

Tender specifications

Attached to the Invitation to tender EMSA/OP/11/2016

for

Provision of testing and quality assurance services related to EMSA maritime applications

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1 Introduction

The European Maritime Safety Agency (EMSA) was established under Regulation (EC) No 1406/2002 of the European Parliament and of the Council¹ for the purpose of ensuring a high, uniform and effective level of maritime safety. Among its tasks, the Agency should facilitate cooperation between Member States and the European Commission in the field of European Vessel Traffic Monitoring and Information System in the context of Directive 2002/59/EC.

EMSA contributes to the enhancement of the overall maritime safety system in the European Union. Its goals are, through its tasks, to reduce the risk of maritime accidents, marine pollution from ships and the loss of human lives at sea.

The Agency develops, maintains and operates software applications that support Member States in implementing European maritime legislation. Those applications are regularly upgraded and before roll them out to production, there is the need of validating the correct implementation of those upgrades.

Further information about EMSA can be obtained on its website: www.emsa.europa.eu

2 Objective, scope and description of the contract

2.1 Objective

The objective of this procurement is to establish an acquisition channel to procure IT quality assurance services related to the EMSA critical maritime information applications.

The procurement will result in the award of a multiple IT Framework Contract with re-opening of competition with three (3) successful contractors.

2.2 Scope

The IT quality assurance services to be contracted under the resulting contracts relating to the EMSA maritime applications hosted and operated in EMSA are:

- Functional testing,
- Operational Readiness, Fault-tolerance and Resilience,
- Stress, Load and Soak Testing,
- Performance Analysis,
- Capacity Planning,
- Application Security Assessments,
- Source Code quality assurance,
- Integration testing,
- Commissioning testing,
- Development and maintenance of test related artefacts.

¹ Regulation (EC) No 1406/2002 of the European Parliament and of the Council of 27 June 2002 establishing a European Maritime Safety Agency (OJ L 208, 5.8.2002, p.1.).

The above services relate to the following maritime applications: SafeSeaNet (including SSN core, Stires, and BlueBelt modules), LRIT IDE, LRIT DC, LRIT Ship Data Base, EO DC, THETIS, IMDaTE, STAR, SEG; as well as to the Horizontal ICT Services' platforms or applications that are used by these, such as IdM/SSO, OSB, Liferay Portal or reference registries or any new applications.

2.3 Description of type of services/activities to be performed

Under this multiple IT Framework Contract, the contractors shall provide the services described in this section.

2.3.1 Functional testing

Functional readiness is achieved by means of testing conducted on a complete, integrated system to evaluate the system's compliance and usability against its requirements specification. System testing falls within the scope of black box testing, and as such, should require no knowledge of the inner design of the code or logic.

This kind of testing generally involves running a suite of tests in which each individual test, known as a test case, exercises a particular operating condition of the user's environment or feature of the system, and the result will be either pass or fail (i.e. there is generally no degree of success or failure).

The test pass/fail criteria are usually expressed in a business domain language. These are high level tests to test the completeness and correct implementation of the defined use cases. The specification of these tests shall be agreed between business customers, business analysts, testers and developers. As the tests pass their success criteria, the business owners can be sure of the fact that the developers correctly implemented how the application was envisaged to work and so it is essential that these tests include both business logic tests as well as UI validation elements when relevant.

The specification of these tests shall include:

- Test name;
- Test duration;
- Conditions under which the test is to be performed;
- Data to be gathered;
- Data acquisition requirements including tolerance, number of samples, etc;
- Results to be obtained, including some method of documentation and any analytical calculations required;
- Measurable success criteria;
- Precautions associated with executing the procedure (if applicable);
- Description of the test procedure steps in the order they are to be performed including:
 - The prerequisites required to be ready to perform the test;
 - The steps necessary to prepare for the test;
 - The actual steps in the test process;
 - The steps necessary to return the system to normal operating status;
 - Instruction regarding information that needs to be documented and a place to record this information.

In what concerns the functional readiness, the contractor shall provide to EMSA, as a minimum, the following services:

- Analysis of the system requirements specification;
- Functional tests specification and design based on the system requirements specification analysis;
- Setup and execution of the functional tests;
- Verification of interface operation in terms of dataflow and data display;
- Ensuring traceability between the requirements, business rules, use cases and user interfaces with the test cases defined and used to validate the software;
- Assessment of the screen layout, structure and presentation options;
- Verification of system to system data;
- Compliance test (for the services based on existing Standards such as OGC Standards)
- Provide recommendations to solve the problems identified during the tests execution;
- Providing proposals aiming at improving the layout, design and technical structure of the user interfaces to be used by EMSA.

2.3.2 Operational Readiness, Fault-tolerance and Resilience

A fault-tolerant system, also known as fail-safe, is a system that is able to continue operation, possibly at a reduced level, rather than failing completely, when some part or component of the system fails. When applied to computer-based systems, it relates to a system which is designed to continue more or less fully operational with, for example, a reduction in throughput or an increase in response time in the event of some partial failure. That is, the system as a whole is not stopped due to problems either in the hardware or the software.

Fault-tolerance is usually a key design driver for high-availability or life-critical systems. A fault tolerant system must obey, at least, to the following generic requirements:

- No single point of failure: in case of a failure the system must continue to operate without interruption during the repair process.
- Fault isolation to the failing component: in case of a failure the system must be able to isolate it to the offending component.
- Fault containment to prevent propagation of the failure: in case of a failure the system must prevent the propagating of the failure to the rest of the system.
- Fault tolerance can usually be achieved by using a spares design approach. This can be done in three ways:
 - Replication: providing multiple identical instances of the same system or subsystem, directing tasks or requests to all of them in parallel and choosing the correct result on the basis of a quorum;
 - Redundancy: providing multiple identical instances of the same system and switching to one of the remaining instances in case of a failure (failover);
 - Diversity: providing multiple different implementations of the same specification, using them like replicated systems to cope with errors in a specific implementation.

In what concerns the operational readiness, fault-tolerance and resilience technical domains, the contractor shall provide to EMSA, the following services:

- Analyse the existent or new systems in order to plan and specify failover and resilience assessments;
- Execute failover (fault-tolerance) and resilience tests involving different system components (e.g. server, database);

- Provide recommendations to solve or minimize the impacts of the problems identified during the test campaigns.

2.3.3 Stress, Load and Soak Testing

Stress Testing aims at testing the response of a system to extreme conditions (e.g. with an exceptionally high workload over a short span of time), often to a breaking point, to identify vulnerable points within the software and to show that the system can withstand normal workloads.

Stress testing is subjecting a system to an unreasonable load while denying it the resources (e.g. RAM, HDD, CPU, interrupts, threads and database connections) needed to process that load. The system is stressed to the breaking point in order to find bugs that will make that break potentially harmful. The system is not expected to process the overload without adequate resources, but to behave (e.g. fail) in a predictable and non-critical manner (e.g. not corrupting or losing data). The load in stress testing is often deliberately manipulated so as to force the system into resource exhaustion.

Load testing is subjecting a system to a previously defined representative load and is usually performed when testing the reliability and performance of the system. In performance testing, load is varied from a minimum (zero) to the maximum level the system can sustain without running out of resources or having transactions suffering excessive delay in comparison with the performance requirements. Load testing can also be used with the purpose of determining the maximum sustainable load the system can handle with the following objectives:

- Determining whether the application performance degrades gracefully given a shortage of resources;
- Determining how much performance degrades given a shortage of resources;
- Determining the hotspot above which making more resources of a given type available will not affect the system performance, given the expected maximum workload in a production environment.

Soak testing consists of running a system at high levels of load for prolonged periods of time. Soak testing enables the detection of particular kind of errors, such as memory or connection leaks, which only reveal themselves after a prolonged period of working time.

In what concerns stress, load and soak testing, the contractor shall provide to EMSA, as a minimum, the following services:

- Planning, specifying and report of load tests for existent or new applications;
- Planning, specifying and report of stress tests for current or new applications;
- Profiling the execution of the applications to measure individual components' response time during load tests;
- Analysing the profiling reports;
- Provide recommendations to solve or minimize the impacts of the problems identified during the test campaigns.

2.3.4 Performance Analysis

Performance analysis of a system encompasses, at least, the following set of activities:

- Performance Review: reveal obvious performance issues in systems or applications by walking through common user scenarios and analysing what is happening on the front and back ends.
- Network Analysis: diagnose network performance delays from large data transfers and high number of network round-trips. Provide end-user response time projections for any network line speed and latency.
- Load Test: identify and isolate performance bottlenecks in an application under a simulated workload. Report metrics such as the number of concurrent users, transaction throughputs and end-user response times.
- Scalability Test: determine the impact on application performance as a result of hardware scale up or scale out, operating system migrations, database server upgrades or other changes.
- Performance Active Monitoring: monitor real-time performance in the target environment and measure transaction response times which are outside of service level agreements.

The outcome of the aforementioned performance analysis related activities shall be:

- Prioritizing the performance issues that were found.
- Improving performance through tuning and optimization of services.
- Providing suggestions based on performance best practices and optimization strategies.

In what concerns to the performance analysis technical domain, the contractor shall provide to EMSA, as a minimum, the following services:

- Execute performance assessments over existent system/applications to identify existent bottlenecks, possible future problems;
- Provide recommendations to solve or reduce the impacts of the identified problems.

2.3.5 Capacity Planning

Generally, capacity estimations are required when:

- A new application is developed;
- Current applications are consolidated;
- Applications are downsized from a powerful server with a large number of CPUs and many Gigabytes of memory supporting a large number of users.

Capacity planning activities shall cover, at least, the following areas of analysis:

- CPU consumption;
- Memory usage;
- Network throughput and bandwidth;
- Storage capacity;
- Application workload.

With regards to capacity planning, the contractor shall provide to EMSA, as a minimum, the following services:

- Execute capacity assessments over existent systems/applications to identify possible optimizations or to anticipate and correct possible future lack of resources that could lead to systems/applications unavailability or crashes;
- Provide recommendations and best-practices to be followed.

2.3.6 Application Security Assessments

Application security assessments aim on providing a targeted code review and a comprehensive vulnerability assessment of the application in order to determine security weaknesses and/or misconfigurations. Applications should be reviewed from both technical and non-technical perspectives, revealing security weaknesses and detailed recommendations should be provided for the resolution of the discovered vulnerabilities.

With regards to application security assessments technical domain, the contractor shall provide to EMSA, as a minimum, the following services:

- Inspection of application validation and bounds checking for both accidental and mischievous input;
- Manipulation of client-side code and locally stored information such as session information and configuration files;
- Analysis of inter-application interaction between components such as the web service and back-end data sources;
- Discovery of opportunities that could be utilised by an attacker to escalate their permissions;
- Analysis of event logging functionality;
- Analysis of authentication methods in use for their robustness and resilience to various subversion techniques;
- Provide recommendations and best-practices to be followed.

2.3.7 Source Code Quality Assurance

Software Quality Assurance requires different types of verification activities throughout the development process and planned deliveries:

- Early verification focuses on evaluating intermediate software builds and removing defects at coding time. This represents an emerging trend because performing verification early in the process can improve overall quality and reduce development time.
- Post-production verification focuses on evaluating final build quality or finding defect root causes after the product is complete.

Source Code validation and verification (also known as Source Code revision or Source Code inspection) is one technique that can be used during Early verification and Post-Production verification. Among others, with Source Code Validation and Verifications EMSA aims to:

- Assess and assure Source Code Suitability
 - Reliability
 - Correctness
 - Accuracy
 - Efficiency
 - Usability
- Assess and assure Source Code Maintainability
 - Understandability
 - Modifiability
 - Traceability
 - Testability
 - Portability

- Reusability

Taking into consideration any specific Maritime Application, the contractor shall provide the following services:

- Perform Early Verifications
- Perform Post-Production Verifications
- Gather and interpret Source Code metrics
- Assess Source Code Suitability, identify issues/potential problems, propose solutions/changes and confirm implementation results
- Assess Source Code Maintainability, identify issues/potential problems , propose solutions/changes and confirm implementation results
- Implement, update and maintain automatic Validation and Verification processes over a specific application, system and/or component

2.3.8 Integration Testing

Integration is a key software development life cycle (SDLC) strategy. Generally, small software systems are integrated and tested in a single phase, whereas larger systems involve several integration phases to build a complete system, such as integrating modules into low-level subsystems for integration with larger subsystems. Integration testing encompasses all aspects of a software system's performance, functionality and reliability.

In recent years EMSA Maritime Applications have become increasingly interconnected and reliant on each other for the provision of services to the end users. Additionally, EMSA is moving towards and Service Oriented Architecture in which enterprise services are used by several maritime applications. This is true especially in the case of base registries for common reference data.

Additionally, in the context of the European Interoperability Framework, EU calls for building interoperable systems. EU has defined interoperability in several European Directive Technical Guidelines such as the view, discovery and download technical guidelines in the INSPIRE directive.

These tendencies pose major challenges and risks which integration testing shall allow mitigating.

The contractor shall define and conduct integration testing of specific integration use cases covering several maritime applications and external systems.

2.3.9 Commissioning Testing

EMSA exchanges data with Member States and other entities. These data exchanges are governed by specific regulations and contractual agreements.

In order to assess the technical compliance of the implemented data exchanges with external entities, each interface is subject to Commissioning Tests.

The contractor shall provide support to EMSA in conducting Commissioning testing of specific data exchanges.

2.3.10 Development and maintenance of test related artefacts

With the evolution of the Maritime Applications the testing requirements, procedures and existing testing items tend to become obsolete.

The contractor shall provide services for the development and corrective or evolutive maintenance of test items, including:

- Development of a test methodology that allows being repeated by EMSA staff and easy adaption in case of modifications of the system;
- Implementation of Test tools and frameworks;
- Generation of test data;
- Development and maintenance of test data generators and test simulators;
- Maintenance of test scripts;
- Maintenance of test and user documentation; Maintenance of traceability documentation: Mapping of the relationships between requirements, business rules, use cases, user interfaces, implemented software components and classes;
- Optimization of tests and ensuring repeatability;
- Automation of existing tests including web graphical user interface testing;
- Support EMSA in creating test plans and/or update existing plans by including additional test cases descriptions following agreement with EMSA;
- Prepare test cases definitions and test data to support a test driven design process for new and/or existing functionalities under testing;
- Create / update corresponding test suites in Testlink or in any other format;
- Link tests to software requirements in order to obtain requirement test coverage;
- Implement the complete set of test automation scripts used for an assignment and detailed instructions on how to use/run the scripts;
- Hand-over to EMSA the test artefacts used to validate the software releases.

2.4 **Required staff profiles**

The following staff profiles are expected to perform the services covered by this contract:

- Project manager;
- Test Designer;
- Tester;
- Developer;
- Quality Assurance Engineer;
- Network/Security Expert.

2.5 **Description of the type of Contract**

The outcome of this procurement shall be a multiple IT Framework contract with a re-opening of competition system. Point **8 - Terms of contract** describes the contract implementation.

Please note that the Contractor to be awarded this Contract has to respect the “two-chamber principle”, which means he will not test products which he has previously developed for the Agency.

2.6 General conditions for the provision of services

General Working Methods/Procedures

EMSA has a pre-defined set of working methods/procedures that are defined in the following Appendices:

- Appendix C: Initial quality gate for java projects.
- Appendix D: Service Procedures for Maintenance

These reference documents are tailored for each contract according to their characteristics.

Tenderers are encouraged to take this set of working methods/procedures in attention while preparing their answers for this procurement.

Language

The English language shall be used throughout the implementation of the multiple IT Framework contract, during communication, reports and in the documentation.

Used products and infrastructure

The sub-Appendices to Appendix E, E.1 - SSN, E.2 - EU LRIT DC, E.3 - Clean SeaNet, E.4 - SEG, E.5 - IMS, E.6 - IMDatE and E.7 – THETIS provide summarized technical descriptions of EMSA Maritime Applications including specificities in terms of technologies, architecture and products which may be relevant to the provision of the IT quality assurance services in this tender. The EMSA System Landscape is presented in Annex II, Appendix 1 to the IT Framework Contract – “ICT Architecture: System and Application Technical Landscape”.

Relevant technologies and products used in the Maritime Applications include (see appendices for additional relevant technologies and products):

- SSL
- Web Services (SOA and REST)
- Oracle Databases
- Oracle SOA suite and Middleware
- Geographic Information Systems
- Event Driven Architecture

Common tools related to the test process currently used by EMSA include TestLink, TeamForge, JMeter, Security tools, Test automation tools, SOAPUI, Ready API, LOADUI, Python and HermesJMS.

The contractor providing the services shall use only the standard software packages in use at EMSA, and no other software shall be installed or used without reference in the Specific Contracts or the prior written authorization of EMSA.

Place of performance

The place of performance shall be the contractor's premises with a VPN access to EMSA servers. In some Specific Contracts, the contractor may be requested to perform the service at EMSA premises.

Work time

The work shall be carried out within the normal working hours and on normal working days of EMSA.

3 Contract management responsible body

EMSA – Unit C.4, in charge of Digitalisation and Application Development, will be responsible for managing the contract.

4 Project Planning

Within the multiple IT Framework Contract to be concluded, the following meetings might take place:

- FWC Kick-off meeting: following the signature of the IT Framework contract (within one month from entry into force);
- For each specific contract:
 - **Kick-off meeting:** After the signature of each specific contract, a kick-off meeting may be held in order to present a work breakdown structure of the activities and to define the details of the tasks to be undertaken.
 - **Final meeting:** Prior the end of the specific contract, a final meeting shall be held to mark the end of the contract and enable the contracting parties to discuss the services provided.
 - **Regular management meeting:** Regular meetings to be held between EMSA and the contractor. The regularity of these meetings is to be agreed for each specific contract and to be defined in the respective kick-off meetings.

EMSA may call for additional meetings if this should be considered necessary for the better execution of the contract.

Meetings will be held in EMSA premises in Lisbon, Portugal; although some meetings could be held on the contractors premises or take another form (e.g. virtual) if mutually agreed by EMSA and the contractor. EMSA will not reimburse any travel and subsistence expenses to the contractor, which may be incurred in relation to the attendance of the above meetings.

Each specific contract shall be managed as an independent project which should include the following deliverables:

Initial delivery:

- Project Management Plan
- Requirement Analysis Document

Interim deliverables:

- An interim report detailing:
 - The relationships between requirements, business rules, use cases, user interfaces, implemented software components and classes and findings;
 - Methodology used;
 - Preliminary assessment of screen technology;
 - Tested functionalities results;

- Verified system to system data transfers
- Constraints and limitations encountered
- Mapping of processes covered and
- Immediate provision of issue reports to be used by EMSA;
- Preliminary documentation and user guide;
- Draft minutes of any meeting with EMSA.

Final deliverables:

- A final report detailing:
 - The relationships between requirements, business rules, use cases, user interfaces, any implemented software components and classes and findings;
 - Test scripts, test cases and documentation;
 - Requirement mapping and coverage information;
 - Assessment of screen technology with proposals for improvement, a report assessing the quality of the implementation and proposals for improvement;
 - Functionalities tested;
 - Report per tested user and system to system interfaces;
 - Constraints and limitations encountered;
 - Complete mapping of all processes;
 - Recommendations on software and configuration changes required to improve the quality of the service provided by the system subject to testing.
- Final documentation and user guide for repetition of tests;
- Training of EMSA staff ensuring knowledge transfer.

Specific contracts may define additional specific deliverables as applicable.

These contracts might foresee the need for the contractor to attend meetings or testing sessions in EMSA premises. All costs related to the participation to these meetings or testing sessions shall be included in the price of the specific contract based on the fixed price offer as per point 12 - Price below.

After signing the IT Framework Contract, the contractors shall receive a preliminary annual plan of the services to be requested through Specific Contracts during the contractual period. The plan is indicative and not binding for EMSA and will be updated when necessary.

5 Timetable

The multiple IT Framework Contract shall have a maximum duration of 4 years.

The estimated date for signature of the contract is November 2016.

The estimated date for the implementation of the contract, i.e. for launching the first request for service is the 4th quarter 2016.

6 Estimated Value of the Contract

The maximum budget available for this contract is EUR 2,000,000 excluding VAT, covering its four years duration. Nevertheless, EMSA has no obligation to purchase up to the maximum amount of the contract value.

7 Terms of payment

Payments shall be issued in accordance with the provisions of the draft service framework contract available in the Procurement Section under the call to tender EMSA/OP/11/2016 on EMSA's website (www.emsa.europa.eu).

8 Terms of contract

It should be stressed that the multiple IT Framework Contract involves no direct commitment and, in particular, does not constitute orders per se. Instead, it lays down the legal, financial, technical and administrative provisions governing the relationship between EMSA and the contractors during the period of validity. Actual orders shall be placed after the multiple IT Framework Contract is signed and in force, through "Specific Contracts" concluded in performance of the IT Framework Contract.

A Multiple IT Framework Contract with re-opening of competition system shall be concluded, since the exact nature, quantities, subject and the precise timing of delivery or execution of the services cannot be specified in advance.

The purpose of this system is to put contractors of the multiple IT Framework Contract into competition at later stages. The multiple IT Framework Contract, as the result of the present public procurement procedure – if successful – shall be awarded without any declared or effective priority or ranking amongst contractors.

When preparing the offers tenderers must take it into consideration the conditions laid down in the draft IT Framework Contract and its annexes, submitting an offer means that tenderers accept them.

Procedure for the award of Specific Contracts during the implementation of the Multiple IT Framework Contract:

The present tender specifications for awarding multiple IT Framework Contract set out a general description of the services. According to the detailed needs, when EMSA would like to purchase specific services, a 'Request for offer with re-opening of competition' shall be sent (by email) to all contractors of the multiple IT Framework Contract specifying the following:

- Services needed;
- the deadline for submitting a specific offer;
- the terms of reference for the service to be provided (if applicable);
- the deliverables to be provided (if applicable);
- the duration of the service and the performance deadlines (if applicable);
- the number of meetings between EMSA and the contractor (if applicable);
- the exact form of reporting (if applicable);
- payment instalments (if applicable);

The services shall be provided on the basis of two different kinds of Specific Contracts:

- Time & Means (TM) contracts which correspond to the order of a number of days performed;
- Fixed Deliverable and Timing (FDT) contracts which correspond to the order of a defined project with a number of specified deliverables.

Within the deadline specified in the request for offers, the contractors shall provide EMSA with a written specific offer (by email).

In case the contractor does not provide any answer within the deadline specified, it is considered that the contractor is not in the position to make a specific offer.

EMSA shall examine the specific offers received, and the Specific Contract shall be awarded in accordance with the award criteria stated in Point 15 of these Tender Specifications.

9 Financial guarantees

Not applicable.

10 Sub-contracting

If the tenderer intends to either subcontract 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. It should be noted that the overall responsibility for the work remains with the tenderer.

The tenderer 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 criteria². 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.

11 Requirements as to the tender

Bids can be submitted in any of the official languages of the EU. However, as the main working language of the Agency is English, bids should preferably be submitted in English and should in particular include an English version of the documents requested under points 14.5 and 15 of the present tender specifications.

The tenderer must comply with the minimum requirements provided for in these tender specifications. This includes compliance with applicable obligations under environmental, social and labour law established by Union law, national law and collective agreements or by the international environmental, social and labour law provisions listed in Annex X to Directive 2014/24/EU of the European Parliament and of the Council.³

The tenderer shall complete the Tenderer's Checklist.

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

² To rely on the capacities of a subcontractor means that the subcontractor will perform the works or services for which these capacities are required.

³ Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement and repealing directive 2004/18/EC (OJ L 94, 28.3.2014, p. 65).

The tender must be presented as follows and must include:

- a) **A signed letter** indicating the name and position of the person authorised to sign the contract and the bank account to which payments are to be made.
- b) **The Financial Form** completed, signed and stamped. This document is available on the Procurement Section (Financial Form) of EMSA's website (www.emsa.europa.eu)
- c) **The legal Entity Form** completed, signed and stamped along with the requested accompanying documentation. This document is available on the Procurement Section (Legal Entity Form) of EMSA's website (www.emsa.europa.eu)

Tenderers are exempt from submitting the Legal Entity Form and Financial Form requested if such a form has already previously been completed and sent either to EMSA or any EU Institution. 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.

Part A: All the information and documents required by the contracting authority for the appraisal of tenders on the basis of the points **13, 14.2 and 14.6** of these specifications (part of the exclusion criteria).

Part B: 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 point **14.4** of these specifications.

Part C: 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 point **14.5** of these specifications.

Part D: All the information and documents required by the contracting authority for the appraisal of tenders on the basis of the **Award Criteria** set out under point **15** of these specifications.

Part E: Setting out **prices** in accordance with **point 12** of these specifications.

12 Price

- a) Prices for the multiple IT Framework Contract shall include all costs.
- b) Prices must be quoted in Euro.
- c) Prices must be fixed amounts, non-revisable and remain valid for the duration of the contract. This estimate should be based on Articles I.3 and II.16 of the draft contract. This estimate will comprise all foreseen travels and will constitute the maximum amount of travel and daily subsistence allowance expenses to be paid for all tasks.
- d) Under Article 3 and 4 of the Protocol on the privileges and immunities of the European Union, EMSA is exempt from all duties, taxes and other charges, including VAT. This applies to EMSA pursuant to the Regulation (EC) No 1406/2002. 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.

13 Joint Offer

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 bid.

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.

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.

14 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

14.1 Legal position – means of proof required

When submitting their bid, tenderers are requested to complete and enclose the **Legal Entity Form** and requested accompanying documentation, available in the Procurement Section (Legal Entity Form) of EMSA's website (www.emsa.europa.eu).

14.2 Grounds for exclusion - exclusion criteria

To be eligible to participate in this contract award procedure, a tenderer must not be in any of the following exclusion situations:

- a) it is bankrupt, subject to insolvency or winding up procedures, its assets are being administered by a liquidator or by a court, it is in an arrangement with creditors its business activities are suspended or it is in any analogous situation arising from a similar procedure provided for under national legislation or regulations;
- b) it is subject to a final judgement or a final administrative decision establishing that it is in breach of its obligations relating to the payment of taxes or social security contributions in accordance with the law of the country in which it is established, with those of the country in which the contracting authority is located or those of the country of the performance of the contract ;
- c) it is subject to a final judgement or a final administrative decision establishing that it is guilty of grave professional misconduct by having violated applicable laws or regulations or ethical standards of the profession to which the person belongs, or by having engaged in any wrongful conduct which has an impact on its professional credibility where such conduct denotes wrongful intent or gross negligence, including, in particular, any of the following:
 - i. fraudulently or negligently misrepresenting information required for the verification of the absence of grounds for exclusion or the fulfilment of selection criteria or in the performance of a contract;
 - ii. entering into agreement with other persons with the aim of distorting competition;
 - iii. violating intellectual property rights;
 - iv. attempting to influence the decision-making process of the contracting authority during the award procedure;
 - v. attempting to obtain confidential information that may confer upon it undue advantages in the award procedure ;
- d) it is subject to a final judgement establishing that the person is guilty of any of the following:
 - i. fraud
 - ii. corruption
 - iii. participation in a criminal organisation
 - iv. money laundering or terrorist financing

- v. terrorist-related offences or offences linked to terrorist activities
- vi. child labour or other forms of trafficking in human beings as defined in Article 2 of Directive 2011/36/EU of the European Parliament and of the Council
- e) the person has shown significant deficiencies in complying with the main obligations in the performance of a contract financed by the Union's budget, which has led to its early termination or to the application of liquidated damages or other contractual penalties, or which has been discovered following checks, audits or investigations by an Authorising Officer, OLAF or the Court of Auditors;
- f) it is subject to a final judgement or a final administrative decision establishing that the person has committed an irregularity within the meaning of Article 1(2) of Council Regulation (EC, Euratom) No 2988/95
- g) for the situations of grave professional misconduct, fraud, corruption, other criminal offences, significant deficiencies in the performance of the contract or irregularity, the applicant is subject to:
 - i. facts established in the context of audits or investigations carried out by the Court of Auditors, OLAF or internal audit, or any other check, audit or control performed under the responsibility of an authorising officer of an EU institution, of a European office or of an EU agency or body;
 - ii. non-final administrative decisions which may include disciplinary measures taken by the competent supervisory body responsible for the verification of the application of standards of professional ethics;
 - iii. decisions of the ECB, the EIB, the European Investment Fund or international organisations;
 - iv. decisions of the Commission relating to the infringement of the Union's competition rules or of a national competent authority relating to the infringement of Union or national competition law; or
 - v. decisions of exclusion by an authorising officer of an EU institution, of a European office or of an EU agency or body.

14.3 Legal and regulatory capacity – Selection criteria

14.3.1 Requirements: The tenderer must have the legal and regulatory capacity to pursue the professional activity needed for performing the contract.

14.4 Economic and financial capacity – Selection criteria

14.4.1 Requirements:

The tenderer must be in a stable financial position and must have the economic and financial capacity to perform the contract

14.4.2 Evidence:

- a) Financial statements or their extracts for the last three years for which accounts have been closed.
- b) Statement of the overall turnover and, where appropriate, turnover relating to the relevant services for the last three financial years available.
- c) 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.
- d) 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 its 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 at any moment during the procedure any other document enabling it to verify the tenderer's economic and financial capacity.

14.5 Technical and professional capacity – Selection criteria

14.5.1 Requirements:

- a) The tenderer must have a very good level of technical and professional capability in the provision of the requested IT quality assurance services, namely know-how, efficiency, experience and reliability in the requested technical domain and the suitability to supply the services covered by the multiple IT Framework contract.
- b) The tenderer must have at least 3 years of experience in the management of similar contracts in the field of IT.
- c) The mandatory technical and professional capacity of the team members are:
 - Project Manager:
 - University Degree;
 - Proven hands-on experience in relevant Project/Technical Management;
 - Excellent English speaking and writing skills;
 - More than 10 years of working experience including at least 5 in the IT sector.
 - Quality Assurance Engineer
 - More than 5 years of working experience including at least 3 years in the IT sector;
 - 5 projects in relevant technologies (see in appendices the technologies used in EMSA applications);
 - 5 projects in the profile role;
 - Test Designer
 - More than 5 years of working experience including at least 3 years in the IT sector;
 - 5 projects in relevant technologies (see in appendices the technologies used in EMSA applications);
 - 5 projects in the profile role.
 - Tester
 - 2 years of relevant IT professional experience;
 - 2 projects in relevant technologies (see in appendices the technologies used in EMSA applications);
 - 2 projects in the profile role.
 - Developer:
 - 2 years of relevant IT professional experience;
 - 2 projects in relevant technologies (see in appendices the technologies used in EMSA applications);
 - 2 projects in the profile role.
 - Network/Security
 - More than 5 years of working experience including at least 3 years in the IT sector;
 - 5 projects in relevant technologies (see in appendices the technologies used in EMSA applications);
 - 5 projects in the profile role.

The proposed team needs to:

- Have experience in setting up/defining test cases in HermesJMS, JMeter and SOAP UI/Ready API;
- Be able to execute tests in HermesJMS, JMeter and SOAP/Ready API;
- Be able to define and execute performance tests.

EMSA accepts that the experience and knowledge is shared between the members of the proposed team

For each profile of the team, it will be considered as an advantage:

- Experience having worked on projects related to vessel traffic monitoring, geographical information systems and positioning system data this will be considered an advantage;
- Experience in the EMSA Maritime Applications or providing similar services;
- Experience in mission-critical international systems i.e. high performance requirements.

The tenderer shall propose a minimum of two consultants per profile requested;

14.5.2. Evidence:

- a) The suitability of the tenderer's organizational structure to supply the services covered by the Multiple IT Framework contract, based on the description of the measures employed to ensure the quality of the services to be provided. This description should include at least:
 - i. An overview of the company departments mentioning the currently allocated number of staff and levels;
 - ii. Description of the relationship of this company and those of the group if applicable;
 - iii. Description of the tools employed;
 - iv. Description of the Quality Assurance procedures including any standard, best practices that the company follows (e.g. ISO 9001, CMMI, ECSS, PMP, PRINCE, ITIL).

For this purpose, the tenderers are requested to fill the Table 1 of the Appendix A - Extended Evaluation Grid.

- b) The previous experience in the management of similar contracts in the field of IT, based on a description of the last four major contracts performed during the past three years similar to those described in the tender specifications, and in particular experience with public entities as clients. Each reference must at least include the following information:
 - i. Contract number or reference;
 - ii. Start and finish date;
 - iii. Client name;
 - iv. Contact person at client site and contact details;
 - v. Volume in Euros;
 - vi. Short description of the services covered by this contract;

For this purpose, the tenderers are requested to fill the Table 2 of the Appendix A - Extended Evaluation Grid with the contract information

- c) The Curriculum Vitae (CVs) of a minimum of two consultants per profile requested, including the educational background, degrees and diplomas, professional experience, research work, publications and linguistic skills. When describing the professional experience of each consultant, reference must be made to the sectors in which it has been gained and the areas dealt with. The document describing the Technical and Professional capacity of the proposed team should have less than 100 pages (including the CVs).

For this purpose, the tenderers are requested to fill the Table 3 of the Appendix A - Extended Evaluation Grid with the summary of the CVs' proposed.

14.6 Evidence to be provided by the tenderers

For this purpose the Declaration of Honour available on the Procurement Section of EMSA's website (www.emsa.europa.eu) shall be completed and signed.

Please note that **upon request** and within the time limit set by EMSA the tenderer shall provide information on the persons that are members of the administrative, management or supervisory body, as well as the following evidence concerning the tenderer or the natural or legal persons which assume unlimited liability for the debt of the tenderer:

For exclusion situations described in (a), (c), (d) or (f) of point 14.2 above, production of a recent extract from the judicial record is required or, failing that, an equivalent document recently issued by a judicial or administrative authority in the country of establishment of the tenderer showing that those requirements are satisfied.

For the exclusion situation described in (a) or (b) of point 14.2 above, production of recent certificates issued by the competent authorities of the State concerned is 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.

Where any document described above is not issued in the country concerned, it may be replaced by a sworn statement made before a judicial authority or notary or, failing that, a solemn statement made before an administrative authority or a qualified professional body in its country of establishment.

If the tenderer already submitted such evidence for the purpose of another procedure, its issuing date does not exceed one year and it is still valid, the person shall declare on its honour that the documentary evidence has already been provided and confirm that no changes have occurred in its situation.

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.

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 tenderer is required to submit a statement confirming that its situation has not changed.

15 Award criteria

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

15.1 Criteria for the award of the Multiple IT Framework contract

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

1. Quality criterion 1 ($W_1 = 30\%$) - **Quality of the proposed team (30%);**
2. Quality criterion 2 ($W_2 = 10\%$) - **Quality and suitability of the services to be provided under this IT Framework contract and described in section 2.3 - Description of type of services/activities to be performed.**

Within their bids, tenderers shall:

- Explain the approach, methodologies, techniques and tools used to deliver successfully the services requested in point 2.3 - Description of type of services/activities to be performed with high quality;

- Provide relevant and detailed information about the approach, methodologies and techniques to implement and maintain testing items, including how they shall minimize maintenance effort, how they plan to keep the items updated and the tools used for that purpose;
- EMSA implemented a subset of the Information Technology Infrastructure Library (ITIL) practices. For all the required services listed, the tenderers shall have to demonstrate experience and understanding of the impact of ITIL recommendations in the services to be provided;
- Demonstrate understanding of EMSA maritime applications, including the associated infrastructure, products and technologies and describing the capability of providing the requested services.
- Demonstrate understanding of the requirements applicable to the different deliverables and outline the contents.

The tenderers are requested to fill in the Table 4 of the Appendix A - Extended Evaluation Grid.

3. Quality criterion 3 ($W_3 = 30\%$) - **Quality of the testing services solutions based on the detailed proposal for the following three (3) fictitious evaluation scenarios (total of 30%, with 10% per scenario).**

For each scenario the tenderers shall provide within their bids information on how they would address such a project, addressing as a minimum the following points:

- Project Plan;
- Used methodologies and description of the proposed tasks;
- Description of the means, tools/frameworks planned to be used for testing, including specific hardware needed to execute the tests and software simulators if to be used;
- The cost of the testing tools license, if applicable;
- Project team, define the responsibility of each team member, skills used and tasks assignments;
- Provision of templates for the key deliverables (e.g. test report, final report, etc);
- Propose a test plan with the most relevant tests;
- If the proposed solution includes automated tests, it should be described the complexity of maintaining the automated tests compatible with the new software release;
- Estimated value for the scenario;
- Estimated effort by filling in the Tables 6, 7 and 8 of the Appendix A - Extended Evaluation Grid. (total and per profile);

The tenderer should envisage that it would have to plan and execute the necessary tests in the different environments, typically in test environment for functional tests and pre-production environment for performance tests.

The tenderer should envisage that the testing artefacts (e.g. test scripts, test data, etc) used to validate a specific release needs to be handed over to EMSA.

The tenderers are requested to fill the Table 5 of the Appendix A - Extended Evaluation Grid.

Scenario 1: IMDATE Test Scenario (10%)

The Tenderer shall analyse and propose a solution to test the correct functioning of surveillance type "In Area" of the Automated Behaviour Monitoring tool implemented in IMDATE' and described below.

Automated Behaviour Monitoring (ABM) – algorithm “In Area”

Background

The IMDaTE platform includes a tool which monitors the behaviour of ships in an automated way, and raises alerts when specific user-defined criteria are met. These alerts may be distributed by email and/or visualised via the IMDaTE Web User Interface (WUP).

This tool is Automated Behaviour Monitoring (ABM), and it analyses all of the ship position reports received by EMSA. ABM is based on the tracking systems available using the IMDaTE platform (i.e. T-AIS, S-AIS, LRIT and VMS), and is subject to individual users access rights.

ABM has different types of surveillance defined and are accessible for users that were granted by the EMSA administrator to have access to it.

ABM tool

1. Common features

This section describes the common parameters used when a new surveillance type has been created.

a. How to receive the alert

The user specifying a new surveillance type must define the way in which the alert is to be received, bearing in mind that the two available options are email messages (see Figure 2) or pop-up alerts (see Figure 3).

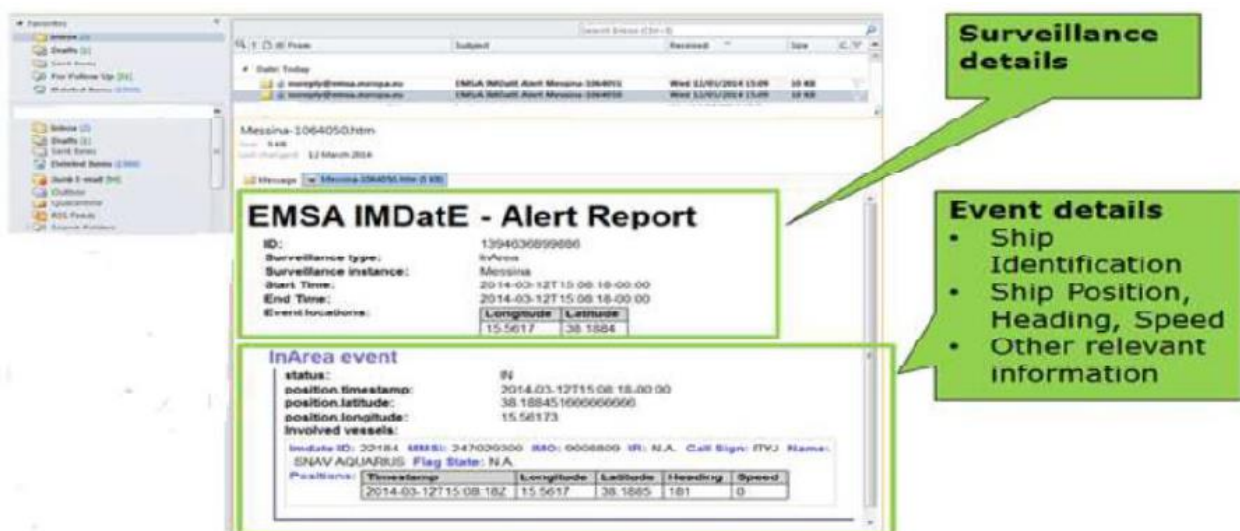


Figure 2: Email alert example

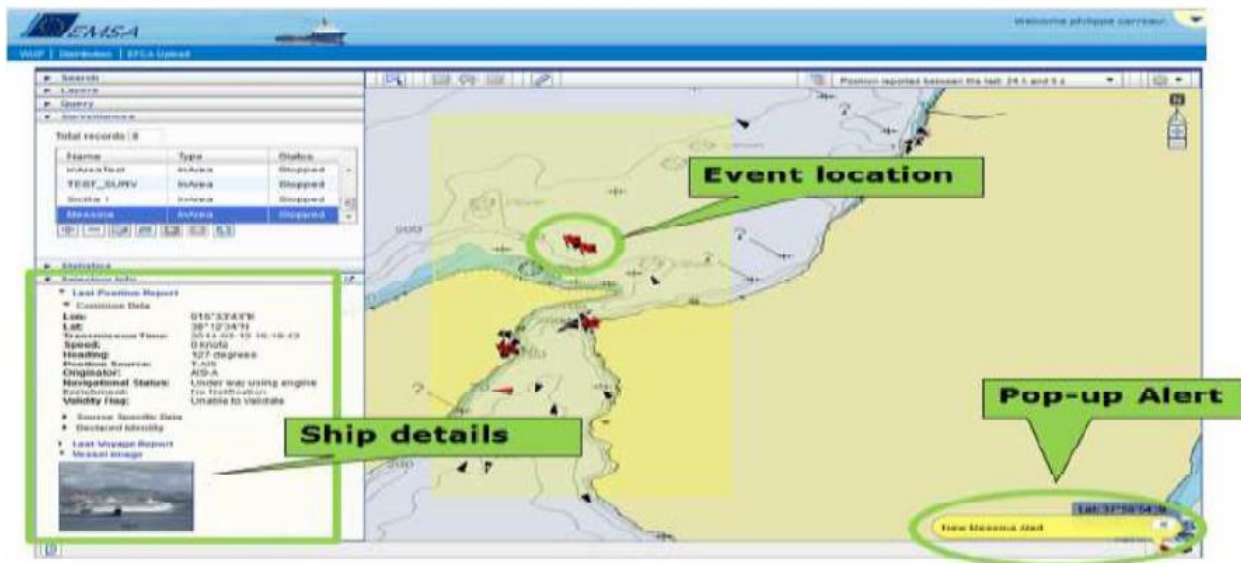


Figure 3: Visualising an Alert in the IMDatE graphical interface

b. Area of Interest (AOI)

The surveillance area must be limited geographically, as defined by the user. This area is called the Area of Interest (AOI), and its boundary may be a simple rectangle or a more complex polygon (see Figure 1).

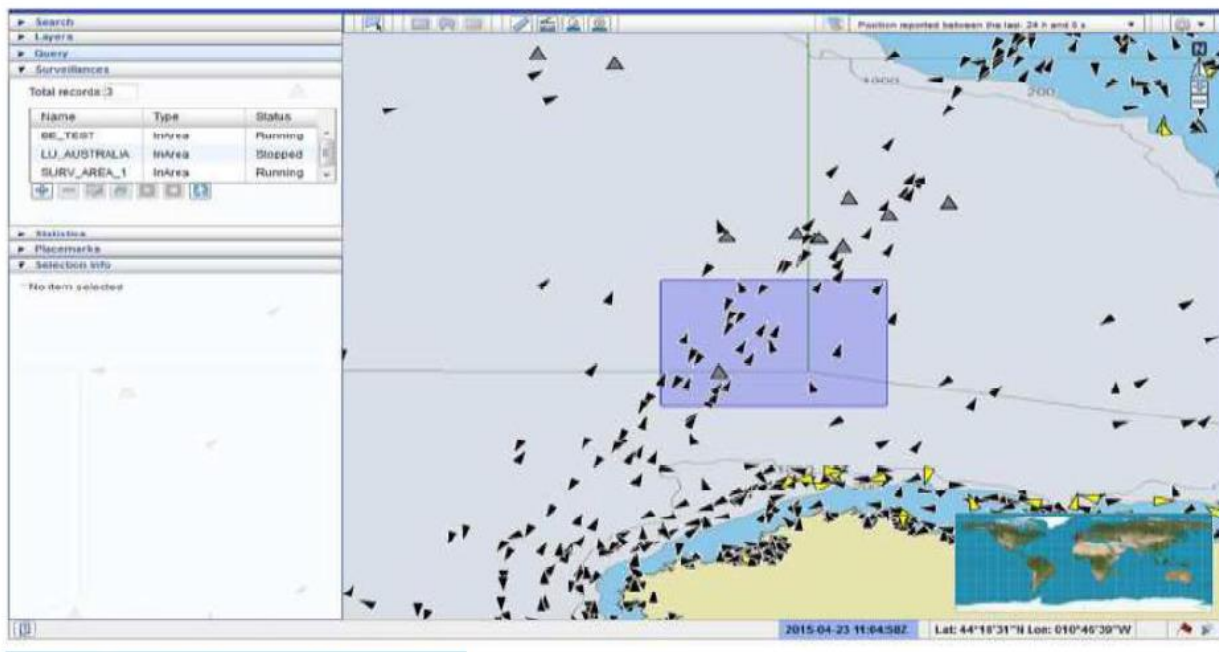


Figure 1: Example of an area of interest (AOI)

c. Vessels of Interest (VOIs)

The surveillance area can apply to an individual ship, or to a predefined group of ships, which for these purposes are called “Vessels of Interest” (VOI). The selection of VOI is not mandatory for the different surveillance types. The user can choose the VOI in the following ways:

- A specific list of ship(s) identified using the IMO or MMSI numbers.
- All ships filtered by:
 - Ship type, based on the AIS parameters (e.g. cargo ships, passenger ships, tankers, etc.).
 - Ship flag, also based on the AIS message information.

2. Surveillance type – In Area

This surveillance type lets users know when ships have entered or left a selected area. In order to set it up, the user needs to define, as a minimum:

- the area (i.e. an ESRI shape file or geographical coordinates), and;
- a ship (or list of ships) to which the surveillance type will apply.

Use case

A potential use case might be to monitor the ships entering a specific area (e.g. an MRS), and to assess whether they are reporting the required information. For example, the WETREP area is relatively extensive, and such a tool could provide the list of tankers entering the area. This information could be of interest to coastal station staff in order to assess the comprehensiveness/accuracy of the WETREP reporting in their area.

Specific types of ship entering the area of responsibility of an authority could also be monitored using this algorithm (e.g. passenger ships, tankers, etc.).

This type of approach is already being used for anti-piracy and customs purposes, and has the potential to be extended to other areas of interest for safety, security and environmental monitoring purposes.

Scenario 2: SSN Test Scenario (10%)

The Tenderer shall analyse and propose a solution to test the fictitious scenario using a black-box approach. The scenario test system to system interfaces, where the requester and the provider are external systems.

Request data using Request Response mechanism

Introduction

System users may request SSN details from PortPlus notifications regarding a ship or calls in a port.

Search parameters give the possibility to request PortPlus notification details at various stages of a ship call (expected ship call, most recent arrival, most recent departure, completed ship calls, active situation of a ship etc...).

System users may request additional detailed information regarding dangerous and polluting goods (Hazmat), waste and cargo residues, or security information, as is stored in the national SSN System of the relevant MS.

Request results may consist in a unique ship call or in a list of ship call. Detailed information can only be requested of a unique ship calls (not provided for list of ship calls).

This service is implemented by exchanging XML messages between the external system of the data requester, the SafeSeaNet System and, in case of request for Hazmat, Waste and Security detailed information, the external system of the data provider.

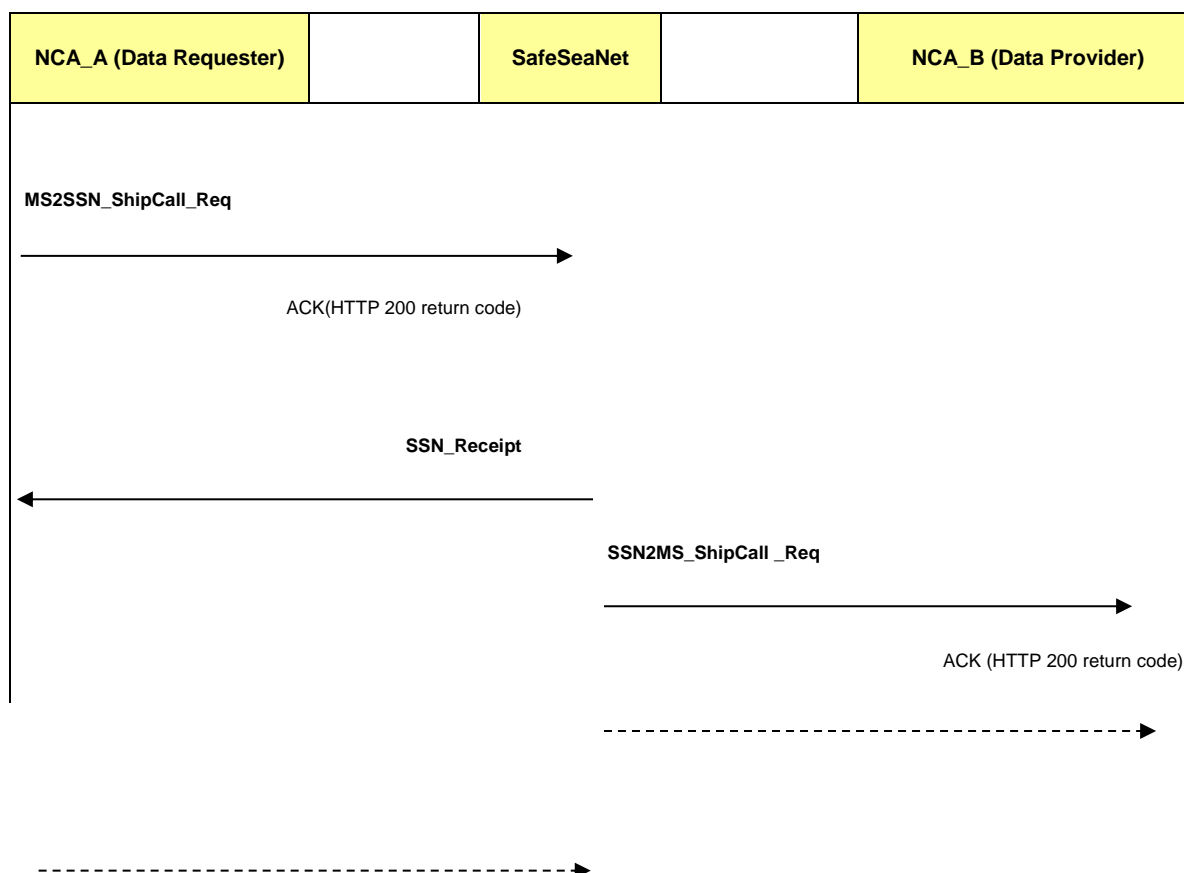
This section describes the different XML messages provided for this transaction.

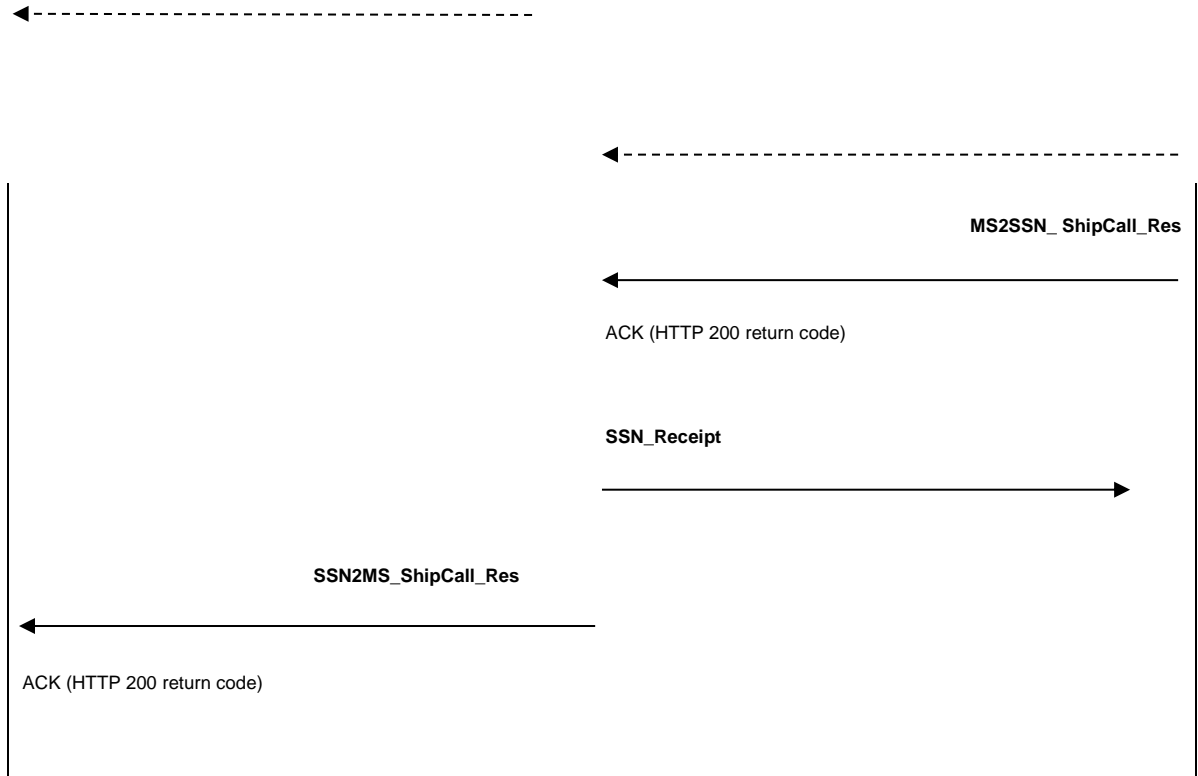
General flow of the XML messages

The following figures outline the expected asynchronous flows of XML messages related to this SafeSeaNet XML transaction. SafeSeaNet has most of ships calls' related details in its database and as such can respond directly to a request (stored when e.g. receiving the MS2SSN_PortPlus_Not.xml notification messages from the data provider during the various phases of a ship voyage), there is no need to ask the data provider for sending details, except in the case of the request of the Hazmat, Waste or Security details as depicted in the figure.

Data Flow

The flow of XML messages when the 'NCA A' (Data requester) asks for Hazmat, Waste or Security details. SafeSeaNet system needs to ask first the data provider for sending the details and then forwards the details to the data requester.





XML messages

MS2SSN_ShipCall_Req

```

<?xml version="1.0" encoding="UTF-8"?>
<urn:MS2SSN_ShipCall_Req xmlns:urn="urn:eu.emsa.ssn">
  <urn:Header From="NCACYLMS1" MSRefId="SSN_EIS_SI_1461746263847" SentAt="2016-04-27T08:37:43Z"
  TimeoutValue="60" To="SafeSeaNet" Version="3.0"/>
  <urn:Body>
    <urn:RequiredResponseCriteria>
      <urn:ShipCallResp GetDetails="ExpectedCallOfSelectedShip" GetHazmat="HazmatDetails"/>
    <urn:SearchCriteria>
      <urn:TimePeriodCriteria EndDateTime="2016-05-02T08:36:30Z" StartDateTime="2016-04-26T08:36:30Z"/>
      <urn:ShipIdentificationCriteria IMONumber="9382217"/>
    </urn:SearchCriteria>
  </urn:RequiredResponseCriteria>
</urn:Body>
</urn:MS2SSN_ShipCall_Req>
  
```

SSN_Receipt

```

<?xml version="1.0" encoding="UTF-8"?>
<SSN_Receipt xmlns="urn:eu.emsa.ssn">
  <Header Version="3.0" SentAt="2016-04-27T08:37:44Z" From="SafeSeaNet" To="NCACYLMS1"
  MSRefId="SSN_EIS_SI_1461746263847" SSNRefId="316756184" StatusCode="OK" StatusMessage="The message
  processed successfully."/>
  
```

</SSN_Receipt>

SSN2MS_ShipCall_Req

```
<?xml version="1.0" encoding="UTF-8"?>
<SSN2MS_ShipCall_Req xmlns="urn:eu.emsa.ssn">
  <Header Version="3.0" SentAt="2016-04-27T08:37:45Z" From="SafeSeaNet" To="KW_POR_GRPPIR"
  SSNRefId="316756186" TimeoutValue="60"/>
  <Body>
    <Source Requestor="NCACYLMS1"/>
    <RequiredResponseCriteria>
      <ShipCallResp GetHazmat="HazmatDetails"/>
      <SearchCriteria>
        <ShipIdentificationCriteria IMONumber="9382217"/>
        <AdditionalSearchCriteria ShipCallId="SSN_EIS_SI_1461746114275"
        GetHazmatType="HazmatTowardPortOfCall"/>
      </SearchCriteria>
    </RequiredResponseCriteria>
  </Body>
</SSN2MS_ShipCall_Req>
```

MS2SSN_ShipCall_Res

```

<?xml version="1.0" encoding="UTF-8"?>
<ssn:MS2SSN_ShipCall_Res xmlns:ssn="urn:eu.emsa.ssn">
  <ssn:Header From="SafeSeaNet" MSRefId="MR_oHaOh7SpnKJLCcrl62DPuEAF" SSNRefId="316756186"
    SentAt="2016-04-27T08:37:45Z" StatusCode="OK" StatusMessage="The message processed successfully."
    To="KW_POR_GRPIR" Version="3.0"/>
  <ssn:Body>
    <ssn:ProvidedResponseCriteria>
      <ssn:ShipCallResp GetHazmat="HazmatDetails"/>
      <ssn:SearchCriteria>
        <ssn:ShipIdentificationCriteria IMONumber="9382217" MMSINumber=""/>
        <ssn:AdditionalSearchCriteria GetHazmatType="HazmatTowardPortOfCall"
          ShipCallId="SSN_EIS_SI_1461746114275"/>
      </ssn:SearchCriteria>
    </ssn:ProvidedResponseCriteria>
    <ssn:QueryResults>
      <ssn:VesselIdentification IMONumber="9382217" MMSINumber=""/>
      <ssn:VoyageInformation BriefCargoDescription="a" ETAToNextPort="2014-10-01T09:30:47Z"
        ETAToPortOfCall="2014-08-30T09:30:47Z" ETDFromLastPort="2014-08-17T09:30:47Z" ETDFromPortOfCall="2014-
        10-01T07:30:47Z" LastPort="PTLIS" NextPort="NLAMS" PortFacility="a" PortOfCall="DEBON"
        PositionInPortOfCall="a" ShipCallId="SSN_EIS_SI_1461746114275">
        <ssn:PurposeOfCall CallPurposeCode="10"/>
      </ssn:VoyageInformation>
      <ssn:HazmatInformation>
        <ssn:HazmatSummary INFShipClass="INF1">
          <ssn:DG DGClassification="IMDG"/>
        </ssn:HazmatSummary>
        <ssn:HazmatDetails>
          <ssn:Source LastUpdateReceivedAt="2001-12-17T09:30:47Z" ProviderOfLastUpdate="aaaaaaa"/>
          <ssn:CargoInformation>
            <ssn:Consignment PortOfDischarge="PTLIS" PortOfLoading="PTSET"
              TransportDocumentID="TransportDocumentID1">
              <ssn:DPGItem AdditionalInformation="IMDGTest" DGClassification="IMDG" FlashPoint="23.35"
                IMO HazardClass="1.1" MarpolCode="Y" PackageType="BG" PackingGroup="II" TextualReference="tr2"
                TotalNrOfPackages="33" UNNumber="1234"/>
            </ssn:Consignment>
          </ssn:CargoInformation>
        </ssn:HazmatDetails>
      </ssn:HazmatInformation>
    </ssn:QueryResults>
  </ssn:Body>
</ssn:MS2SSN_ShipCall_Res>

```

SSN_Receipt

```

<?xml version="1.0" encoding="UTF-8"?>
<SSN_Receipt xmlns="urn:eu.emsa.ssn">
  <Header Version="3.0" SentAt="2016-04-27T08:37:51Z" From="SafeSeaNet" To="SafeSeaNet"
    MSRefId="MR_oHaOh7SpnKJLCcrl62DPuEAF" SSNRefId="316756187" StatusCode="OK" StatusMessage="The
    message processed successfully."/>
</SSN_Receipt>

```

SSN2MS_ShipCall_Res

```

<?xml version="1.0" encoding="UTF-8"?>
<SSN2MS_ShipCall_Res xmlns="urn:eu.emsa.ssn">
  <Header Version="3.0" SentAt="2016-04-27T08:37:51Z" From="SafeSeaNet" To="NCACYLMS1"
MSRefId="SSN_EIS_SI_1461746263847" SSNRefId="SSN_EIS_SI_1461746263847" StatusCode="OK"/>
  <Body>
    <ProvidedResponseCriteria>
      <ShipCallResp GetDetails="ExpectedCallOfSelectedShip" GetHazmat="HazmatDetails"/>
      <SearchCriteria>
        <TimePeriodCriteria StartDateTime="2016-04-26T08:36:30Z" EndDateTime="2016-05-02T08:36:30Z"/>
        <ShipIdentificationCriteria IMONumber="9382217" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:type="VesselIdentificationType"/>
      </SearchCriteria>
    </ProvidedResponseCriteria>
    <QueryResults>
      <PortPlusNotificationList>
        <Source ProviderOfLastUpdate="KW_POR_GRPIR" LastUpdateReceivedAt="2016-04-27T08:36:31Z"/>
        <VesselIdentification IMONumber="9382217" MMSINumber="259763000" CallSign="LAMH7"
ShipName="BOURBON OCEANTEAM 101"/>
        <VoyageInformation ShipCallId="SSN_EIS_SI_1461746114275" LastPort="ITROM" PortOfCall="GRPIR"
PositionInPortOfCall="marine" ETDFromLastPort="2016-04-22T08:36:30Z" ETAToPortOfCall="2016-04-27T06:36:30Z"
NextPort="GRPER" ETAToNextPort="2016-05-01T08:36:30Z" ETDFromPortOfCall="2016-04-27T08:36:30Z"/>
        <PreArrival3DaysNotificationDetails CargoVolumeNature="fuel" PlannedOperations="unloading"
PlannedWorks="Maintenance" ConditionCargoBallastTanks="inerted" PossibleAnchorage="Y"
ShipConfiguration="SHT"/>
        <PreArrival24HoursNotificationDetails POBVoyageTowardsPortOfCall="123"/>
        <HazmatConfirmation HazmatOnBoardYorN="Y"/>
      </PortPlusNotificationList>
      <PortPlusNotificationDetails>
        <HazmatInformation>
          <HazmatSummary INFShipClass="INF1">
            <DG DGClassification="IMDG"/>
          </HazmatSummary>
          <HazmatDetails>
            <Source ProviderOfLastUpdate="aaaaaaa" LastUpdateReceivedAt="2001-12-17T09:30:47Z"
ShipCallId="SSN_EIS_SI_1461746114275"/>
          <CargoInformation>
            <Consignment TransportDocumentID="TransportDocumentID1" PortOfLoading="PTSET"
PortOfDischarge="PTLIS">
              <DPGItem DGClassification="IMDG" TextualReference="tr2" IMO HazardClass="1.1" UNNumber="1234"
PackingGroup="II" FlashPoint="23.35000000000000142108547152020037174224853515625" MarpolCode="Y"
PackageType="BG" TotalNrOfPackages="33" AdditionalInformation="IMDGTest"/>
            </Consignment>
          </CargoInformation>
          <HazmatDetails>
            <HazmatInformation>
              <PreArrival3DaysNotificationDetails CargoVolumeNature="fuel" PlannedOperations="unloading"
PlannedWorks="Maintenance" ConditionCargoBallastTanks="inerted" PossibleAnchorage="Y"
ShipConfiguration="SHT"/>
            </PreArrival3DaysNotificationDetails>
          </HazmatInformation>
        </HazmatDetails>
      </PortPlusNotificationDetails>
    </QueryResults>
  </Body>
</SSN2MS_ShipCall_Res>

```

Scenario 3: STAR down sample: Performing load and stress tests and assessing resilience (10%)

The Tenderer shall analyse and propose a solution to test the performance and fault tolerance of STAR down sample component prior to enter into production. The following tasks are foreseen:

- Load tests subjecting the system to a representative load varying from a minimum (zero) up to a maximum level that the system can sustain without running out of resources;
- Stress tests subjecting the system to an unreasonable load while denying it the resources it needs to process that load;
- Resilience tests assessing the degree of resilience of the system, i.e., which kind of mechanisms the system implements in order to achieve that resilience degree under certain defined scenarios.

STAR down sample component

Introduction:

The STAR down sampling component receives AIS data in the CDF format on a JMS queue.

Down sampling is based on the rules described below, putting not down sampled messages on a remote JMS queue.

Down sample rules:

1. The ID to be used for a message is based on the message source as follows:

Source	ShipParticular used to determine the ID
T-AIS	MMSI
Sat-AIS	MMSI
S-AIS	MMSI
LRIT	IMO
VMS	IR

2. Messages having position timestamps posterior to the current system time (i.e. "in the future") plus one hour shall be discarded.
3. The down sampling component caches positions based on ID, Source and Provider.

4. When a position A is processed from the queue with a certain ID, Source and Provider and the cache has no position with the same ID, Source and Provider
 - a. position A is put on the remote JMS queue, position A is added to the cache
5. When a position A is processed from the queue with a certain ID, Source and Provider and the cache has a position B with the same ID, Source and Provider
 - a. the timestamp of A + down sampling period > timestamp of B; the position A is put on the remote JMS queue, position A is added to the cache and position B is removed.
 - b. the timestamp of A + down sampling period <= timestamp of B; the position A is down sampled and not put on the remote JMS queue.
6. The down sampling period is configurable. Currently it is set to 1 minute.

Down sample Performance:

The STAR down sample component shall process a nominal input rate of 600 messages per second, irrespective of the amount of messages it has to pass downstream after down sampling.

CDF messages

aisSpecific.xsd

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>

<xs:schema xmlns="http://schemas.emsa.europa.eu/cdf/position" xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns:cdf="http://schemas.emsa.europa.eu/cdf" xmlns:ais="http://schemas.emsa.europa.eu/cdf/ais"
  targetNamespace="http://schemas.emsa.europa.eu/cdf/ais" elementFormDefault="qualified" version="1.0">

  <xs:import namespace="http://schemas.emsa.europa.eu/cdf" schemaLocation="http://schemas.emsa.europa.eu/0101010101/emsBaseTypes.xsd"/>

  <xs:element name="AisSpecific" type="ais:AisSpecificType">

    <xs:annotation>

      <xs:documentation>Root for the AIS Specific ship position information</xs:documentation>

    </xs:annotation>

  </xs:element>

  <xs:complexType name="AisSpecificType">

    <xs:sequence>

      <xs:element name="VoyageAndStatic" type="ais:VoyageAndStaticType" minOccurs="0"/>

      <xs:element name="RawMessage" type="xs:string" minOccurs="0"/>

    </xs:sequence>

    <xs:attribute name="msgId" type="ais:PositionMsgIdType" use="required"/>

    <xs:attribute name="positionAccuracy" type="ais:PositionAccuracy" use="optional"/>

    <xs:attribute name="raimFlag" type="ais:RAIMFlagType" use="optional"/>

  </xs:complexType>

</xs:schema>
```

```

</xs:complexType>

<xs:complexType name="VoyageAndStaticType">

    <xs:sequence>

        <xs:element name="ShipAndCargoType" type="ais:ShipAndCargoTypeType" minOccurs="0"/>

        <xs:element name="DimRefPos" type="ais:DimRefPosType" minOccurs="0"/>

        <xs:element name="ElectronicPositionFixingDevice" type="ais:ElectronicPositionFixingDeviceTypeType"
minOccurs="0"/>

        <xs:element name="EstimatedTimeOfArrival" type="xs:date" minOccurs="0"/>

        <xs:element name="Draught" type="xs:decimal" minOccurs="0"/>

        <xs:element name="Destination" type="cdf:LocationType" minOccurs="0"/>

        <xs:element name="DataTerminalReady" minOccurs="0"/>

    </xs:sequence>

</xs:complexType>

<xs:simpleType name="PositionMsgIdType">

    <xs:annotation>

        <xs:documentation>Root for the AIS Specific ship position information</xs:documentation>

    </xs:annotation>

    <xs:restriction base="xs:int">

        <xs:enumeration value="1"/>

        <xs:enumeration value="2"/>

        <xs:enumeration value="3"/>

        <xs:enumeration value="5"/>

        <xs:enumeration value="18"/>

        <xs:enumeration value="19"/>

        <xs:enumeration value="27"/>

    </xs:restriction>

</xs:simpleType>

<xs:simpleType name="PositionAccuracy">

    <xs:annotation>

        <xs:documentation>1 = High (<10m. Differential mode of e.g. DGNSS receiver);

```

0 = Low (> 10m; Autonomous mode of e.g. GNSS receiver or other electronic

position fixing device); default = 0</xs:documentation>

</xs:annotation>

<xs:restriction base="xs:int">

<xs:enumeration value="0"/>

<xs:enumeration value="1"/>

</xs:restriction>

</xs:simpleType>

<xs:simpleType name="RAIMFlagType">

<xs:annotation>

<xs:documentation>(Receiver Autonomous Integrity Monitoring) flag of electronic position fixing

device; 0= RAIM not in use = default; 1 = RAIM in use.</xs:documentation>

</xs:annotation>

<xs:restriction base="xs:int">

<xs:enumeration value="0"/>

<xs:enumeration value="1"/>

</xs:restriction>

</xs:simpleType>

<xs:simpleType name="AISVersionIndicatorType">

<xs:annotation>

<xs:documentation>0 = Station compliant with AIS Edition 0 (Rec. ITU-R M.1371-1);

1 - 3 = Station compliant with future AIS Editions 1, 2, and 3.</xs:documentation>

</xs:annotation>

<xs:restriction base="xs:int">

<xs:minInclusive value="0"/>

<xs:maxInclusive value="3"/>

</xs:restriction>

</xs:simpleType>

<xs:simpleType name="RepeatIndicatorType">

<xs:annotation>

<xs:documentation>Used by the repeater to indicate how many times a message has been repeated. 0 - 3; default = 0; 3 = do not repeat again.</xs:documentation>

</xs:annotation>

<xs:restriction base="xs:int">

<xs:minInclusive value="0"/>

<xs:maxInclusive value="3"/>

</xs:restriction>

</xs:simpleType>

<xs:simpleType name="ShipAndCargoTypeType">

<xs:annotation>

<xs:documentation>0 = not available or no ship = default;

1 - 99 = as defined in Table 11;

100 - 199 = reserved, for regional use;

200 - 255 = reserved for future use.</xs:documentation>

</xs:annotation>

<xs:restriction base="xs:int">

<xs:minInclusive value="0"/>

<xs:maxInclusive value="255"/>

</xs:restriction>

</xs:simpleType>

<xs:simpleType name="ElectronicPositionFixingDeviceTypeType">

<xs:annotation>

<xs:documentation>0 = Undefined (default);

1 = GPS,

2 = GLONASS,

3 = Combined GPS/GLONASS,

4 = Loran-C,

5 = Chayka,

6 = Integrated Navigation System,

7 = surveyed,

8 - 15 = not used</xs:documentation>

</xs:annotation>

<xs:restriction base="xs:int">

<xs:minInclusive value="0"/>

<xs:maxInclusive value="7"/>

</xs:restriction>

</xs:simpleType>

<xs:simpleType name="DraughtType">

<xs:annotation>

<xs:documentation>in 1/10 m; 255 = draught 25.5 m or greater,

0 = not available = default; in accordance with IMO Resolution A.851</xs:documentation>

</xs:annotation>

<xs:restriction base="xs:int">

<xs:minInclusive value="0"/>

<xs:maxInclusive value="255"/>

</xs:restriction>

</xs:simpleType>

<xs:simpleType name="DataTerminalReadyType">

<xs:annotation>

<xs:documentation>Data terminal ready (0 = available 1 = not available = default)</xs:documentation>

</xs:annotation>

<xs:restriction base="xs:int">

<xs:minInclusive value="0"/>

<xs:maxInclusive value="1"/>

</xs:restriction>

</xs:simpleType>

<xs:complexType name="DimRefPosType">

<xs:annotation>

<xs:documentation>Reference point for reported position;

Also indicates the dimension of ship in metres</xs:documentation>

```

</xs:annotation>

<xs:sequence>

    <xs:element name="A" type="xs:decimal" minOccurs="0"/>

    <xs:element name="B" type="xs:decimal" minOccurs="0"/>

    <xs:element name="C" type="xs:decimal" minOccurs="0"/>

    <xs:element name="D" type="xs:decimal" minOccurs="0"/>

</xs:sequence>

</xs:complexType>

</xs:schema>

```

and the price criteria and associated weighting:

4. **Price of the bid** ($W_{Team} = 30\%$): based on the prices per profile presented in Appendix B - Price grid for evaluation of the Tenders.

For evaluation purposes, please fill in the Table 1 and 2 of the Appendix B - Price grid for evaluating the offers with prices per profile and person day and discounts, if applicable.

The price of the bid is the price of the team, which is calculated based on the price of a standard testing team for one day, one month, one quarter, one semester and one year.

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

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

Only bids that have reached a minimum of 70 % for Q_1 , Q_2 and Q_3 , 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.

15.2 Criteria for the award of the Specific Contract

The following criteria and procedure shall be used for awarding the Specific Contracts under this Framework contract:

Admissibility

Only admissible specific offers will be evaluated. The criteria of admissibility of the offers are the following:

- the deadline for submission of offers has been respected;

Award criteria

Taking into account the use of the multiple IT Framework Contract with re-opening of competition, the following award criteria are set to determine the best offer to which the Specific Contract will be awarded:

1. **Quality criterion 1 (Q1) ($W_1 = 30\%$) - Quality and organization of the proposed team** for the specific tasks requested.
2. **Quality criterion 2 (Q2) ($W_2 = 10\%$) – Quality and suitability of the specific methodology** for the tasks being requested.
3. **Quality criterion 3 (Q3) ($W_3 = 30\%$) – Quality of the solution proposed** for the tasks being requested.
4. **Price of the solution ($W_{\text{Price}} = 30\%$)** with detailed breakdown of profile and price per person in line with FWC prices.

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

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

Only bids that have reached a minimum of 70% for Q_1 , a minimum of 70 % for Q_2 , and a minimum of 70% of Q_3 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.

16 Rejection from the procedure

Contracts will not be awarded to tenderers who, during the procurement procedure, are in one of the following situations:

- a) are in an exclusion situation;
- b) have misrepresented the information required as a condition for participating in the procedure or have failed to supply that information;
- c) were previously involved in the preparation of procurement documents where this entails a distortion of competition that cannot be remedied otherwise.

17 Intellectual Property Right (IPR)

Please consult the contract for IPR related clauses.

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.

\

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.

18 Special negotiated procedure under Article 134(1)(e) RAP

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)(e) of the Rules of Application to the Financial Regulation.

List of Appendices

Appendix A: Extended Evaluation Grid
Appendix B: Price grid for evaluation of the Tenders
Appendix C: Initial quality gate for java projects
Appendix D: Service Procedures for Maintenance
Appendix E : Overview of Applications