

**Annex A of the Tender Specifications attached to the
Invitation to tender N° EMSA/NEG/64/2015 for further
development of EMSA's mobile applications for IMS**

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1 Introduction

1.1 Work breakdown

In this respect it is anticipated that the project plan shall include the following work-packages as per the table below. The offer should detail further the specific activities to be executed under each work-package and the milestone events associated with the activities.

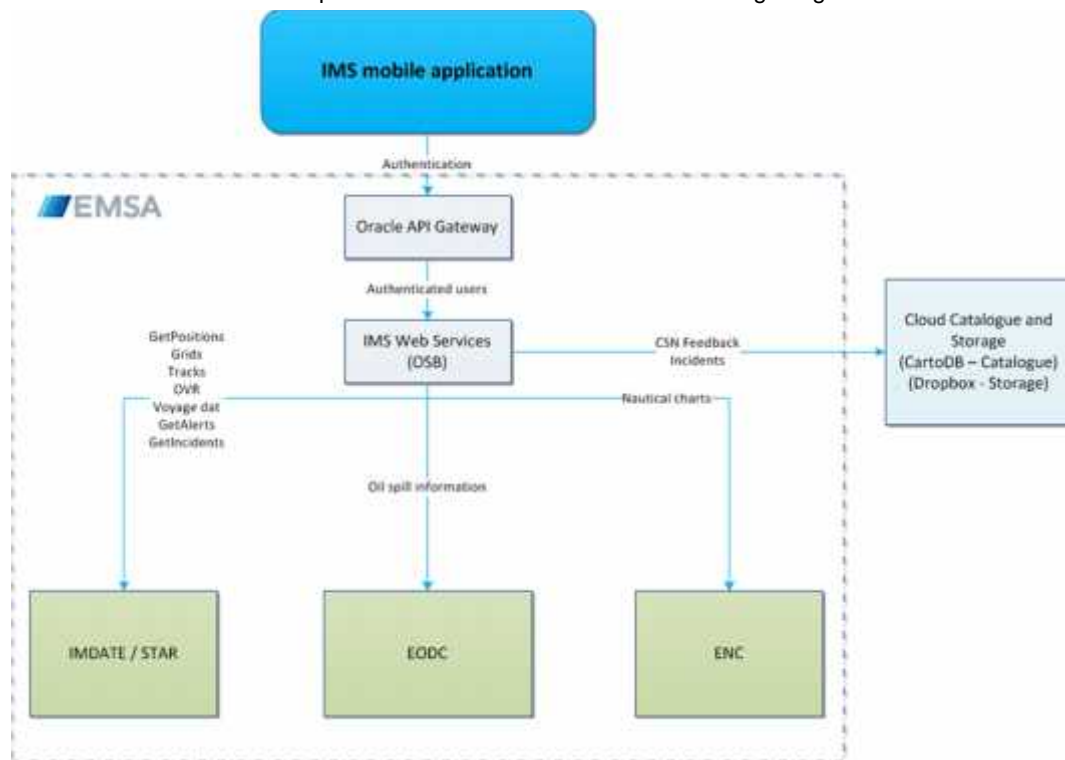
Ref	Work package name	Work package description
WP1	Further developments of IMS application for multiple platforms	Further developments of the IMS mobile applications, including three sub-work packages: <ul style="list-style-type: none">WP1.1: iOS (iPad – screen size up to 10’')WP1.2: iOS (iPhone – screen size up 5’')WP1.3: Android (Tablet – screen size up to 10.5’')
WP2	Further developments of the IMS web services	Further developments of IMS web services and cloud catalogue and storage services including the two following sub-work packages: <ul style="list-style-type: none">WP2.1 Additional functionalities related with the OSB server side business logic componentWP2.2 Additional functionalities linked with the cloud catalogue and cloud storage components
WP3	Maintenance	One year of maintenance and support for the developed solutions.

1.2 General information

Ref: IMS_INFO_01	Nature: Informative
General description	
The first IMS app project deployed an operational mobile solution to EMSA users of integrated services. This included: <ul style="list-style-type: none">Development of iOS and Android application to address a set of use cases, including:<ul style="list-style-type: none">Vessel position & detail informationArea centric queryIncident reportingOil spill monitoring and feedbackDevelopment of the IMS web services on top of EMSA's Oracle Service Bus that connect to all other web-services needed by the mobile applicationIntegration with the EMSA's single sign on via Oracle API Gateway	
Ref: IMS_INFO_01A	Nature: Informative
Versions	
Three separate versions of the application were developed, tested with the end-users and deployed operationally: <ul style="list-style-type: none">iOS (smartphone)iOS (Tablet)Android (Tablet)	
Ref: IMS_INFO_01B	Nature: Informative
Source code	

Source code of the version 1 applications (both iOS and Android) will be provided to the contractor at the start of the project.	
Ref: IMS_INFO_02	Nature: Informative
Cloud catalogue and configuration	
<p>CartoDB is currently used as catalogue service to inventory all the multimedia contents metadata. This is a standard catalogue service that provides standard interfaces as Open Geospatial Consortium Catalogue Services (OGC-CSW) and compliant with INSPIRE discovery service. Additionally CartoDB is used for:</p> <ul style="list-style-type: none"> - Storing meta-information about uploaded content - Storing menu preferences and lists to be used in the application - Storing credentials for the cloud storage <p>A detailed CartoDB interface definition document will be provided to the Contractor at the Kick-Off meeting of the project.</p>	
Ref: IMS_INFO_03	Nature: Informative
Cloud storage	
<p>The EMSA IMS mobile application uses Dropbox to store uploaded rich content (video, images and documents). A detailed interface with Dropbox will be provided at the Kick-Off meeting of the project.</p>	
Ref: IMS_INFO_04	Nature: Informative
Oracle API Gateway	
<p>EMSA has implemented the Oracle API Gateway solution for the mobile application to interact with the existing IdM. This will:</p> <ol style="list-style-type: none"> 1) Provide user authentication 2) Allow access to EMSA resources 3) Provide login / logout functionalities 4) Identify the user's role <p>Detailed documentation regarding <u>EMSA's Oracle API Gateway</u> is provided in <u>Appendix B</u>.</p> <p>The contractor is not responsible for changes to the Oracle API Gateway. The IMS mobile application will interact with these web services that provide authentication services, enabling access to resources.</p>	
Ref: IMS_INFO_05	Nature: Informative
IMS mobile web-service	
<p>The EMSA IMS mobile application consumes information provided by the IMS web services. These web services are deployed on top of EMSA's Oracle Service Bus. A complete description of the services, methods, calls and architecture are included in Appendix C to these technical specifications.</p>	
Ref: IMS_INFO_07	Nature: Informative
Overall architecture	

The overall architecture of the current implementation can be found in the following image.

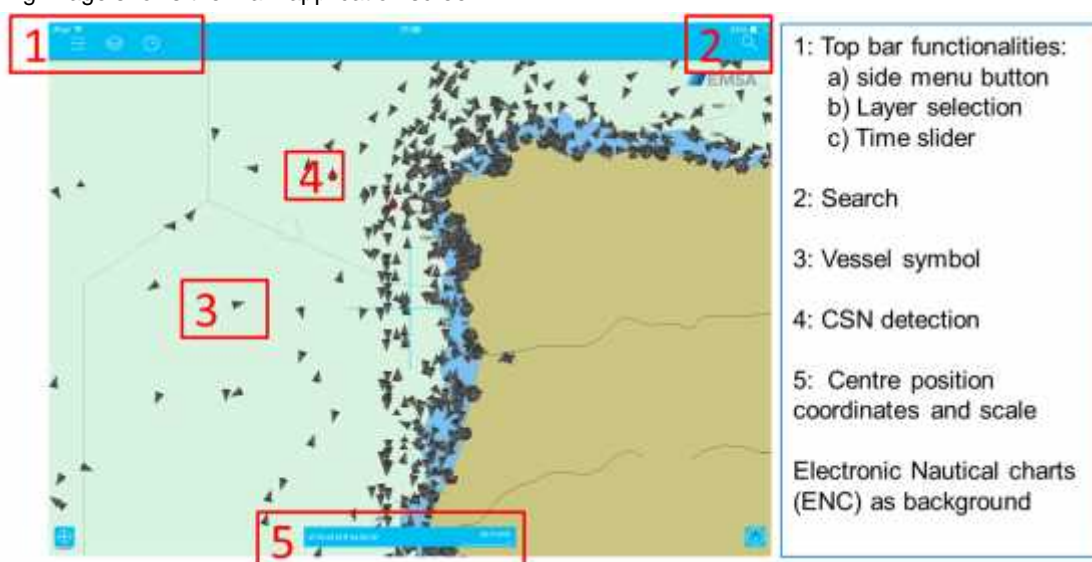


Ref: IMS_INFO_08

Nature: Informative

Main application screen

The following image shows the main application screen:

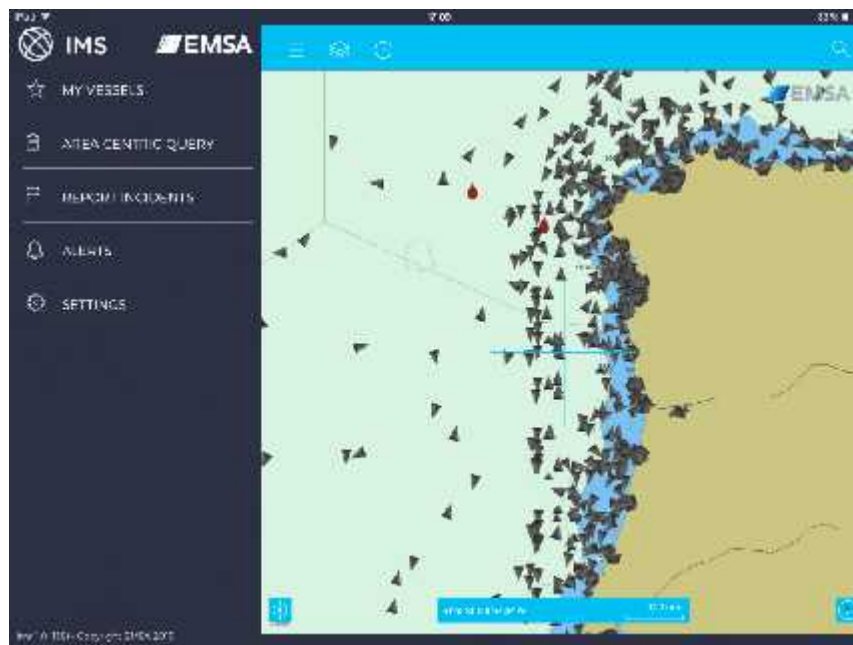


Ref: IMS_INFO_09

Nature: Informative

Main menu

The following image shows the main menu detail.

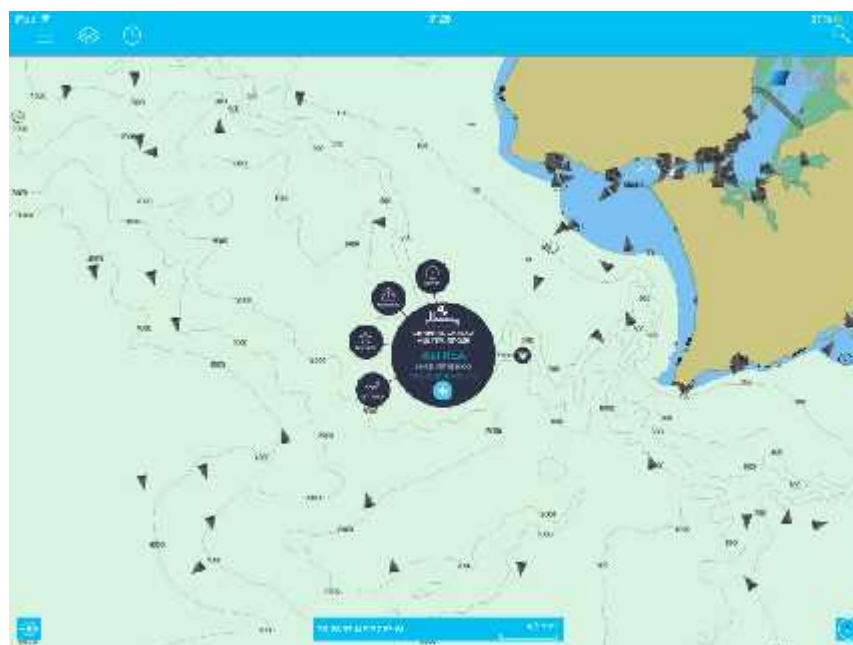


Ref: IMS_INFO_10

Nature: Informative

Vessel selection menu

The following image shows the vessel selection menu.

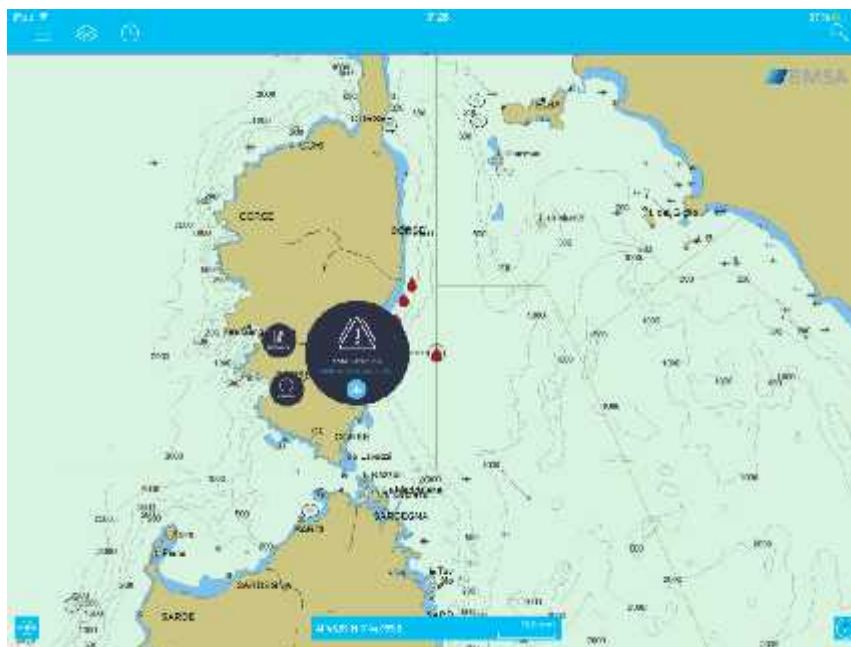


Ref: IMS_INFO_11

Nature: Informative

CSN detection menu

The following image shows the CSN detection selection menu.

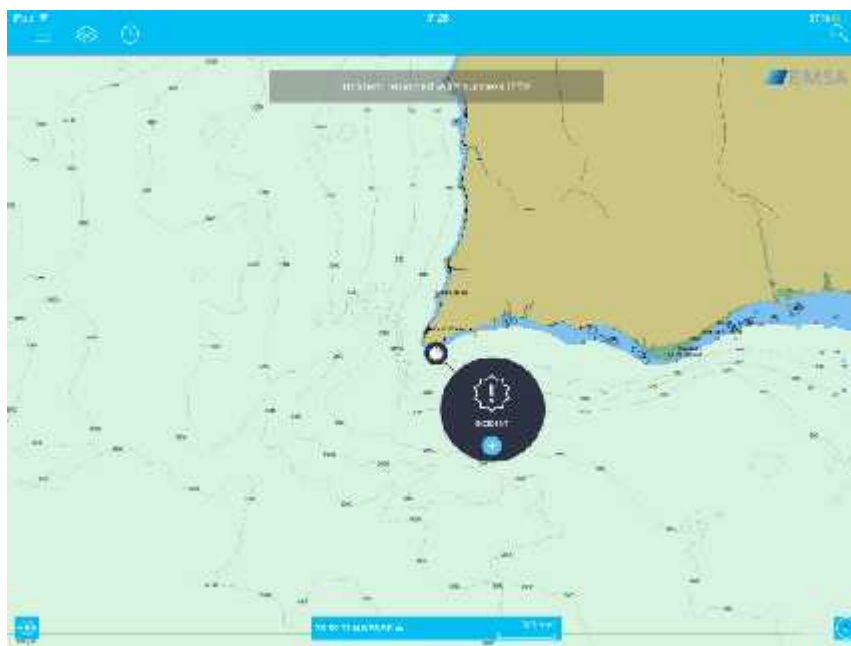


Ref: IMS_INFO_12

Nature: Informative

Incident selection menu

The following image shows the incident selection menu.

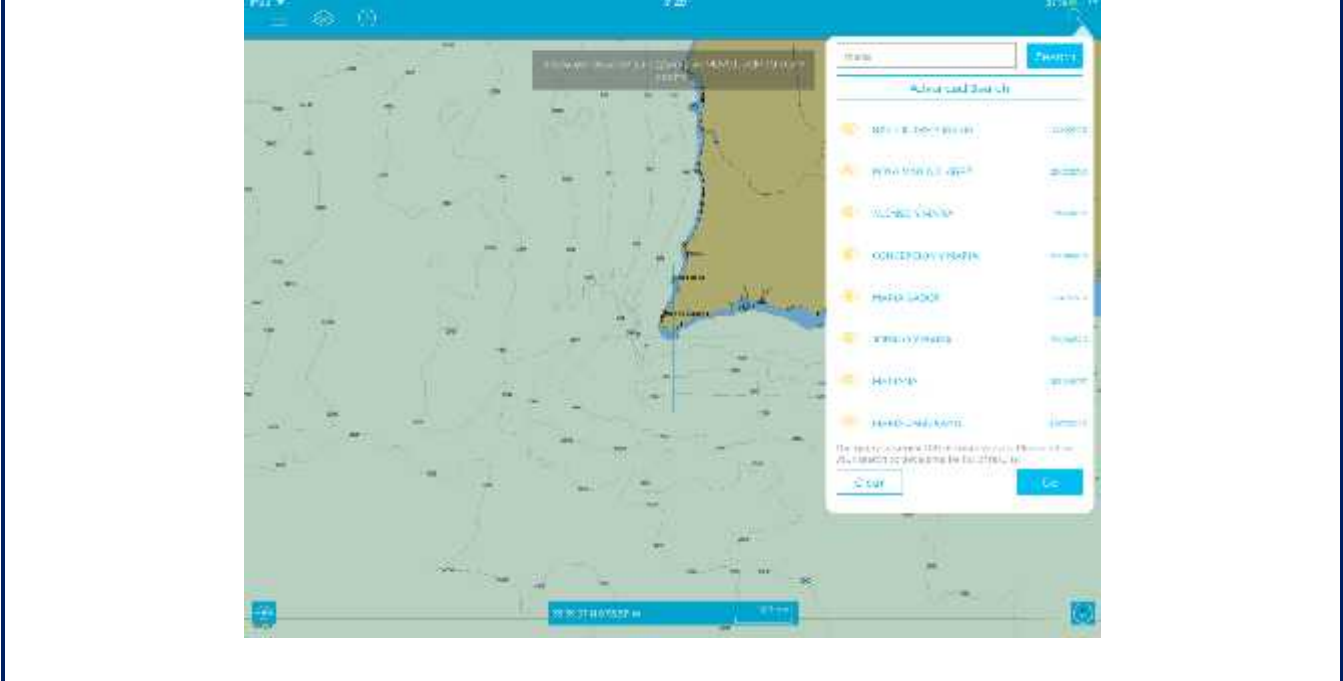


Ref: IMS_INFO_13

Nature: Informative

Basic Search

The following image shows the basic search results.

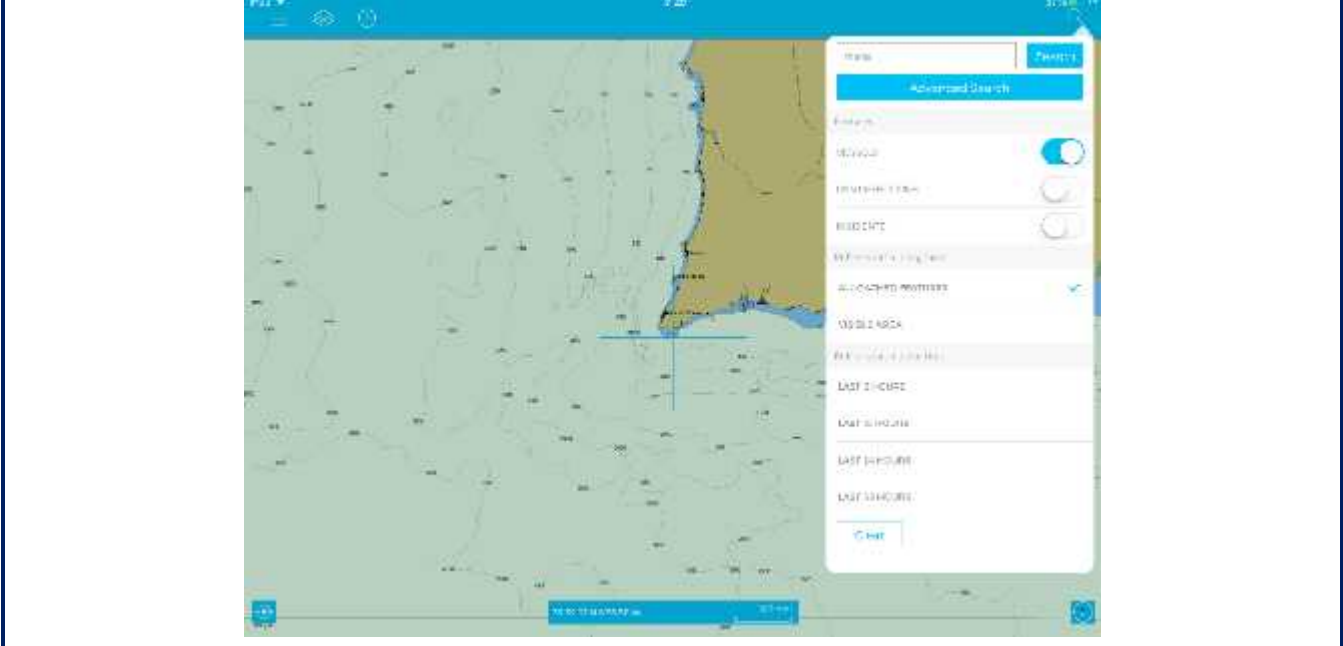


Ref: IMS_INFO_14	Nature: Informative
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Ref: IMS_INFO_14	Nature: Informative
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Advanced search

The following image shows the advance search menu.



Ref: IMS_INFO_15	Nature: Informative
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Ref: IMS_INFO_15	Nature: Informative
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CSN feedback menu

The following image shows the CSN report feedback menu

The screenshot shows a mobile application interface with a map in the background. A 'REPORT FEEDBACK' menu is displayed on the right side. The menu contains the following fields and options:

- INCIDENT TYPE: [Dropdown menu]
- DATE OF INCIDENT: [Date picker]
- LOCATION: [Text input field]
- WEATHER: [Dropdown menu]
- DESCRIPTIVE: [Text input field]
- CAUSE: [Text input field]
- WITNESS: [Text input field]
- INVESTIGATOR: [Text input field]
- REPORTER: [Text input field]
- CONTACT: [Text input field]
- COMMENTS: [Text input field]

At the bottom of the menu, there are two buttons: 'Go Back' and 'Submit'.

Ref: IMS_INFO_16

Nature: Informative

Incident feedback menu

The following image shows the Incident report menu

The screenshot shows a mobile application interface with a map in the background. A 'REPORT INCIDENT' menu is displayed on the right side. The menu contains the following fields and options:

- INCIDENT TYPE: [Dropdown menu]
- DATE OF INCIDENT: [Date picker]
- LOCATION: [Text input field]
- WEATHER: [Dropdown menu]
- DESCRIPTIVE: [Text input field]
- CAUSE: [Text input field]
- WITNESS: [Text input field]
- INVESTIGATOR: [Text input field]
- REPORTER: [Text input field]
- CONTACT: [Text input field]
- COMMENTS: [Text input field]

At the bottom of the menu, there are two buttons: 'Go Back' and 'Submit'.

Ref: IMS_INFO_17

Nature: Informative

Vessel cluster detail

The following image shows the vessel cluster menu



2 Global requirements

Ref: IMS_GEN_01	Nature: Informative
Deviation from requirements	
If the bidder has to deviate from the requirements set out in this document, then the bidder must present equivalent requirements and must justify the deviation(s). EMSA reserves the right to disagree with the deviation and the proposed solution.	
Ref: IMS_GEN_02	Nature: Informative
References	
References in this document like “Chapter”, “Section” or “Paragraph” are referring to this document unless other reference documents are identified explicitly.	
Ref: IMS_GEN_03	Nature: Mandatory
Requirements scope	
The requirements for further developments included in WP1 are valid for all applications (iOS phone, iOS tablet and Android Tablet) except if stated otherwise.	
Ref: IMS_GEN_04	Nature: Mandatory
General requirement	
When a requirement mentions “the Contractor” it is referring to the company or consortium to which the contract will be awarded.	
When a requirement mentions “the bidder” it is referring to the company producing a bid for this tender offer and refers to elements that should be address directly in the bid.	

Ref: IMS_GEN_05	Nature: Mandatory
Nature of requirements	
<p>There are two main types of requirements:</p> <ul style="list-style-type: none"> ▪ <u>Informative</u>: These requirements are included in the specifications to provide information to the bidder – No compliancy assessment is needed. ▪ <u>Mandatory</u>: These requirements are compulsory in terms of assessment of compliancy. Non-compliancy of the requirement will result in a lower score during the evaluation. 	
Ref: IMS_GEN_06	Nature: Mandatory
WP1 and WP2 requirements	
<p>The requirements presented in this Annex shall be implemented by the contractor in order to further develop the existing IMS mobile applications. The objective is not to fully re-implement the existing application but to build upon what is currently in place.</p>	
Ref: IMS_GEN_07	Nature: Mandatory
Visibility of system status	
<p>The system should always keep users informed about what is going on, through appropriate feedback within reasonable time. I.e. when search results exceeds certain number, when a query is being processed, or when a certain system process is taking excessive time the status information should be provided as much as possible to avoid the user “over clicking” on the screen or giving the idea that the mobile application is unresponsive.</p>	
Ref: IMS_GEN_08	Nature: Mandatory
Harmonized experience	
<p>The bidder should follow OS guidelines in terms of generic functionalities (multi-gestures, zoom, etc.). For the implementation of specific functionalities of the EMSA IMS App the bidder should demonstrate providing a harmonized and seamless user experience between the two platforms.</p>	
Ref: IMS_GEN_09	Nature: Mandatory
Technology	
<p>The contractor shall implement the requirements of this annex using native applications for each platform, Android and iOS.</p>	
Ref: IMS_GEN_10	Nature: Mandatory
Battery autonomy	
<p>The implemented developments should take into account the battery drainage of the devices aiming to have a good battery/performance usage balance</p>	
Ref: IMS_GEN_11	Nature: Mandatory
Privacy and data access on the device	
<p>The application shall not require any extra permissions other than those needed for implementing the specified requirements (e.g. no need to access the user's contacts list or stored emails on the client side).</p>	
Ref: IMS_GEN_12	Nature: Mandatory
iOS version	
<p>The developments shall be compatible with IOS version 8 (or above). The contractor shall have the responsibility of updating the mobile application to any iOS changes for the duration of the project (including maintenance phase).</p>	
Ref: IMS_GEN_13	Nature: Mandatory
Android version	

The developments shall be compatible with Android version 4.4 (or above). The contractor shall have the responsibility of updating the mobile application to any Android changes for the duration of the project (including maintenance phase).	
Ref: IMS_GEN_14	Nature: Mandatory
Development approach – multi-platform	
The requested developments are multi-platform (iOS + Android). The overarching development strategy will imply that the development will start firstly with the iOS versions, where most of the functional and non-functional iterations will occur. Only when certain functionalities or components are fully tested and deemed stable will they be duplicated for Android. The aim of this requirement is to minimize the duplication of effort during the implementation.	
Ref: IMS_GEN_15	Nature: Mandatory
Interaction with the Oracle API Gateway	
Interaction with the Oracle API gateway is implemented in the existing mobile applications. The contractor is responsible to ensure that new functionalities, and access to any new resources implemented under this contract, still make use of the Oracle API gateway for authentication purposes.	
Ref: IMS_GEN_16	Nature: Mandatory
General responsiveness of the application	
The contractor shall ensure that implemented features should, for the majority of devices, be responsive and delivery the respective functionality in a timely manner ensuring a good navigational and user experience. This usually implies that any functionality provides response to the user in less than one second.	
Ref: IMS_GEN_17	Nature: Mandatory
Metadata	
<p>At least the following information that describe the multimedia content that is updated shall be recorded:</p> <ul style="list-style-type: none"> ▪ Identification (unique resource identifier, resource title, resource description, resource type, resource language); ▪ Resource Keywords; ▪ Geographic Location (preferable Latitude and Longitude in EPSG 4326 as coordinate reference system), ▪ Temporal Reference (described in ISO 19108 for example) ▪ Responsible Party (identification of the organization, identification of the user, identification of the device, user role); ▪ Resource locator (which point to the location (URL) where the multimedia content can be located). <p>The contractor shall as much as possible create the aforementioned metadata in automatic way, therefore without the needs for users to fill-in information.</p> <p>EMSA suggests to use standards metadata for describing the content of the digital document uploaded by the users (for example ISO 19115 and the INSPIRE metadata for datasets), and when and if it is necessary, the contractor shall extends the metadata with additional information.</p>	

3 WP1 – Mobile applications further developments

3.1 Graphic design requirements

Ref: IMS_WP1_GRAPH_1	Nature: Mandatory
Design elements	
<p>For the elements the functional elements to be implemented under WP1 developments the contractor shall provide:</p> <ul style="list-style-type: none"> ▪ Graphical elements to be used ▪ Wireframes of all the application pages 	

- Proposal for the workflow between the pages

At the status meetings with the EMSA team the different graphical design approaches shall be presented by the contractor towards deciding the way forward in terms of graphic design. The different design approaches shall be applicable to the requested mobile device typologies (smartphone and tablet). EMSA reserves the right to request further changes to the proposals presented.

Ref: IMS_WP1_GRAPH_2	Nature: Mandatory
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Corporate image

The contractor shall abide as much as possible to EMSA's visual identity guidelines as included in Appendix F. This includes fonts, colours, distinctive elements, logos and others.

Ref: IMS_WP1_GRAPH_3	Nature: Mandatory
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Global graphical improvement and alignment with corporate image

As per the previous requirement the overall interface will have to be refreshed, in terms of design, to align the new corporate image elements and modern design practices. This will include updates to:

- Main menu
- Top and left side bar (side menu)
- All section menus (vessel, CSN detection and Incidents)
- Feedback menus (incident, CSN feedback)
- Vessel information
- Oil spill information
- Incident information
- Search menu
- Centre coordinate information
- North arrow

The principle of bold and clean design should be applied throughout the interface to increase map area and optimize the use of the interface.

The use of transparencies and overall harmonization of menu colours is also required (i.e. main menu with the same colour patterns than information and feedback menus.).

The contractor will be requested to propose changes to the abovementioned elements to reflect this requirement.

3.2 Functional requirements

3.2.1 Fisheries control use case

Ref: IMS_WP1_F_01	Nature: Mandatory
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Fisheries control use case

The contractor shall implement a new use case linked with Fisheries reporting.

This use case includes:

- Display of symbology and specific areas associated with fisheries control
- Provision of new fisheries reports (digital content and metadata to be uploaded to CartoDB and the cloud file storage)
- Display of existing fisheries reports
- Automatic generation of a PDF report

Ref: IMS_WP1_F_02	Nature: Mandatory
Implementation approach	
The bidder shall provide a short description (this may include draft mock-ups, wireframes, ideas or others) that allows EMSA to understand how the bidder intends to implement the different user cases.	

3.2.2 Vessels nearby

Ref: IMS_WP1_F_03	Nature: Mandatory
Vessels nearby	
The contractor shall implement a function called “vessels nearby” that based on the either the user location (gps coordinated) or the vessel selected, will list vessels sorted by distance and include: <ol style="list-style-type: none"> 1) Visualize as a table with name, MMSI of displayed vessels, flag and age of the position (design details for this table will be decided during implementation) or as thumbnails. 2) Refine the search within the displayed vessels (remove a vessel and/or re-define other criteria, such as data sources) 3) Highlight vessels that are in the table. The bidder shall propose a way to implement this list that is adapted to the smartphone and tablet versions.	
Ref: IMS_WP1_F_04	Nature: Mandatory
Vessels nearby - configuration	
The contractor shall implement, in the configuration menu, a maximum distance parameter, to be used in the nearby vessel search.	

3.2.3 CSN detections

Ref: IMS_WP1_F_05	Nature: Mandatory
CSN detection – visualization of possible source (from existing web-service)	
Associated with a CSN detection contractor shall display the “possible source” information provided by the CSN web-service. The service output is the name and MMSI of the possible source that should be displayed in the CSN detection details. (Development of this web-service is out of scope of this tender). <div data-bbox="140 1370 430 1594" data-label="Image"> </div> A potential solution for this would be to create a new branch of the CSN detection menu to include the possible source information.	
Ref: IMS_WP1_F_06	Nature: Mandatory
CSN detections – visualization of feedbacks (from existing web-service)	
The contractor shall implement a functionality that allows the visualization of CSN detections that have associated feedbacks, as reported by the associated CSN web- service. (Development of this web-service is out of scope of this tender).	

3.2.4 Main vessel menu

Ref: IMS_WP1_F_07	Nature: Mandatory
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Vessel selection menu - additional items – heading, speed and age of the position

Currently the vessel selection menu (figure bellow):




The contractor shall add to the vessel selection menu the heading, speed and age of the position (all this information is retrievable from the existing positions web-service).

3.2.5 Vessel display symbologies

Ref: IMS_WP1_F_08	Nature: Mandatory
Vessel symbology – data source of position	
<p>The contractor shall implement a vessel symbology that indicates the position type with a different colour.</p> <p>Example:</p> <ol style="list-style-type: none"> 1) T-AIS is displayed in blue 2) S-AIS is displayed in green 3) LRIT is displayed in grey 4) VMS is displayed in black <p>Note: the data source is one of the elements being provided by the IMS mobile web-service, associated to each vessel position.</p>	
Ref: IMS_WP1_F_09	Nature: Mandatory
Vessel type symbols	
<p>The contractor shall propose and implement a vessel symbology that represents the vessels by different types. The symbology of the different vessel types can expand the base symbology (i.e. adding a colour bar to the triangle defining a vessel and the colour would vary according to the ship type). The bidder shall propose at least one option for this symbology considering</p>	
	
Example of vessel type symbols (from www.marinetraffic.com/)	Example of vessel type symbols (from SafeSeaNet Graphical Interface)

Ref: IMS_WP1_F_10	Nature: Mandatory
Vessel symbol selection	
<p>The contractor shall implement a functionality that allows the user to quickly shift between vessel symbolologies.</p> <p>The application shall retrieve the latest symbolizer configuration when a session is started.</p> <p>The bidder shall suggest ways to configure the toggle of the different symbolologies.</p>	

3.2.6 Vessel track

Ref: IMS_WP1_F_11	Nature: Mandatory
Vessel track – source position information	
<p>The user shall be able to query the individual positions that constitute a track. Information to be displayed for the positions include:</p> <ul style="list-style-type: none"> ▪ Ship flag ▪ Ship Name ▪ Coordinates ▪ Date / time ▪ Source of the position (AIS, LRIT, VMS, etc.) <p>An example of this functionality (copyright Marinetraffic.com) can be shown in the picture bellow. Please note that this picture is for illustrative purposes only and the precise implementation will be agreed upon within the project.</p>	
	

3.2.7 Configuration menu requirements

Ref: IMS_WP1_F_12	Nature: Mandatory
Configuration menu items – additional background layers	
<p>The contractor shall include the ability to select additional background layers:</p> <ol style="list-style-type: none"> 1) Google maps (satellite) 2) Bing maps (maps + aerial) 	
Ref: IMS_WP1_F_13	Nature: Mandatory
Summary list of uploaded content	
<p>From the side menu the user shall be able to visualize a summary list of all uploaded content. This includes:</p>	

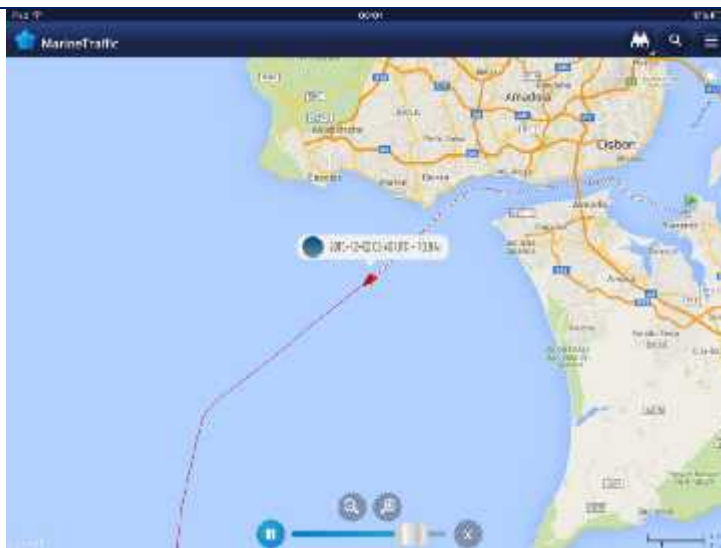
1) CSN feedback reports 2) Incidents 3) Fisheries reports	
Ref: IMS_WP1_F_14	Nature: Mandatory
Summary list of uploaded content	
The summary list of uploaded content shall allow: 1) Edit content 2) Delete content The list should present the results sorted by type and then date (i.e. All CSN feedbacks sorted with newest first).	
Ref: IMS_WP1_F_15	Nature: Mandatory
Clear Cache	
The contractor shall implement in the configuration menu the ability to clear all cached information from the device.	

3.2.8 Favourite vessel list

Ref: IMS_WP1_F_16	Nature: Mandatory
Favourite vessel list – show tracks	
The contractor shall implement functionalities that allow to automatically show the tracks (default 24 hours) for all vessels in the favourite vessel list.	
Ref: IMS_WP1_F_17	Nature: Mandatory
Favourite vessel list – highlight vessels	
The contractor shall implement functionalities that highlight the favourite vessels on the map screen.	

3.2.9 Replay functionality

Ref: IMS_WP1_F_18	Nature: Mandatory
Replay function – general requirement	
The contractor shall implement a replay functionality to replay of the movement over a pre-defined period of time (12,24 or 48 hours), of: <ul style="list-style-type: none"> ▪ Single vessel ▪ List of vessels (i.e. My favourite vessel list) The Play/Replay shall be available for selected vessels with a minimum number of actions required by the user. The picture below (copyright marinetrffic.com) shows an example of the implementation of a replay function for a single vessel.	



Please note that this picture is for illustrative purposes only and the precise implementation will be agreed upon within the project.

3.2.10 Additional search functionalities

Ref: IMS_WP1_F_19	Nature: Mandatory
Search functionality –Export and send	
<p>The user shall be able send the search results as csv, xls to email or cloud storage application installed (i.e. dropbox, OneDrive, google drive, etc). The export and send function should follow a typical mobile app navigation setting for these features and include:</p> <ul style="list-style-type: none"> ▪ Press “export functionality” button ▪ Choose format (default is pre-marked) ▪ Choose destination 	

3.2.11 Area centric query

Ref: IMS_WP1_F_20	Nature: Mandatory
Area centric query – vessel list	
<p>The current implementation of the area centric query shows vessel positions on the map that fit a set of user defined criteria. Additionally to the implemented functionality the user shall be able to:</p> <ol style="list-style-type: none"> 1) Visualize a summary table of name, MMSI of displayed vessels and flag (design details for this table will be decided during implementation) 2) Highlight vessels that are in the table. <p>The bidder shall make a proposal on how these features can be implemented</p>	

3.2.12 Display of specific areas

Ref: IMS_WP1_F_21	Nature: Mandatory
Display of specific areas	
<p>The contractor shall implement in the mobile application the display of user specific areas. From CartoDB the user specific areas should be possible to load in the catalogue and used in the mobile application. It should be possible to restrict the visualization of the areas to:</p>	

- Public (visible to all users)
- User limited (visible to just one user)
- Operation or project limited (visible to a group of users depending on the project – project or operation information will be provided by an IMDATE web-service)

3.2.13 Filter

Ref: IMS_WP1_F_22	Nature: Mandatory
Filter – new filter options	
<p>The contractor shall implement a filtering functionality that allows:</p> <ul style="list-style-type: none"> ▪ Filtering of vessels per time ▪ Filtering of vessels per data source ▪ Filtering of vessels per vessel type 	

3.2.14 Export current screen



Ref: IMS_WP1_F_23	Nature: Mandatory
Export current view	
<p>The contractor shall implement functionality that allows the user to:</p> <ol style="list-style-type: none"> 1) Generate a png or pdf with the contents of the screen currently being visualized 2) Store the generated file on the device and/or send it by email / dropbox / google drive, etc. <p>The contractor may rely on built-in device / OS functionalities to implement this requirement.</p>	

3.2.15 Login screen

Ref: IMS_WP1_F_24	Nature: Mandatory
Login screen	
<p>The contractor shall implement a login screen that is aligned with the look and feel of the EMSA's Maritime Application Portal (MAP).</p>	
	

The login screen may be adjusted to adapt to the reality of mobile devices (i.e. smaller screen sizes).

3.2.16 Incident and CSN detection selection menus

Ref: IMS_WP1_F_25	Nature: Mandatory
Additional elements to the Incident selection menu	
<p>The following elements should be added to the incident selection menu:</p> <ol style="list-style-type: none"> 1) Date/time of the incident 2) Incident type 3) Vessel name and MMSI (if incident related with a vessel) 	
	
Ref: IMS_WP1_F_26	Nature: Mandatory
Additional elements to the CSN detection selection menu	
<p>The following elements should be added to the CSN detection selection menu:</p> <ol style="list-style-type: none"> 1) Area of spill 2) Length of spill 3) Frame ID of image 	
	

3.3 Non-Functional requirements

Ref: IMS_WP1_NF_01	Nature: Mandatory
Generic non-functional requirements	
<p>IMS App architectural design and implementation shall be fully in-line with requirements included in the technical landscape document in Appendix A.</p>	
Ref: IMS_WP1_NF_02	Nature: Mandatory
Scalability, Resilience and High Availability	
<p>Bidders shall address how the system responds to the several non-functional characteristics, namely:</p>	

<ul style="list-style-type: none"> ▪ Scalability, ▪ Availability ▪ Performance ▪ Usability ▪ Resilience. 	
Ref: IMS_WP1_NF_03	Nature: Mandatory
Fisheries use case - Offline usage and caching	
<p>The contractor shall take into account that the implementation of fisheries use case requires storage of the data on the device (background layers, latest position of vessels, etc.). Furthermore, and in case of offline usage, content to be uploaded (photos, reports, videos, and all associated metadata) shall be stored on the device and uploaded when connectivity is available.</p>	
Ref: IMS_WP1_NF_04	Nature: Mandatory
Vessel cluster and vessel display improvements	
<p>Currently there are some performance issues when displaying a larger number of vessels and/or creating the vessel clusters using the grid service. The contractor shall re-design the current cluster display to enhance the performance in slower devices and in the Android versions (that currently suffer from more performance issues than iOS).</p>	
Ref: IMS_WP1_NF_05	Nature: Mandatory
Area centric query – performance enhancements	
<p>The contractor shall explore ways of increasing (if possible) the performance of the area centric query. These can included:</p> <ol style="list-style-type: none"> 1) Re-defining how the requests are made to the web-services 2) Reassessing the way the tracks and positions within an area centric query are displayed on the application 	
Ref: IMS_WP1_NF_06	Nature: Mandatory
Enhancements to the display of Electronical Nautical Charts (ENCs)	
<p>The contractor is expected to build upon the existing display processes and client side caching solution and provide:</p> <ul style="list-style-type: none"> ▪ Performance enhancements in the display of ENCs (i.e. by changing the caching strategy, the request structure (more parallel requests or different ways to request the ENCs) and/or pre-loading some tiles on the application) ▪ Better quantification of the size of the ENC cache on the device (both current and estimated for the offline storage functionality) <p>It is out of scope to address changes on the ENC web-service. This requirement is strictly linked with client side improvements.</p>	

4 WP2: Further developments to IMS web services

4.1 Functional requirements

4.1.1 WP2.1 IMS Web Services

Ref: IMS_WP2_WS_01	Nature: Mandatory
Implement GetIMDATE id service	
<p>IMDATE implemented a new service that is used to retrieve the IMDATE ID of any vessel. The contractor shall implement a call to this service in the IMS web services. The most recent IMDATE ICD will be provided to the contractor at the KOM.</p>	
Ref: IMS_WP2_WS_02	Nature: Mandatory
Position service correction – display last position (global)	

Currently the position service returns the last position per data sources (T-AIS, S-AIS, LRIT, etc.). The contractor shall implement in the IMS web services a method to sort the last position globally, regardless of the source.	
Ref: IMS_WP2_WS_03	Nature: Mandatory
Area Centric query - getIncidentsForShip	
The contractor shall implement the connection with the new IMDATE service to allow the retrieval of all incidents linked with a certain ship	
Ref: IMS_WP2_WS_04	Nature: Mandatory
User Operation/Project information	
The contractor shall implement the connection with the IMDATE services to allow the retrieval of the list of projects / operations a user belongs to. The most recent IMDATE ICD will be provided to the contractor at the KOM.	
Ref: IMS_WP2_WS_05	Nature: Mandatory
CSN “possible source” and “CSN feedback”	
The contractor shall update the existing IMS Mobile Web-service connection to the EODC to allow the retrieval of the of possible source information and CSN feedback information.	
Ref: IMS_WP2_WS_06	Nature: Mandatory
Documentation for new developments	
Further developments on the IMS web services should abide with the current architecture concepts, as defined in Appendix C. The contractor shall update the current architecture document with the new developments, to be approved by EMSA, before the development is initiated.	

4.1.2 WP2.2 CartoDB

Ref: IMS_WP2_CARTO_01	Nature: Mandatory
User information	
<p>The contractor shall store in CartoDB user information (username, First and Last Name), as provided by the Oracle API Gateway, associated with all submitted user content, including:</p> <ul style="list-style-type: none"> ▪ Fisheries reports ▪ Incidents ▪ CSN feedbacks 	
Ref: IMS_WP2_CARTO_02	Nature: Mandatory
User specific areas in CartoDB	
<p>The contractor shall implement in CartoDB user specific areas to be loaded in the catalogue and used in the mobile application. For each area the following elements should be implemented:</p> <ul style="list-style-type: none"> ▪ Visualization restrictions: <ul style="list-style-type: none"> ○ Public (visible to all users) ○ User limited (visible to just one user) ○ Operation or project limited ▪ Display conditions (line thickness, line colour, etc.) 	
Ref: IMS_WP2_CARTO_03	Nature: Mandatory
User specific areas - changes	
Changes to the user specific areas should not entail re-deployment of the mobile application or of the IMS web services.	
Ref: IMS_WP2_CARTO_04	Nature: Mandatory

Configuration items – CartoDB	
<p>The IMS mobile application currently has a configuration menu where the user selects several settings. The contractor shall implement the storage of these configurations on CartoDB, so that when a user logs in with a different device the configurations are retrieved from CartoDB. Configurations will include:</p> <ul style="list-style-type: none"> ▪ My vessels ▪ Units ▪ Offline area definition ▪ Query windows (CSN detections, Incidents, etc.) 	
Ref: IMS_WP2_CARTO_05	Nature: Mandatory
Configuration and management of uploaded content – EMSA administrator access	
<p>The contractor shall implement, in the configuration interface, functionalities that allow the EMSA authorized administrators to:</p> <ol style="list-style-type: none"> 1) Visualize a list of previously uploaded information (video, photos, text) for all users 2) Edit / Delete the uploaded information for all users 	

4.2 WP2 Non-Functional requirements

Ref: IMS_WP2_NF_01	Nature: Mandatory
Generic non-functional requirements	
<p>The IMS web services developments shall be fully in-line with requirements included in the technical landscape document in Appendix A and aligned with the Architecture document as described in Appendix C.</p>	
Ref: IMS_WP2_NF_02	Nature: Mandatory
Sizing requirements	
<p>The developments on the IMS web services shall take into consideration that EMSA's user are growing at a moderate yearly rate (less than 10%) and that the following sizing requirements should be met:</p> <ul style="list-style-type: none"> ▪ Expected maximum number of users: 5000 ▪ Expected maximum number of concurrent users: 200 <p>Bidders shall consider the current EMSA PRODUCTION infrastructure as a baseline.</p>	
Ref: IMS_WP2_NF_03	Nature: Mandatory
Scalability, Resilience and High Availability	
<p>Contractors shall address how the system responds to the several non-functional characteristics, namely:</p> <ul style="list-style-type: none"> ▪ Scalability, ▪ Availability ▪ Performance ▪ Usability ▪ Resilience. 	

5 WP3 - Maintenance

Ref: IMS_WP3_01	Nature: Mandatory
Warranty	

The contractor shall provide warranty support to all elements of IMS App that are part of the requirements in WP1, WP2. Any defects linked with functionalities that are part of the abovementioned requirements shall be promptly rectified by the contractor as part of the warranty support. There shall not be any cost to EMSA linked with warranty related actions. Warranty shall be provided up to two years for all deliverables.

Ref: IMS_WP3_02

Nature: Mandatory

General requirements

Maintenance is deemed to comprise of all operations necessary to maintain the system in perfect working order, or to restore a defective system or one of its components to perfect working order, inclusive of the costs of travelling and labour, if necessary.

Corrective maintenance is the reactive modification of a software product performed after delivery to correct discovered problems.

Preventive maintenance is the modification of a software product after delivery to detect and correct latent faults in the software product before they become effective faults. The system has to be updated to the most recent versions of the underlying software implemented.

Once implementation of WP1 and WP2 is concluded the Contractor will provide the corrective and preventive maintenance of the system necessary to ensure the required level of operational performance. Maintenance shall last one year.

The contractor shall adhere to the general EMSA requirements linked with project maintenance, presented in Appendix E.

Ref: IMS_WP3_03

Nature: Mandatory

Main deliverables

The main deliverables that are to be produced in the context of maintenance activities are:

- Monthly Maintenance Reports and Statistics on maintenance activities described in the context of Service Level Management.
- Change Management Documents for each change submitted to the Change Management Process. It must include at least, Change Request Form, Evaluation of the Change, Planning and Acceptance
- Updated versions of the system deliverables (design documentation, test documentation, user documentation, system documentation, software releases and release notes) for each change implemented and submitted to the Release Management Process.

Ref: IMS_WP3_04

Nature: Mandatory

Service levels

Occurrences (Incidents/Defects or Findings) considered as blocking (no service being provided) will have **Priority = Highest**. A dedicated phone line shall be available 24x7 for handling this type of occurrences.

Occurrences (Incidents/Defects or Findings) significantly impacting the one or more components causing a partial loss of the service provided or foreseen to be blocking during the next 2 days will have **Priority = High**.

Occurrences (Incidents/Defects or Findings) significantly impacting the one or more components with reduction of service provided (e.g. affecting performance) or foreseen to be blocking during the next week will have **Priority = Medium**.

Service levels for corrective maintenance (Incidents/Defects) shall be:

Priority	Acknowledge time	Solve time
Highest	Immediately, 24/7 basis	Immediately
High	3 working hours, 7/5 basis	1 working day
Medium	2 working days, 7/5 basis	7 working days

Ref: IMS_WP3_05

Nature: Mandatory

Processes and management plans

The contractor shall abide to the requirements present in Appendix E regarding service delivery and working procedures.

Occurrences (Incidents/Defects or Findings) considered as blocking (no service being provided) will have Priority = Highest .	
Ref: IMS_WP3_06	Nature: Mandatory
Support in testing of underlying business services	
As the IMS web services orchestrate requests to other EMSA web-services the contractor shall provide testing support (in terms of validation and identification of errors generated by the IMS web service) to new deployments of other EMSA web services.	
Example: A new version of IMDATE is released with a change to the position web-service. The contractor shall support EMSA in identifying if this change affects the IMS web service and/or the IMS mobile application. If minor corrections on the IMS web services or IMS application are needed they should be handled under the maintenance,	

6 Testing and project delivery requirements

6.1 Mobile application deployment

Ref: IMS_TEST_01	Nature: Informative
Mobile application deployment – MDM solution for test application deployment	
EMSA is using the mobile device management (MDM) solution AirWatch, for deployment of the app for testing purposes. This MDM solution allows: <ul style="list-style-type: none"> ▪ Support to “bring your own device” (BYOD) ▪ Deployment of apps both in iOS and Android ▪ Mobile browsing management, including configure of mobile access gateway ▪ Establishment of development workflows (split the application development into steps and assign them to different users). When a development step is completed, users assigned to next step are automatically notified. The entire workflow process can be repeated for each new version of the application. 	
Ref: IMS_TEST_02	Nature: Mandatory
Mobile application deployment - MDM solution management	
For the duration of the project, (including maintenance phase) the contractor shall be responsible for the management of AirWatch MDM for the purpose of deploying the develop apps for testing purposes. This includes deployment to EMSA staff and a restricted number of end users.	
Ref: IMS_TEST_03	Nature: Mandatory
Mobile application deployment – Publication of production apps (public app stores)	
The contractor shall be responsible to deploy the production applications in the public application stores. This will be the main method to deploy the application to end-users.	

6.2 Usability and functional testing

Ref: IMS_TEST_04	Nature: Mandatory
Usability and functional testing – General requirement	
The contractor is responsible for usability and functional testing of all developed elements, before they are further tested by EMSA and its users.	
Ref: IMS_TEST_05	Nature: Mandatory
Usability and functional testing – Testing strategy	
The bidder should indicate what will be its strategy for usability and functional testing of the developed applications.	

Ref: IMS_TEST_06	Nature: Informative
Usability and functional testing - EMSA and user testing	
For the purpose of this project a restricted group of EMSA and Member States will be involved in the testing of the developed applications.	

6.3 WP2 Web services - Testing & Deployment

Ref: IMS_TEST_07	Nature: Informative
Web service testing and deployment - Service Transition activities	
The contractor shall be aware of how testing and deployment activities (denominated service transition) are handled at EMSA. These are documented in Appendix G to these specifications and applicable to all WP2 developments.	
Ref: IMS_TEST_08	Nature: Mandatory
Web service testing and deployment - Corrections	
The contractor of IMS App project shall perform all the essential corrections to the software delivered taking into account the reports of the functional and non-functional site acceptance tests.	
Ref: IMS_TEST_09	Nature: Mandatory
Web service testing and deployment - Releases	
The contractor shall provide during the implementation one release. The release should abide to all testing requirements (functional and non-functional) as well the relevant requirements defined the Project Delivery Appendix linked with development and testing (Appendix D).	
Ref: IMS_TEST_10	Nature: Mandatory
Web service testing and deployment - Functional testing	
Functional tests shall be designed, implemented, executed and the results documented by the contractor within the context of factory acceptance tests prior to any delivery to ensure compliance with requirements here-in. Bidders shall describe in detail how they plan to execute Functional Tests and what tools will be used. The Contractor shall deliver a complete set of Test Documentation, including Test Strategy, Test Cases, Test Scripts, Test Data, and Test Results. The Contractor shall deliver a full and working test environment (including tools, configurations, test scripts, test data, execution instructions); This Test environment shall be deployed at EMSA and will be used during Site Acceptance and in any for future runs. Further technical details on the test environment will be provided at K.O.	
Ref: IMS_TEST_11	Nature: Mandatory
Web service testing and deployment – Detailed test plan	
Upon delivery of a release, a detailed test plan shall be provided to be approved by EMSA. The test plan shall include complete description of the test and details on the necessary actions to perform it. The plan should also specify the category of each test. Categories include: <ul style="list-style-type: none"> ▪ Traceability between requirements and tests ▪ Regression test of previous approved functional elements ▪ Corrected bugs and defects from previous versions ▪ New functionalities ▪ Known bugs / errors in release (if any) 	
Ref: IMS_TEST_12	Nature: Mandatory
Web service testing and deployment - Non-functional testing	
Non-functional tests shall be designed, implemented, executed and the results documented by the contractor within the	

context of factory acceptance tests prior to any delivery to ensure compliance with requirements here-in.

Site acceptance non-functional tests shall be executed in the scope of the project by a test contractor chosen by EMSA as well as by EMSA staff.

Non-functional tests shall include:

- Load Tests
- Stress Tests,
- Availability/Resilience Tests
- Security Tests
- Traceability between requirements and tests

Bidders shall describe in detail how they plan to execute Non-Functional Tests and what tools will be used.

The Contractor shall deliver a complete set of Test Documentation, including Test Strategy, Test Cases, Test Scripts, Test Data, and Test Results for the tests types specified above.

The Contractor shall deliver a full and working test environment (including tools, configurations, test scripts, test data, execution instructions); This Test environment shall be deployed at EMSA and will be used during Site Acceptance and in any for future runs.

Ref: IMS_TEST_13

Nature: Mandatory

Web service testing and deployment - Go Live

The contractor shall be responsible for defining the Go Live strategy to be applied in PRODUCTION and PRE-PRODUCTION.

Go Live strategy shall address the deployment, Migration (, all configurations and post-Production support for applicable IMS App related developments (WP1 and WP2). Bidders shall propose the Go Live strategy and Planning.

The contractor shall adhere to the general EMSA requirements linked with project delivery and service requirements, presented in Appendix D and Appendix E, when it concerns to Go Live issues.

Ref: IMS_TEST_14

Nature: Mandatory

Web service testing and deployment - Documentation

The contractor is in charge to maintain and update he following documents during the lifetime of the project;;

- Installation manual
- Operating and maintenance manual (O&M)
- Incident procedures

The contractor is also responsible to update any of the abovementioned documents on request by EMSA. Further details on documentation are provided in Appendix D and Appendix E on service and project delivery.

Ref: IMS_TEST_15

Nature: Mandatory

Web service testing and deployment - Integration

The contractor is responsible for the integration with EMSA's web services. The contractor shall also be asked to document any issues it encounters in terms of this integration, towards being communicated EMSA

6.4 Project delivery requirements

Ref: IMS_TEST_16

Nature: Mandatory

General Project delivery requirements

The contractor shall follow the requirements set forth in Appendix D Project delivery when concerns the main project phases:

- Design
- Development and testing

- Deployment
- Go-Live

7 Project planning requirements

Ref: IMS_PM_01	Nature: Mandatory
Project management tool – Team Forge	
TeamForge will be the main tool for managing issues, sharing documents, and posting meeting minutes. EMSA will setup an account for the contractor.	
Ref: IMS_PM_02	Nature: Mandatory
Agile methodology	
The contractor shall follow an agile-based approach for implementing the project (WP1 and WP2), with multiple iterations of the solutions presented, to ensure that EMSA's staff can follow-up closely/review, comment and interact with the software and graphic design experts throughout all phases of project implementation.	
Ref: IMS_PM_03	Nature: Mandatory
Meetings	
There shall be at least 1 meeting every 10 days (phone conference or at EMSA's premises). In case the contractor or EMSA requires an additional meeting it has to be arranged within 2 working days. Regarding the minutes: <ul style="list-style-type: none"> ▪ The contractor is in charge of the minutes of the meeting and provides them within 2 working days after the end of the meeting. ▪ The meeting minutes have to contain actions with deadlines. ▪ The meeting minutes shall be uploaded to TeamForge and approved by EMSA. ▪ The contractor is responsible to upload to the TeamForge tracker any actions stemming from the meeting. 	
Ref: IMS_PM_04	Nature: Mandatory
Risk management	
The bidder shall identify the main risks and mitigating actions to reduce overall risk of project failure.	
Ref: IMS_PM_05	Nature: Mandatory
Work breakdown structure, project activities and dependencies	
The bidder shall present: <ul style="list-style-type: none"> ▪ Work break down structure ▪ Gantt chart (per Work package) ▪ Risk assessment grid for each identified risk ▪ Person day effort per activity and allocated profiles for executing the work.. 	

8 Summary of deliverables (Informative)

Ref: IMS_LIST_01	Nature: Informative
Overview	
This chapter summarizes the main deliverables expected from the contractor during the implementation of the project, linked with each of the work packages. Details on the content of each of the deliverables are provided in the above requirements or respective Appendices.	
Ref: IMS_LIST_02	Nature: Informative
Summary of main deliverables – WP1 (mobile application side)	
<ul style="list-style-type: none"> ▪ Graphical and navigational elements including: <ul style="list-style-type: none"> ○ Wireframes produced, describing all the above mentioned elements linked with the 4 use cases ○ Graphical elements, organized per page, used in the implementation of the of the IMS App (including versions excluded during sprints) ▪ Source code for implemented developments including: <ul style="list-style-type: none"> ○ iOS versions (iPhone and iPad developments) ○ Android ○ Server side developments including cloud catalogue and storage ▪ Source code for automated tests ▪ Build scripts & manuals ▪ Installation manual ▪ Operating and maintenance manual (O&M) ▪ Incident procedures 	
Ref: IMS_LIST_03	Nature: Informative
Summary of main deliverables – WP2 (server side components)	
<ul style="list-style-type: none"> ▪ After Kick-off <ul style="list-style-type: none"> ○ Functional design specifications ○ Technical design specifications ○ Draft software test approach ▪ For final release <ul style="list-style-type: none"> ○ Full system documentation (updated) ○ User documentation (updated) ○ Test documentation (including software test plan) ○ final version of the system to be deployed in all 3 environments ○ Source code of the developed solution 	
Ref: IMS_LIST_04	Nature: Informative
Summary of main deliverables – WP3 (Maintenance)	
<ul style="list-style-type: none"> ▪ Monthly Maintenance Reports and Statistics on maintenance activities ▪ Change Management Documents ▪ Updated versions of the system deliverables 	

Acronyms and definitions

Abbreviation	Definition
CISE	Common Information Sharing Environment
COTS	Commercial off the shelf
EO	Earth Observation
EU	European Union
FFI	Norwegian research institute
FMC	Fisheries Monitoring Centre
GUI / GI	Graphical (User) Interface
IdM	Oracle Identity Manager
IHS	IHS Fairplay
IVEF	Inter-VTS Exchange Format
LDAP	Lightweight Directory Access Protocol
LLI	Lloyds List Intelligence
MS	Member State
NPR proxy	Now renamed as SSN SI (Streaming interface)
OAM	Oracle Access Manager
OIM	Oracle Identity Manager
SAR	Satellite Aperture Radar / Search and Rescue
SHT	Single Hull Tanker
SSO	Single Sign On
SSO	Single Sign-On
UDDI	Universal Description Discovery and Integration
UMC	User Management Console
VDS	Vessel Detection System
WFS	Web Feature Service
WMS	Web Map Service
WUP	Web User Portal

Term	Definition
Application	<p>Application is a computer program or set of computer programs designed to help people perform a predefined set of activities. Applications could be implemented on custom-made code or commercial-off-the shelf software (COTS) such as Oracle database server, Oracle Identity management suite, Weblogic or Apache application servers, ArcGIS or Geoserver suites, Liferay portal server, Microsoft server, Active Directory, Open LDAP, etc.</p> <p>Maritime applications at EMSA include: CleanSeaNet, LRIT DC, LRIT Ship database, LRIT IDE, Thetis, STCW, IMDATE integrated services (MARSURV-1, MARSURV-3 and future VAS) and those included in the SSN system (currently EIS, STIRES, SSN Data warehouse).</p>
Interface	<p>The communication boundary between:</p> <ul style="list-style-type: none"> IT entities such as: IT systems, applications, software modules within an application, software or hardware devices, Users and IT systems (i.e. graphical interface)
Portlet	<p>Portlets are pluggable user interface software components that are managed and displayed in a web portal. Portlets produce fragments of markup code that are aggregated into a portal. Typically, following the desktop metaphor, a portal page is displayed as a collection of non-overlapping portlet windows, where each portlet window displays a portlet. Hence a portlet (or collection of portlets) resembles a web-based application that is hosted in a portal. Portlets are defined in JSR-000168 and JSR-000268 standards.</p>
Service	<p>(OASIS definition) Service is a mechanism to enable access to one or more capabilities, where the access is provided using a prescribed interface and is exercised consistent with constraints and policies as specified by the service description</p>
User	<p>A human being or an Authority accessing one or more EMSA applications using a web – based interface. The “Authority” could be understood as an account that allows a team of persons to</p>

Term	Definition
	access one or more applications.
User interface	User interface is everything designed into an IT system which includes one or more applications which a human being may interact with -- this includes, but is not restricted to: display screen, keyboard, mouse, light pen, desktop appearance, illuminated characters, help messages, and how an application program or a Web site invites interaction and responds to it.

Appendices to Annex A

Ref	Content
(A)	EMSA technical landscape
(B)	EMSA's Oracle API Gateway solution
(C)	IMS web service – architecture document
(D)	EMSA requirements for Project delivery
(E)	EMSA requirements for Service delivery and working procedures
(F)	EMSA Visual identity guidelines
(G)	EMSA Service Transition activities