

TENDER ENCLOSURE I - TECHNICAL SPECIFICATIONS**ATTACHED TO THE INVITATION TO TENDER**

Invitation to tender no. EMSA/OP/17/2014
concerning contracts for maritime surveillance
from TerraSAR-X/Tandem-X/PAZ products

Table of contents

1. Introduction.....	3
1.0. Background	3
1.1. Earth Observation data services	4
2. General considerations	5
3. Objective, Scope and description of contract	5
4. Near Real Time (NRT) coverage.....	6
5. Area coverage.....	7
6. Service use cases	8
7. Service Performance	8
8. Service Provision	9
8.0. Data reception at Ground Station and NRT SAR processing	9
8.1. Satellite imaging modes	10
Table 2: EMSA SAR product class definition for TerraSAR-X.....	13
8.1.1. Geometric correction and referencing during processing	14
8.2. Vessel detection service	14
8.3. SAR wind and other derived products	17
8.4. Targeted activity detection	18
8.5. New technologies, products and services.....	20
8.6. Quality Parameters.....	21
8.6.0. SAR Image Quality.....	21
8.6.1. Service Validation	24
8.7. Interface with the EMSA EODC.....	24
8.7.1. Earth Observation image products information model	25
8.7.2. SAR retrieved products interface.....	25
8.7.3. Earth Observation Data Centre - Contractor interface	26
8.8. NRT data transmission and Telecommunications network	27
8.9. System performance	28
9. Service delivery.....	28
9.0.1. Timing.....	29
9.0.2. Price Reductions	30
10. Planning and ordering requests and timing	32
10.1. Journaling, Reports and Invoicing.....	35
11. Contact Point	36
12. Compliance Matrix	36
13. Contract management responsible body	37
14. Project management.....	37
15. Timetable	39
16. Estimated Value of the Contract	40
17. Terms of payment	40

18. Terms of contract	41
19. Pre-financing	41
20. Joint Offer	42
21. Sub-contracting.....	43
22. Price	44
23. Information from the Bidder	48
23.0. Legal position – means of proof required.....	48
23.1. Exclusion Criteria - Grounds for exclusion.....	48
23.2. Evidence to be provided by the Bidder	49
23.3. Selection Criteria.....	49
23.3.0. Economic and financial capacity – means of proof required	49
23.3.1. Technical and professional capacity - means of proof required	50
24. Criteria for the award of contract.....	51
24.0.1. Quality Criterion 1 Fulfilment of technical requirements	52
24.0.2. Quality Criterion 2 Performance and quality assurance	52
24.1. Price award criteria.....	53
25. Contracts will not be awarded to tenderers who, during the procurement procedure: ..	53
26. False declarations by Bidders	54
27. Intellectual Property Right (IPR)	54
28. Requirements as to the tender	54
28.1. Part A	55
28.2. Part B	55
28.3. Part C	55
28.4. Part D.....	56
28.5. Part E:	56
29. No commitment by the Agency.....	57
30. Retention of tenders	58
31. No reimbursement of tender expenses	59
32. Information resources	60
Appendix A Abbreviations, acronyms and definitions.....	61
Appendix B The POR and JOU of the EO Data Centre	62
Appendix C Technical Compliance Matrix	64
Appendix D Price Matrix	65
Appendix E EICD	66
Appendix F TeamForge Issue Management	67

1. Introduction

1.0. Background

- 1.0.0.1 The European Maritime Safety Agency (hereafter EMSA or the Agency) was established under Regulation 1406/2002/EC, as amended by Regulation 100/2013/EC of 15 January 2013, for the purpose of ensuring a high, uniform and effective level of maritime safety and prevention of pollution by ships.
- 1.0.0.2 The Agency's main objective is to provide technical, operational and scientific assistance to the European Commission and Member States in the proper development and implementation of EU legislation on maritime safety, pollution by ships and security on board ships. To accomplish this, one of EMSA's most important supporting tasks is to improve cooperation with, and between, Member States in all key areas.
- 1.0.0.3 In October 2009, the European Commission issued Communication COM(2009)538 towards the integration of maritime surveillance which aims for "a more interoperable surveillance system to bring together existing monitoring and tracking systems used for maritime safety and security, protection of the marine environment, fisheries control, control of external borders and other law enforcement activities".
- 1.0.0.4 Against this background EMSA has developed Earth Observation services using satellite based monitoring systems in combination with vessel traffic information, and other data to provide an integrated maritime awareness picture.
- 1.0.0.5 The amended EMSA Founding Regulation mandated the Agency to facilitate co-operation between the Member States and the Commission by providing, upon request, relevant vessel positioning and Earth observation data to competent national authorities and EU bodies to facilitate measures against threats of piracy and other unlawful acts. EMSA is already facilitating this cooperation through existing projects implemented with EFCA, FRONTEX and EUNAVFOR. The demand for maritime surveillance is growing, particularly for Southern Europe. These services may also provide value to actors in other maritime sectors such as customs, law enforcement and defence.
- 1.0.0.6 Copernicus, previously known as GMES (Global Monitoring for Environment and Security) is the European Earth Observation (EO) Programme which combines the use of satellite imagery and data with local, in situ, data sources to deliver geo-spatial information services and products to a wide range of end-users. It aims at achieving an autonomous and operational European capability in environmental and security information services (<http://www.copernicus.eu>)

- 1.0.0.7 If EMSA is awarded a role in the implementation of the security strand on maritime surveillance of Copernicus¹, services may start to be delivered as of mid-2015.

1.1. Earth Observation data services

- 1.1.0.1 EMSA has contracts with (i) Satellite Operators (SOs) and Licence Providers (LPs), operating the satellites and providing the licences to use the satellite data and (ii) Service Providers (SPs) which provide Ground Station and value adding image analysis services based on the satellite data.
- 1.1.0.2 SOs are the entities which own and/or are responsible for the operations of the satellite systems which acquire satellite image data for EMSA.
- 1.1.0.3 EMSA acquires satellite licences directly from LPs and makes these licences available to the SPs, enabling them to downlink and process the data on behalf of EMSA.
- 1.1.0.4 The LPs provide the Agency the right to distribute satellite images to other EMSA's contractors for the provision of added value services.
- 1.1.0.5 The LPs also provide the Agency the right to distribute satellite images to coastal State (CS) authorised users.
- 1.1.0.6 SPs are the entities which offer a 24/7/365 service chain to EMSA including the downlink of satellite acquisition at a Ground Station, NRT processing of the SAR data, image analysis services and delivery of products and associated metadata.
- 1.1.0.7 A LP or SP may be requested to downlink and process the satellite image to a Ground Station and then transfer the product to another EMSA contracted Service Provider for value adding analysis services.
- 1.1.0.8 In case the coverage of an SPs Ground Station is not sufficient to provide a service within the required time, or if licence conditions prohibit the downlink to a particular EMSA contracted Ground Stations, or if the coastal State's facilities/service requires so, the downlink and processing of the satellite acquisitions might use other EMSA contracted Ground Stations. This can also be the case if using a particular Ground Station

¹ According to the Regulation (EU) No 377/2014 of the European Parliament and of the Council of 3 April 2014 establishing the Copernicus Programme and repealing Regulation (EU) No 911/2010 Text with EEA relevance

would result in reduced quality and/or a delivery time incompatible with coastal State operational requirements.

- 1.1.0.9 SPs deliver the satellite images and all associated analysis products and metadata to the Earth Observation Data Centre (EODC) at the Agency.
- 1.1.0.10 The EODC is a common standardised system to handle Earth Observation data and associated metadata. At the Agency, the EODC is the central element for Earth Observation data: i) reception from SPs as well as other external data sources; ii) management; iii) storage; iv) archiving; v) fusion; and vi) dissemination to the different users. The EODC is designed primarily to fulfil the user requirements of the operational entities in the coastal States and to support Earth Observation planning and tasking activities of the Agency.
- 1.1.0.11 The Agency has a platform which integrates multiple sources of maritime data, including Earth Observation products, in accordance with the needs of different user communities involved in maritime surveillance activities. Some elements currently managed in the EODC might be transferred to the IMdatE interface. If this is the case, EMSA and the contractor shall adapt their procedures accordingly.

2. General considerations

- 2.0.0.1 All requirements of the specification are compiled in the form of a "compliance matrix" provided as Tender Enclosure I – Appendix C.
- 2.0.0.2 Where equivalents are being offered by bidders (with respect to the technical specifications), they must be duly motivated and justified. Equivalents will be accepted only if they meet the requirements as defined in this document. EMSA reserves the right to disagree with the proposed equivalents.
- 2.0.0.3 Throughout this document the term "the bidder" means that the tenderer shall address the requirement in its offer. Reference to "the contractor" means that the tenderer shall perform or implement such requirement during the execution of the contract.
- 2.0.0.4 The terms 'images', 'data', 'data products', 'metadata' and 'derivative works' are terms used throughout this document and may be referred to collectively as satellite "products".

3. Objective, Scope and description of contract

- 3.0.0.1 The objective of this Call for Tender is to procure maritime surveillance services from TerraSAR-X/TanDEM-X/PAZ.
- 3.0.0.2 Bids shall be evaluated on the quality and price of the services being offered. The most economically advantageous bid will be ranked first, with remaining bids ranked in descending order accordingly.

- 3.0.0.3 A (Multiple) Framework Contract (in cascade) will be signed with each of the Contractors which have been ranked above a price/quality threshold. The Framework Contract will specify their ranking position. EMSA may sign a single Framework Contract if only one bid is above the threshold for award of contract.
- 3.0.0.4 The services shall be purchased from the Service Provider through Specific Contracts as follows:
- Module 1: One specific contract for service set-up and testing.
 - Module 2: Specific contract(s) for services. Under specific contract(s) Tasking Forms shall be issued for the purchase of the services. The Tasking Forms will cover the costs of the service, including all products, and transmission costs to the EODC.
 - Module 3: Specific contract(s) for future developments of the service upon request of EMSA.
- 3.0.0.5 The Service Provider (SP), which may also be hereafter referred to as 'Bidder' or 'Contractor' as appropriate, is requested to provide a service chain, or elements of the service chain, including (i) acquisition of TerraSAR-X/TanDEM-X/PAZ satellite data at ground station(s), (ii) processing SAR data in Near Real Time, (iii) value adding services for maritime surveillance, including vessel detection and target activity detection, (iv) product delivery to the EODC, following agreed standards/protocols/time limits, as per this Technical Specification.
- 3.0.0.6 TerraSAR-X/TanDEM-X/PAZ satellite image licences are purchased from the Licence Provider through a separate contract. EMSA shall make these licences available to the contracted SPs. Therefore satellite licence costs shall not be included in the bid.

4. Near Real Time (NRT) coverage

- 4.0.0.1 The term 'Near Real Time' or 'NRT' refers to the delay introduced by automated data processing, analysis, and transmission, between sea surface imaging, transmission to Ground Station for data processing and analysis and transmission of products to the EODC. The term implies that there are no significant delays. Timings allowed for data processing, analysis and transmission are defined in Table 4 "Required maximum delivery times of products".
- 4.0.0.2 NRT service coverage is required within the Service Provider ground station mask.

5. Area coverage

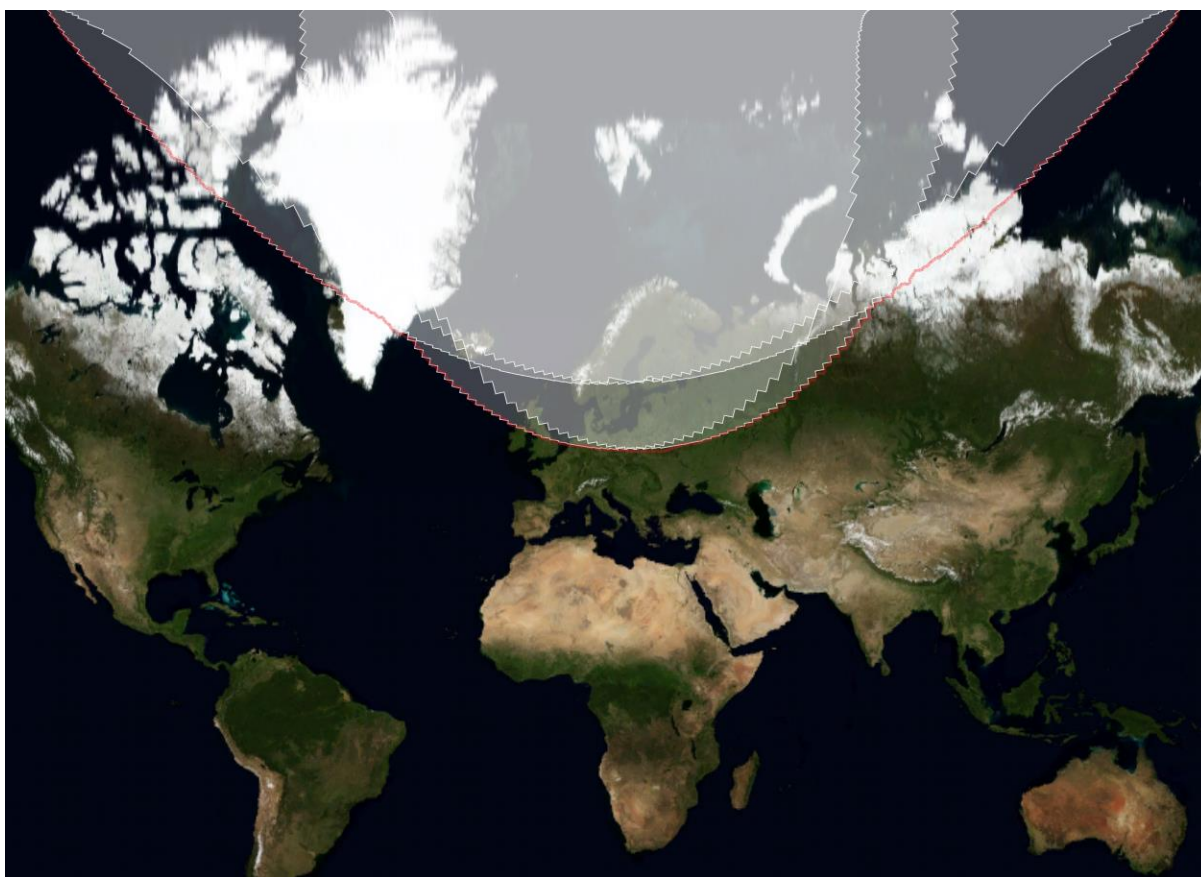


Figure 1

The area covered by an existing contract for Terra-SAR-X/Tandem-X valued adding services

- 5.0.0.1 The greyed area in Figure 1 indicates the mask of the downlink area that EMSA has Terra-SAR-X/Tandem-X services available in NRT through existing Framework Contract EMSA/OP/15/2013.
- 5.0.0.2 The purpose of this contract is to address the “coverage gaps” in Framework Contract EMSA/OP/15/2013 regarding provision of Terra-SAR-X/Tandem-X services in NRT.
- 5.0.0.3 Notwithstanding the outcome of this Call for Tender, EMSA will procure maritime surveillance services as illustrated in the greyed area of Fig. 1 with the EMSA/OP/15/2013 contracted service providers who had demonstrated their capability to process in NRT TerraSAR-X/TanDEM-X satellite data in their bids. Any extension of the greyed area after the deadline for submission of the EMSA/OP/15/2013 bids will not apply.
- 5.0.0.4 The areas of interest for NRT services for maritime surveillance include the Mediterranean Sea, Straits of Gibraltar, and the Atlantic Ocean near the coasts of Morocco, Spain and the Canary Islands.

- 5.0.0.5 EMSA reserves the right to identify new areas of interest worldwide for NRT during the lifetime of the framework contract.

6. Service use cases

The following examples describe scenarios for ordering services.

6.0.0.1 **Use case A. NRT services within a ground station mask of one or more OP17 contracted Service Providers:**

Use Case:

A satellite image is planned to be acquired over the Mediterranean, the associated data is downlinked to a SP ground station, processed in NRT, and vessel detection value added services performed. The products are transferred to EMSA EODC respecting the delivery times as per requirement 9.0.1 and 8.0.0.7.

If two Service Providers have ground station coverage capable of providing the service within NRT, the service provider selected will be the one ranked most highly in the evaluation.

6.0.0.2 **Use case B. Services outside the Ground Station mask of one or more OP17 contracted Service Providers:**

EMSA may task the acquisition of satellite data for any area outside the visibility range of any service provider coverage. By using the on-board recorder of the satellite, when the satellite enters into the Ground Station coverage of the SP Contractor, the acquired images can be downlinked, processed and delivered to the EO DC. Delivery time of products are defined according to requirement 8.0.0.7.

Use Case:

A satellite image is acquired over Somali waters; it is stored on the satellite on-board recorder and downlinked to a GS of a contracted SP for NRT processing, value adding services and delivery to EMSA. The service provider selected will be according to his capability to provide the requested service (including timeliness) and which has been ranked most highly in the evaluation. The delivery timeliness delivery time window e.g. 1 hour / 2 hours / 3 hours, will be determined by the Agency in consultation with the end-user.

7. Service Performance

- 7.0.0.1 The following performance indicators shall be used to measure the implementation of the contract.

- 7.0.0.1.1. Failure to meet a minimum of 95% on an annual basis of the ordered images in the 5 degree ground station footprint, confirmed by the SO as successfully acquired by the satellite sensor and down-linked to the ground station on an annual basis.
- 7.0.0.1.2. Failure to meet 90% NRT timeliness reliability on the delivered images and value added services an annual basis.
- 7.0.0.1.3. Failure to solve non-conformances related to unsatisfactory service performance or unsatisfactory service quality, which have been systematically reported by EMSA, and are affecting the quality of the service or products for the end users at Coastal States as described in TeamForge Issue Management procedure Appendix F.
- 7.0.0.1.4. Failure to meet performance indicators for image quality, specifically product specification compliance (PS-compliance) and position accuracy.
- 7.0.0.2 In case of the inability by the contractor to deliver services due to a ground station failure, or other technical failure, EMSA reserves the right to immediately cancel services, and order services from a contractor who has ground station coverage and has been ranked next in the evaluation procedure.
- 7.0.0.3 If the contractor fails to meet the specified performance indicators listed in this section, EMSA reserves the right to stop, for a temporary period, Tasking Forms for individual services from the contractor and order services from the contractor who has Ground Station antenna coverage (capable of providing products and services) and has been ranked next in the evaluation procedure.

8. Service Provision

8.0. Data reception at Ground Station and NRT SAR processing

- 8.0.0.1 Bidders shall submit in electronic format, a GIS shapefile (ESRI), of the location and associated footprint of the Ground Stations proposed in their bid for TerraSAR-X/Tandem-X/PAZ, for ascending and descending passes and taking into account obstacles which would obstruct the antenna line of vision.
- 8.0.0.2 Bidders shall submit in electronic format, a GIS shapefile (ESRI), their service coverage worldwide for the full service chain including downlink, processing, value adding and delivery, for TerraSAR-X/Tandem-X/PAZ for the following delivery time category (30 minutes, 1 hour, 3 hours).
- 8.0.0.3 Bidders shall describe their Ground Station facilities.

- 8.0.0.4 Bidders shall describe in detail the TerraSAR-X/Tandem-X/PAZ processing chain. The description shall include the software and hardware used, with focus on the SAR processor(s) and its algorithms, as well as the back-up strategy.
- 8.0.0.5 Bidders shall be able to process segments of varying length (up to four times the length of a standard image) to SAR-Native1 products as a single strip of continuous data or as a sequence of consecutive scenes if applicable.
- 8.0.0.6 The delivery time shall be used as the reference for price calculations in the Earth Observation DC (EO DC).
- 8.0.0.7 **Delivery time:** is the duration of time elapsed between T1 and T0 when T1 is the FTP transmission completion time at the EO DC and (i) T0 is the actual satellite acquisition stop time in case of direct downlink or (ii) T0 is the stop time of the data downlink in case an on-board recorder has been used or (iii) T0 is the FTP transmission completion time of satellite products to the service provider.
- 8.0.0.8 **Maximum Delay:** In some cases EMSA may decide to impose a maximum delay (Dmax) in hours between actual acquisition stop time and downlink time. In that case, T0 shall be MIN (Downlink completion time, Actual Acquisition stop time + Dmax). Example 1. If the maximum delay is set to 3 hours, and the image downlinked 90 minutes after the acquisition stop time, then T0 is the downlink time. Example 2. If the maximum delay is set to 3 hours, and the image is acquired 4 hours after acquisition, the T0= acquisition stop time + 3 hours.
- 8.0.0.9 EMSA shall be able to order archived data. Archived data shall be made available in a timely manner.
- 8.0.0.10 Archived delivery timeliness (minimum, average and maximum) shall be provided in the bid. Times shall be measured from request to data availability in the EO DC.
- 8.0.0.11 Archived data corresponds to data that was already acquired by the Contractor and to all images delivered 24 hours after satellite acquisition.
- 8.0.0.12 Bidders shall be able to analyse images in segments to shorten the time for delivery of analysis products e.g. parallel processing and analysis.

8.1. Satellite imaging modes

- 8.1.0.1 EMSA services will use the TerraSAR-X/Tandem-X/PAZ imaging modes described in this section.

Table 1 Indicative list of TerraSAR-X/TanDEM-X/PAZ modes

Mission/	Standard image size	Resolution
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Operational Imaging mode	(km)	(Azimuth Resolution) (m)
TerraSAR-X/TanDEM-X/PAZ ScanSAR Wide	200-270 x 200-270 ² (single pol)	40
TerraSAR-X/TanDEM-X/PAZ ScanSAR	100 x 150 ³ (single pol)	18.5
TerraSAR-X/TanDEM-X/PAZ StripMap	30 x 50 ⁴ (single pol)	3.3
	15 x 15 (dual pol)	6.6
TerraSAR-X/TanDEM-X/PAZ Spotlight (SL)	10 x 10 (single/dual pol)	1.7 (single pol)
		3.4 (dual pol)
TerraSAR-X/TanDEM-X/PAZ High Resolution Spotlight 150 MHz	10 x 5 (single/dual pol)	1.1 (single pol)
		2.2 (dual pol)
TerraSAR-X/TanDEM-X/PAZ High Resolution Spotlight 300 MHz	7x 7 (single pol)	1.1 (single pol)
TerraSAR-X/TanDEM-X/PAZ Staring Spotlight (ST)	4 x 3.7 (single pol)	0.25 (single pol)

8.1.0.2 The bidder shall provide a table of available TerraSAR-X/TanDEM-X/PAZ modes. The sensor mode name shall differentiate different sensor operational modes with different characteristics.

8.1.0.3 It is expected that the majority of images ordered by EMSA shall be TerraSAR-X/Tandem-X/PAZ StripMap in Level1B format, as they currently most closely meet the requirements of maritime surveillance users.

8.1.0.4 If other modes are available and suitable for maritime surveillance then the bidder should include these products in their bid e.g. a wider swath achieved as a combined product of the two satellites.

² Wide ScanSAR can be extended up to 1500 km in azimuth direction

³ ScanSAR acquisition length is extendable up to 1,650 km in azimuth direction

⁴ StripMap acquisition length is extendable up to 1,650 km in azimuth direction

- 8.1.0.5 The Level1B products shall be available in all possible combinations of polarisations available at instrument level.
- 8.1.0.6 The bidder shall provide detailed description on all the available modes describing all the sensor operational modes and their respective characteristics For all these modes available the standard image size (swath and length), pixel spacing and the resolution shall be given.
- 8.1.0.7 The products provided shall comply with the product specifications.
- 8.1.0.8 The contractor shall provide segments of varying length up to 1400 km or up to 4 times of the standard image length.
- 8.1.0.9 EMSA has defined a resolution category for EO SAR products described in Table 2. This resolution category is based on the ESA defined Resolution Class for EO data sets for Copernicus services. The Azimuth resolution is taken as the reference to define the class resolution of each product (sensor mode).
- 8.1.0.10 For the "Medium Resolution" class MR1, several subclasses are introduced which classify the image product to reflect the extended time for analysis of large images.

Table 2: EMSA SAR product class definition for TerraSAR-X.

EMSA product class (Resolution Area)	Resolution Class Description	SAR product examples (Azimuthal Resolution)	Image acquisition area x in 1000 km²
VHR1	Very High Resolution 1 where resolution $x \leq 1\text{m}$	TerraSAR-X STARING SPOTLIGHT (0.25m)	
VHR2	Very High Resolution 2 where resolution $1\text{m} < x \leq 4\text{m}$	TerraSAR-X High Resolution SPOTLIGHT (1.1-2.2m) TerraSAR-X SPOTLIGHT (1.7-3.4m) TerraSAR-X STRIPMAP Single Pol (3.3m)	
HR1	High Resolution 1 where resolution $4\text{m} < x \leq 10\text{m}$	TerraSAR-X STRIPMAP Dual Pol (6.6m)	
HR2	High Resolution 2 where resolution $10\text{m} < x \leq 30\text{m}$	TerraSAR-X SCANSAR (18.5m)	
MR1.1	Medium Resolution: $30\text{m} < x \leq 100\text{m}$	TerraSAR-X SCANSAR WIDE (40m)	$X \leq 30$
MR1.2			$30 < X \leq 70$
MR1.3			$70 < X \leq 150$
MR1.4			$150 < X \leq 300$
MR1.5			$300 < X \leq 700$
MR1.6			$700 < X \leq 1500$
MR2	Medium Resolution where resolution $100\text{m} < x \leq 300\text{m}$	n/a	

8.1.0.11 Products listed in Table 2 shall be read and processed by latest versions of ENVI⁵, and by NEST⁶

8.1.0.12 Each product shall be delivered in SAR-Native1 format to the EODC.

8.1.1. **Geometric correction and referencing during processing**

8.1.1.1 Geometric correction (also referred to as geo-rectification) is the removal of those distortions from sensor geometry which are preventing overlap with map layers, comparisons between image scenes, and impeding the association of geographic coordinates to the image pixels.

8.1.1.2 These corrections account for systemic distortions such as scan skew, panoramic distortion, along scan distortion (pixels at edge are slightly larger) and earth rotation. Geometric corrections shall also include some non-systematic distortions such as altitude and attitude variations in satellite.

8.1.1.3 Geometric referencing is the conversion of pixel coordinates to ground coordinates. Consequently, images can then be mapped by the EODC.

8.1.1.4 Bidders shall specify what geometric corrections are applied to the delivered products and the processes/algorithms to assign the ground coordinates to the pixels in the image.

8.1.1.5 Bidders shall provide the accuracy of the geo-referencing for each relevant satellite and mode provided.

8.1.1.6 Bidders shall apply the requested geometric referencing and correction operations linked with each specific product level.

8.1.1.7 The EODC is able to process image shifting using a correction vector. A correction vector for geometric correction shall be provided according to the External Interface Control Document (EICD).

8.2. **Vessel detection service**

8.2.0.1 In maritime surveillance vessel targets are frequently small (<15m length) and not reporting AIS messages. Vessels may be made of non-metallic materials, such as wood or rubber, and therefore more difficult to detect by SAR imagery than vessels with a metallic hull or metallic deck structures.

8.2.0.2 Rates of detection of vessels in SAR images are influenced the configuration of the SAR sensor including acquisition mode and associated

⁵ <http://www.itvis.com/ProductServices/ENVI.aspx>

⁶ <http://www.array.ca/nest/tiki-index.php>

resolution, incidence angle, sea state and wind conditions, and the size, structure and material of the vessel.

- 8.2.0.3 Bidders shall indicate their service performance levels for their success rate (accuracy of algorithm) for detection of vessels of length 15m according to a SAR product class.
- 8.2.0.4 Bidders shall describe their service chain for the detection of vessels within a SAR image. This description shall provide a detailed breakdown of the methodology, software and algorithms used for vessel detection. Bidders shall refer to 8.2.0.11 for description of the algorithms used to calculate confidence and error values.
- 8.2.0.5 Bidders shall be able to correlate vessel SAR detections with vessel traffic information (e.g. AIS/LRIT) provided by the Agency or available at Service Providers. The Bidder shall describe their methodology and algorithms used for correlation. Identified vessels shall be reported using the "vessel identification" element described in 8.2.0.8. Vessel identification shall be provided on request of the Agency for selected services only.
- 8.2.0.6 Wake detection shall be part of the vessel detection analysis. For example a vessel could be reported based only on wake detection.
- 8.2.0.7 SAR processors assume targets are stationary. If a target has a speed component in the range direction (V_{range}) then the scatter will be shifted in the azimuth direction by an extra Doppler shift proportional to V_{range} . This displacement is visible in SAR imagery. Bidders shall propose a methodology to correct the detection coordinates for this displacement.
- 8.2.0.8 Vessel detection parameters shall include:

Position information

- date and time of vessel detection in UTC calculated from acquisition time and vessel position on the image (units: ISO8601 format)
- position of the detection expressed as the latitude and longitude of the centre co-ordinates of detected vessel (units: decimal degrees) without Doppler effect.
- a vector representing the offset of the vessel due to Doppler effect.
- a position accuracy error range to express any uncertainty in the determination of the vessel position.

Movement information

- vessel heading (units: degrees °; minimum: 0; maximum: 359 0=360=Geographical North)
- vessel speed classification (fast/slow)
- vessel speed over ground (SOG) (units: expressed in m/s)

- error in the estimation of the vessel speed over ground (SOG)

Vessel details

- vessel length class (units: <15m small, medium <50m, large >50 m)
- vessel length/beam (units:m)
- error in the estimation of vessel length (m)
- vessel width/breadth (units:m)
- error in the estimation of vessel width (m)
- vessel type taken from a fixed list of values. The final list will be in the EICD but will evolve. For example
 - fishing vessels;
 - inflatable rubber boats/zodiac;
 - sailing yacht/high speed motorized yachts
 - wooden skiff;
 - passenger ship,
 - patrol/search and rescue vessel,
 - tugs
 - tanker vessels
 - cargo vessels
 - other types of ship
 - unknown
- confidence level of vessel type (expressed as a percentage)

Detection parameters

- radar cross section (RCS)
- maximum pixel value
- confidence level (expressed as a percentage) of vessel detection

Vessel identification

- IMO number
- AIS MMSI
- Vessel name

- Vessel call sign
- Confidence level of vessel identification
- Order of priority. If there is more than one possible identified vessel coming from vessel traffic information systems, corresponding to the vessel detection, then all possible candidates shall be reported by order of priority.

Clip image of the vessel detected

- Clip image shall be provided
- The Clip image shall be centred on the detected vessel.

8.2.0.9 The confidence or the error fields shall be systematically filled every time the information they refer to is provided.

8.2.0.10 The confidence or error values shall be the result of an algorithm.

8.2.0.11 The bidder shall provide a description of the algorithm including parameters (image resolution, sea state) used for calculating each confidence or error value.

8.2.0.12 Bidders shall be capable of using complex SAR image data for vessel detection.

8.2.0.13 Vessel detection products shall be delivered to the EODC in EMSA EICD format.

8.3. **SAR wind and other derived products**

8.3.0.1 The Bidder shall provide a detailed description of the proposed methodology and procedure for retrieval of the SAR Sea Surface Wind Field.

8.3.0.2 SAR-Native1 products used as input for the SAR wind retrieval shall be correctly calibrated, according to the processing requirements from the generation algorithm.

8.3.0.3 SAR retrieved wind products shall meet the quality specifications expected from the generation algorithm regarding accuracy and resolution.

8.3.0.4 Surface wind fields from numerical weather prediction models shall be used within the procedure to initialise SAR wind direction estimation. The Bidder is asked to describe the numerical model they use for this purpose, including temporal resolution, forecast range and update frequency.

8.3.0.5 Contractors shall provide a SAR retrieved wind field at the best possible resolution in relation to the algorithm being used, for each input SAR product.

8.3.0.6 SAR retrieved products shall be delivered to the EODC as NetCDF files.

- 8.3.0.7 Bidders are requested to list and describe the full content of the NetCDF file (i.e. attributes, dimensions and variables and standard names etc.).
- 8.3.0.8 Bidders might offer other relevant products from SAR data including Swell Wave Spectra (long ocean waves) and Sea Surface Currents (radial surface velocity) useful for the service. The Bidder should provide a detailed description of the proposed methodology and procedure, as well as a description of the utility and feasibility of using such products in the analysis procedure.
- 8.3.0.9 The Bidder shall provide a detailed description of the SAR retrieved products including their expected accuracy and resolution, for each different input SAR product used. Furthermore the description shall include the processing requirements from the point of view of the retrieval algorithm on the input SAR products, e.g. radiometric accuracy and noise level.

8.4. Targeted activity detection

- 8.4.0.1 The purpose of targeted activity detection is to perform satellite detection of specific features that are linked with activities of interest to EMSA.
- 8.4.0.2 Bidders shall describe their service chain for targeted activity detection within a SAR image. This description shall provide a detailed breakdown of the methodology, software and algorithms used for targeted activity detection. When describing the methodology and procedure Bidders shall take the technical requirements of this tender specification into account.
- 8.4.0.3 EMSA shall order from Service Providers
- the type of targeted activity detection to be performed. Examples of requests include but are not restricted to maritime border control, fisheries surveillance, drugs smuggling
 - The sub-type of targeted activity detection e.g. rendezvous at sea relating to maritime border control a mother vessel passing migrants to smaller vessels, transfer of drugs at sea between two vessels
 - One or more Area(s) of Interest (AOI). This is the area where the activity detection shall be performed.
 - The AOI priority indicates for each AOI the order of priority to be analysed first.
- 8.4.0.4 The contractor shall provide the results of areas of highest priority in a first delivery step. Only after the highest priority location is analysed shall the remaining AOI(s), which can be the full image or not, be analysed.
- 8.4.0.5 The Contractor shall perform change detection over time between a set of images linked with a specific target or targeted activity.

8.4.0.6 Targeted activity detection parameters shall include:

Targeted activity type

- the type of targeted activity detection to be performed. Dynamic list subject to change. Examples of requests include but are not restricted to maritime border control, fisheries surveillance, drugs smuggling.
- The sub-type of targeted activity detection. Dynamic list subject to change. e.g. rendezvous at sea relating to maritime border control a mother vessel passing migrants to smaller vessels, transfer of drugs at sea between two vessels
- Text description of the request from EMSA
- Text description of the activity reported by Service Provider
- Confidence level (low, medium, high) of activity detection
- Clip image shall be provided

Position information of the activity

- date and time of activity detection in UTC calculated from acquisition time and position on the image (units: ISO8601 format)
- centre position of the activity detection expressed as the latitude and longitude of the centre co-ordinates of detected activity (units: decimal degrees).
- a position accuracy error range to express any uncertainty in the determination of the position of the activity
- polygon describing the area extent of the reported activity

Vessels associated to the activity reported

There may be 1 or more vessels associated with this activity. For example a rendezvous at sea would normally involve a minimum of two vessels. For each vessel the following elements shall be provided in accordance with vessel detection information as described under 8.2.0.8

Other feature associated to the activity reported

- Text description of the feature associated with this activity, including any other information relevant for the specific object type
- Change detection
 - Change status (initial report or amplifying)
 - Reference to previously reported feature

- Text describing any change observed for that feature since last detection
 - centre position of the feature detected expressed as the latitude and longitude of the centre co-ordinates of detected activity (units: decimal degrees).
 - a position accuracy error range to express any uncertainty in the determination of the position of the feature.
 - Size of feature (m/m²)
 - Clip image shall be provided for the feature
- 8.4.0.7 The confidence or the error fields shall be systematically filled every time the information they refer to is provided.
- 8.4.0.8 The confidence or error values shall be the result of an algorithm.
- 8.4.0.9 The bidder shall provide a description of the algorithm including parameters (image resolution, sea state) used for calculating each confidence or error value.

8.5. **New technologies, products and services**

- 8.5.0.1 To achieve the best possible service the Agency wishes to encourage the industry to be innovative in providing a comprehensive service chain and welcomes any proposal that meets the requirements stated in this technical specification as well as offering potential new added value elements.
- 8.5.0.2 Bidders are invited to propose new technologies, products and services, which are not specified in this tender, but are relevant for maritime surveillance. New technologies could include innovative or advanced techniques to improve the performance or reliability of the products and services.
- 8.5.0.3 If new technologies, products or services are included in the price for the vessel detection or target activity detection, these features will be taken as an advantage and the bid will be evaluated higher.
- 8.5.0.4 If Bidders wish to provide an additional cost on top of the standard price, then Bidders are invited to present their price offer. Each price has to be linked to a service. New services beyond the specifications as laid down in this tender shall be added as an additional fixed fee on top of the normal service price. Prices for new technologies, products or services shall not be taken into consideration for the price evaluation for this tender.

8.6. Quality Parameters

8.6.0. SAR Image Quality

- 8.6.0.1 SAR-Native1 quality can be affected by several sources of error: for example during transmission downlink from satellite to Ground Station, NRT SAR processing, post-processing or during file transmission to EODC. Bidders shall propose an image quality methodology to track and report these errors.
- 8.6.0.2 The image quality methodology shall aim to evaluate compliance with the product specifications provided by the Satellite Operator.
- 8.6.0.3 Product specification compliance (PS-compliance) shall be considered a performance indicator. PS-compliance shall refer to the Quality Indicator (QI) values listed in Table 3 Quality Indicators in relation to the product specifications provided by the Satellite Owner.
- 8.6.0.4 If no threshold for a QI is given by the Satellite Operator or if a QI cannot be unambiguously evaluated it shall not be taken into account for the PS-compliance assessment.
- 8.6.0.5 In order to correctly evaluate PS-compliance with respect to position accuracy, the Contractor is required to provide EMSA with the orbit data error for each product.
- 8.6.0.6 Each SAR-Native1 shall individually undergo quality control during operational production. This procedure shall be hereafter denominated as SAR-Native1 Image Inspection (SII). The main purposes of the SII are:
- support the decision if the product is acceptable for service delivery or not,
 - provide an estimation of the position accuracy of the product,
 - assess if product meets planned coverage (coverage compliance),
 - report area of the product considered usable for analysis (and also the discarded area).
- 8.6.0.7 The outcome of the SII shall be documented and delivered to EMSA. Two products shall be delivered:
- a Quality Notification (QNO)
 - a Quality Report (QUA).
- 8.6.0.8 The QNO product shall state if the product has been considered suitable for service delivery or not and contain an estimation of the position accuracy.
- 8.6.0.9 If any displacement (or other geometrical transformation) is performed on the image before the analysis, in order to improve geolocation accuracy

“on-the-fly”, this operation has to be stated and fully described in the QNO (e.g. vector displacement in lines/columns of original data and also in Lat/long coordinates). This is in order to make it possible for the EODC to correctly display SAR images and service results.

- 8.6.0.10 The QUA product shall, as a minimum, provide an assessment of the coverage compliance and of the discarded area.
- 8.6.0.11 In case the estimation of the position accuracy is based on the measurement of the coastline or of known landmarks displacement in the image, the displacement vector shall be provided. The shift has to be reported both in lines/columns of original data and also in Lat/long coordinates as specified in the EICD.
- 8.6.0.12 Coverage compliance shall refer to how well coverage requirements are met along track, by comparing the delivered track length versus what has been planned. Coverage compliance shall be expressed as the percentage of planned track length that has been correctly acquired and processed to SARNative1 format.
- 8.6.0.13 The usable area shall be defined based on data integrity quality criteria – missing data and artefacts – and also on the evaluation of other quality factors like Radiometric Mismatch, Residual Scalping and Target Ambiguities, which can corrupt pixels making them unsuitable for analysis. Contractors shall report the usable area as a percentage of the part of the image for which the along track length is in compliance with the planning.
- 8.6.0.14 EMSA shall implement a quality control system based on the quantitative estimation of the QI’s indicated.

Table 3 Quality Indicators

Quality Criteria	Quality Indicators
Radiometric Quality: Sensitivity	Noise Equivalent Sigma Nought ($NE\sigma_0$)
Radiometric Quality: Resolution	Equivalent Number of Looks (ENL)
Radiometric Quality: Error	Radiometric Error
Radiometric Quality: Residual Scalping	Periodic Intensity Variation of Intensity Along-track
Radiometric Quality: Beam Radiometric Mismatch	Intensity Variation within Sub-swath
Geometric Quality: Spatial Resolution	<ul style="list-style-type: none"> • Azimuth Resolution • Ground Range Resolution
Geometric Quality: Side lobes Energy Spread	<ul style="list-style-type: none"> • Peak to Side lobe Ratio (PSLR) • Integrated Side lobe Ratio (ISLR)
Geometric Quality: Point Target Ambiguities	<ul style="list-style-type: none"> • Azimuth Ambiguity to Signal Ratio (AASR)

Quality Criteria	Quality Indicators
	<ul style="list-style-type: none"> • Range Ambiguity to Signal Ratio (RASR)
Geometric Quality: Position Accuracy	Absolute Location Error (Δ_{loc})
Data Integrity	Missing Data
Data Integrity	Artefacts
Coverage	Matched Coverage

8.6.0.15 Contractors will provide a GIS layer on the discarded areas.

8.6.0.16 The Bidder shall describe in detail how they will implement the SII procedure including:

- QNO and QUA
- position accuracy estimation method
- usable/discarded area evaluation method
- list of cases and conditions in which a SAR image shall be reprocessed.

8.6.0.17 The Bidder shall also propose a methodology for periodical detailed quality analysis of samples of products in order to track and solve quality problems in the processing and acquisition chain.

8.6.0.18 SAR-Native1 products used for generating SAR derived products shall meet the necessary quality processing requirements from the point of view of the extraction algorithm on the input SAR products, e.g. radiometric accuracy and noise level.

Image Reprocessing

8.6.0.19 In case the SAR product is compromised due to errors in the Contractor processing chain, and if re-processing could increase the quality significantly, the Agency may request the Contractor to re-process and re-deliver products to EMSA

8.6.0.20 EMSA may also request free of charge, if necessary for operational needs, re-processing and re-delivery of products that do not meet nominal Quality Indicators product specification.

8.6.0.21 Whenever possible, all re-processed images should make use of definitive orbit data.

Re-analysis and reporting

8.6.0.22 In case of poor quality or errors in image analysis, EMSA shall issue non-conformances to the Contractor. If these non-conformances are not corrected, EMSA may apply a quality co-efficient of one category lower, for the price calculation for the relevant products as described in Table 6 'Price Coefficient for quality'.

8.6.0.23 On a case by case basis, EMSA may request the Service Providers to perform a re-analysis of a service that has already been delivered to the EODC. This re-analysis shall include new or additional data and an additional cost may be charged to EMSA as described in the price grid.

8.6.1. Service Validation

8.6.1.1 The service and its constituent data products shall be subject to an evaluation, through validation exercises which will be held in co-operation with Member States and other EU Agencies. This service validation shall be used to ensure product quality during the lifetime of the service.

8.6.1.2 All aspects of the service will be evaluated by the contracting parties (Contractor and EMSA), with the involvement of Member States, and other EU Agencies, based on at least:

- Verifications; the verification of the service products by Coastal States and other EU Agencies, will be done through aerial surveillance, or other ship based means or vessel traffic monitoring systems.
- False positives for activity or vessel detections which, after verification, are shown not to be correct) and false negatives (no vessel or activity reported where, after verification, there is a target).

8.6.1.3 The EODC will be the reference source of data for the evaluation.

8.6.1.4 All information, parameters and their specified associated limits of timeliness, reliability and accuracy shall be evaluated as part of the service validation. The Contractor is responsible for drafting a procedure for service evaluation for EMSA review and eventual acceptance. Service evaluation reports shall be generated by the Contractor, at least once on an annual basis, on the request of EMSA, and have to be endorsed by EMSA.

8.7. Interface with the EMSA EODC

8.7.0.1 All information which has been acquired by the Contractor or generated during the analysis shall be provided to the EODC.

- 8.7.0.2 Interfaces between the Contractor and the EODC shall be built on common public Internet communication standards, OGC standards, and open-source protocols.
- 8.7.0.3 The External Interface Control Description (EICD) describes the technical interface, file naming conventions and data exchange protocols to be implemented between the Service Providers and the EODC.
- 8.7.0.4 The EICD is available as Appendix E of this Technical Specification.

8.7.1. **Earth Observation image products information model**

- 8.7.1.1 Earth Observation (EO) satellite image products shall be compliant with the EODC EICD. In the EICD, EO images are described using the Geography Mark-up Language (GML) application schema for EO Products as defined by the Heterogeneous Mission Accessibility (HMA) interface specifications. The Application Earth Observation Products (EOP) and Application Earth Observation Products – SAR profiles are the reference regarding interface technical specifications.
- 8.7.1.2 The HMA standards are based on the resolutions of the HMA Architectural Working Group (AWG). The Contractor(s) shall design the system taking into account the developments of these standards.
- 8.7.1.3 Below is a representation of the layered view of the GML Earth Observation Products application schema approach as described in the OGC specification document.

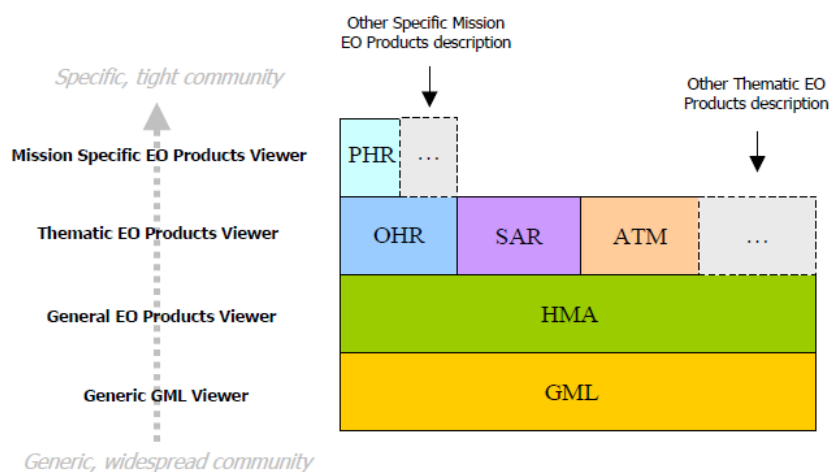


Figure 2 GML Earth Observation Product data layered view

8.7.2. **SAR retrieved products interface**

- 8.7.2.1 SAR retrieved products shall be stored in NetCDF format.
- 8.7.2.2 The NetCDF data format is "self-describing" and platform independent format, comprising of a header which describes the layout of the rest of

the file, in particular the data arrays, as well as arbitrary file metadata in the form of name/value attributes. Data arrays are rectangular, and stored in a simple and regular fashion that allows efficient sub-setting.

- 8.7.2.3 NetCDF conventions define metadata that provide a definitive description of what the data in each variable represents, and the spatial and temporal properties of the data. This enables users of data from different sources to decide which quantities are comparable, and facilitates building applications with powerful extraction, re-gridding, and display capabilities.
- 8.7.2.4 The NetCDF metadata convention to be used is the Climate and Forecast (CF) convention.

8.7.3. **Earth Observation Data Centre - Contractor interface**

- 8.7.3.1 The External Interface Control Description (EICD) specifies the interface to be implemented between the Earth Observation Data Centre and the Service Provider. The Contractor shall comply with this document.

Deliveries from Contractor to EMSA

- 8.7.3.2 Communication between the EODC and the Contractors shall be provided over the Internet using a secure Point to Point link (2-way SSL).
- 8.7.3.3 The Contractor shall transfer all relevant data and products to the EO DC in several data packages consisting of one or more files via a File Transfer Protocol (FTP) as specified in the EICD.
- 8.7.3.4 For each file, the Contractor shall generate an MD5 checksum that will be used to monitor product delivery integrity.
- 8.7.3.5 The transfer of data package will be achieved through the following steps. The time stamps of the web service messages will be used to monitor delivery timeliness:
 - The Contractor shall call a specific synchronous web service providing file description and the associated md5.
 - If the answer of the service is positive, the Contractor shall start the FTP transfer of the file.
 - Once all the files of a data package have been delivered, the Contractor shall provide the list of all files transferred. This end message is used to mark the end of data package delivery and shall be used to monitor the completeness of delivery.

Provisions from EMSA to SP

- 8.7.3.6 EMSA will provide the Contractors with access to vessel traffic information data as described.
- 8.7.3.7 EMSA will provide the Contractors with all relevant details for accessing the vessel traffic information in the EICD.

- 8.7.3.8 Service Providers shall be able to retrieve the relevant vessel traffic information data for vessel identification purposes when required.

8.8. NRT data transmission and Telecommunications network

Network provided by the Contractor

- 8.8.0.1 The Bidder has to specify a network connection to EMSA enabling the delivery of the data as specified in this tender specification. Any technology with a sufficient bandwidth can be proposed.
- 8.8.0.2 The Bidder has to specify a secondary (back-up) communication link to the EODC via the internet, in the case of technical failure of the primary communication link.
- 8.8.0.3 Whether this service is managed by the Contractor or sub-contracted to a telecommunications service provider, it should be a fully managed service including all necessary circuit, hardware and software rental and maintenance for the duration of the contract.
- 8.8.0.4 The Contractor shall bear all costs (set-up, maintenance, operation and the fee's to the communication service providers) for data transfer to the end point.
- 8.8.0.5 The data security concept shall be described in the bid. As a minimum the Contractor shall use firewalls in conjunction with the encryption of data for data security.
- 8.8.0.6 The Contractor shall perform standard virus checking, anti-hacking and network security procedures on all messages to prevent malicious attacks.
- 8.8.0.7 EMSA reserves the right to reject network solutions if they are not compatible with the EMSA facilities or the EMSA IT landscape (available from EMSA on request).

Use of GEANT

- 8.8.0.8 EMSA has a connection to the European R&E⁷ 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.
- 8.8.0.9 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.

⁷ Research and Education

- 8.8.0.10 The Contractor may, through the local NREN, connect to the R&E network.
- 8.8.0.11 The GEANT network is connected to the Canadian R&E Network CANAIRE.
- 8.8.0.12 The cost of the data transmission over the GEANT network and the transmission from the Portuguese NREN to EMSA will be covered by the Agency.
- 8.8.0.13 If the Contractor decides to use the R&E network, the Contractor has to bear only 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.
- 8.8.0.14 In order for the delivery of all products (incl. satellite images and associated metadata) to be done consistently within the timescales identified, the Contractor will be responsible for the telecommunications services between their data-centre and their local NREN node, ensuring an adequate guaranteed bandwidth.
- 8.8.0.15 If the Contractor is using the R&E network as the primary network connection to the EO DC, and in case of a technical failure of the R&E network, the Contractor shall use his backup internet connection instead.
- 8.8.0.16 Service Providers are responsible for investigating any transmission delays that could originate from the network.

8.9. System performance

- 8.9.0.1 The Bidder must be capable of processing a minimum of 1000 images per year.
- 8.9.0.2 The Bidder must be capable of processing a minimum of 8 images per 12 hour period.
- 8.9.0.3 The health of the systems, which are part of the service chain, shall be permanently checked by the Contractor and shall be reported to the EO DC through a periodic system status report indicating availability of the system. The default rate for this check is 30 minutes but can be changed on request.
- 8.9.0.4 The Bidder shall describe contingency measures in case of system failures which may impact the EO service chain.

9. Service delivery

- 9.0.0.1 All information which has been acquired by the Contractor or generated during the analysis shall be provided to the EODC.
- 9.0.0.2 This section will summarise the products to be delivered to the EODC, and present the required timing for delivery of each data product and price reductions for late or poor quality products.

- 9.0.0.3 For each satellite acquisition the following data products shall be delivered to the EODC:
- i. EO product SAR-Native1 image (EOP)
 - ii. Quality notification (QNO)
 - iii. SAR derived products (DER)
 - iv. SAR vessel detection (DER ->VDS in future)
 - v. Activity detection (ACT)
 - vi. Quality Report (QUA)
- 9.0.0.4 It is foreseen that the SAR vessel detection and the SAR derived products will be reported in separate packages, a 'DER' package for SAR derived products, and a 'VDS' for vessel detection products. This change shall be done at no additional cost for the Agency.
- 9.0.0.5 For each satellite data acquisition, data products will be delivered to the EODC in several data packages consisting of one or more files being transferred by FTP as described in 8.7.3.
- 9.0.0.6 If a file is successfully transferred to the EO DC, but is subsequently rejected during ingestion into the EO DC because the file is either incomplete, corrupted or not format compliant due to the fault of the Contractor, it will be considered as NRT category 5 for the application of the pricing matrix.
- 9.0.0.7 For some services EMSA may request non delivery of the image file. In that case the EOP product shall be delivered containing only the metadata of the image and not the image file. If the image is requested and not included in the EOP, the EOP is considered as not delivered.

9.0.1. **Timing**

- 9.0.1.1 The SAR-Native1 product if requested should be delivered to the EODC as soon as possible.
- 9.0.1.2 All products have to be delivered at the latest according to Table 4 Required maximum delivery times of products as a function of SAR image acquisition length (calculated from satellite acquisition stop time) with EMSA product class applied as a multiplication factor.

Table 4 Required maximum delivery times of products

EMSA product classes	Maximum delivery time of Products (EOP, QNO)	Maximum delivery time of Products (DER, VDS, ACT)	Maximum delivery time of Products (QUA)

MR1.1, MR 1.2 MR1.3, HR2, HR1, VHR2, VHR1	20 minutes	30 minutes	6 hours
MR1.4	25 minutes	35 minutes	6 hours
MR1.5	30 minutes	40 minutes	6 hours
MR1.6	35 minutes	45 minutes	6 hours

9.0.2. **Price Reductions**

Delivery Delay

- 9.0.2.1 In the event of delivery delays the coefficients described in Table 5 “Price co-efficient for delivery time delay” will apply to the base price.
- 9.0.2.2 The calculation for each service will be based on the lowest price co-efficient for delivery time delay. For example if an ACT package is delivered 10 minutes late, then the price co-efficient for delivery time delay falls into NRT category 2. However, if for the same service, an EOP package is delivered with a 29 minutes delay, then the price co-efficient falls into NRT category 3 for the entire service.

Table 5: Price co-efficient for delivery time delay

Delay of product delivery	Product delivery time category	Co-efficient of the service price EOP, QNO, DER, VDS, ACT	Co-efficient of the service price QUA
No delay	NRT category 1	100%	100%
Up to 15:00 minutes (min:sec)	NRT category 2	75%	75%
From 15:01 to 30:00 minutes (min:sec)	NRT category 3	50%	
From 30:01 to 60:00 minutes (min:sec)	NRT category 4	25%	
Over 60 minutes or not delivered (min:sec)	NRT category 5	10%	

Quality

9.0.2.3 The quality parameter is a percentage value calculated from:

The coverage compliance as defined in 8.6.0.12

AND

The usable area of the product as defined in 8.6.0.13

AND

A reduction in the quality co-efficient category as defined in 8.6.0.22

9.0.2.4 The following co-efficient will apply to the base price regarding quality:

Table 6 Price co-efficient for quality

Quality parameter	Co-efficient of the service price	Product quality classification
91% - 100 %	100%	Quality category 1
71 % - 90%	90%	Quality category 2
51 % - 70%	60%	Quality category 3
31 % - 50%	30%	Quality category 4
<30%	0%	Quality category 5

Total Price Reduction

9.0.2.5 The price coefficient(s) for timeliness, and quality, are multiplied and then are applied to the price list for every acquisition.

10.Planning and ordering requests and timing

10.0.0.1 Image planning refers to (1) the process of performing a feasibility plan defining a list of satellite acquisitions and selecting to which ground station the data shall be downlinked, and (2) the request of the commitment of satellite owners and service providers that they are able and commit in providing licenses and services for each individual item in the list of acquisitions (confirmation phase).

10.0.0.2 The planning procedure is indicative. It may evolve based on operational needs. Planning procedures shall be formalised document to be agreed after contract signature based on principles defined below.

10.0.0.3 Acquisitions are defined as segments. The size can vary and may differ from the standard framing.

10.0.0.4 Based on the agreed feasibility plan, image ordering refers to the process of, (1) preparing and issuing the Task Form containing the list of acquisitions, following final submission to the end-user for approval, (2) internal EMSA approval, following financial control and (3) communication of the final Task Form which defines the orders to the satellite owners and service providers.

10.0.0.5 The Figure below describes the general⁸ planning and ordering workflow:

⁸ This workflow describes the standard planning. It will be adapted for other types of planning.

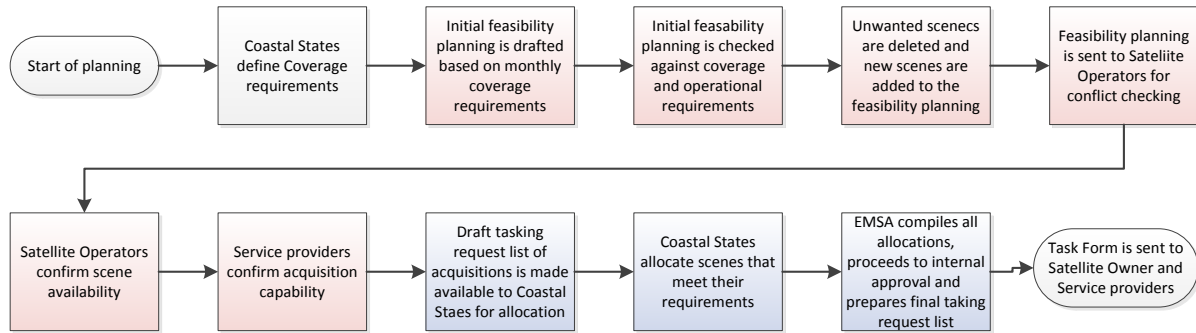


Fig. 3 EO planning (pink) and ordering (blue) workflow

10.0.0.6 The POR (Planning and Ordering) interface of the EMSA EODC is the reference for the core activities to be performed within the planning and ordering process. The POR workflow is described in **Annex A**. The POR is used for the following Contractor actions:

- Communicate to EMSA which acquisitions are confirmed/not confirmed to be available (confirmation phase).
- Communicate to EMSA if acquisitions are cancelled at a later stage or if a satellite anomaly at time of acquisition/downlink occurred. This shall also be communicated by email to EMSA and to the relevant ground station.
- Communicate to EMSA the reason for a cancellation or in case of anomaly the reason that prevented the proper image acquisition and/or downlink.

10.0.0.7 EMSA planning/ordering activities can be classified into the following categories

- Standard Planning
Bulk ordering for routine monitoring activities, for a long period e.g. one month, based on fixed requirements; orders to cover specific requests to support for example temporary operations.
- Short notice planning
Following a short notice request from users
- Archived 'planning'
To be applied to request data previously acquired.

10.0.0.8 Once the feasibility plan is uploaded in the POR, the contractor has the following deadlines to confirm the service provision:

- Standard Planning-> 1 working day

- Short notice Planning-> 4 hours (24/7/365). EMSA will inform the contractor as soon as discussions with satellite operator have started to prepare a short notice feasibility plan. The 4 hours time limit only starts when the agreed feasibility planning is uploaded in the POR.

10.0.0.9 The format of the feasibility plans is common to all missions used by EMSA Earth Observation services. The format is defined in the EICD. This is also the format of the planning files that can be exported from the POR system.

10.0.0.10 The EICD planning file format will become the unique format for exchanging planning information between EMSA and the contractor. Accordingly, the contractor shall be able to generate feasibility planning files compliant to this common planning format and shall be able to use the feasibility planning files made available through the POR into its planning software tools, to perform the requested support planning activities.

10.0.0.11 The bidder shall propose options regarding the online access to the TerraSAR-X/Tandem-X/PAZ order tool.

10.0.0.12 Planning will consist of 1 to several Data Request's (DR) which may be of the type

- Standard requests
- Short notice requests

The bidder shall propose the applicable timeline for the different requests.

10.0.0.13 In case of an anomaly during transmission of signal from satellite to ground station the SP must report the reason for the anomaly to EMSA and to identify if the responsibility is with the SO or the SP. The SP shall report their findings to EMSA according to procedures to be established during service implementation.

Tasking forms

10.0.0.14 At the end of the planning and ordering workflow, the planning is approved in the EODC by the Authorising Officer at EMSA. The approval generates automatically digitally signed Task Forms. The date and time of approval by the Authorising Officer appears in the Task form.

10.0.0.15 The information contained in the Approved Task Form is the unique legal basis for ordering. Each acquisition in the task form is referenced by an order ID which is unique.

10.0.0.16 The actual time of acquisition might change between the time the Task Form is issued and the date of acquisition. The reference for the area to be imaged is the footprint of the image in the POR and not the start and stop time of acquisition.

10.0.0.17 Detailed information on acquisition characteristics can be found in the POR and the JOU using the order ID.

10.0.0.18 At the same time a tasking form is approved, the service ID status changes to Tasked in POR and the GIS viewer.

10.0.0.19 EMSA will communicate to the Contractor the Task Forms by email.

Cancellations

10.0.0.20 EMSA reserves the right to cancel acquisitions up to 24 hours before acquisition time without penalties. EMSA cancellations will be performed in the POR.

10.1. Journaling, Reports and Invoicing

Journaling

10.1.0.1 The Contractor shall use the relevant interface of the (EODC Journaling - JOU) for monitoring the delivery of the products.

10.1.0.2 The EODC will allow the Contractor to access the JOU containing the list of all products ordered. For each service delivered, the JOU indicates the status, the service quality and the delivery time of each individual product expected for that service.

10.1.0.3 Contractors shall have 96 hours after acquisition stop time to contest, through the JOU, information on delivered products and associated delivery times and quality.

10.1.0.4 After 96 hours, the contractor cannot contest information contained in the JOU. The status is "frozen".

10.1.0.5 If products information is contested, EMSA and the contractor negotiate an agreement which is reported by EMSA in the JOU and acknowledged by the contractor.

10.1.0.6 Even after the status is frozen, EMSA can still report errors on information contained in the JOU by using the comment field. As for a contest raised by the contractor, an agreement has to be found between EMSA and the contractor.

10.1.0.7 EMSA marks products with status "final" that were not contested within the 96 hours delay or for which an agreement has been found.

10.1.0.8 Information in the JOU on products marked as final cannot be changed.

10.1.0.9 Time and quality information for products marked as final in the JOU serves as reference input for calculating the price and issuing the service report.

Reports

10.1.0.10 EMSA will communicate to the contractor a monthly basis by email, a report extracted from the financial system, which presents for each individual service detailed information, including on coefficients and prices. EMSA can deviate from the monthly time period if necessary.

10.1.0.11 The contractor will have 15 days after reception to agree to or contest the Report. Contest can only be related to the calculation of the service price itself.

10.1.0.12 If no disagreement has been communicated to EMSA in these 15 days, the report shall be considered as agreed.

Reporting of non-conformances

10.1.0.13 EMSA will issue non-conformance reports to the Contractor if delivered products or services do not comply with the specifications or quality. Non-conformance reports will be issued by EMSA to the Contractor using a project management collaborative tool defined by EMSA. It is mandatory for Contractor to use this tool to reply to issued non-conformance reports.

Invoicing

10.1.0.14 The contractor shall request the payment of the services delivered and agreed by the parties on a periodic basis as defined in the draft framework contract (Tender enclosure II).

10.1.0.15 Invoices shall indicate the Quantity and Base Price applied. The amount of the invoice shall correspond with the amounts in the agreed reports.

11. Contact Point

11.0.0.1 The contractor shall provide a contact point which EMSA can address regarding resolution of pricing or invoicing issues. Enquiries shall be resolved in a timely manner.

11.0.0.2 The contractor shall provide a contact point for satellite acquisition planning. This will be the focal point for exchanging information or addressing any issue regarding the planning and the use of the EODC interfaces. Enquiries shall be resolved in a timely manner.

12. Compliance Matrix

12.0.0.1 The Bidder shall fill in the compliance matrixes for all requirements.

12.0.0.2 Compliance is assessed in 3 levels:

- 2: Fully compliant: If the requirement is fully met by the Bidder.
- 1: Partially compliant: if the requirement is not fully met by the Bidder but presents a partial solution.

- 0: Not compliant: if the requirement is not met or addressed by the Bidder.

13.Contract management responsible body

The European Maritime Safety Agency (Unit C.2 Information Services, Operational Management) will be responsible for managing the contract.

The address of EMSA is the following:

European Maritime Safety Agency
Praça Europa Nº4
1249-206 Lisbon, Portugal

14. Project management

14.0.0.1 The project will require the highest standards of project management, and product and service delivery, covered by the contract. Recognised standards for project management shall be identified in the bid.

14.0.0.2 The Bidder shall provide a Project Management Plan. This plan should contain;

- Proposed team structure and the involvement and interaction of each team member within the project;
- Detailed curriculum vitae of the key technical and management persons who will be delivering the service under the proposed contract.
- A plan detailing the activities and timelines for the implementation period (service set-up and testing phase). The outline Plan shall include a work breakdown, a Gantt chart showing tasks, schedule and milestones for service set-up and testing and an outline test plan progress reporting;
- Risk Management Plan: Risk analysis on their proposed solutions in terms of:
 - Technical performance;
 - Implementation time;
 - Management issues.

The Agency will evaluate the risk management plan including risk analysis and the possible risk mitigation and associated management procedures.

14.0.0.3 In case the team structure and the involvement and interaction of each team member within the project changes during the framework contract, EMSA shall be immediately informed and the team structure document including the CV's be updated accordingly.

- 14.0.0.4 The Bidder shall describe contingency measures in case of system failures which may impact the EO service chain.
- 14.0.0.5 The Contractor shall be available for a monthly teleconference.
- 14.0.0.6 The Contractor shall provide a monthly report of service performance including number of services ordered, delivered, quality issues and non conformances, and updates on service evaluation activities.
- 14.0.0.7 The Contractor shall provide an Annual report.
- 14.0.0.8 All documentation shall be written in the English language.
- 14.0.0.9 A project management collaborative tool, as defined by EMSA, will be used by both parties for the duration of the contract.
- 14.0.0.10 The Annual Report shall assess the performance of the service for vessel detection and activity detection. The evaluation shall take into account field verifications when available.
- 14.0.0.11 Annual review meetings and Annual Reports are scheduled as indicated in Table Annual Meetings and Reports.

Table 7 Annual Meetings and Reports

	Event / Delivery	Date, Location From T0	Comment	Event	Deliver	Milesto
T0	Annual Report	t0+11 months	Include Service Evaluation Report		x	
T1	Annual Meeting	t0+12 months at EMSA		x		x
T2	Annual Report	t0+23 months	Include Service Evaluation Report		x	
T3	Annual Meeting	t0+24 months at Contractors premises		x		x
T4	Annual Report	t0+35 months	Include Service Evaluation Report		x	
T5	Final Meeting	t0+36 months at EMSA or if contract is extended at Contractors premises		X		x
T6	Annual Report	t0+47 months	Include Service Evaluation Report		x	
T7	Final Meeting	T0+48 months at EMSA		x		x

- 14.0.0.12 For service developments the Contractor will be required to provide to a service development project plan. EMSA acceptance of the final test acceptance report will be linked to the payment plan for the specific contract in question.

14.0.0.13 During the set-up and test phase the Contractor shall provide a Progress Report on implementation status every month, and more frequently upon the request of EMSA.

14.0.0.14 An update of the Project Management plan shall be provided upon the request of the EMSA Project Manager.

14.0.0.15 The kick-off meeting will be held at EMSA. Its purpose shall be to enable all contracting parties to discuss the project to be fulfilled by the Contractor, as well as to settle all the details of the work to be undertaken.

14.0.0.16 The Contractor's project manager, responsible for the work to be undertaken, and key technical staff must be present at the kick-off meeting.

15. Timetable

15.0.0.1 The estimated date for signature of the framework contract is May 2015.

15.0.0.2 Services will be procured through the signature of specific contracts. The Contractor shall comply with the due date for all deliverables and meetings identified in Table 7 and Table 8.

15.0.0.3 The set-up of the service chain for the delivery of EO products to the EMSA EO DC shall start from the date of the signature of the specific contract for service set-up and testing.

Table 8 Set up and testing Project Plan

	Event / Delivery	Date, Location From T0	Comment	Event	Delivery
T8	Kick-off meeting (KOM) Signature of specific contract for service set-up and testing ⁹	K.O at EMSA		x	
T9	Service Set-Up Plan, Update of Plan as presented within the bid.	+ 2 weeks from KO			x
T10	Test plan and test specifications	+ 4 weeks			x
T11	Testing begins	+ to be agreed at K.O	Including Service Implementation Plan review	x	

⁹ Framework contract(s) shall be already in place prior to kick-off meeting

			All specifications will be reviewed		
T12	Delivery of documentation	+ to be agreed at K.O	Report on the service implementation and test result; To be approved by EMSA		x
T13	Final acceptance test, afterwards Service in full operation	+ to be agreed at K.O	Final acceptance test with accepted test report	x	x

15.0.0.4 Any deviations from the given time frame must be justified. EMSA reserves the right to disagree with the deviations and the proposed time plan.

16. Estimated Value of the Contract

16.0.0.1 For this Invitation to Tender, for all framework contracts (in cascade) together, the maximum budget is 4 Million euro excluding VAT. This in no way indicates that the total amount will be spent by EMSA under these contracts.

16.0.0.2 The budget must cover all costs of the contract (e.g. costs for setting up the service, testing, operations, maintenance and upgrades, and travelling) for the duration of the contract.

17. Terms of payment

17.0.0.1 Payments shall be issued in accordance with the provisions of the draft framework contract and specific contract(s) (Tender Enclosure II) available on the Procurement Section under the call to tender EMSA/OP/17/2014 on the EMSA website at the following address: <http://www.emsa.europa.eu>

18. Terms of contract

- 18.0.0.1 EMSA may, before the contract is signed, either abandon the procurement or cancel the award procedure without the tenderers being entitled to claim any compensation.
- 18.0.0.2 The contract to be signed following this call for tender is a Framework Contract. The draft Framework Contract and draft Specific Contracts applicable are provided as Tender Enclosure II. Tenderers are invited to carefully read this contract. In drawing up a bid, the Tenderer should bear in mind that the terms of the contracts.
- 18.0.0.3 Tenderers attention is drawn to the fact that the Framework Contract does not constitute placement of an order but is merely designed to set up the legal, financial, technical, and administrative terms governing commercial relations between the Agency and the Contractor during the Contract period.
- 18.0.0.4 Signature of the Framework Contract does not commit the Agency to placing orders and does not give the Framework Contractor any exclusive rights to the services covered by the Framework Contract. In any case, the Agency reserves the right, at any time during the Framework Contract, to cease placing orders without the Framework Contractor thereby having the right to any compensation.
- 18.0.0.5 The Framework Contract will be signed for a duration of 3 years, with a possible extension of a maximum of 1 year.
- 18.0.0.6 The project shall be implemented by:
- Module 1:** A specific contract for service set-up and testing. The specific contract shall be issued immediately after the signature of the framework contract;
- Module 2:** Specific contract(s) for services. Under specific contract(s) Tasking Forms shall be issued for the purchase of the services. The Tasking Forms will cover the costs of the service, including all products, and transmission costs to the EO DC.
- Module 3:** Specific contract(s) for future developments of the service upon request of EMSA.
- 18.0.0.7 EMSA may at a later stage exercise the option to increase the estimated value of the contract via negotiated procedure with the successful tenderer in accordance with Article 134(1)(f) of the Rules of Application to the Financial Regulation

19. Pre-financing

- 19.0.0.1 The contractor may request pre-financing for Module 1 and 3 in case the value of the specific contract exceeds EUR 60,000.

20.Joint Offer

- 20.0.0.1 Groupings, irrespective of their legal form, may submit bids. Tenderers may, after forming a grouping, submit a joint bid on condition that it complies with the rules of competition. Such groupings (or consortia) must specify the company or person heading the project and must also submit a copy of the document authorising this company or person to submit a bids.
- 20.0.0.2 Each member of the consortium must provide the required evidence for the exclusion and selection criteria. The exclusion criteria will be assessed in relation to each economic operator individually. Concerning the selection criteria the evidence provided by each member of the consortium will be checked to ensure that the consortium as a whole fulfils the criteria.
- 20.0.0.3 If awarded, the contract will be signed by the person authorised by all members of the consortium. Tenders from consortiums of firms or groups of service providers, contractors or suppliers must specify the role, qualifications and experience of each member or group.

21.Sub-contracting

- 21.0.0.1 If the tenderer intends to either sub contract part of the work or realise the work in co-operation with other partners he shall indicate in his offer which part will be subcontracted, as well as the name and qualifications of the subcontractor or partner. (NB: overall responsibility for the work remains with the tenderer).
- 21.0.0.2 The tender must provide required evidence for the exclusion and selection criteria on its own behalf and when applicable on behalf of its subcontractors. The evidence for the selection criteria on behalf of subcontractors must be provided where the tenderer relies on the capacities of subcontractors to fulfil selection criteria. To rely on the capacities of a subcontractor means that the subcontractor will perform the works or services for which these capacities are required. The exclusion criteria will be assessed in relation to each economic operator individually. Concerning the selection criteria, the evidence provided will be checked to ensure that the tenderer and its subcontractors as a whole fulfil the criteria.

22.Price

- 22.0.0.1 Prices for this contract shall include all costs for Module 1, Module 2 and Module 3 elements (including travel expenses and daily subsistence allowances for meetings and reports).
- 22.0.0.2 Prices must be quoted in Euro.
- 22.0.0.3 Prices shall be fixed amounts and not subject to revision during the whole duration of the contract.
- 22.0.0.4 Under Article 3 and 4 of the Protocol on the privileges and immunities of the European Communities, EMSA is exempt from all duties, taxes and other charges, including VAT. This applies to EMSA pursuant to the Regulation 1406/2002/EC. These duties, taxes and other charges can therefore not enter into the calculation included in the bid. The amount of VAT must be shown separately.
- 22.0.0.5 The contractor is requested to present a price breakdown as specified in this chapter. The format is available as an Excel template (Appendix D). The contractor is requested to provide the worksheet filled in, in digital format together with the bid. Deviations or modifications to the tables are not allowed.

Module 1: Set-up and testing

- 22.0.0.6 The price for Module 1 Set-up and testing should cover all necessary works and adaptations of the products and services to be compliant with the specifications until the service is accepted for operational performance (Acceptance Test). This shall include testing for interfacing with the EO DC.
- 22.0.0.7 Set-up and testing costs shall be a maximum of 75.000 Euro. Set-up and testing costs shall not exceed this maximum. If the bidder has previously set up a service chain and implemented an interface to the EMSA EODC, they shall only be able to avail of a contract of maximum of 25.000 Euro for Module 1.

Table 9 Price grid for implementation costs

	Price (Euro)	Unit
Set-up and testing		
Kick-off meeting, drafting detailed product and service specifications, prototyping, interfaces definition, implementation, acceptance tests.		Fixed price

Module 2: Service Unit Costs

22.0.0.8 The price for Module 2 services should include all costs for service delivery. Any additional service costs relevant for Module 2 have to be included in the individual unit costs.

22.0.0.9 The Bidder shall provide prices for each product class in case new modes become available in the future for product classes, where currently there is no mode available.

22.0.0.10 The prices are composed of a fixed base price per service activation plus a price per area for the different resolution classes (VHR1, VHR2, HR1, HR2, MR1) as defined in Table 2 EMSA SAR product class definition.

The costs of satellite licences are shall not be included in the bid as the licenses to use the satellite data are provided by EMSA.

Table 10 Price grid for service elements.

EMSA product class	Reception of satellite data at Ground Station	NRT processing to SAR1Native Product	Vessel detection service	Target activity detection service
VHR1 fixed service fee				
VHR1 price per 1 sqkm				n/a
VHR2 fixed service fee				
VHR2 price per 1 sqkm				n/a
HR1 fixed service fee				
HR1 price per 1000 sqkm				n/a
HR2 fixed service fee				
HR2 price per 1000 sqkm				n/a
MR1fixed service fee				
MR1 price per 1000 sqkm				n/a

22.0.0.11 For different image modes the following factors shall apply

Table 11 Price grid for different polarisation modes

Mode	Factor on the segment price
Single polarisation/ cross polarisation	100%
Dual polarisation	
Other polarisation	

Table 12 Price grid for new technologies, products and services

New technologies, products and services - Title	Price in EURO per service

22.0.0.12 The following fees may be applied per service

Table 13 Price grid for additional fees

Additional Fee	Price in EURO per service
Fee for re-analysis of service with additional data as defined in section 8.6.0.23	

22.0.0.13 The prices will be subject to a price reduction according to the number of segments delivered and paid per year as described in 22.0.0.15 . A service is considered delivered and paid when the total price reduction as defined in section 9.0.2.5 of the tender specification is not zero.

22.0.0.14 The volume price reduction for services shall be via a step discount pricing method. All segments, regardless of the product type will count as one unit for the volume price reduction. The reduction will apply on the whole service with all elements: download, processing, analysis and extra services. For example the initial 400 services would be paid 100% of the price. The price would be reduced to 95% for the next 400 services (401 to 800). The price would be again reduced to 90% for the next 400 services (801 to 1200).

22.0.0.15 The discount is applicable for the amount of services delivered over a 1 year period, starting on the date of the first service delivered under the framework contract e.g. 12 months later, at day one of the month, the count is reset to zero, and accordingly the price factor to 100%.

Throughout the year with the tasking of images, the prices will be reduced according to the thresholds as given.

Table 14 Price factor according to volume of units

Units per year	co-efficient of base price
< 400	100%
401 until 800	95%
801 until 1200	90%
Over 1200	85%

Module 3: Further developments

22.0.0.16 Further developments which might have to be undertaken due to changes in the service or product specifications requested by EMSA after the service is accepted for operational performance.

22.0.0.17 The price for Module 3 further developments should be charged on a time and materials basis where there should be fixed prices for one working day.

Table 15 Price grid for further developments.

Components	Price (Euro)	Unit per day
Senior specialist: programmer, engineer, manager more than 10 years' work experience		Fixed price
Project specialist: programmer, engineer, manager more than 5 years' work experience		Fixed price
Junior programmer, engineer, manager less than 5 years' work experience		Fixed price

23.Information from the Bidder

Information concerning the personal situation of the service provider and information and formalities necessary for the evaluation of the minimum economic, financial and technical capacity required.

23.0. Legal position – means of proof required

23.0.0.1 When submitting their bid, the Bidder is requested to complete and enclose the **Legal Entity Form** and requested accompanying documentation, available on the Procurement Section (Legal Entity Form) on the EMSA Website at the following address: <http://www.emsa.europa.eu>.

23.1. Exclusion Criteria - Grounds for exclusion

To be eligible for participating in this contract award procedure, tenderers must not be in any of the following exclusion grounds:

- a) they are bankrupt or being wound up, are having their affairs administered by the courts, have entered into an arrangement with creditors, have suspended business activities, are the subject of proceedings concerning those matters, or are in any analogous situation arising from a similar procedure provided for in national legislation or regulations;
- b) they have been convicted of an offence concerning their professional conduct by a judgement which has the force of res judicata;
- c) they have been guilty of grave professional misconduct proven by any means which the contracting authority can justify;
- d) they have not fulfilled obligations relating to the payment of social security contributions or the payment of taxes in accordance with the legal provisions of the country in which they are established or with those of the country of the contracting authority or those of the country where the contract is to be performed;
- e) they have been the subject of a judgement which has the force of res judicata for fraud, corruption, involvement in a criminal organisation or any other illegal activity detrimental to the Union financial interests;
- f) they have been the subject of the administrative penalty for being guilty of misrepresentation in supplying the information required by the contracting authority as a condition of participation in the procurement procedure or failing to supply an information, or being declared to be in serious breach of his obligation under contract covered by the budget.

23.2. Evidence to be provided by the Bidder

- 23.2.0.1 For this purpose the Declaration on Honour available on the Procurement Section on the EMSA Website (<http://www.emsa.europa.eu>) shall be completed and signed.
- 23.2.0.2 Please note that the tenderer to whom the contract is to be awarded shall provide additional proof evidencing eligibility.
- 23.2.0.3 For situations described in (a), (b) and (e), production of a recent extract from the judicial record is required or, failing that, a recent equivalent document issued by a judicial or administrative authority in the country of origin or provenance showing that those requirements are satisfied. Where the tenderer is a legal person and the national legislation of the country in which the tenderer is established does not allow the provision of such documents for legal persons, the documents should be provided for natural persons, such as the company directors or any person with powers of representation, decision making or control in relation to the tenderer.
- 23.2.0.4 For the situation described in point (d) above, recent certificates or letters issued by the competent authorities of the State concerned are required. These documents must provide evidence covering all taxes and social security contributions for which the tenderer is liable, including for example, VAT, income tax (natural persons only), company tax (legal persons only) and social security contributions.
- 23.2.0.5 For any of the situations (a), (b), (d) or (e), where any document described in two paragraphs above is not issued in the country concerned, it may be replaced by a sworn or, failing that, a solemn statement made by the interested party before a judicial or administrative authority, a notary or a qualified professional body in his country of origin or provenance.
- 23.2.0.6 If the tenderer is a legal person, information on the natural persons with power of representation, decision making or control over the legal person shall be provided only upon request by the contracting authority.
- 23.2.0.7 When the tenderer to be awarded the contract has already submitted relevant evidence to EMSA, it remains valid for 1 year from its date of submission. In such a case, the reference of the relevant project(s) should be mentioned and the Contractor is required to submit a statement of confirmation that their situation has not changed.

23.3. Selection Criteria

23.3.0. Economic and financial capacity – means of proof required

- 23.3.0.1 Requirements: The tenderer must be in stable financial position and have the economic and financial capacity to perform the contract.

23.3.0.2 Evidence:

- Financial statements for the last three years for which accounts have been closed.
- Statement of overall turnover and turnover relating to the relevant services for the last three financial years.
- Tenderers are exempt from submitting the documentary evidence if such evidence has already been completed and sent to EMSA for the purpose of another procurement procedure and still complies with the requirements. In this case the tenderer should simply indicate on the cover letter the procurement procedure where the evidence has been provided.
- If, for some exceptional reason which EMSA considers justified, a tenderer is unable to provide one or other of the above documents, he may prove his economic and financial capacity by any other document which EMSA considers appropriate. In any case, EMSA must at least be notified of the exceptional reason and its justification in the tender. EMSA reserves the right to request any other document enabling it to verify the tenderer's economic and financial capacity.

23.3.1. **Technical and professional capacity - means of proof required**

23.3.1.1 To prove their technical and professional capacity the Bidder should provide proof of the following mandatory criteria with their application:

23.3.1.2 **Relevant experience:** This proof will consist of a list identifying work carried out during at least the last three years that is of relevance and/or analogous to the services to be provided. This list should clearly show evidence of:

- The Bidders level of experience for the provision of maritime surveillance services based on Synthetic Aperture Radar satellite images;
- A description of the services previously offered, with an indication of the objectives, contracting parties, duration and budget;
- Any evidence, statement or testimonial from the customer, from the public sector or private sector, relating to the performance and/or quality of the services previously provided by Bidders;

23.3.1.3 The Bidders should provide a company profile illustrating the company structure, technical and management organisation demonstrating their capability to implement and maintain the requested service.

24.Criteria for the award of contract

Only the tenders meeting the requirements of the exclusion and selection criteria will be evaluated in terms of quality and price.

24.0.0.1 The contract will be awarded to the Bidder who submits the most economically advantageous bid (the one with the highest score) based on the following quality criteria and their associated weightings:

The Agency shall refer to the bid and to the level of fulfilment of the following criteria.

1. **Quality criterion 1** fulfilment of technical requirements ($W_1= 50\%$)
2. **Quality criterion 2** performance and quality assurance ($W_2= 20\%$)
and the price criterion and associated weighting:
3. **Price** of the bid ($W_{Price}= 30\%$).

For all bids evaluators will give marks between 0-10 (half points are possible) for each quality criterion.

The score is calculated as

$$S = SQ + SP$$

where: The average quality for quality criterion i is

$$Q_i = \frac{1}{\text{number of evaluators}} * \sum_{\text{evaluator}} \text{mark of the evaluator for quality criterion } i$$

The overall weighted quality is

$$Q = \sum_i Q_i * W_i$$

The score for quality is

$$SQ = \frac{Q}{Q \text{ of the bid with highest } Q} * 100 * \sum_i W_i$$

The score for price is

$$SP = \sum_i \frac{\text{lowest Price}_i \text{ of all bids}}{\text{Price}_i} * 100 * W_{Price_i}$$

Only bids that have reached a minimum of **60 %** for all **Quality criterion 1 and 60% for Quality criterion 2** will be taken into consideration when calculating the score for quality SQ , score for price SP and score S .

Only bids that have reached a minimum of **70** % for the score *S* will be taken into consideration for awarding the contract.

24.0.0.2 Bidders are requested to complete a compliance matrix (Appendix C Technical Compliance Matrix), which is available as an Excel template from the EMSA website, on the Procurement Section under the call to tender EMSA/OP/17/2014 on the EMSA website at the following address: <http://www.emsa.europa.eu> and to provide the worksheet in printed and in digital format together with the bid. The compliance matrix will be used by the Agency to evaluate the bids for their level of compliance with the service requirements described in this document. A deviation or modification of the tables is not allowed.

24.0.0.3 Compliance shall be assessed in 3 levels:

2: fully compliant – if the requirements are fully met by the Bidder

1: Partially compliant – if the requirement is not fully met by the Bidder but presents a partial solution

0: Not compliant – if the requirement is not met or addressed by the Bidder.

24.0.1. **Quality Criterion 1 Fulfilment of technical requirements**

24.0.1.1 The criteria used to evaluate the appropriateness of the proposed technical solution are:

- Degree of fulfilment of the technical requirements for vessel detection and target activity detection
- Extent of Ground Station coverage and NRT service provision (based on GIS/ESRI shape comparison).
- The operational facilities used to perform the contracted tasks including archiving, networking and telecommunication infrastructure; hosting environment; contingency planning.

24.0.2. **Quality Criterion 2 Performance and quality assurance**

The Contractor must ensure high performance of the system and services offered. Bidders must provide documentation indicating performance as specified in section 7 service performance indicators and section 8.9 system performance.

A quality management plan shall be provided by Bidders and evaluated by the Agency. The document shall describe quality control and assurance procedures. The procedures for system quality checking and assurance used to perform the tasks under the terms of the contract will be evaluated.

24.1. Price award criteria

24.1.0.1 The price evaluation will be done based upon the following scenario (sum of Module 2+ Module 3):

Table 16 Scenario for price evaluation

Module 2 - Number of services annually:	
VHR1 activity detection service (10 km image length)	2
VHR 2 vessel detection service (20 km image length)	100
HR1 vessel detection + activity detection service (50 km image length)	100
HR1 vessel detection service (100 km image length)	50
HR2 vessel detection service (100 km image length)	50
MR 1 vessel detection service (500 km image length)	10
Module 3 - Further developments based on:	
Year two	
Senior specialist: manager more than 10 years' work experience	5 days
Project specialist: engineer, analyst, designer more than 5 years' work experience	10 days
Junior specialist: programmer, engineer, tester less than 5 years' work experience	20 days
Year three	
Senior specialist: manager more than 10 years' work experience	5 days
Project specialist: engineer, analyst, designer more than 5 years' work experience	10 days
Junior specialist: programmer, engineer, tester less than 5 years' work experience	20 days

25.Contracts will not be awarded to tenderers who, during the procurement procedure:

(a) Are subject to a conflict of interest;

(b) Are guilty of misrepresentation in supplying the information required by the contracting authority as a condition of participation in the contract procedure or fail to supply this information.

26.False declarations by Bidders

26.0.0.1 Without prejudice to the application of penalties laid down in the contract, Bidders and Contractors who have been guilty of making false declarations concerning situations referred to in points regarding their technical and professional capacity or in relation to the award criteria above, or have been found to have seriously failed to meet their contractual obligations in an earlier procurement or grant shall be subject to administrative and financial penalties set out in Article 145 of Commission Delegated Regulation of 29.10.2012 on the rules of application of Regulation (EU) No 966/2012 of the European Parliament and of the Council on the financial rules applicable to the general budget of the Union.

27.Intellectual Property Right (IPR)

27.0.0.1 Please consult the contract for IPR related clauses.

27.0.0.2 If the results are not fully created for the purpose of the contract this should be clearly pointed out by the tenderer in the tender. Information should be provided about the scope of pre-existing rights, their source and when and how the rights to these rights have been or will be acquired.

27.0.0.3 In the tender all quotations or information originating from other sources and to which third parties may claim rights have to be clearly marked (source publication including date and place, creator, number, full title etc.) in a way allowing easy identification.

28.Requirements as to the tender

28.0.0.1 Bids can be submitted in any of the official languages of the EU. The working language of the Agency is English. Bids must include an English version of the documents requested under point 23.3.1 & 24 of the present tender specifications.

28.0.0.2 The tenderer shall complete the Tenderer's checklist.

28.0.0.3 If the tenderer intends to either sub contract part of the work or realise the work in co-operation with other partners (Joint Offers) he shall indicate in his offer by completion of the form – Information regarding joint offers and subcontracting.

28.0.0.4 The tender must be presented as follows and must include:

28.0.0.5 Signed cover letter indicating the name and position of the person authorised to sign the contract and the bank account on which payments are to be made.

28.0.0.6 Financial Form completed, signed and stamped: available on the Procurement Section (Financial Form) on the EMSA Website at the following address: <http://www.emsa.europa.eu>.

28.0.0.7 Legal Entity Form completed, signed and stamped and requested accompanying documentation, available on the Procurement Section (Legal Entity Form) on the EMSA Website at the following address: <http://www.emsa.europa.eu>.

28.0.0.8 Tenderers are exempt from submitting the Legal Entity Form and Financial Form requested if such a form has already been completed and sent either to EMSA or any EU Institution previously. In this case the tenderer should simply indicate on the cover letter the bank account number to be used for any payment in case of award.

28.0.0.9 Additional information requested:

- The name, phone number and Email of the persons who will be responsible for the technical and contractual management of any resulting contract and who would be nominated as such in the contract;
- The name, address, fax, phone number and Email of the Bidders contact person to whom all communications related to the invitation to tender should be addressed;
- The name, address, fax, phone number and Email of each subcontractor proposed, if any;
- The name of the author(s) of the Tender;
- References and experiences of the company or all companies involved in the consortium.

28.1. **Part A**

28.1.0.1 All the information and documents required by the contracting authority for the appraisal of tenders on the basis of the points 20, 23.1-23.2 of these specifications (part of the Exclusion criteria).

28.2. **Part B**

28.2.0.1 All the information and documents required by the contracting authority for the appraisal of tenders on the basis of the Economic and Financial capacity (part of the Selection Criteria) set out under Section 23.3.0 of these specifications;

28.3. **Part C**

28.3.0.1 All the information and documents required by the contracting authority for the appraisal of tenders on the basis of the Technical and professional

capacity (part of the Selection Criteria) set out under section 23.3.1 of these specifications. Bidders are requested to include a copy in English of the documents requested under this section.

28.4. **Part D**

- 28.4.0.1 All the information and documents required by EMSA as the contracting authority for the appraisal of tenders on the basis of the **Award Criteria** set out under section 24 of these specifications;
- 28.4.0.2 The fulfilment of the requirements have to be stated in a compliance matrix (Appendix C Technical Compliance Matrix), which is available as an Excel template from the EMSA website, on the Procurement Section under the call to tender EMSA/OP/17/2014 on the EMSA website at the following address: <http://www.emsa.europa.eu> and to provide the worksheet in printed and in digital format together with the bid.

28.5. **Part E:**

- 28.5.0.1 Setting out prices in accordance with section 24.1 of these specifications.
- 28.5.0.2 Bidders are requested to fill in all the prices in the Price grids (Appendix D Price Matrix), which is available as an Excel template from the EMSA website, on the Procurement Section under the call to tender EMSA/OP/17/2014 on the EMSA website at the following address: <http://www.emsa.europa.eu> and to provide the worksheet in printed and in digital format together with the bid.
- 28.5.0.3 The printed version of the price sheet shall be duly signed by Bidders.

29. No commitment by the Agency

29.0.0.1 This Invitation to Tender, comprising of Technical Specifications and all enclosures, does not bind the Agency in any way to place a contract, and the Agency reserves the right to place a contract for the whole or only part of the activities covered by the Invitation to Tender. EMSA may, before the contract is signed, either abandon the procurement or cancel the award procedure without the Bidders being entitled to claim any compensation.

30.Retention of tenders

- 30.0.0.1 Any document submitted in reply to this Invitation to Tender shall become the property of the Agency, which will use proprietary information solely for the purpose of the evaluation of the Tender.

31.No reimbursement of tender expenses

31.0.0.1 Expenses incurred in the preparation and dispatch of the Tender will not be reimbursed.

32.Information resources

32.0.0.1 Bidders are advised to consult the EMSA (<http://www.emsa.europa.eu>) for links to reference documents and further information.

Appendix A Abbreviations, acronyms and definitions

AIS	Automatic Identification System for vessels	MS	Member States
AOI	Area of Interest	NRT	Near Real Time
API	Application Programming Interface	OGC	Open GeoSpatial Consortium
COTS	Commercial off-the-shelf	POR	Planning and Ordering component
CS	Coastal State	PQP	Project Quality Plan
CSA	Canadian Space Agency	QA	Quality Assurance
CSN	CleanSeaNet	QC	Quality Control
EODC	EO Data Centre	QI	Quality Indicator
DC	Data Centre	QNO	Quality Notification
EC	European Community	QUA	Quality Report
EICD	External Interface Control Document	SAR	Synthetic Aperture Radar
EMSA	European Maritime Safety Agency	SAR-Native1	SAR image level1B in native format
ENC	Electronic Nautical Charts	SII	SAR-Native1 Image Inspection
EO	Earth Observation	SLA	Service Level Agreement
ESA	European Space Agency	SO	Satellite owner
EU	European Union	SOA	Service Oriented Architecture
EU MS	European Member States	SOAP	Simple Object Access Protocol
EUSC	European Union Satellite Centre	SP	Service Provider
FTP	File Transfer Protocol	SSL	Secure Sockets Layer
GMES	Global Monitoring of Environment and Security	SSN	SafeSeaNet
GML	Geography Mark-up Language	SST	Sea Surface Temperature
GUI	Graphical User Interface	STIRES	SafeSeaNet Tracking Information Relay Exchange System
HTML	Hyper Text Mark-up Language	URL	Uniform Resource Locator
HTTP	Hyper Text Transfer Protocol	UTM	Universal Transverse Mercator
ICT	Information Communication & Technology	VD	Vessel Detection
IMO	International Maritime Organisation	VMS	Vessel Monitoring Service
JPEG	Joint Photographic Experts Group	VTs	Vessel Tracking Service
JOU	Journaling component	WBS	Work Breakdown Structure
KML	Keyhole Mark-up Language	WCS	Web Coverage Service
KMZ	Keyhole Mark-up Language zipped	WFS	Web Feature Service
LRIT	Long Range Identification and Tracking	WGS84	World Geodetic System reference coordinate system
MAT	Multi-Mission Planning Analysis Tool (MAT)	WMS	Web Mapping Service
MDA	MacDonald Dettwiler and Associates	XML	eXtensible Mark-up Language
MSSO	Maritime Support Service Operator	WUP	Web User Portal Component

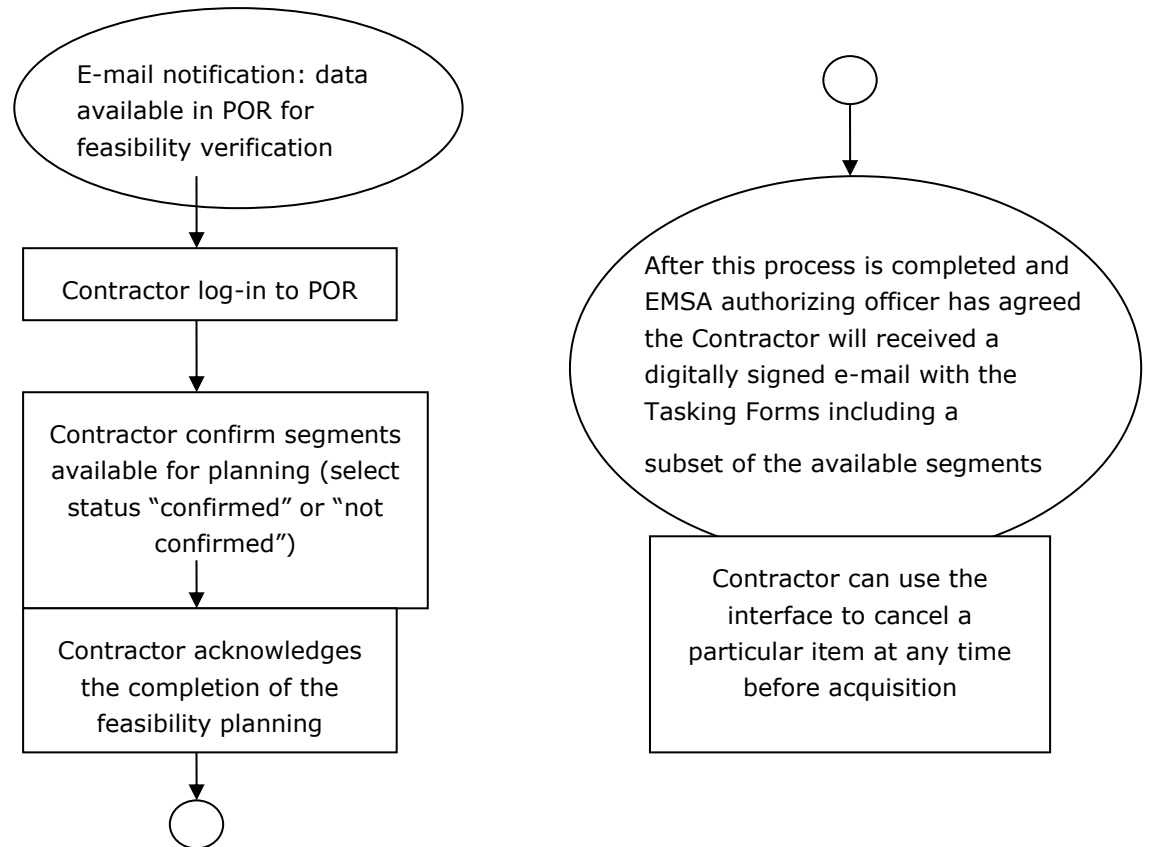
Appendix B The POR and JOU of the EO Data Centre

The contractor shall use two systems of the Earth Observation Data Centre (EODC) to routinely exchange planning-related information with EMSA:

- Planning and Ordering system (POR): to confirm the availability of the segments for tasking, and to cancel individual segments only due to Charter of Major Disasters requests, Emergency request, satellite manoeuvres or due to satellite safety reasons.
- Journaling system (JOU): to consult the scenes which have been tasked.

The POR workflow

- The contractor will receive an e-mail informing that data is available in POR for feasibility verification. This is done on request and generally the data available in the POR will cover at least one month of acquisitions.
- The contractor shall log-in to POR and can export the EMSA initial planning to APT.
- The contractor shall use POR to confirm which scenes/segments are available for planning.
- Once this is done the contractor shall acknowledge that the feasibility analysis is done using POR and an automatic e-mail will be sent to EMSA.



**Schematic description of the POR
workflow for satellite owner**

- The Contractor shall respect the time limits described in this specification.
- The Contractor will receive a digitally signed e-mail with the Tasking Forms.
- To cancel a scene/segment, in the cases foreseen, the Contractor shall use the POR system, selecting the scene/segment and changing its status to cancel.
- In case EMSA will cancel a scene, the Contractor will be notified via e-mail.
- To generate service reports, the Contractor can log in to JOU to extract information on the number of delivered/cancelled scenes or the ones not delivered due to an SP or SO anomaly.

Appendix C Technical Compliance Matrix

Appendix D Price Matrix

Appendix E EICD

The EICD shall be provided on request by sending an email to EMSAOP17@emsa.europa.eu

Appendix F TeamForge Issue Management