BLAST

Bringing Land and Sea Together

The Interreg IVB North Sea Region Programme

Investing in the future by working together for a sustainable and competitive region

BLAST WP5
User Requirements

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Background

Based on the new territorial programme for the period 2007 – 2013, a new INTERREG IV B program has been developed in the various regions within EU. The North Sea Region has developed an Operational Program with four different priorities. One of the priorities is on “Promoting the Sustainable management of Our Environment”, and this Project Description for BLAST project is primarily referring to this priority. But this project will also refer another priority, namely on innovation.

The BLAST project is primarily linked to the intervention 2.1 “Sustainable development of the coastal land and sea areas through integrated coastal zone management.”

User Requirement Objectives

The User Requirement presented in BLAST WP5, Task 2 shall formulate the frame for a monitoring system for the North Sea are aimed for shore based users.

References

Very important references for this document are the E-navigation documents under development by IMO and IALA and their sources for building up shore based user requirements. See the reference list in Annex . This also includes the on-going work with STIRES under the SafeSeaNet umbrella and the documents here under.

Contents

Introduction

Shortly after the contract was agreed the WP 5 lead partner prepared for a Kick Off meeting to inform the partners and delegates about the work to be performed and what the WP5 lead partner expect from the delegates to complete the work that is planned for in this WP.

The WP5 Lead Partner prepared for and arranged a kick off meeting 28.10.2009 in Bergen. The project plan for BLAST was presented and a more detailed discussion took place for WP5.
A work strategy for Task 2 was studied in detail and after some discussion the group agreed in the following:

1. Design a questionnaire for investigation of users' needs in our sector.
2. Distribute the questionnaire to the partners' delegates for further distribution to relevant bodies at country level.
3. To arrange a user's workshop to discuss and develop users' needs further.

Based on the input from the questionnaires and the workshop a Users' Needs document was created. The User Needs presented in STIRES specifications are also taken into consideration

Purpose of the document

To set up a monitoring system for the North Sea Region we need to know something about the technology that is available or available in the short future. Further, we need to know the purpose and we need to know the user needs so she/he can fulfil the purpose.

In fact there is not a distinct difference between these two parts. Therefore, they will be described side by side.

User requirement

In the work with the User Requirement survey we discovered soon that the time available was not sufficient to have a real knowledge base to design a well-defined operational Monitoring System for the North Sea Area.

To achieve a more elaborated system we decided to take a closer look into the E-navigation work that is going on in IMO and IALA to improve the outcome of this project. This will give us the ability to test some of the E-navigation functionality in an early stage and the experience

gathered can be used to improve the final E-navigation specification. The STIRES system is also under development and improvement, which will be an important reference to our work

In this document we will concentrate on the shore based user needs.

Application for demonstration

The requirements presented in this document will be a basic source for a technical system specification that is needed to build a proper functional demonstrator as the finale task in this work package. The Monitoring system shall be an "eye" into the BLAST covered area: the BLAST-eye.

The BLAST-eye shall:

- Be capable of providing a rapid reply to any request
- Be based upon communication between BLAST Members by electronic means
- Support message implementation in XML
- Be flexible: be able to include new requirements stemming from, new services requirements, new members in the network, etc.
- Be easy to use, with users able to quickly become familiar with its procedures
- Ensure the security of communications.

Reference work and documents

The reference documents and work for this document is first of all the work done in the WP 5 group and the Questionnaire survey prepared and completed by the group. It was also arranged a Workshop 3.2.2010 to discuss the outcome of the survey and create proposals to have a more elaborated system for demonstration. The development of STIRES will also become a valuable source for knowledge, new ideas and serve as a reference.

Relevant documents

The following sources have been used to more or less extent to formulate this document:

- User Requirement Survey performed by WP5
- BLAST Project description
- Directive 2002/59/EC on a EC Vessel Traffic Monitoring & Information System
- Directive 2000/59/EC on Port Réceptions Facilites
- Directive 95/21/EC and 2001/106/EC Port State Control
- Regulation 725/2004/EC on international security provisions, especially, the SOLAS and MARPOL Conventions
- NAV 56 Report w/Annexes (released)
- SafeSeaNet system documents
- STIRES Specification.

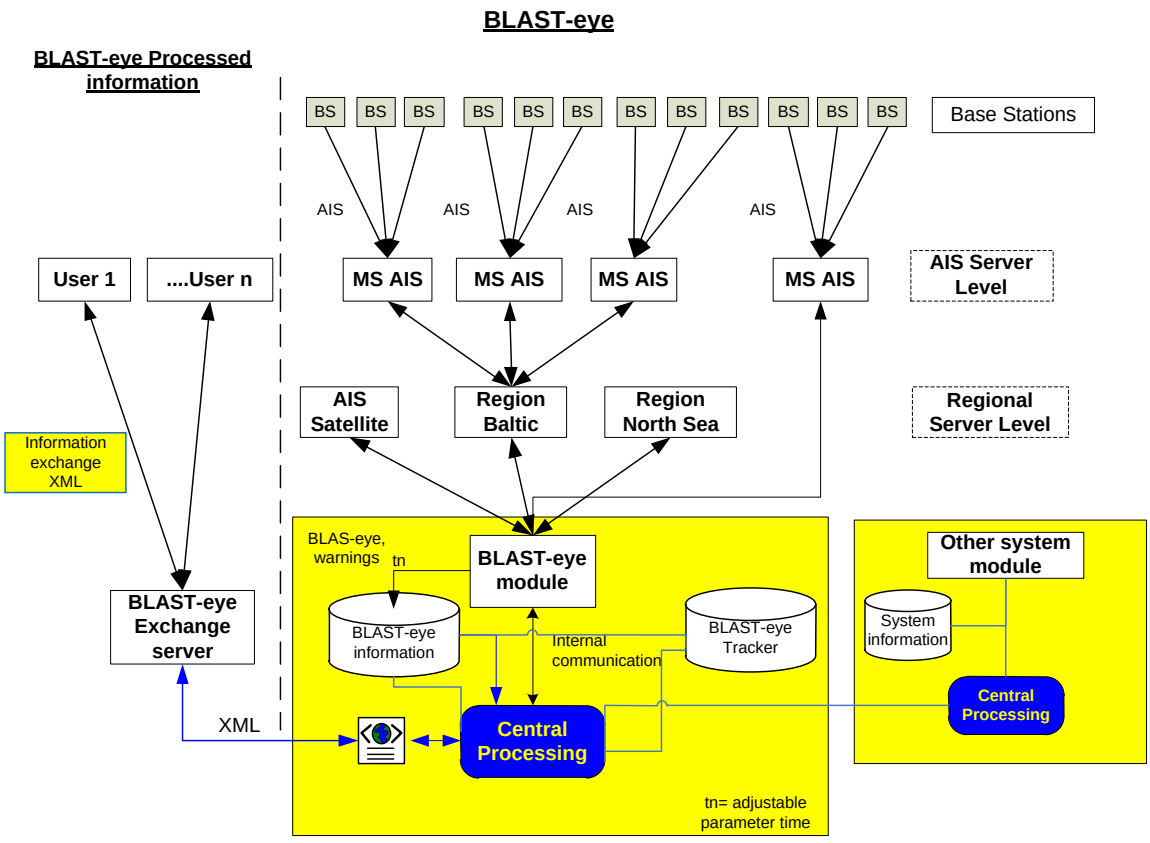
Comments to the specification

The outcome of the survey indicated that users prefer to combine data from several sources into a functional information package that can support the actual task the individual user is performing, and to be able to pick each information element and create a user adapted information package.

That might be creating boundaries that marks dangerous areas, indicate Economic Zones, security areas around oil platforms, coastal zone activity like fish farm information, etc., - giving information as to whether they are on the move or not and other static/dynamic information.

System concept

The monitoring system layout is in general as shown below.



The BLAST-eye module can exchange information with either the regional server or the national server.

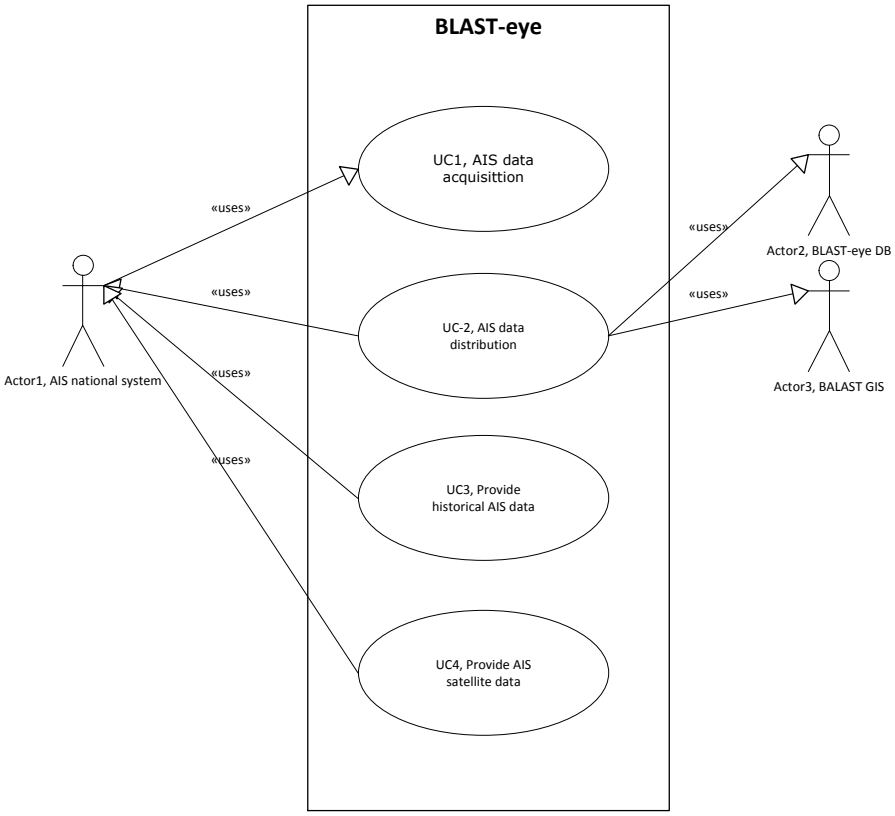
The AIS system can be arranged to form a short range identification and tracking system that will be of great value for the shore based user. In our project we will be able to introduce the satellite AIS information for the first time. The system will also be connected to a graphical information system with harmonized ENCs for the actual region. From this system we will be able to produce a ENC based graphical WEB presentation for the end user.

High Level User Requirements

In BLAST-eye the requirements will be to do data acquisition and distribution of ordinary AIS data (terrestrial AIS) and satellite AIS. The AIS data can come from the national AIS network or from a regional server. The BLAST-eye will be a regional system by itself that cover the BLAST region.

The great benefit of the BLAST-eye system will be the use of harmonized ENCs as the new position references in our region.

Described by use case technique the high level user requirements will be:



Overall BLAST-eye Use Case

AIS data acquisition and distribution

The BLAST-eye system will act as a central network hub within the different AIS networks in the region (here; those that participate in the demonstrator). The module will therefore be able to acquire AIS data from regional or national AIS networks in order to create a more comprehensive vessel traffic image for the BLAST area. The AIS will be stored for later use. In parallel the system will redistribute the acquired AIS data to other participating network in the region. BLAST-GIS will also receive AIS data to be able to provide a graphical traffic image based on harmonized ENCs.

It may also be possible to transfer AIS information to other users on request. This is a matter of Access rights.

BLAST-eye System requirements nomenclature

The requirement nomenclature that is used to identify different requirements in the BLAST-eye system will have the following format:

- XXX-XX.YYY.ZZZ.###
- Where:
  - XXX-XX: Recalls the category of requirement.
  - YYY: Recalls the Work Package Task
  - ZZZ: Recalls the function or body the requirement is steaming from
  - ###: is the unique number of the requirement itself.

Three different levels of compliance are defined:

- [M] means Mandatory
- [G] means Goal (requirement if achievable inside the resource frame)
- [N] means Nice to have

Each user requirement is described in a table segment that looks like this:

ID	***XXX-XX-YYY-ZZZ-###*** ***Example: WP5-T2-Port-001***	Source	***MS***	***BLAST***	***Audit***	***Other***	Compliance	***M***	***G***	***N***
Characterisation:	<the functional requirement here>									
Comment:	<the functional comment here>.									

User Requirements

In this chapter we will present the user requirements based on the survey we had among BLAST partners and input from the WP5 Task 2 Workshop. We will also take into account results from discussions we have had with VTS operators and SafeSeaNet users. In addition we have studied E-Nav documents from IALA and IMO where we have picked user requirements that is in compliance with the BLAST project description. We have also studied the specification work going on in STIERS to develop this system further. The objective for this work package, WP5, is defined as:

"User needs and requirements connected to regional maritime traffic monitoring based on sensors like AIS, VTS and LRIT"

To make the reader aware of the role the harmonized ENC plays in this project we will refer to the statement the Project Manager made during the WP5 Task2 Workshop:

"the overall aim of the project is to improve Integrated Coastal Zone Management and Planning (ICZM&P) and maritime safety in a broad sense, by improving and contributing to harmonising terrestrial and sea geographical data and by developing planning and visualisation tools as well as improvement of navigation, in the context of climate change." And one of the main objective is to develop: "A proposed common vertical datum for the North Sea Region." he said.

Harmonized ENCs will be delivered from another WP in BLAST for use in the WP5 demonstrator.

Administration Requirements

Here we have gathered requirements coming from administrative units.

ID	***BLAST-W5-T2-Adm-001***	Source	***MS***	***BLAST***	***Audit***	***Other***	Compliance	***M***	***G***	***N***
Characterisation:	Have a vessel's updated position in the national coastal area based on AIS real time information, and for the BLAST area (AIS information from BLAST Member states participating in WP5) with tracking possibilities.									
Comment:										

ID	**BLAST-W5-T2-Adm-002**	Source	*MS*	*BLAST*	*Audit*	*Other*	Compliance	*M*	*G*	*N*
Characterisation:	The system shall be able to handle AIS B-type data when relevant									
Comment:										

ID	**BLAST-W5-T2-Adm-003**	Source	*MS*	*BLAST*	*Audit*	*Other*	Compliance	*M*	*G*	*N*
Characterisation:	Data down sampling from a AIS net should be possible if the information flow tend to overload the system.									
Comment:										

ID	**BLAST-W5-T2-Adm-004**	Source	*MS*	*BLAST*	*Audit*	*Other*	Compliance	*M*	*G*	*N*
Characterisation:	The main functions of the BLAST-eye system shall: • Collect data • Distribute data • Store data • Have authentication system compliant with SafeSeaNet • Have web services for subscription • Have an Internet connection and communication compliant with SafeSeaNet requirements. • Have a function for administration of users • Processing and communication speed shall be as relevant for a "Real Time System" • Have a GUI interface for connecting local system to Central system • Have an error handling relevant for a demonstrator									
Comment:										

ID	**BLAST-W5-T2-Adm-005**	Source	*MS*	*BLAST*	*Audit*	*Other*	Compliance	*M*	*G*	*N*
Characterisation:	The BLAST-eye system shall have a web portal with the following functions: • Display the combined AIS picture on a graphical ENC background (ENC converted to Web) • Be able to perform playback of AIS data • Generate statistical reports • Be able to download files with queried data • Be able to download document files • Be able to upload files for distribution									
Comment:										

ID	**BLAST-W5-T2-Adm-006**	Source	*MS*	*BLAST*	*Audit*	*Other*	Compliance	*M*	*G*	*N*
Characterisation:	The system must be able to handle the complete information processing and information flow relevant for the region and the storage capacity must comply with the needs. In the region we have approximately 10000 movements pr. day.									
Comment:										

ID	**BLAST-W5-T2-Adm-007**	Source	*MS*	*BLAST*	*Audit*	*Other*	Compliance	*M*	*G*	*N*
Characterisation:	Have a vessel's global updated position based on LRIT specification, with tracking possibility									
Comment:										

ID	BLAST-W5-T2-Adm-008	Source	MS	BLAST	Audit	Other	Compliance	M	G	N
Characterisation:	The system shall have a tracking functionality that manage an automatic transfer between AIS coverage and LRIT coverage and vice versa.									
Comment:										

ID	BLAST-W5-T2-Adm-009	Source	MS	BLAST	Audit	Other	Compliance	M	G	N
Characterisation:	The tracking system shall have possibilities for introducing area boundaries, both on more permanent basis and on ad hoc basis. This can be country boarder, Economical Zone boundaries, oil platform security zone etc.									
Comment:										

ID	BLAST-W5-T2-Adm-010	Source	MS	BLAST	Audit	Other	Compliance	M	G	N
Characterisation:	The tracking system shall be able to create warning when a boundary is crossed. From which direction shall be selectable and programmable.									
Comment:										

ID	BLAST-W5-T2-Adm-011	Source	MS	BLAST	Audit	Other	Compliance	M	G	N
Characterisation:	For statistical purpose it shall be possible to have an automatic count of the number of vessels inside a boundary on continuous basis with timestamps. The periods or time slots for counting shall be selectable and programmable									
Comment:										

ID	BLAST-W5-T2-Adm-012	Source	MS	BLAST	Audit	Other	Compliance	M	G	N
Characterisation:	For statistical purpose it shall be possible to count the number of vessels that are crossing a boundary on continuous basis with timestamp. In which direction shall be selectable. The periods or time slots for counting shall be selectable and programmable									
Comment:										

ID	**BLAST-W5-T2-Adm-013**	Source	MS	BLAST	Audit	Other	Compliance	M	G	N
Characterisation:	The system shall have reference databases that can be accessed by authenticated users. The following DBs should be available: Ship database (based on Lloyd's) ITU AIS database + National AIS register Port database with Location codes Hazard material database with codes and proper shipping name									
Comment:										

ID	**BLAST-W5-T2-Adm-014**	Source	MS	BLAST	Audit	Other	Compliance	M	G	N
Characterisation:	Navigational status for monitored vessels shall be available on request or as programmable reporting. (deviation reporting)									
Comment:										

ID	**BLAST-W5-T2-Adm-015**	Source	MS	BLAST	Audit	Other	Compliance	M	G	N
Characterisation:	When you point the cursor on a ship you shall get a window (tagged to the cursor) with some details about the ship such as: IMO number MMSI (Maritime Mobile Service Identity) number Ship name Ship type Ship position Ship Draught Number of persons on board Departing Port Arriving Port ETA									
Comment:										

ID	**BLAST-W5-T2-Adm-016**	Source	MS	BLAST	Audit	Other	Compliance	M	G	N
Characterisation:	An automatic consistency check for the MMSI number should be made and a report shall be generated if inconsistency is recognised. The report shall be distributed to relevant body. Such reports shall also be stored in the database for later lookups.									
Comment:										

ID	**BLAST-W5-T2-Adm-017**	Source	MS	BLAST	Audit	Other	Compliance	M	G	N
Characterisation:	The positions of cargo on board the ship should be Visualised, special the Hazard materials. This to improve the emergency response.									
Comment:										

ID	**BLAST-W5-T2-Adm-018**	Source	MS	BLAST	Audit	Other	Compliance	M	G	N
Characterisation:	The system shall request SafeSeaNet automatically to recognise whether the ship (or agent) has sent a port notification. If not the ship should have a warning mark (a yellow ring?). The VTS or Port traffic manager should make a request to the ship to request for a proper notification to SafeSeaNet. (here the national regulation has to be followed)									
Comment:										

ID	**BLAST-W5-T2-Adm-019**	Source	MS	BLAST	Audit	Other	Compliance	M	G	N
Characterisation:	The number of crew on board shall be available The number of passenger on board shall be available The passenger list shall be available on request									
Comment:										

ID	BLAST-W5-T2-Adm-020	Source	MS	BLAST	Audit	Other	Compliance	M	G	N
Characterisation:	The system shall have functions to validate risk and it shall be possible to mark or create zones with high risk. The system shall have functions for risk management									
Comment:										

ID	BLAST-W5-T2-Adm-021	Source	MS	BLAST	Audit	Other	Compliance	M	G	N
Characterisation:	The system shall be able to receive information on coastal activity (long and short term activity). The information shall be input to traffic risk management function. The system shall be able to generate reports and maps to be used as information to the ships or vessels in the area. The actual area(s) shall be marked									
Comment:										

ID	BLAST-W5-T2-Adm-022	Source	MS	BLAST	Audit	Other	Compliance	M	G	N
Characterisation:	All "slave" systems shall be updated with the latest information from the master.									
Comment:										

ID	BLAST-W5-T2-Adm-023	Source	MS	BLAST	Audit	Other	Compliance	M	G	N
Characterisation:	When available the graphical part of the system shall be based on Harmonized ENCs.									
Comment:										

ID	BLAST-W5-T2-Adm-024	Source	MS	BLAST	Audit	Other	Compliance	M	G	N
Characterisation:	It shall be possible to do incremental updates of the maps when new information is available									
Comment:										

ID	BLAST-W5-T2-Adm-025	Source	MS	BLAST	Audit	Other	Compliance	M	G	N
Characterisation:	It shall be a function that convert the monitored information into a Web presentation									
Comment:										

ID	BLAST-W5-T2-Adm-026	Source	MS	BLAST	Audit	Other	Compliance	M	G	N
Characterisation:	Navigational status for monitored vessels shall be available on request or as programmable reporting. (deviation reporting)									
Comment:										

ID	BLAST-W5-T2-Adm-027	Source	MS	BLAST	Audit	Other	Compliance	M	G	N
Characterisation:	The information in the monitoring system shall be available to users via XML messages so information can be available inside the users systems without retyping (system integration). The user shall be able to subscribe for information. The subscribed information shall be automatically transferred when available or time triggered. The user shall have the opportunity to post a request for information and the system shall respond with a relevant response.									
Comment:										

ID	BLAST-W5-T2-Adm-028	Source	MS	BLAST	Audit	Other	Compliance	M	G	N
Characterisation:	The system shall be connected to SafeSeaNet STIRES to expand the AIS coverage area.									
Comment:										

ID	BLAST-W5-T2-Adm-029	Source	MS	BLAST	Audit	Other	Compliance	M	G	N
Characterisation:	The system shall be connected to SafeSeaNet Alert distribution to be able to pick up distributed Alerts and eventually create Alert Notification.									
Comment:										

ID	BLAST-W5-T2-Adm-030	Source	MS	BLAST	Audit	Other	Compliance	M	G	N
Characterisation:	The system shall be connected to SafeSeaNet LRIT to be able to monitor and present LRIT data									
Comment:										

VTS User Requirements

Under this chapter we will not repeat standard VTS requirements. Only functions that are rare or not existing are presented. Requirements that are of same type as written under Adm are not repeated.

ID	BLAST-W5-T2-VTS-001	Source	MS	BLAST	Audit	Other	Compliance	M	G	N
Characterisation:	Have separate or support layers in the monitoring system to present weather forecast in a region or for local areas									
Comment:										

ID	BLAST-W5-T2-VTS-002	Source	MS	BLAST	Audit	Other	Compliance	M	G	N
Characterisation:	Have separate or support layers in the monitoring system to present oil drifting models. Have separate or support layers in the monitoring system to present drifting object models. This is also important for S&R.									
Comment:										

ID	BLAST-W5-T2-VTS-003	Source	MS	BLAST	Audit	Other	Compliance	M	G	N
Characterisation:	Make use of weather sensors in exposed areas or critical areas for the ships to be able to manage the traffic in a secure manner. There should be a separate Window on the monitoring system for real time weather data.									
Comment:										

ID	BLAST-W5-T2-VTS-004	Source	MS	BLAST	Audit	Other	Compliance	M	G	N
Characterisation:	Have an automatic request to SafeSeaNet for Port Notification and Hazmat Notification for ships entering the VTS area. Lack of Port Notification will trigger a request to the ship so a proper Notification can be forward. Lack of Hazmat Notification will trigger a request to the ship so a proper Notification can be forward.									
Comment:										

ID	BLAST-W5-T2-VTS-005	Source	MS	BLAST	Audit	Other	Compliance	M	G	N
Characterisation:	The route plan of the ship should be available for the VTS, special the part that will influence on the movements in the regulated VTS area									
Comment:										

ID	BLAST-W5-T2-VTS-006	Source	MS	BLAST	Audit	Other	Compliance	M	G	N
Characterisation:	Create a hand over procedure when a ship leave one VTS area and enter another VTS area. There should be a system for short messaging between the VTSs to be able to give short notices about vessels and traffic situations.									
Comment:										

S&R requirements

In general the S&R units shall have free access to all information relevant for the operation from a monitoring system, SafeSeaNet or a VTS system.

Parts of the requirements that could have been inserted under this chapter is in the chapter for Administrative requirements and VTS requirements. In the following we have included special items for pollution fighting and for Search and Rescue.

ID	***BLAST-W5-T2-S&R-001***	Source	*MS*	*BLAST*	*Audit*	*Other*	Compliance	*M*	*G*	*N*
Characterisation:	It shall be possible to create boundaries for areas of any shape and any size. It shall be possible to search for any possible resources inside this area. It shall be possible to put weather forecast data as a layer for the actual area. It shall be possible to run drifting models as separate layers inside the actual area.									
Comment:										

ID	***BLAST-W5-T2-S&R-002***	Source	*MS*	*BLAST*	*Audit*	*Other*	Compliance	*M*	*G*	*N*
Characterisation:	Ships inside the specified area shall be searchable. Aids to navigation inside the area shall be searchable The latest Navigational Warning shall be available Notice to mariners shall be available									
Comment:										

ID	***BLAST-W5-T2-S&R-003***	Source	*MS*	*BLAST*	*Audit*	*Other*	Compliance	*M*	*G*	*N*
Characterisation:	A Path prediction procedure should be available to identify ships that can be of any help in the actual area.									
Comment:										

E-Nav Requirements

The E-navigation work by IMO is ongoing, but some of the presented user requirements are also relevant for the BLAST-eye. We have added those most relevant, but if a user requirement is already covered above it is not repeated here.

ID	***BLAST-W5-T2-Nav-001***	Source	*MS*	*BLAST*	*Audit*	*Other*	Compliance	*M*	*G*	*N*
Characterisation:	Provision of information to vessels. Identify the information necessary to be provided to vessels, taking into account the responsibility assigned to the shore based provider. We have to identify the relevant information in BLAST-eye for transfer to a vessel. Will be justified later.									
Comment:										

ID	***BLAST-W5-T2-Nav-002***	Source	*MS*	*BLAST*	*Audit*	*Other*	Compliance	*M*	*G*	*N*
Characterisation:	Shore-to-shore information exchange. Identify and/or develop necessary protocols, formats and data structures to share information among stakeholders. We have to identify the relevant information in BLAST-eye for transfer to a stakeholder. Will be justified later.									
Comment:										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