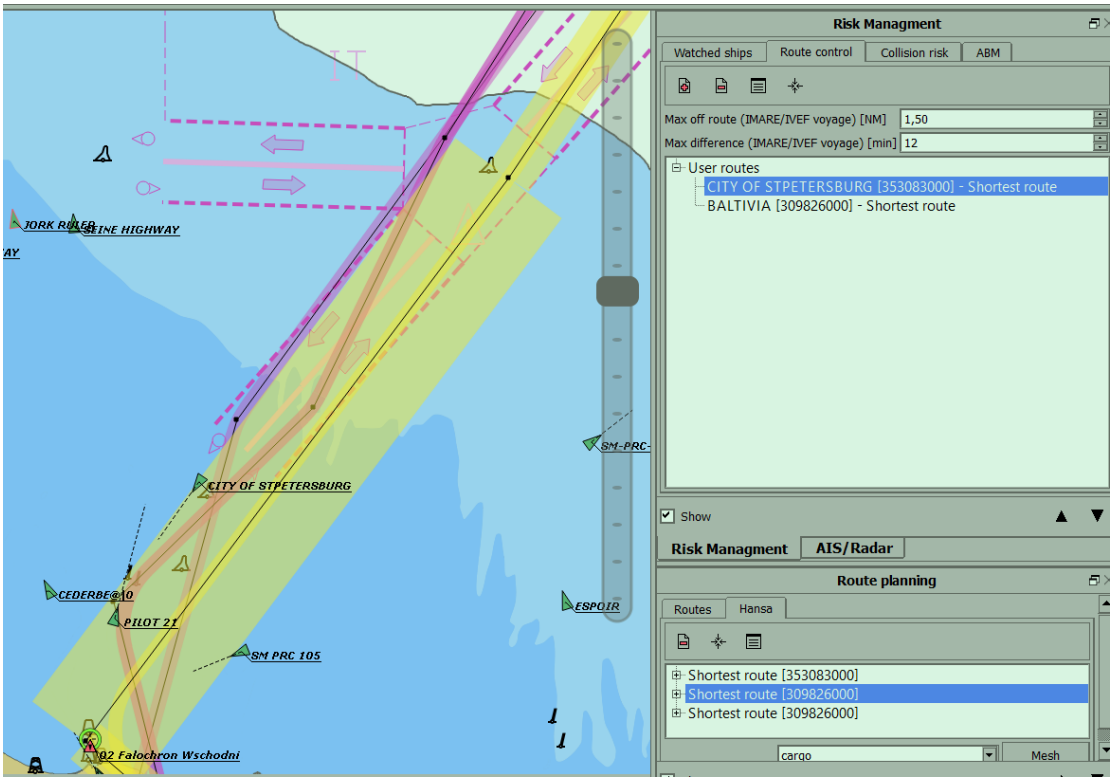

DAR MLODZIEZY

F. Route planning using Hansa recommended corridor.

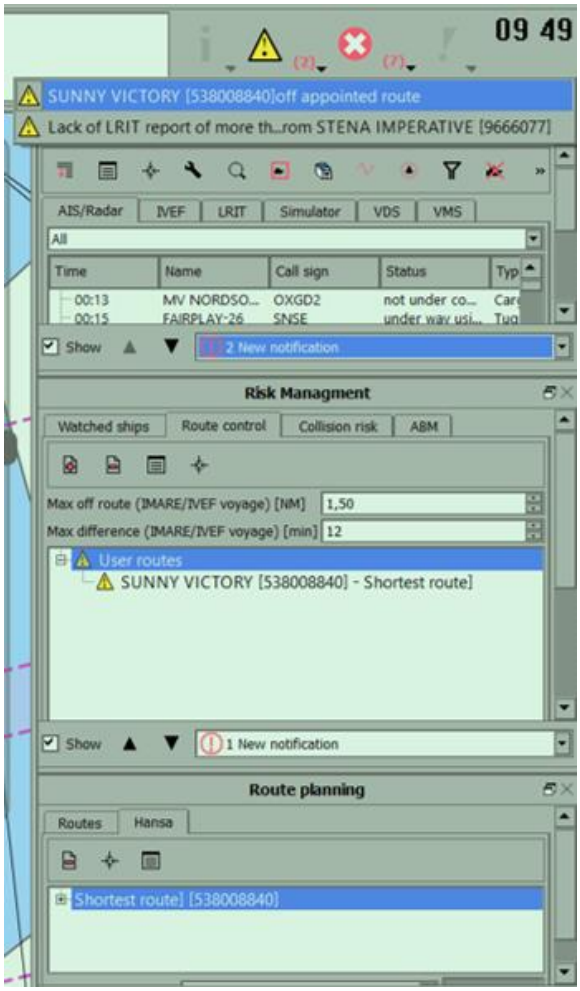


G. Route control

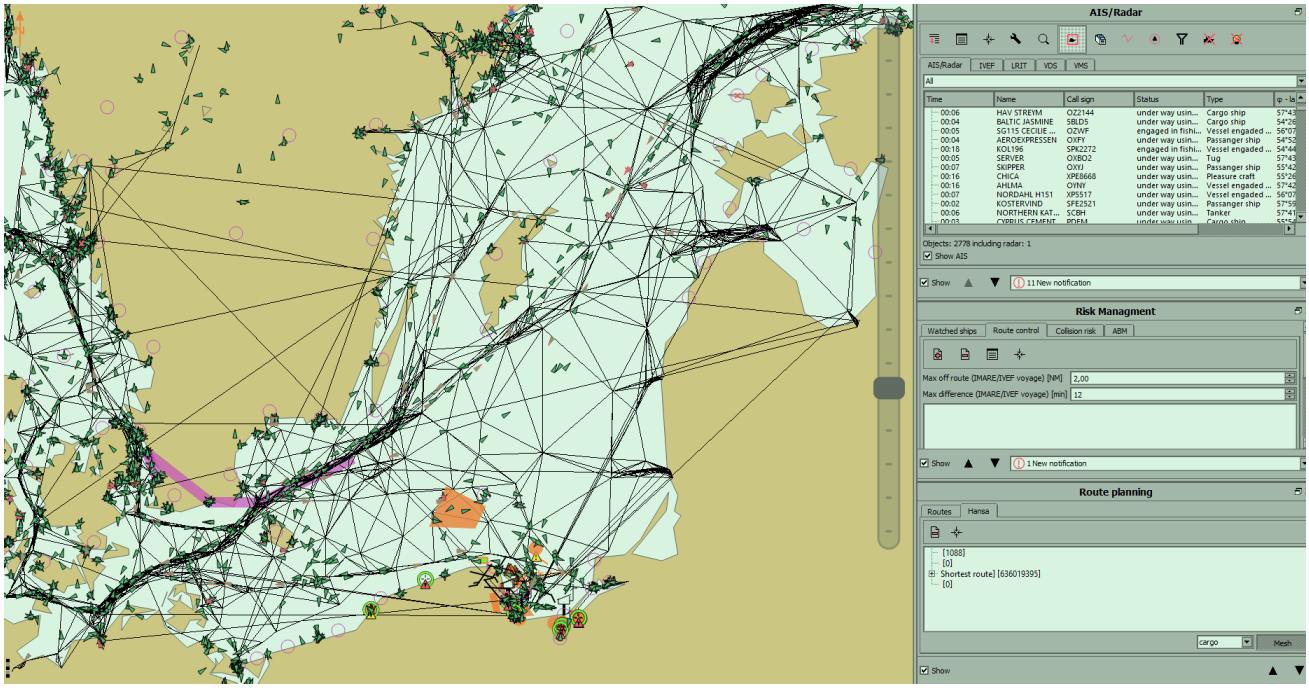


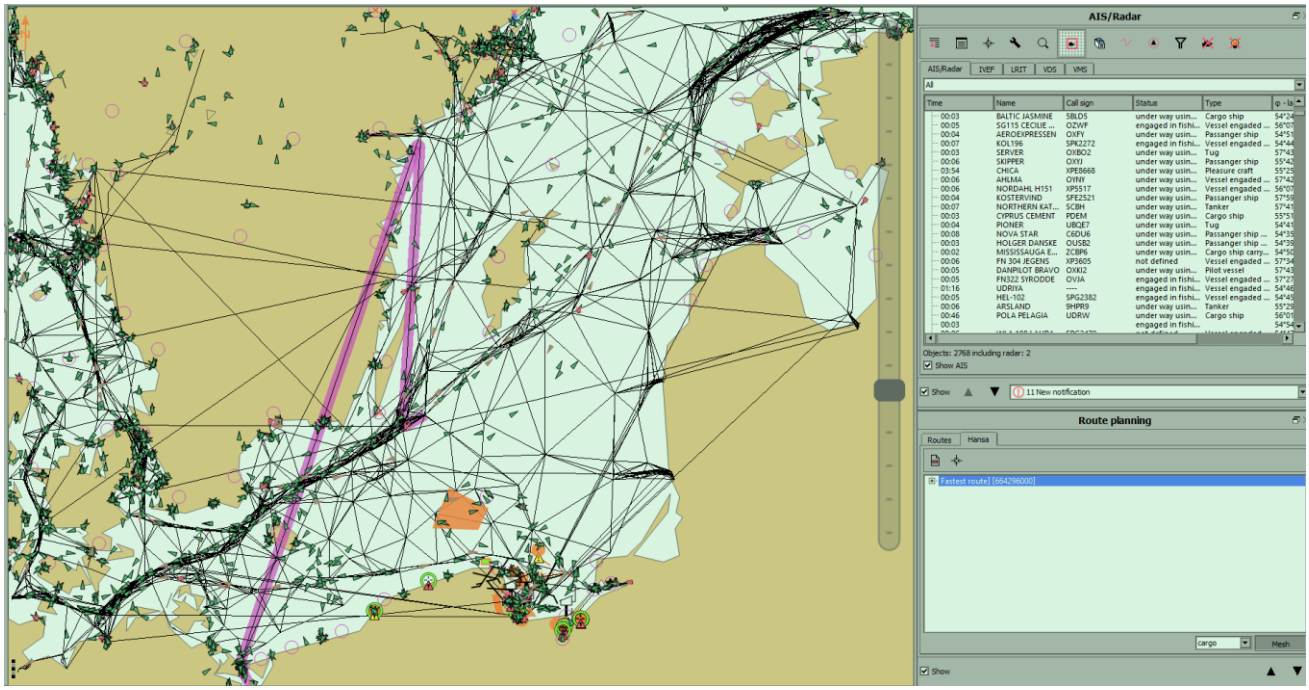


H. System warnings



I. Sample of mesh.

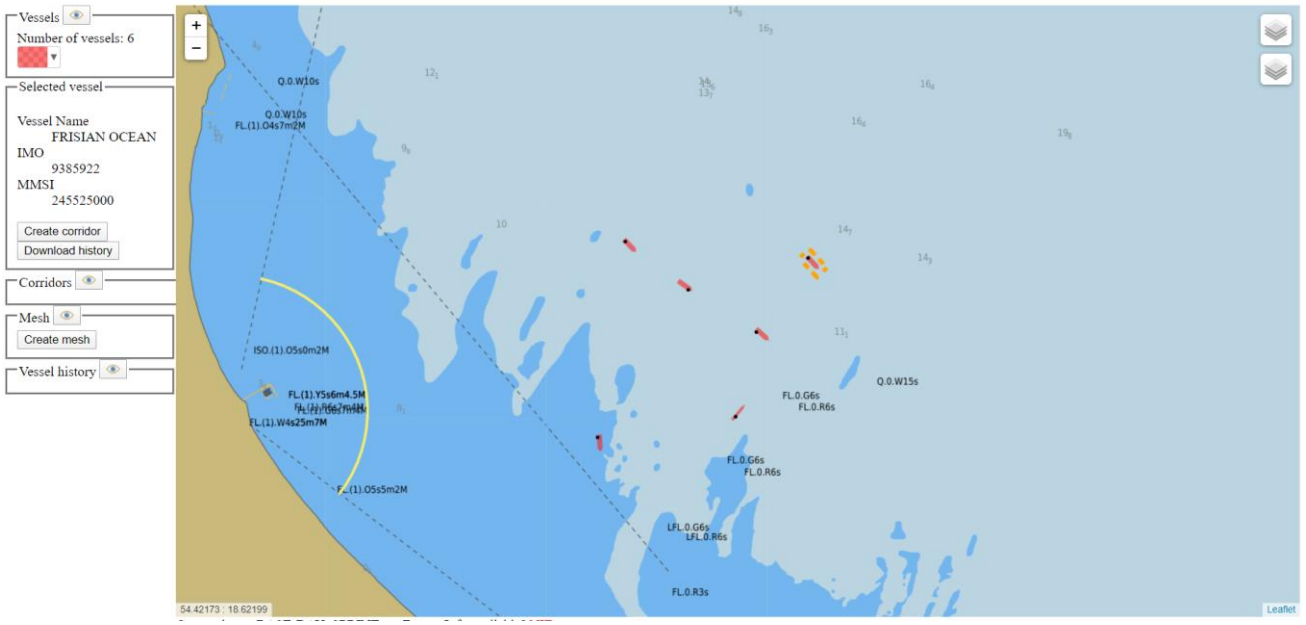




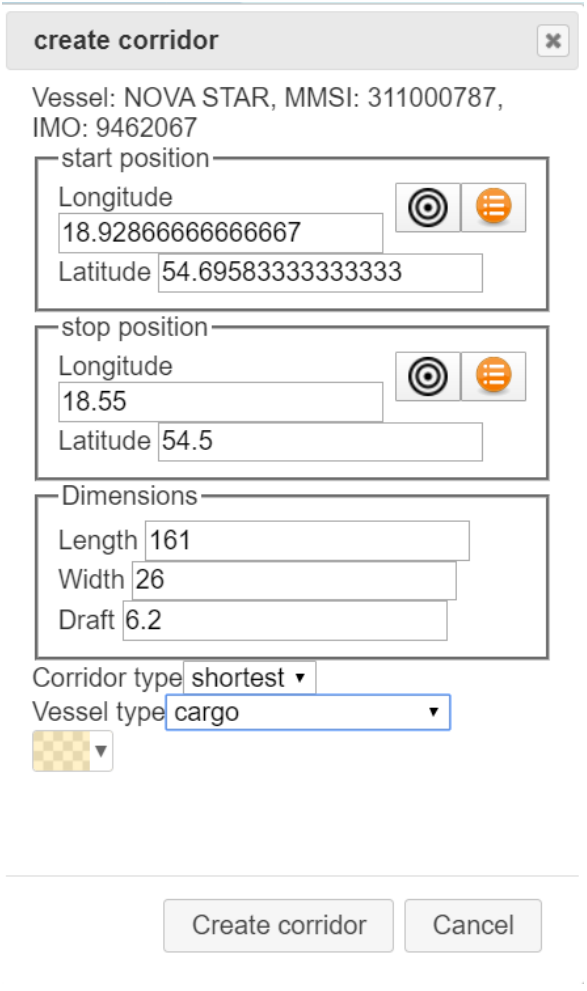
5.2 SPRINT Web application

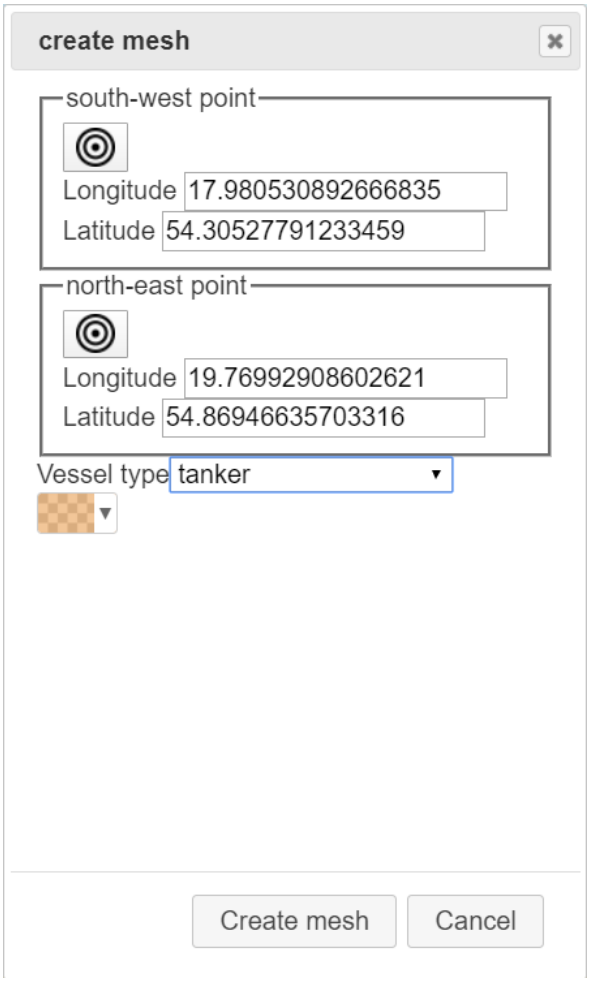
Screens from the dedicated Web application.

A. Selected ship.

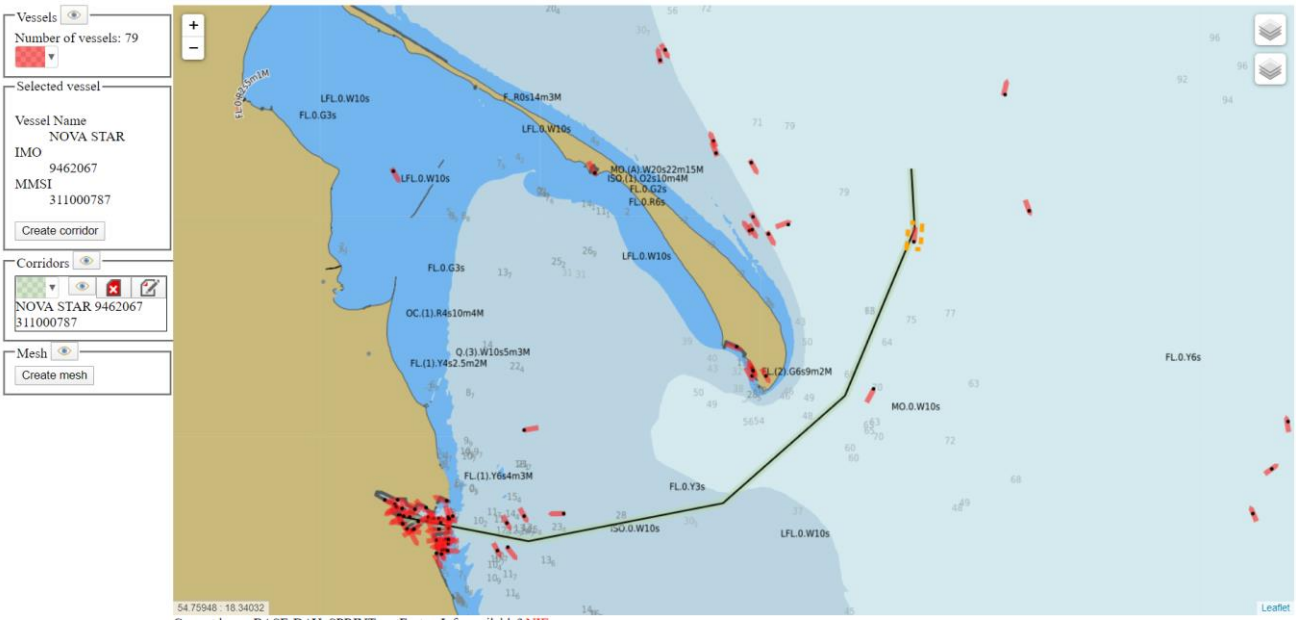


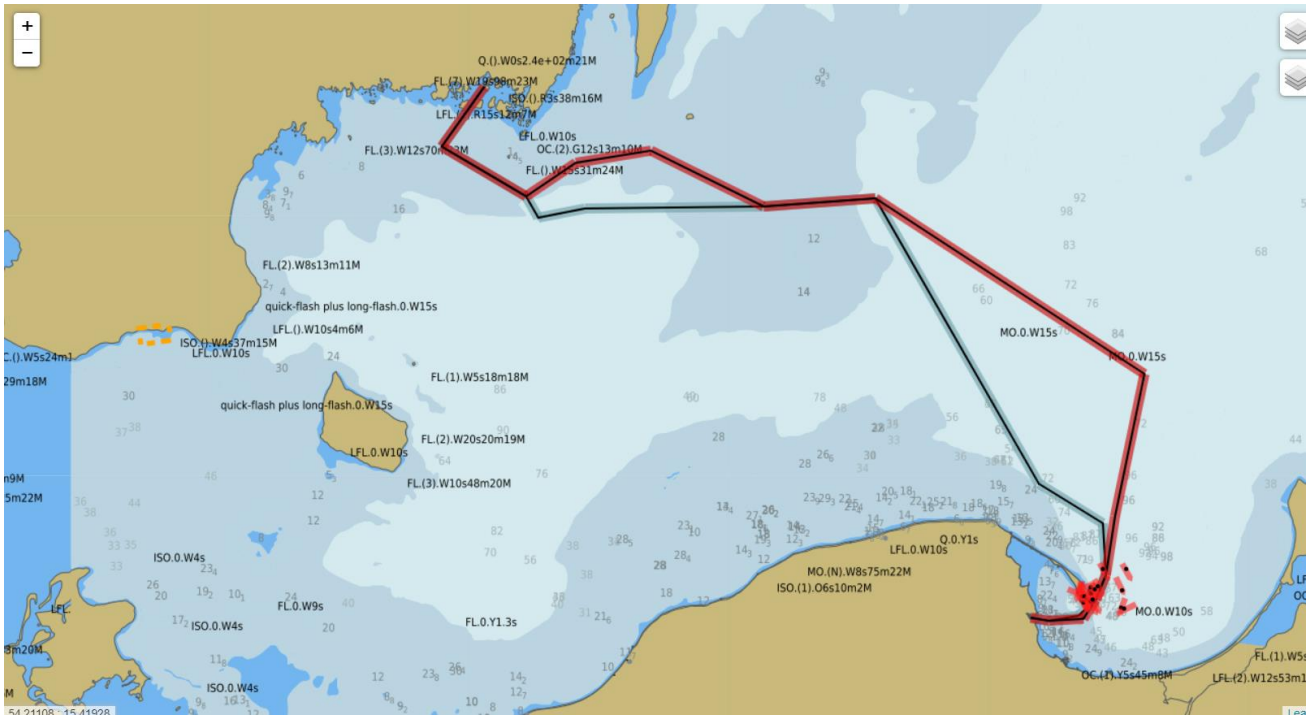
B. Request window.

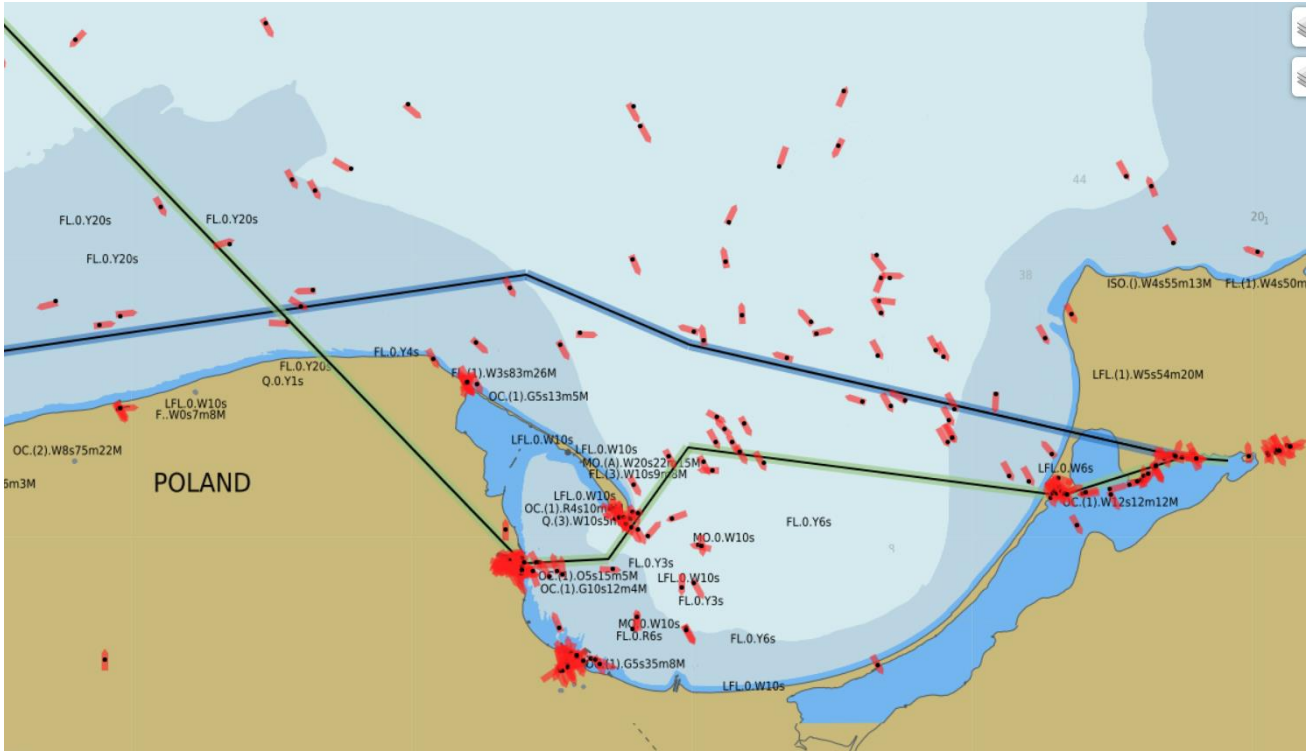


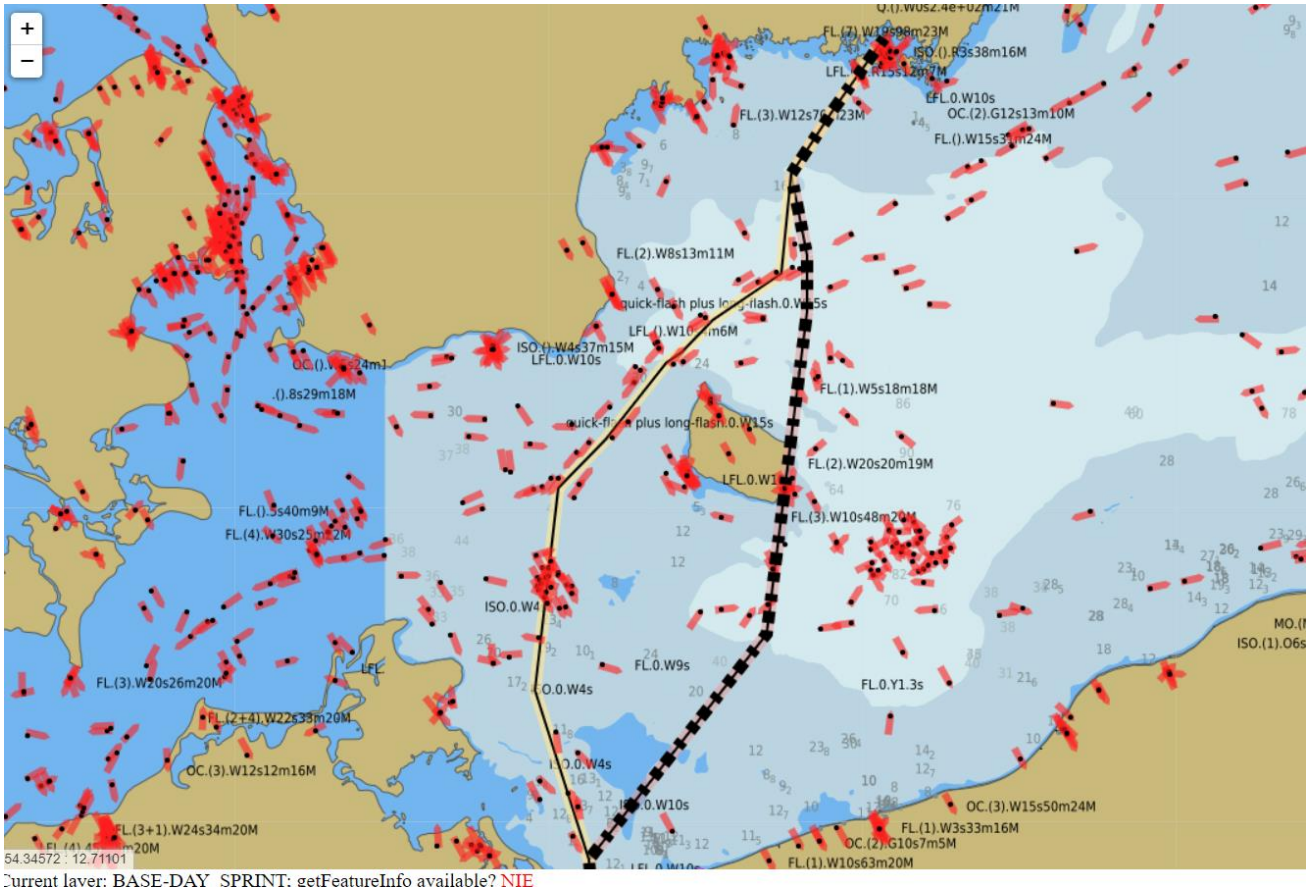


C. Sample of corridors.



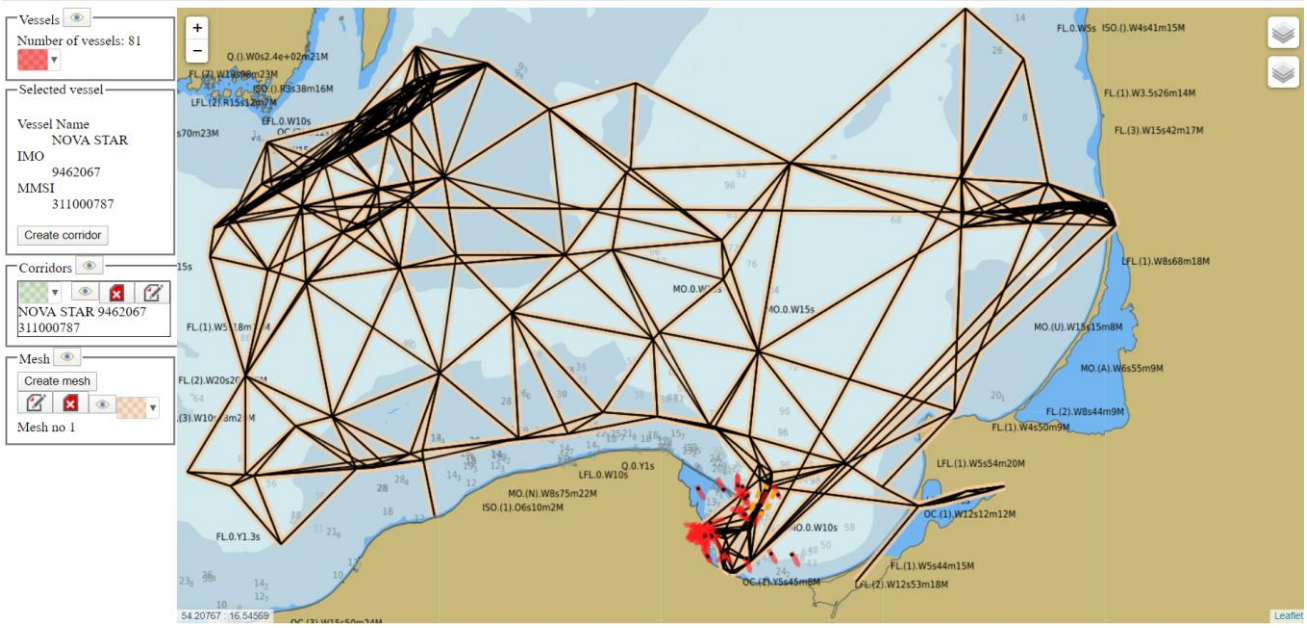

Q.().W0s2.4e+02m21M
ISO.().R3s38m16M
LFL.0.W10s
OC.(2).G12s13m10M
FL.(2).W8s13m11M
quick-flash plus long-flash.0.W15s
LFL.().W10s4m6M
ISO.().W4s37m15M
LFL.0.W10s
FL.(1).W5s18m18M
quick-flash plus long-flash.0.W15s
FL.(2).W20s20m19M
LFL.0.W10s
FL.(3).W10s48m20M
ISO.0.W4s
FL.0.W9s
ISO.0.W4s
FL.0.Y1.3s
ISO.0.W4s
MO.0.W15s
LFL.0.W10s
Q.0.Y1s
MO.(N).W8s75m22M
ISO.(1).O6s10m2M
MO.0.W10s
OC.(7).Y5s45m8M
LFL.(2).W12s53m1

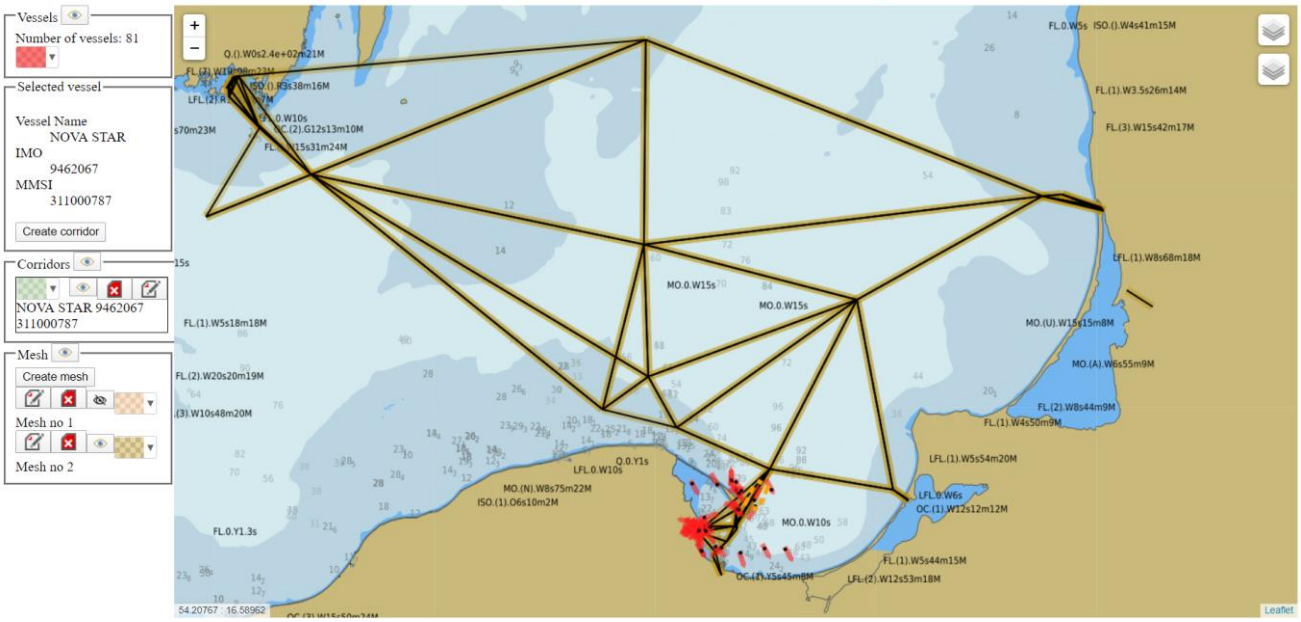

FL.0.Y20s
FL.0.Y20s
FL.0.Y20s
FL.0.Y4s
FL.0.Y20s
Q.0.Y1s
LFL.0.W10s
F..W0s7m8M
OC.(2).W8s75m22M
POLAND
OC.(1).G5s13m5M
LFL.0.W10s
LFL.0.W10s
OC.(1).R4s10m
Q.(3).W10s5m
MO.0.W10s
FL.0.Y6s
FL.0.Y3s
LFL.0.W10s
FL.0.Y3s
FL.0.R6s
FL.0.Y6s
LFL.0.W10s
ISO.().W4s55m13M
LFL.(1).W5s54m20M
LFL.0.W6s



Current layer: BASE-DAY_SPRINT: getFeatureInfo available? NIE

D. Sample of mesh.




Vessels
Number of vessels: 81
Selected vessel
Vessel Name
NOVA STAR
IMO
9462067
MMSI
311000787
Create corridor
Corridors
NOVA STAR 9462067
311000787
Mesh
Create mesh
Mesh no 1
Mesh no 2
Leaflet