

Appendix A to Tender Specifications

Product Requirements

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Definitions and acronyms

Acronym	Description
RPAS	Remotely Piloted Aircraft Systems
RDC	RPAS Exploitation Data Centre
WFS	Web Feature Service
WMS	Web Map Service

1. Structure of the document

Requirements

The RPAS Exploitation Data Centre (**RDC**) **product requirements** are described in the following sections and are numbered using the naming convention ***RDC_PDT_REQ_X***.

The more requirements the offered product is compliant with the higher the bid will score during the evaluation.

Section 4 further elaborates on the requirement rollout priorities. A first release of the RDC (version 0.1.0) should already include the requirements tagged with (*P1*) in the rollout priority field. The last version of the RDC at the end of the implementation of Module 1 should include the remaining requirements which are offered in the bid.

Template

Ref: <i>RDC_PDT_REQ_X</i>	Rollout Priority: <i>[P1]</i> or <i>[P2]</i>
Description of the requirement	
<i>Guidance on how to demonstrate compliance to requirements in the bid (in italic)</i>	

Some requirements also provide guidance (in *italic*) on how to demonstrate their compliance in the bid.

Following the description of the requirement(s) (*numbered RDC_PDT_REQ_X*), indications may be given regarding the how the functionality translates into use cases.

Use cases

Use cases (*numbered RDC_PDT_UC_X*) may be given in relation to the specific requirement or to a number of requirements.

The use cases will be considered when verifying the implementation of the specific user requirements.

Template

Use case No: <i>RDC_PDT_UC_1</i>
Ref: <i>RDC_PDT_REQ_X – RDC_PDT_REQ_X; RDC_PDT_REQ_X</i>
Use cases (for information only): < descriptive or figure >

2. Functional Requirements

2.1 General

RDC_PDT_REQ_1.

Rollout Priority: P2

RDC Purpose

The **purpose of the RDC is to provide services for a data centre** to be used by the users and allowing them to exploit data coming from several sensors in multiple RPAS operational surveillance missions running in parallel by separate user communities.

The Bidder is requested to describe in the bid in detail the RDC architecture and technology, and to provide access to a mock-up or demo materials (e.g. video) during the evaluation phase demonstrating the visualisation and data exploitation capabilities of the offered system.

RDC_PDT_REQ_2.

Rollout Priority: P2

The RDC within EMSA Service Delivery Chain

Figure 1 below places the RDC within the EMSA RPAS Service Delivery Chain and highlights the scope of the tender.

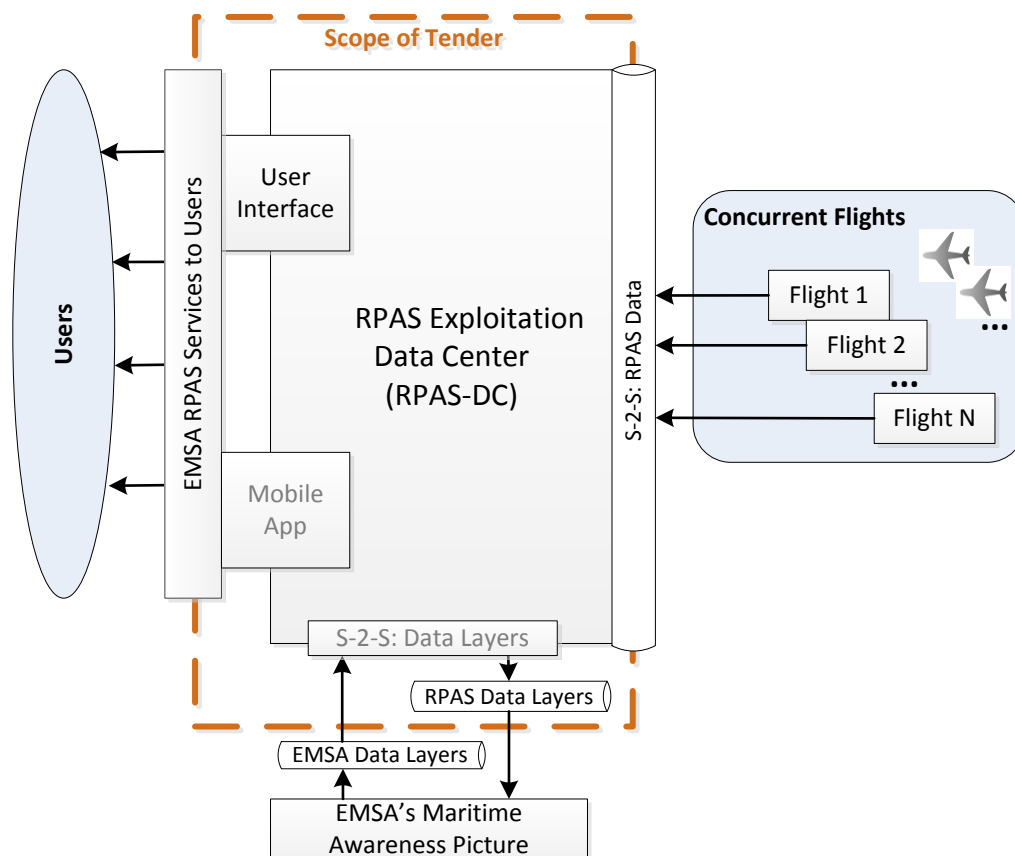


Figure 1: RPAS Exploitation Data Centre (RDC) within EMSA Service Delivery Chain

The interfaces of the RDC are the data streams coming from the RPASs, EMSA data layers to be integrated into the RDC, layers of RPAS data to be integrated in the EMSA operational picture and

the interfaces to the EMSA users.

All the necessary resources and logistics to run the RPAS missions including the RPAS themselves, the flight permits, the staff, the ground stations etc... are excluded from the scope of this tender.

RDC_PDT_REQ_3.	Rollout Priority: P2
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RDC High Level User Needs

The high level user needs for the RDC have been identified as:

- **Live Mission support** – display all flight and sensor data integrated with EMSA's own data and to create a single operational awareness picture to be exploited by the users during the missions in real time.
- **Post Mission Analysis** – the same data as for the live mission support shall be available for post mission analysis. The user shall be able to browse through past missions and have necessary export functions to extract the data and prepare post mission reports.
- **Chat** – messaging system to support communication during operations

RDC_PDT_REQ_4.	Rollout Priority: P2
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Flexibility to Handle Multiple RPAS

Throughout the duration of the contract several RPAS deployments are expected to take place. The contractor will be required to configure the RDC accordingly taking in consideration that the RPASs and sensors can come from different manufacturers and operated by different entities, however are using similar interface protocols.

The architecture of the RDC should allow to easily handling the integration of new RPAS.

RDC_PDT_REQ_5.	Rollout Priority: P2
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Data Layers Exchange

The RDC should interface with EMSA's Maritime Awareness Picture and exchange data layers.

RDC_PDT_REQ_6.	Rollout Priority: P2
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System availability and proven technology - Using COTS

In order to have a stable system with a proven technology, the bidder shall analyse the possibility of using COTS in the RDC which shall strongly be envisaged. COTS could be a commercially available solution (any company can purchase licence) or an existing proprietary solution (building block).

The bidder is requested in his offer to clearly describe the COTS solution he intends to use for the RPAS-DC.

RDC_PDT_REQ_7.	Rollout Priority: P2
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Mapped and unmapped data

The system shall allow the live visualisation of all data in two modes:

- as mapped data
- as unmapped data (which could be augmented with additional information in the case of video

and image)

This dual visualisation principle should be available throughout the whole system.

2.2 Product Features

2.2.1 Live Mission Support

RDC_PDT_REQ_8.	Rollout Priority: P1
Integrated Operational Picture on a Map	
<p>The RDC shall include an integrated operational picture on a map composed of the mapped data products as defined in RDC_PDT_REQ_23, e.g.:</p> <ul style="list-style-type: none">• Aircraft position• Flight path• Sensor(s) footprint• Live images (single and stitched/mosaicked)• Live video streaming projected on the map• Georeferenced objects and incidents of interest in any of the RPAS sensor data• Deployment Map• EMSA's Maritime Awareness Picture layers <p><i>In case this requirement cannot be fully met by Release 0.1.0 (refer to §4) the bidder should clearly identify in his bid which what be available by release 0.1.0 and what will be available by release 1.0.0.</i></p>	

RDC_PDT_REQ_9.	Rollout Priority: P1
Unmapped Live Sensor Data	
<p>The RDC shall allow visualizing live sensor data (refer to RDC_PDT_REQ_23) in dedicated windows or alike in an unmapped manner, including for instance Live Streaming Video and images from the image sensor but also vector data and metadata.</p>	

RDC_PDT_REQ_10.	Rollout Priority: P2
Augmented unmapped Video and Image Data in Real Time	
<p>The RDC should provide augmented video and images in real time: video and images augmented with data in real time as identified in RDC_PDT_REQ_23, e.g.: vessel positions with ShipName, oil spill polygons.</p>	

2.2.2 Post Mission Analysis

RDC_PDT_REQ_11.	Rollout Priority: P1
Past Mission and Data	
<p>The user shall be able to browse through past missions and data. At least the following data should be available for searching and filtering of missions:</p> <ul style="list-style-type: none">- Flight path- Time- Sensor data- List of sensors used per mission	

- Events

RDC_PDT_REQ_12.	Rollout Priority: P2
Replay Mode	
The same data as for the live mission support shall be available for post mission analysis in replay mode, including augmentation.	

RDC_PDT_REQ_13.	Rollout Priority: P1
Specific Data Export and Support to Mission Reports	
The RDC shall provide tools to export data into “standard” file formats and support the preparation of post mission reports.	

2.2.3 Chat/Messaging

RDC_PDT_REQ_14.	Rollout Priority: P2
Chat Interaction	
For communication purposes between contracting authority, the requesting national users (or European Agency or the European Commission) and the Contractor operational team, a chat interaction shall be established.	

RDC_PDT_REQ_15.	Rollout Priority: P2
Chatrooms	
Several chatrooms shall run in parallel, as defined by the operational needs defined by EMSA.	

RDC_PDT_REQ_16.	Rollout Priority: P2
User Account Management	
The proposed tool shall allow for users account management including creation, editing, deleting and access rights management per chatroom.	

RDC_PDT_REQ_17.	Rollout Priority: P2
Exporting	
A user shall be to export chat conversations into typical readable formats (e.g. including CSV, excel, PDF for later use.	

RDC_PDT_REQ_18.	Rollout Priority: P2
Online storing	
All chats shall be kept available online for the duration of 6 months.	

RDC_PDT_REQ_19.	Rollout Priority: P2
Archiving	
All chats older than 6 months shall be archived and stored for up to 5 years, if not kept online.	

RDC_PDT_REQ_20.	Rollout Priority: P2
Interface A web based client GUI shall be available in order not to oblige the users to install a chat client on their computers or systems.	

RDC_PDT_REQ_21.	Rollout Priority: P2
Standard The chat/messaging interaction shall be established based on JABBER/XMPP protocol	

RDC_PDT_REQ_22.	Rollout Priority: P2
Scalable chat Architecture A server based architecture should be chosen with one central server for all user communication. The chat server shall be able to connect directly to chat clients, but also to other chat server.	

2.3 Data Products

2.3.1 Overview

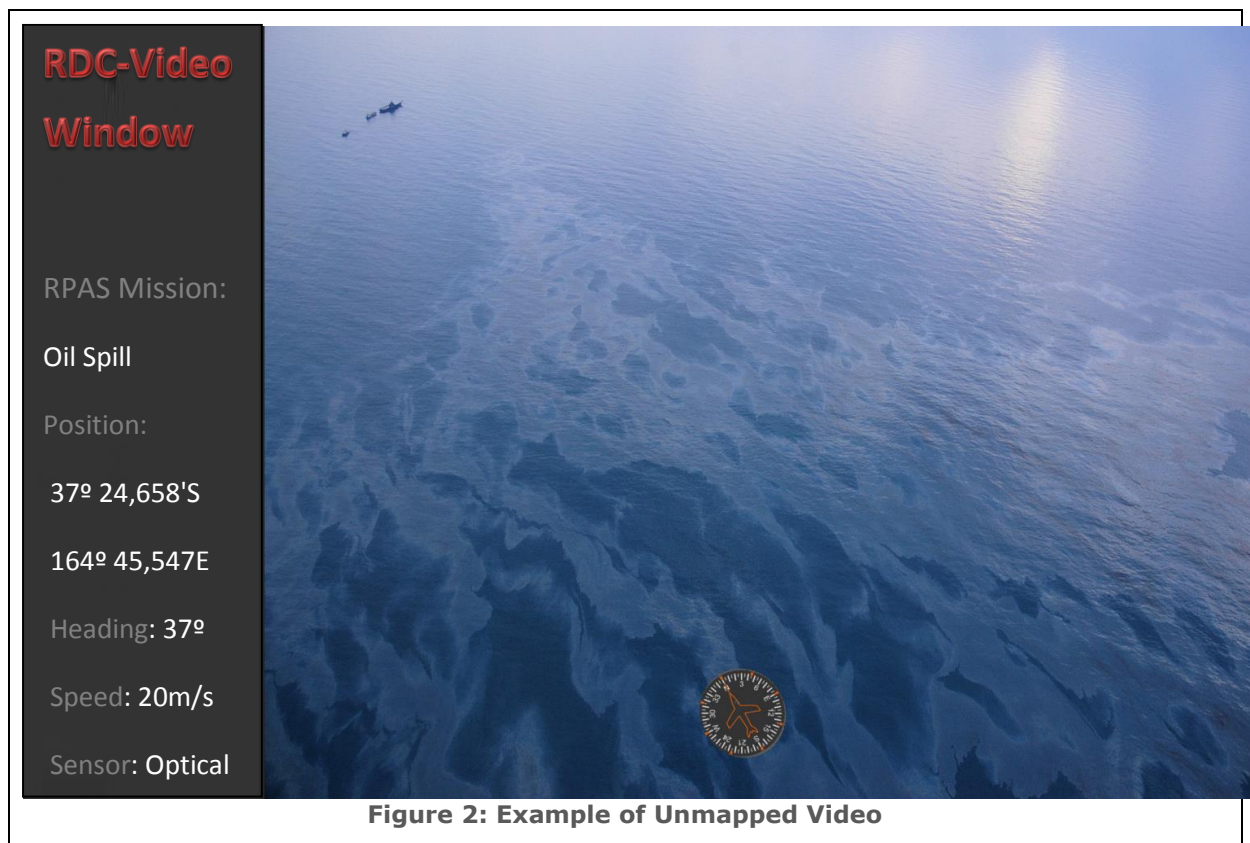
RDC_PDT_REQ_23.	Rollout Priority: P2	
Summary of Data Products to be Visualised		
At least the following data products are foreseen to be visualised and shall be supported by the RDC:		
Products	Visualisation geometry	Details
Color/multichannel video/ greyscale	<ul style="list-style-type: none">Unmapped videoMapped video	Color/multichannel: Electrooptical (RGB) and multichannel Greyscale: Synthetic aperture radar and IR.
	<ul style="list-style-type: none">Augmentation to unmapped video	Products to be used for augmentation are identified with (*) in the first column of this table
Color/multichannel images/greyscale	<ul style="list-style-type: none">Unmapped imagesMapped images	Color/multichannel: Electrooptical (RGB) and multichannel Greyscale: Synthetic aperture radar and IR
	<ul style="list-style-type: none">Individual ImageStitched / mosaicked	
	<ul style="list-style-type: none">Augmentation to unmapped images	Products to be used for augmentation are identified with (*) in the first column of this table
Chemical concentrations (SOx, NOx)	Data visualisation	Sniffer data or spectroscopic data
Sensor footprint (*)	Vector data visualisation	

(polygon)		
Other Sensor Data (*) (e.g. objects in radar signal, events, value added data, ...)	Vector data visualisation: <ul style="list-style-type: none"> • Point • Polygon • Text Metadata visualisation	<ul style="list-style-type: none"> • Identified objects in the radar signal, electro-optical and IR images. • AIS information and track (position, MMSI, ...) of the vessels. • Georeferenced objects and incidents of interest in any of the sensor data. • Oil spills • Distress information
Flight path information (*)	Vector data visualisation	<ul style="list-style-type: none"> • Current mission: past and planned flight path. • Past missions: flight path of the mission
RPAS Platform housekeeping/flight parameters(* for the heading)	Metadata visualisation along track	Position (lat, lon), Altitude, Heading, Temperature, Pitch, Roll, Yaw, etc.
EMSA's Maritime Awareness Picture layers (refer to §2.4.5)		OGC layers (WMS, WFS) Other.
Deployment map	<ul style="list-style-type: none"> • Map oriented to North • Map Moving with RPAS heading 	Different maps are expected to be available, including nautical charts.
Table 1: Overview of Data Products		

The different possibilities for the visualisation of the above mentioned products are described below.

2.3.2 Visualisation – Unmapped Video

RDC_PDT_REQ_24.	Rollout Priority: P1
Unmapped Video The RDC shall allow to visualize unmapped video live. The image below shows a simple example for standard video visualisation (optical).	



RDC_PDT_REQ_25.	Rollout Priority: P1
Unmapped Video – multiple videos streams	
As several sensors will provide information at the same time multiple video streams for the different sensors shall be visible in parallel.	

RDC_PDT_REQ_26.	Rollout Priority: P2
Unmapped Video – additional information in the video window	
In addition to the video information, the flight parameters and sensor metadata should be available live, e.g.	
<ul style="list-style-type: none"> - RPAS related data: <ul style="list-style-type: none"> o heading (as numbers and as a compass) o coordinates - Sensor metadata <ul style="list-style-type: none"> o Sensor type and mode o Viewing direction o Sensor specific information 	
This is not an exclusive list and will be depend on the RPAS/sensor to be commissioned.	

2.3.3 Visualisation – Mapped Video

RDC_PDT_REQ_27.

Rollout Priority: P1

Mapped Video

Mapped video is defined as the projection of the video data in the map. The RDC shall allow to visualize Mapped video live.

The figure below shows a scene with an identified oil spill. The mapped video is projected in the map (right side). The left side illustrates an unmapped video which could be visualized by the user at the same time as the mapped video.

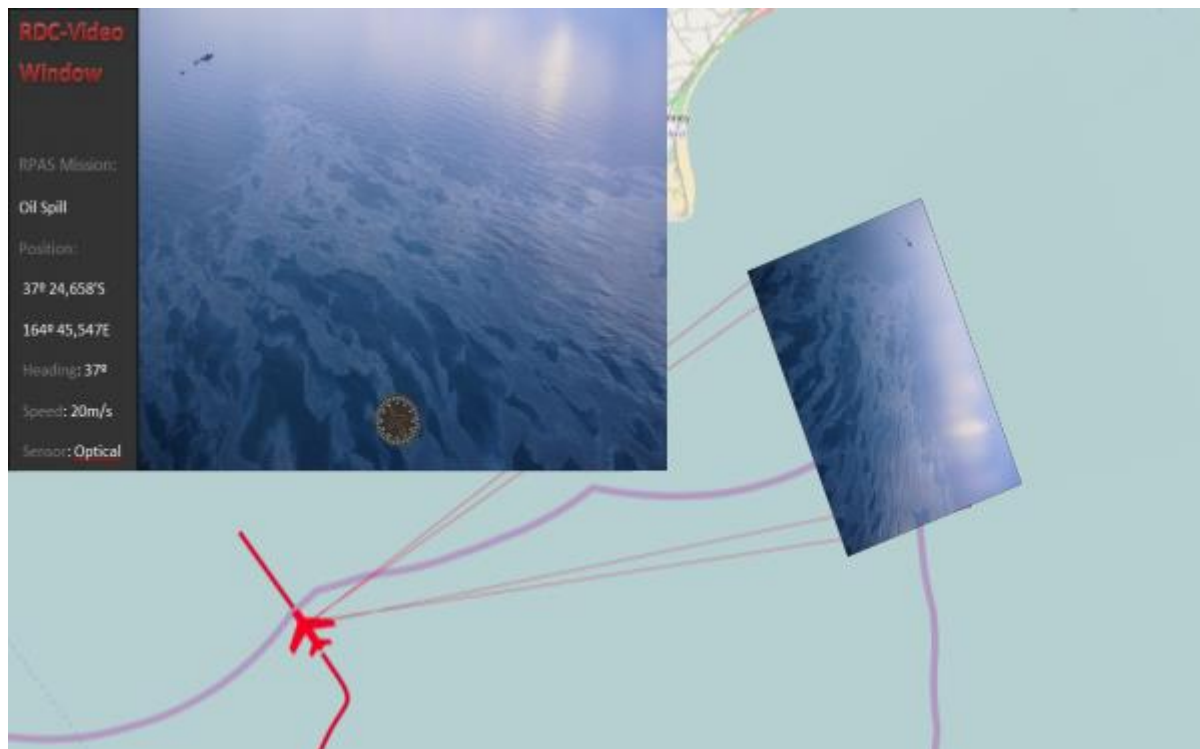


Figure 3: Example of Mapped Video

2.3.4 Visualisation – Augmentation to unmapped video

RDC_PDT_REQ_28.

Rollout Priority: P2

Unmapped Augmented Video

Unmapped augmented video is defined as the video signal augmented with data in real time as identified in RDC_PDT_REQ_23, e.g.: vessel positions with ShipName, oil spill polygons.

The figure below shows the video stream on the left augmented with the oil spill polygon information (red) and moving vessels (white) in real-time. The right side of the figure shows the video sensor coverage and the augmented information projected in the map, which should be visualized in parallel with the augmented video window.

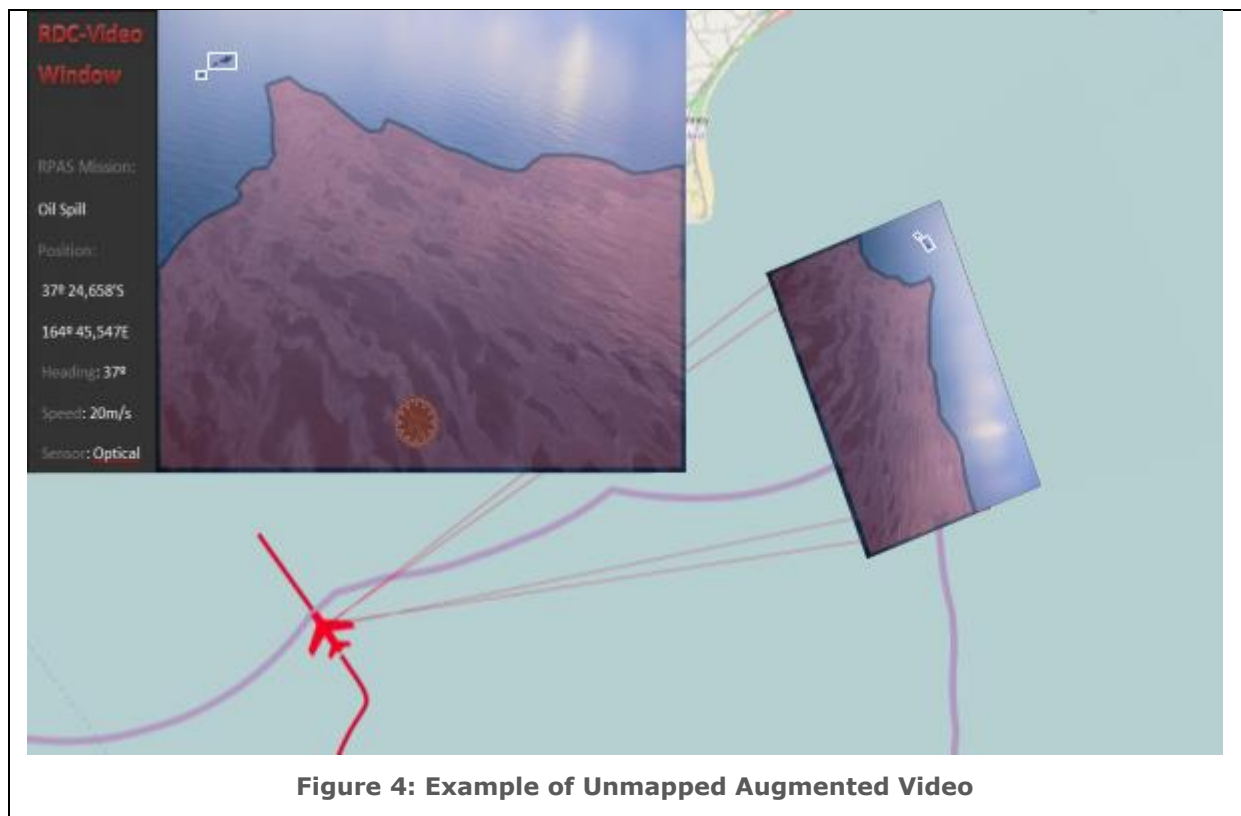


Figure 4: Example of Unmapped Augmented Video

2.3.5 Visualisation – Unmapped Individual Images

RDC_PDT_REQ_29.	Rollout Priority: P1
Unmapped Individual Images	
The RDC shall provide tools to visualise, edit and annotate individual images, during live missions and to support post mission analysis.	

2.3.6 Visualisation – Mapped Individual Images

RDC_PDT_REQ_30.	Rollout Priority: P1
Mapped Individual Images	
The user shall be able to extract images from the video and/or to select already available still images acquired during the missions and project them on the map.	

2.3.7 Visualisation – Images Stitched/mosaicked and Mapped

RDC_PDT_REQ_31.	Rollout Priority: P2
Images Stitched/mosaicked and Mapped	
The RDC shall allow stitching together (Mosaic) several images and/or video sequences to cope with the use case below.	
The stitched images shall be projected on the map or visualized in a dedicated window.	

Use case:	RDC_PDT_UC_1.
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Applicable Requirement: RDC_PDT_REQ_31

RPAS are providing consecutive images along their flight path. These images might heavily overlap. In order to reconstruct an image over a certain area, several consecutive scenes need to be stitched together in order to form a larger image with the full information content. Figure 5 below shows an example where an aircraft is performing a routine operation and an oil spill is observed. The aircraft adjusts his flight path accordingly.

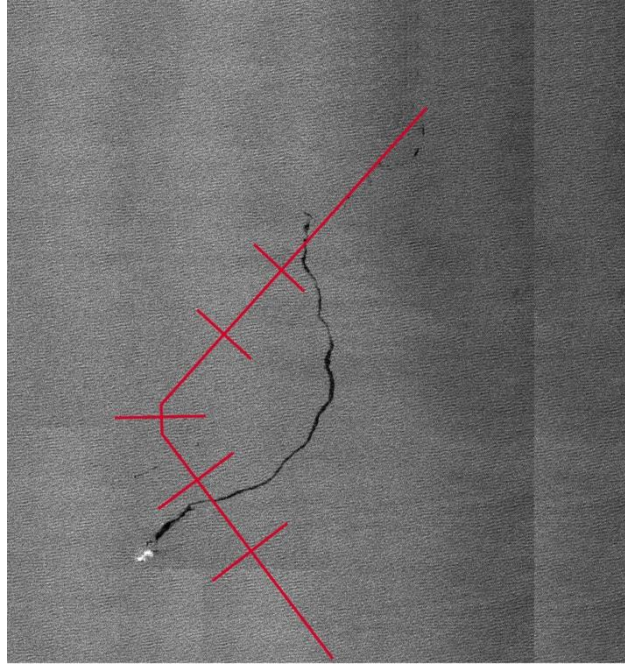
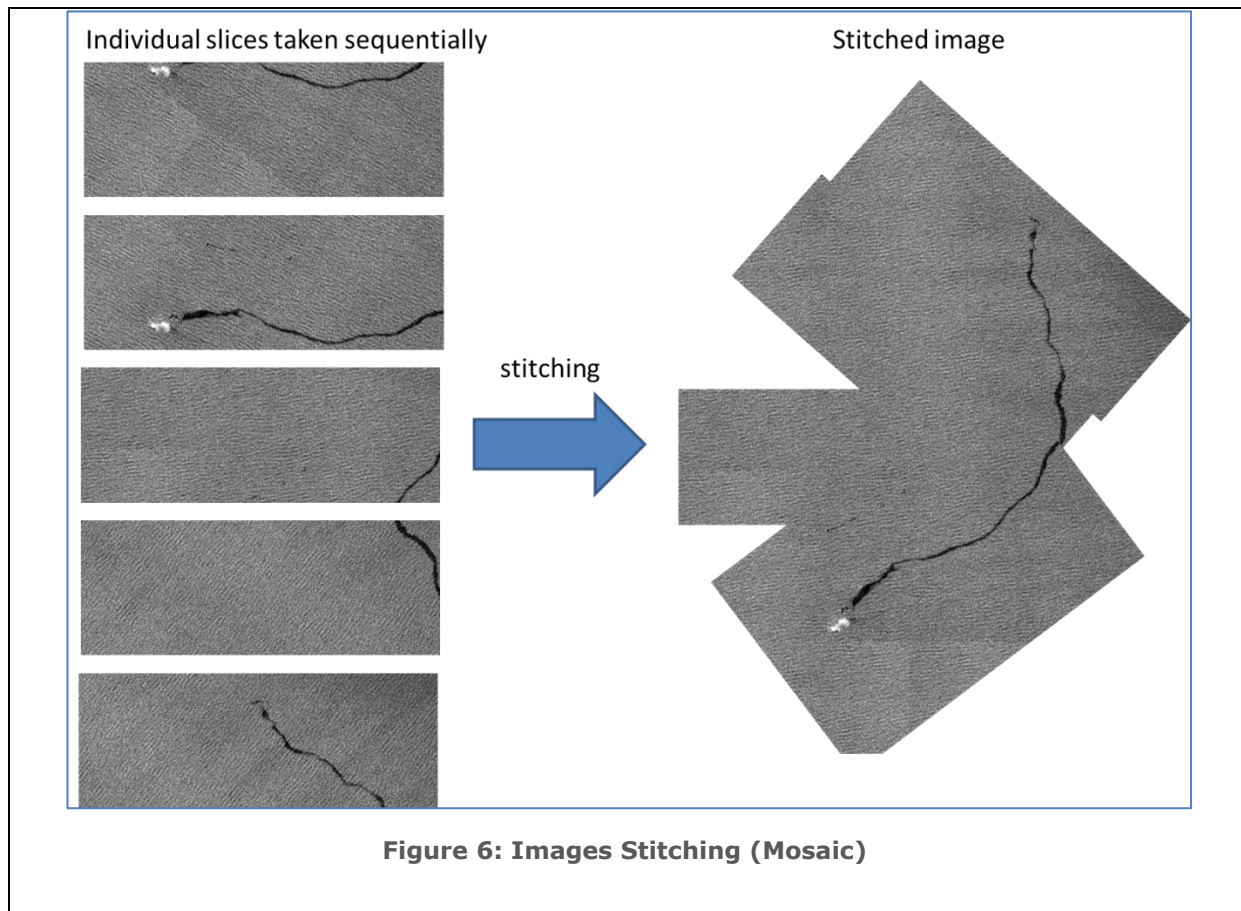


Figure 5: Flight Path Over Oil Spill

The flight track is shown in as a red line intersected by smaller lines which show the centre position of the images taken in nadir mode. Figure 6 below illustrates on the left side the individual slices/images, which individually do not allow to characterise the spill, whereas on the right side the stitched slices are glued together, forming one single image illustrating clearly the oil spill.



2.3.8 Visualisation – Augmentation to unmapped images

RDC_PDT_REQ_32.	Rollout Priority: P2
Augmentation to unmapped images <p>Augmentation to unmapped images is defined as the image augmented with data in real time as identified in RDC_PDT_REQ_23, e.g.: vessel positions with ShipName, oil spill polygons overlaid on top the image.</p>	

2.3.9 Visualisation – Other Live Features

RDC_PDT_REQ_33.	Rollout Priority: P2
Image Enhancement <p>The RDC shall provide enhanced resolution (e.g. by combining several images into a single image of higher resolution) and therefore provide live noise reduction, sharpening and zooming.</p> <p><i>The bidder shall describe in his bid the image enhancement technologies offered in their solution.</i></p>	

RDC_PDT_REQ_34.	Rollout Priority: P2
Image Stabilization	

The RDC shall provide live jitter reduction to cancel jerky sensor movements and provide stabilization of the video image.

The bidder shall describe in his bid the image stabilization technologies offered in their solution.

RDC_PDT_REQ_35.

Rollout Priority: P2

Automatic Motion Detection

The RDC shall allow the automatic live detection of moving objects in the video feed and to track those objects live.

The bidder shall describe in his bid the motion detection technologies offered in their solution.

RDC_PDT_REQ_36.

Rollout Priority: P2

Manual Motion Detection

The RDC shall allow to lock on manually selected moving objects (e.g. vessels at sea) in the video feed and to track those objects live.

RDC_PDT_REQ_37.

Rollout Priority: P2

Marking of Objects

The RDC shall provide the option to mark stationary objects on the video feed and to track those objects live.

RDC_PDT_REQ_38.

Rollout Priority: P2

Coordinates of Objects

The RDC shall provide the coordinates of objects.

RDC_PDT_REQ_39.

Rollout Priority: P2

Tracking Objects outside the Video Frame

The RDC shall be able to memorize objects in case they move temporarily outside of the video frame.

RDC_PDT_REQ_40.

Rollout Priority: P2

Option to Centre

The RDC shall provide the option to centre (position and/or orientation) the video window or map of the RDC on an object.

RDC_PDT_REQ_41.	Rollout Priority: P2
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Annotation of Objects

The RDC shall provide the ability to annotate objects.

2.3.10 Visualisation – Metadata

RDC_PDT_REQ_42.	Rollout Priority: P1
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Metadata Visualisation – data sets

Different sets of metadata, as defined in requirement RDC_PDT_REQ_23 above, are expected to be streamed from different sensors in the RPAS.

This data shall be visualised in the RDC depending on the type of data.

The display methodology shall be explored with EMSA.

RDC_PDT_REQ_43.	Rollout Priority: P2
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Metadata Visualisation – integration into other views

Some metadata shall be integrated into other views, e.g:

- the flight heading shall be visualised by the orientation of the aircraft in the map
- the flight heading shall be visualised via a compass rose in the video (refer to RDC_PDT_REQ_24)
- Navigation aids shall also be displayed next to the map, e.g., bearing, distance to target, estimated time of arrival to a given navigation marker.

2.3.11 Visualisation – Vector Data

RDC_PDT_REQ_44.	Rollout Priority: P1
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Vector Data and Augmentation

Different sets of vector data, as defined in requirement RDC_PDT_REQ_23 above, are expected to be streamed from different sensors in the RPAS.

This data shall be visualised in the RDC in the map, video (refer to RDC_PDT_REQ_28) or image (refer to RDC_PDT_REQ_32) depending on the type of data.

The display methodology shall be explored with EMSA.

2.3.12 Visualisation – Deployment Map

RDC_PDT_REQ_45.	Rollout Priority: P1
Deployment Map	
The RDC shall display a map layer oriented to North.	

RDC_PDT_REQ_46.	Rollout Priority: P2
Deployment Map – Centred on RPAS	
There shall be the possibility for the user to centre the map to coordinates of a specific RPAS and keep it centred in real-time.	

RDC_PDT_REQ_47.	Rollout Priority: P2
Deployment Map – Moving Map	
There shall be the possibility for the user to set the map orientation to move with the RPAS heading in real-time.	

RDC_PDT_REQ_48.	Rollout Priority: P2
Measurement Tools	
The RDC shall provide measurements tools to measure areas (rectangular, polygonal and circular objects) and lines/vectors in the map.	

RDC_PDT_REQ_49.	Rollout Priority: P2
Deployment Map – Different Map Options	
The user shall be able to select the map type from a set of available maps.	
<i>The bidder should describe in his tender the list of maps which are available in the offer.</i>	

RDC_PDT_REQ_50.	Rollout Priority: P2
Deployment Map – EMSA Own Maps	
The RDC shall be able to accommodate additional maps provided by EMSA through the S-2-S Data Layers interface (refer to RDC_PDT_REQ_61).	

2.4 Interfaces

2.4.1 User Interface

RDC_PDT_REQ_51.	Rollout Priority: P1
User Interface	
<p>The user interface shall be able to present in real time via a geospatial information system and video viewer (video/GIS) data captured by all the sensors in the aircraft payload for all the concurrent RPAS missions. The user interface shall follow recognized ergonomic principles.</p> <p><i>The bidder shall describe in his bid the ergonomic principles used in their user interfaces. As requested in RDC_PDT_REQ_1, the bidder shall provide access to a mock-up or demo materials (e.g. video) during the evaluation phase demonstrating the visualisation and data exploitation capabilities of the offered system.</i></p>	

RDC_PDT_REQ_52.	Rollout Priority: P2
User Interface – HTML5 Option	
<p>The user interface shall be a web based video/GIS application (HTML5) and shall be visualised with standard web browsers, preferably without requiring special plugins. The following web browsers should be supported (for the specific version of the browsers, please consult the EC “Browser support” web page: http://ec.europa.eu/ipg/standards/browsers/index_en.htm):</p> <ul style="list-style-type: none">• Microsoft Internet Explorer and Microsoft Edge• Firefox• Chrome• Safari <p><i>In case not all functionalities can be delivered with HTML5 the bidder shall identify in his bid which will be delivered via the HTML5 solution and which will be delivered via a dedicated client solution.</i></p>	

RDC_PDT_REQ_53.	Rollout Priority: P1
User Interface – Dedicated Client	
<p>Alternatively to RDC_PDT_REQ_52, if all requested functions cannot be delivered using an HTML5 interface, a dedicated client tool may be used in parallel to the HTML5 user interface.</p> <p>In such case up to 10 laptops should be provided to EMSA upon request, fully configured with the solution and ready to use.</p> <p>EMSA strongly prefers the solution in HTML5 as indicated in RDC_PDT_REQ_52.</p>	

RDC_PDT_REQ_54.	Rollout Priority: P2
User Interface – User Manual	
<p>Either with a web user interface (refer to RDC_PDT_REQ_52) and/or a dedicated client tool (refer to RDC_PDT_REQ_53) the contractor shall provide a user manual using EMSA brand.</p>	

RDC_PDT_REQ_55.	Rollout Priority: P2
User Interface – Access Rights Access rights shall be applicable at the level of the User Interface. There shall be the possibility to apply access rights per user, meaning that a specific user will have access to specific missions and data.	

2.4.2 Mobile App

RDC_PDT_REQ_56.	Rollout Priority: P2
Mobile App In addition to the User Interface defined in 2.4.1 it is an advantage if the RDC includes a mobile application available through Google Play Store and/or the Apple App Store.	

RDC_PDT_REQ_57.	Rollout Priority: P2
Mobile App – Main Features The focus shall be on delivering <i>Live Mission Support</i> and <i>Chat/Messaging</i> as, described respectively in §2.2.1 and §2.2.3. <i>The user shall identify in his bid which functionalities are delivered the Mobile App.</i>	

2.4.3 Data Standards

RDC_PDT_REQ_58.	Rollout Priority: P1
Data Standards The RDC shall support at least the following data standards in the <i>RPAS Data</i> interface identified in RDC_PDT_REQ_2:	
Type	Standard
Video stream data	STANAG 4609 / MISB 0902 (time coded video data) H.264
Image data	JPEG2000
AIS data	NMEA
Feature data	XML(GML), GEOJSON, NetCDF
Chat communication	JABBER/XMPP
Metadata	ISO 19119/19115

OGC layers	WMS, WFS, WFS-T, CSW
Transfer Mechanisms	HTTP(S), FTP, REST

Table 2: Data Exchange Formats

Compliance to additional data standards is an advantage and should be defined in the bid.

In case this requirement cannot be fully met by Release 0.1.0 (refer to §4) the bidder should clearly identify in his bid which what be available by release 0.1.0 and what will be available by release 1.0.0.

2.4.4 S-2-S: RPAS Data

RDC_PDT_REQ_59.	Rollout Priority: P2
RPAS Data Ingestion	
The RDC shall be able to ingest the data products listed in RDC_PDT_REQ_23 using the standards defined in RDC_PDT_REQ_58.	

RDC_PDT_REQ_60.	Rollout Priority: P2
RPAS Data Interface Specification	
The contractor shall support EMSA in further defining the RPAS Data Interface and documenting it in an ICD (refer to RDC_PDT_REQ_66).	

2.4.5 S-2-S: EMSA Data Layers

RDC_PDT_REQ_61.	Rollout Priority: P1
EMSA Data Layers	
EMSA combines several sets of data from many sources to create a Maritime Awareness Picture (e.g. Vessel position layers, Electronic Nautical Charts, etc.).	
EMSA OGC layers and catalogues containing the maritime awareness picture shall be displayed on the Operational Awareness Picture of the RDC containing the RPAS data under the map view.	

RDC_PDT_REQ_62.	Rollout Priority: P2
EMSA Data Layers – Activation/Deactivation of Layers	
The user shall be able to activate/deactivate the individual layers on the user interface.	
The list of layers may change over time.	

RDC_PDT_REQ_63.	Rollout Priority: P2
EMSA Data Layers – Access Rights	

The RDC shall be able to manage access rights per EMSA OGC layer.
This shall be configurable per user and per mission.

2.4.6 S-2-S: RPAS Data Layers

RDC_PDT_REQ_64.	Rollout Priority: P2
RPAS Data Layers EMSA will explore during the duration of the FWC the integration of RDC data, including collected RPAS data, into EMSA systems. The proposed RDC solution shall provide means to integrate the RDC data into EMSA systems. EMSA favours OGC compatible layers (e.g. WMS, WFS) including a catalogue service (e.g. CSW). <i>The bidder should describe in his proposal the tools/APIs (preferable based on open standards) available to integrate the RDC data into EMSA systems. Namely, he should list which OGC layers with RDC data are or will be available in the offered Product and if their solution includes an inventory of the metadata (e.g. via OGC catalogue service (CSW)). Other available offered API/technologies shall also be listed in the bid.</i>	

RDC_PDT_REQ_65.	Rollout Priority: P2
Data Search Capabilities The RDC shall allow the search and filtering for specific data, e.g.: Flight path, Time, Sensor activity, events...	

2.4.7 Interface Control Document

RDC_PDT_REQ_66.	Rollout Priority: P1
Interface Control Document The contractor shall prepare and maintain detailed common Interface Control Documents (ICDs), to be approved by EMSA, for two interfaces identified in RDC_PDT_REQ_2: <ul style="list-style-type: none">- S-2-S: RPAS Data- S-2-S: RPAS Data Layers The template for the ICDs shall be approved by EMSA. <i>The bidder is requested to describe the proposed ICD template/standard or to provide an example beforehand in the bid.</i>	

RDC_PDT_REQ_67.	Rollout Priority: P2
Architecture	

The bidder shall provide in his bid a description of the system architecture, including technology and cots used. This architecture document has to be maintained throughout the contract.

3. Non-functional requirements

This section provides the RDC non-functional requirements.

3.1 Data Management

RDC_PDT_REQ_68.	Rollout Priority: P2
Online Data - 6 Months	
<p>The RDC shall keep data available live through the system for a minimum of 6 months for all collected RPAS data.</p>	

RDC_PDT_REQ_69.	Rollout Priority: P2
Data Archiving – 5 years	
<p>Data older than 6months may be archived. The archived data may be stored offline. The contracting authority may require the tenderer to provide all or extract specific archived data into readable format as needed.</p> <p><i>The data management approach shall be described in the proposal.</i></p>	

RDC_PDT_REQ_70.	Rollout Priority: P2
Low Volume Data Availability	
<p>Some low volume data, e.g; catalogue, metadata and derived products, shall be kept online throughout the whole contract.</p>	

3.2 Performance

RDC_PDT_REQ_71.	Rollout Priority: P2
Performance	
<p>The data collected from the RPAS shall be visualized in the User Interfaces (refer to §2.4.1) and in the MobileApp (refer to §2.4.2) in under 5 seconds in 95% of the cases.</p> <p>Nevertheless, if possible the bidder should aim to have Live video feed latency of maximum 2 seconds for operational purposes.</p> <p>The performance shall be met in the conditions of the following scenario:</p> <ul style="list-style-type: none">• 5 concurrent missions potentially from different deployments – 5 RPAS flying simultaneously on-task, e.g., collecting sensors data;• Up to 20 concurrent users accessing the RDC through the User Interface;• The RDC receives the following data from each RPAS:	

- one compressed video stream with either a frame rate of at least 10fps and a minimum resolution of 1024 x 768 pixel or a frame rate of at least 25fps and a minimum resolution of 720 x 576 pixel; as requested for the deployment;
- one high resolution image of at least 2 megapixel every second;
- all flight, housekeeping and metadata needed to fully characterise the data received (e.g. georeference).

The bidder is requested to state the expected RDC System latency from the S-2S: RPAS Data interface to a client on a local network.

3.3 Network

RDC_PDT_REQ_72.	Rollout Priority: P2
Bandwidth and Latency	
<p>The bidder shall guarantee the necessary bandwidth and latency to meet the performance of the scenario above in RDC_PDT_REQ_71 for external clients on the web.</p> <p><i>The guaranteed bandwidth and latency shall be indicated in the bid.</i></p> <p><i>In addition the bidder is requested to describe his network including redundancies, etc.</i></p>	

RDC_PDT_REQ_73.	Rollout Priority: N/A (Optional)
Use of GEANT	
<p>EMSA has a connection to the European R&E network GEANT (http://www.geant.net/) via the “National Research and Education Networks” (NREN) which provides a shared bandwidth transfer of up to 1 GBit/s and a guaranteed bandwidth of 250 Mbit/s.</p> <p>With the availability of the guaranteed, high bandwidth and cost effective GEANT solution, the data transmission time contributes only marginally to the overall delivery time.</p> <p>The Contractor may, through the local NREN, connect to the R&E network.</p> <p>The cost of the data transmission over the GEANT network and the transmission from the Portuguese NREN to EMSA will be covered by EMSA.</p> <p>If the Contractor decides to use the R&E network, the Contractor will only need to bear the costs to the next NREN node (set-up, maintenance, operation and communication cost to the next NREN) and potential fees of the local NREN.</p>	

3.4 Security

RDC_PDT_REQ_74.	Rollout Priority: P2
Security Standards	
<p>The RDC shall follow the best practises in what concerns security.</p> <p><i>The data security concept shall be described in the bid.</i></p>	

RDC_PDT_REQ_75.	Rollout Priority: P2
General Guidance <p>As a general rule any connection sent/received to/from Internet must be secure. The system shall be capable to support 2-way Secure Sockets Layer (SSL) when system-to-system Internet connection (Https) is established.</p> <p>The manufacturer security best-practices shall be followed for each specific operating system. Any security measures supported and suggested by the manufacturer of the operating system, such as Anti buffer overflows protections or network services isolation, shall be applied.</p>	

RDC_PDT_REQ_76.	Rollout Priority: P2
Regular Updates <p>Security patches and updates must be applied periodically within the maintenance to all software delivered within the service contract.</p>	

4. RDC Rollout

During the implementation of Module 1 two major release milestones are foreseen:

- Release 0.1.0 - a first very early release with minimum capabilities (maximum 3 months following the signature the specific contract)
- Release 1.0.0 - a final release with the full range of offered capabilities before the end of Module 1 (maximum 6 months following the signature the specific contract).

Between these two releases an agile approach shall be followed with release cycles of 14 days to 30days minimum.

The requirements which shall already be rolled out under release 0.1.0 are tagged with (P1) in the "Rollout Priority" field. By exclusion all remaining offered requirements shall be rolled out by release 1.0.0.