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Title: Procurement report and documentation
Date: 2020-06-11
DOCUMENT STATUS

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<th>Name</th>
<th>Organisation</th>
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<td>Håkan Heurlin</td>
<td>SMA</td>
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Review

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<th>Organisation</th>
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Approval

<table>
<thead>
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<tbody>
<tr>
<td>Ulf Siwe</td>
<td>SMA</td>
<td>US</td>
<td>20-06-22</td>
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INTERREG PROJECT NO: R103

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1 Order to procure

The higher purpose of the Balt Safe project is to increase the safety of the Baltic Sea with focus on tankers.

Sharing information, like sharing voyage plans digitally, Ship to shore (VTS) is one enabler to reach higher safety and to use Sea Traffic Management STM, the concept and infrastructure to share secure digital maritime information is the best solution. Therefor an extended testbed, with vessels using STM compatible navigational equipment was needed in the project.

This procurement will subsidy vessel to upgrade their navigational equipment to be STM compliant and by that, we will have an increased STM compliant testbed used in the project.

The aim of this procurement was to ensure the STM capability in the tank fleet in Baltic Sea Region with traffic in the Gulf of Finland and Bay of Riga

The order to procure was given to the Consulting Company in public and strategic procurement Ecenea, whom in place of SMA conducted the procurement.

The procurement was set to be an open procurement.

Annex 1- Order to procure

2 Information to prospects.

Manufacturers of electronic navigation equipment were identified.

<table>
<thead>
<tr>
<th>Name</th>
<th>Procurement heads up</th>
<th>Answer</th>
</tr>
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<tbody>
<tr>
<td>Adveto</td>
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<td>2019-07-03 Positive answer</td>
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<td>Transas (Wärtsilä Voyage)</td>
<td>2019-07-03</td>
<td>2019-07-03 Positive answer</td>
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<td>Sperry</td>
<td>2019-07-03</td>
<td>2019-07-03 Positive answer</td>
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<td>Ratheyon</td>
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<tr>
<td>Consilium</td>
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<td></td>
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<tr>
<td>Kelvin Hughes</td>
<td>2019-07-03</td>
<td></td>
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<tr>
<td>JRC</td>
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<td>Tokyo Keiki</td>
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<td></td>
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<tr>
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<td></td>
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<tr>
<td>Danelec</td>
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<tr>
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<td>e-Marine</td>
<td>2019-07-03</td>
<td></td>
</tr>
<tr>
<td>GEM elettronica</td>
<td>2019-07-03</td>
<td></td>
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</tbody>
</table>
2.1 Heads up mail

An e-mail was sent to all known manufacturers. The content of the mail was as follows:

“Stay in the lead of development! Join STM Balt Safe!
STM is now beyond test phase and joining now makes you early adopters.
As ECDIS/navigation system manufacturer, you will have a golden opportunity to get a part of your development payed and staying in the lead of technology.

Procurement coming up!
We want to give you heads up that we are launching a procurement for 70 ship systems on the 1st of September.
To be qualified for this procurement you need to be:
1. A manufacturer of type approved ECDIS equipment or have a planning station that is connected with ECDIS.*
2. Ships equipped shall be either/or
   a. Tanker DW, minimum 3000 GT,
   b. Ferries 500 GT
3. The ships equipped shall be planned to trade the Baltic Sea, preferably Gulf of Finland.

*Route in ECDIS shall be possible to be exchanged with planning station without the need for USB-drives.

The development will include systems complying with the updated STM specifications.
It will also include development of automated reporting.
The development period will be in the very end of this year and the start of 2020 with the start of FATs on the 1st of March 2020.

We really hope that you will embark on this next step of STM development with us!
(This information may also be found here: https://www.stmvalidation.eu/projects/stm-balt-safe/procurements-for-stm-balt-safe/)

BRGDS/ Cajsa Jersler Fransson

Swedish Maritime Administration
Tel: +46 10 478 54 63
E-mail: cajsa.jerslerfransson@sjofartsverket.se”
2.2 Information meeting 2019-09-15

An open meeting was held to inform whomever it concerned about the project and the procurement. The meeting was recorded and shared among interested suppliers.

3 Tender

The tender was sent out the 13th of September 2019 with a closing date the 18th of October 2019. The tender is presented in Annex 2 with the attached requirements presented in BS_Deliverable 3.1 and also attached in Annex 3. Formats that are requested in the requirements are route message, text message and voyage information specification here presented as Annex 4-6.

4 Change in tender

No offers were presented after the deadline and the project were forced to move into the next stage. The project lead team chose to go into negotiated procurement, as we did so, we informed all manufacturers of the situation and two of them chose to join and have discussions with us.

We were informed that our timeline was to short and that the problem was the development time. We then took a decision that they were allowed to do this in two steps. In the first phase install STM capability in the electronic navigation equipment on board and then, as the development of STM Balt Safe capability was developed, upgrade the systems. This is to be done before 31st of December 2020. The projects overall aim is to ensure a higher level of safety for tankers in the Baltic Sea Region and upon assessment of the alternatives we found that the expanding of the STM compatible fleet is prior to getting the new updated functions.

The requirement list was updated with dates of implementation. This can be found in Annex 7.

5 Offers

In the negotiated tender, two offers were submitted. One from Wärtsilä and one from Adveto, the offer from Adveto can be found in Annex 8.0 with attachments in Annex 8.1-8.5 and the offer from Wärtsilä can be found in Annex 9.0 with attachments in Annex 9.1-9.9.
6 Selection of supplier

6.1 Evaluation

Quote from the tender
“Tenders that are qualified are evaluated according to the principle the most economically advantageous tender, as a basis for evaluation quality and price will be used.
The tender with the best relation between price and quality, is the tender that obtains the lowest comparative price. Comparative price is a comparison number or fictitious price, calculated by a weighing up of price and obtained 'should'-requirement points.
Comparative price = tendered price for the application system x markup.
Since only one tenderer has proceeded to this stage, this tender has not been evaluated in detail, but all requirements has been met and the proposed design and references was judged to be more than sufficient.”

6.2 Decision

Based on the information given above, it is the intention of the Swedish Maritime Administration to comply with the award decision accept bids from:

Wärtsilä Voyage Limited

The full procurement report can be found in Annex 10

6.3 The contract award decision

The Contract award decision can be found in Annex 11

7 Agreement on offer

The contract was signed by the supplier the 11th of March 2020.
For contract see Annex 12.

8 Function tests

As the developed technology was delayed and postponed to the end of 2020 the functional tests will be conducted and submitted in next deliverable. Deliverable 3.3 Testbed report.
Steffen Fälldt, Wärtsilä Vogage and Cajsa Jersler Fransson, Swedish Maritime Administration meeting up to talk about the agreement.
Using STM to increase BALTic Sea SAFEty

Making the Baltic Sea even safer by improving the situational awareness on ships and shore, building tools that automate work and provide decision support to prevent risk situations and accidents.

Making STM happen!

SAFETY - ENVIRONMENT - EFFICIENCY

Swedish Maritime Administration ◦ VTS Finland ◦ Estonian Maritime Administration ◦ Norwegian Coastal Administration ◦ RISE Research Institutes of Sweden ◦ DNV GL

www.stmbaltsafe.eu
www.stmvalidation.eu/projects/stmbaltsafe
Avsnitt I: Upphandlande myndighet

I.1) Namn och adresser

Officiellt namn
Sjöfartsverket

Organisationsnummer
202100-0654

Postadress
Östra Promenaden 7

Ort
Norrköping

Nuts-kod
SE, SVERIGE

Postnummer
601 78

Land
Sverige

Kontaktperson
Elin Willén

E-post
elin.willen@sjofartsverket.se

Internetadress(er)

Allmän adress
http://www.sjofartsverket.se

I.3) Kommunikation

Upphandlingsdokumenten finns tillgängliga för obegränsad, fullständig och direkt tillgång kostnadsfritt på

URL
https://tendsign.com/doc.aspx?UniqueId=afoihbdjis&GoTo=Docs

Ytterligare upplysningar kan erhållas från
Ovannämnda adress

Anbud eller anbudsansökningar ska skickas
Elektroniskt via

URL
https://tendsign.com/doc.aspx?UniqueId=afoihbdjis&GoTo=Tender

I.4) Typ av upphandlande myndighet

Typ av upphandlande myndighet

Typ av upphandlande myndighet
Departement eller annan central, regional eller lokal statlig myndighet

I.5) Huvudsaklig verksamhet

Huvudsaklig verksamhet

Huvudsaklig verksamhet
Allmänna offentliga tjänster
Avsnitt II: Föremål

II.1) Upphandlingens omfattning

II.1.1) Benämning på upphandlingen

Balt Safe

Referensnummer

19-03921

II.1.2) Huvudsaklig CPV-kod

Huvudobjekt

48100000-9, Programvara för särskild industri

II.1.3) Typ av kontrakt

Varor

II.1.4) Kort beskrivning

The Swedish Maritime Administration (hereinafter SMA) hereby grants you the opportunity to submit a tender regarding STM update on ECDIS or stand alone units connected to ECDIS. The higher purpose of the STM Balt Safe is to increase the safety in the Baltic Sea with the focus on tankers. The aim of this tender is to expand the STM compliant fleet to be able to have a concentrated test bed in the Baltic Sea Region with special focus on Gulf of Finland and Bay of Riga.

II.1.6) Information om delar

Kontraktet är uppdelt i flera delar

Nej

II.2) Beskrivning

II.2.2) Ytterligare CPV-kod(er)

Tilläggsobjekt

38112100-4, Navigations- och positionsbestämningssystem (GPS eller liknande)

48326000-9, Kartprogramvara

48810000-9, Informationssystem

48900000-7, Diverse programvara och datorsystem

72212100-0, Programvaruutvecklingstjänster för särskild industri

72212900-8, Programvaruutvecklingstjänster för diverse programvara och datorsystem

72220000-3, Systemtjänster och tekniska konsulttjänster

II.2.3) Plats för utförande

Nuts-kod

SE, SVERIGE

II.2.4) Beskrivning av upphandlingen

The Swedish Maritime Administration (hereinafter SMA) hereby grants you the opportunity to submit a tender regarding STM update on ECDIS or stand alone units connected to ECDIS. The higher purpose of the STM Balt Safe is to increase the safety in the Baltic Sea with the focus on tankers. The aim of this tender is to expand the STM compliant fleet to be able to have a concentrated test bed in the Baltic Sea Region with special focus on Gulf of Finland and Bay of Riga.

II.2.5) Tillsdelningskriterier

Pris är inte det enda upphandlingskriteriet och alla kriterier anges endast i upphandlingsdokumenten

II.2.7) Kontraktets, ramavtalets eller det dynamiska inköpssystemets löptid

Slutdatum

Detta kontrakt kan förlängas
Nej

II.2.10) Information om alternativa anbud
Alternativa anbud accepteras
Nej

II.2.11) Information om optioner
Option
Nej

II.2.13) Information om EU-medel
Kontraktet är knutet till projekt och/eller program som finansieras med EU-medel
Nej

Avsnitt IV: Förfarande

IV.1) Beskrivning

IV.1.1) Typ av förfarande
Öppet förfarande

IV.1.8) Information om avtalet om offentlig upphandling
Upphandlingen omfattas av avtalet om offentlig upphandling (GPA)
Ja

IV.2) Administrativ information

IV.2.2) Sista datum för mottagande av anbud eller anbudsansökningar
Datum
2019-10-18
Lokal tid
23:59

IV.2.4) Språk som får användas i anbud eller anbudsansökningar
Språk som får användas i anbud eller anbudsansökningar
Engelska

IV.2.6) Minimiperiod under vilken anbudsgivaren är bunden av sitt anbud
Anbud ska vara giltigt till
Anbud ska vara giltigt till
2020-01-18

IV.2.7) Anbudsöppning
Datum
2019-10-21
Lokal tid
00:00

Avsnitt VI: Kompletterande upplysningar

VI.1) Är detta en återkommande upphandling
Detta är en återkommande upphandling
Nej

VI.4) Överprövningsförfaranden

VI.4.1) Behörigt organ vid överprüvning
Officiellt namn
Förvaltningsrätten i Linköping

Ort
Linköping

Land
Sverige

VI.5) Datum då meddelandet sätts
2019-09-16
1. Call for tender

1.1 Procurement

1.1.1 Invitation to tender
The Swedish Maritime Administration (hereinafter SMA) hereby grants you the opportunity to submit a tender regarding STM update on ECDIS or stand alone units connected to ECDIS.

1.1.2 About the Authority
SMA is a central administrative authority with a sector responsibility for shipping. This means a collective responsibility for achieving the government’s transport and economic policy goals in the field of shipping.

The goals of transport policy guiding our operations are to attain an accessible transport system, a high level of transport quality, secure shipping, a favourable environment, positive regional development and an equitable transport system. Regarding economic policy, SMA shall work to take advantage of the potential of shipping as a competitive export industry, and to look after the competitive conditions of the merchant fleet.

Of 1160 SMA’s employees, 240 are located in the head office located in Norrköping.

1.1.3 Purpose/Aim of the Tender
The higher purpose of the STM Balt Safe is to increase the safety in the Baltic Sea with the focus on tankers.

The aim of this tender is to expand the STM compliant fleet to be able to have a concentrated test
bed in the Baltic Sea Region with special focus on Gulf of Finland and Bay of Riga.

1.1.4 Documents in the tender invitation
This invitation consists of the following documents:

- Call for tender (this document)
- Tender requirements
- Drafted agreement

Attachments:

- Appendix_1_Technical requirements
- Appendix_2_Route-Message-system-requirements
- Appendix_3_textMessageSchema_Description_1_3
- Appendix_4_SeaSWIM-Specification-v3.0

Any complementary information, including question and answers, that might be published during the procurement process.

Please note that it is the responsibility of the tenderer to make sure that all procurement documents, questions and answers and other information have been obtained.

Documentation regarding usecases, FAT and SAT protokoll will be published at [https://www.stmvalidation.eu/projects/stm-balt-safe/](https://www.stmvalidation.eu/projects/stm-balt-safe/)

1.1.5 Background

STM BALT SAFE

The sensitive Baltic Sea region has one of the highest shipping intensities in the world. There are many tanker ships and crossing traffic of passenger ships and narrow passages. Shipping accidents happen and may in the worst-case scenario have an extreme impact on the environment. Measures in the field of safety of navigation are needed to reduce accident risks. There is a need to improve the exchange of information between ships and between ships and shore for increased situational awareness and as a catalyst for improved safety of navigation, optimized capacity utilization and just-in-time operations.

Increased safety in the Baltic Sea

STM BALT SAFE (2019-2021) will contribute to increased safety of navigation in the Baltic Sea by providing Sea Traffic Management (STM) enabled maritime services to the tanker traffic in the Baltic. The project will address the recently amended HELCOM recommendations 34 E/2 “Further testing and development of the concept of exchange of voyage plans as well as other e-navigation solutions to enhance safety of navigation and
protection of the marine environment in the Baltic Sea region”. Tanker ships will be made safer by making them STM compatible hence given the ability to send and receive voyage plans with other ships and with public authorities in Baltic Sea countries. By the STM BALT SAFE project, the institutional capacity of the public sector on supporting and developing safety of navigation services and efficiency of sustainable transport will be enhanced.

**Enhanced monitoring and automated reporting**

The project will build on the methods, results and the maritime service infrastructure developed in previous projects like EfficienSea II, MONALISA 2.0 and Sea Traffic Management Validation project and will encompass exchange of voyage plans and integration of STM functionalities in VTS shore centres. Services for enhanced monitoring of maritime traffic, different automatic reporting services to Ship Reporting Systems e.g. GOFREP and SOUNDREP as well as automated reporting to Maritime Single Windows, will be developed and tested in the project. Different services that optimize the ship’s voyage and decrease the administrative burden will also be developed and tested within the STM BALT SAFE.

**New STM-clause enable just-in time for charter parties**

The standard clauses for shipping are currently being developed to be efficient when using Sea Traffic Management to optimize the sea traffic. These new clauses for Charter Party contracts to enable just-in-time shipping will also be tested and validated in practice within the STM BALT SAFE.

**A wide partnership around the Baltic Sea**

The STM BALT SAFE project will be implemented by a Baltic Sea wide partnership of public administrations from Norway, Sweden, Finland and Estonia. The total budget amounts to appr. 4 million euro.

**STM capability on board ships**

STM Balt Safe will provide the ships in the testbed with STM capable onboard system in
order to facilitate ship-to-ship and ship-to-shore exchange of voyage plans. This is fully in line with the amended HELCOM Recommendation 34E/2 on further testing and development of the concept of exchange of voyage plans to enhance safety of navigation and protection of marine environment in the Baltic Sea region. The recommendation also mentions a number of different suitable services such as ice routing and winter navigation services as well as SAR information.

These STM enabled maritime services are also included in in other HELCOM recommendations. The aim is to involve tanker ships and regular ferries in crossing traffic in the Gulf of Finland in the testbed of the STM BALT SAFE project. The increase of the number of STM compatible tanker ships in the Baltic will contribute to increase navigational safety while at the same time increase efficiency and reducing environmental impact.

The STM concept supports ships in both the voyage planning phase and during the voyage e.g. route optimization services, providing pilot routes and Navigational Warnings directly to the navigational system of the ships, ship-to-ship route exchange etc. All services are supported and delivered via the Maritime Digital Infrastructure where the exchange of voyage plans is executed in a standardized way. This caters for that end-to-end interoperability in communication between systems from different manufactures regardless if they are shore based systems or ship based systems and with an ability to interact with maritime services enabled by STM.

By involving a large number of tanker ships in the STM BALT SAFE testbed, a good quantity of data can be collected for analyses and evaluations. The functional requirements for ship systems will also take into account the needs of other maritime services than exchange of voyage plans, i.a. automated ship reporting services etc.

1.1.6 Procurement procedure

The procurement is carried out according to the Swedish Public Procurement Act as an Open procedure

Note that negotiation is not permitted during open procedure. Therefore, submit your final price and all other conditions in the tender.

1.1.7 Overall timetable

<table>
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<tr>
<th>Action</th>
<th>Time</th>
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<tbody>
<tr>
<td>This procurement is published</td>
<td>9/18/2019</td>
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<tr>
<td>Last day for questions</td>
<td>10/11/2019</td>
</tr>
<tr>
<td>Last tender day</td>
<td>10/18/2019 11:59 PM</td>
</tr>
<tr>
<td>Evaluation and tender briefing</td>
<td>2019-10-17-2019-11-17</td>
</tr>
<tr>
<td>Contract sign</td>
<td>2019-12-01</td>
</tr>
<tr>
<td>Milestone 1, system design Review</td>
<td>1 February 2020</td>
</tr>
</tbody>
</table>
Milestone 2, FAT 1 April 2020
Milestone 3, SAT 1 May 2020
Milestone 4, All systems delivered and installed 1 September 2020
Milestone 5, Final Acceptance and Project ending 30 June 2021

Note this timetable is preliminary

1.1.8 Hearing/information meeting
Hearing regarding this tender will be held the 1 October at 10.00. How to join this hearing will be published via https://www.stmvalidation.eu/projects/stm-balt-safe/ and via information message in Tendsign.

1.1.9 Number of contracts
Contract will be signed with maximum 5 tenderers

1.1.10 Contract period
The contract is valid from the time of both parties have signed. Contract time starts when both parts signing the contract and ends when the Project ends.

1.1.11 Close of the tender period
The tender must be received by SMA by 10/18/2019 11:59 PM at the latest. Tenders received after this date will not be considered.

1.1.12 Validity of the tender
The tender should be valid until: 1/18/2020

1.1.13 Extended validity of the tender
If the procurement is subject to a legal review, the validity of the tender may be extended until the contract can be signed, up until a maximum of six (6) months from the end of the validity period.

1.2 Administrative regulations

1.2.1 Submission of tenders in TendSign
Tenderers who want to participate in this procurement shall submit bids electronically via TendSign, tenders received by mail, email or fax will not be considered. If signed documents are requested they shall be scanned and uploaded and all required documents shall be in a legible format.

1.2.2 Instructions for structure
- All shall- and should requirements shall be answered. Answers left out are normally regarded as
unmet requirements.
- All 'shall' requirements must be met for the tender to be considered.
- Should requirements are evaluated and used to obtain the tender that has the most advantageous relationship for the SMA between price and quality, see the section on evaluation.
- If proof in the form of appendices are required, these should generally be attached to the tender. An exception apply for proof of compliance for grounds of exclusion and selection according to the European Single Procurement Document (ESPD) Regulation.

Please submit a complete and final tender.

1.2.3 Costs associated with tendering

No compensation will be provided for any costs associated with the invitation to tender.

1.2.4 Language

Submitted tender and attached document shall be written in English. Questions and answers shall be in English.

1.2.5 Pricing

Tendered prices must be given as follows:

State the price in the comment field below. The price shall be for a fully developed solution, installed in assigned vessels, technical support during the project period and training of bridge officers in the usage of the STM functionalities. The price shall refer to installation in one (1) vessel.

Prices must be stated in EUR and are assumed to be exclusive of VAT, including customs, shipping and handling fees unless otherwise stated in the terms of the agreement.

Budget price for each installation in vessels is max 4200eur/vessel, tenderer with prices above that will be rejected.

<table>
<thead>
<tr>
<th>Total price for the system, installed in one (1) vessel</th>
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<td>Text field</td>
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1.2.6 Acceptance of drafted agreements

The tenderer shall accept the drafted agreements.

<table>
<thead>
<tr>
<th>accept of drafted agreements</th>
</tr>
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<tbody>
<tr>
<td>Yes/No. Yes is required</td>
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</tbody>
</table>
1.2.7 Standard agreements

Standard agreement IT & Telekomföretagens - IT Project, version 2014, General terms and conditions will form the basis of this agreement and must be accepted.

1.2.8 Evaluation of tenders

Qualification and evaluation is conducted as follows:

1. **Qualification of tenderers.** In this step, checks are performed to verify that the tenderers fulfil 'shall' requirements to qualify as a supplier, i.e., that tenderers have fulfilled their social obligations, have adequate finances and have the necessary expertise.

2. **Fulfilment of 'shall' requirements.** In this step, checks are performed to verify that 'shall requirements are fulfilled. Tenders that do not fulfil the 'must requirements are rejected.

3. Those tenders that fulfil all 'shall' requirements are evaluated according to the principle of the Most economically advantageous tender.

1.2.8.1 Most economically advantageous tender

SMA will adopt the tenderers which is the most economically advantageous in consideration of the tenderers price. The tender with the lowest comparative price according to provided prices will get contracts. Maximum 5 tenderers will get contracts. The distribution will be made according to the matrix below based on the number of tenders accepted. If several tenderers end up at the same comparative value, lottery will be applied.

<table>
<thead>
<tr>
<th>Number of accepted bids</th>
<th>1</th>
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</tr>
</tbody>
</table>

1.2.8.2 Price for evaluation

Tenderers stated prices, according to 1.2.5 will be used for evaluation.
1.3 Questions

1.3.1 Information management
The TendSign system is used for distribution of specifications and other information relevant to the procurement. Documents and information are distributed electronically via the internet address (URL link) provided in the Call for Tender.

In order to access the system, a username and password must be obtained by following the simple registration process on www.TendSign.com. Tenderers can use this system free of charge and gain immediate access to the system and specifications once registration has been carried out. TendSign’s support is open on working days between 07.00 – 17.00.

Questions concerning TendSign (how to post questions, tender etc.) shall be addressed to tendsignsupport@visma.com. TendSign answers the questions by telephone or e-mail.

1.3.2 Questions concerning the tender specification
If a tenderer finds the specifications unclear in any aspect then it is important to clarify the issue quickly to avoid any misunderstandings. Questions regarding this tender should be sent in writing via TendSign.

Questions and answers together with any other information about the tender specifications (such as clarifications and corrections) will be distributed via TendSign to all tenderers. Supplementary information is only binding if it is in writing from SMA.

Last date for questions 10/11/2019

1.4 Conflicts of interest
In order to avoid a possible situation of equality, the Swedish Maritime Administration wants information about the tenderer, its owner (with actual influence) or its employees are employed by the Swedish Maritime Administration, or if there is another link that may affect the procurement process or contractual relationship.

Enter if any connection to the Swedish Maritime Administration as described above. If no connection exist, then enter that in the text box.

Yes/No. Yes is required

1.5 Commercial Secrecy
In accordance with the Official Information and Secrecy Act (Offentlighets- och sekretesslag (2009:400)) all information pertaining to a procurement matter is subject to secrecy until an agreement has been entered into or procurement has otherwise been concluded.

Any information mentioned may be subject to secrecy even after the aforementioned time. Note however that only in exceptional cases, information and prices according to the evaluation of the tender
are considered to be of such nature that they may be held secret for commercial reasons. With respect to commercial secrecy for the protection of a tenderer’s information, the requirement is that the information in question refers to the tenderer’s business or service conditions and that there is a specific reason to presume that the tenderer will suffer damages if the information is disclosed.

If a tenderer considers the information submitted in connection with this procurement matter fulfills the aforementioned requirements for commercial secrecy, the tenderer must submit a request for commercial secrecy, in writing, with clarification concerning the information referred to and what damage the tenderer would suffer if the information were disclosed. The decision whether or not the information submitted by the tenderer fulfills the requirements for commercial secrecy will be made by the Contracting Entity.

1.6 Discontinuance of procurement

SMA reserves the right not to make an award and/or to cancel the invitation to tender, to issue a new invitation for tendering, to adapt the procedure for the invitation to tender and/or to introduce alterations to the nature of those according to unexpected economic, political or organizational changes. If offered price is over budget according to the goal of the project, SMA has the right to cancel the procurement.
2. Tenderer requirements

2.1 Tenderer requirements

2.1.1 Requirements for tenderers
Tenderers must meet all requirements in chapter 2.1 in order to qualify for their tender to be examined and evaluated.

2.1.2 Subcontractors
A tenderer may engage subcontractors for part of the work. This should be clearly shown in the tender, and the subcontractor must also meet all the requirements. Upon request by SMA, tenderer shall be able to present a cooperative agreement or similar, showing that each subcontractor agrees to make the necessary resources available.

If a subcontractor will be used, the name of the organization number and the part they intend to perform shall be stated. If no subcontractor is to be used write "not relevant".

2.1.3 Grounds for exclusion
Circumstances that will lead to exclusion of a tender: Examination according to the Swedish Public Procurement Act (2016:1145) 13 CH. § 1, 2 and 3.

Requirements for evidence
The tender shall include a statement certifying that situations described in the Swedish Public Procurement Act CH 1-3 § do not apply.

The tenderer certifies that there are no grounds for exclusion
Yes/No. Yes is required

2.1.4 Registration obligations, payment of taxes and fees
Tenderers shall satisfy the legal requirements of Sweden or their homeland concerning registration, tax and obligatory fees. Tenderers may not have incurred any debts for social security fees or taxes, in Sweden or in their homeland, if the debt has led to registration with the Swedish Enforcement Authority or similar authority in the homeland.

Requirements for evidence
If the tenderer is registered in Sweden no evidence needs to be included. SMA will verify that the
requirements are satisfied and will contact the tenderer if any clarification is needed when the tenders are being processed. If the tenderer is a foreign Company, certified copies of official documents issued by a competent judicial or administrative authority shall be provided to SMA.

2.1.5 Company registration

The tenderer must meet the requirements on company registration (limited liability companies’ register, partnerships register or a similar register) in the country where the tenderer's business is registered.

To confirm requirement fulfillment, tenderers may already attach the following documentation in the tender, but must upon request attach the documents as soon as possible.

- Document from a relevant official authority/equivalent that confirms that the company is registered.

2.1.6 Financial Position

Tenderers shall have a stable financial position, to ensure that all commitments can be fulfilled during the contract period.

Requirements for evidence

If the tenderer is registered in Sweden no evidence needs to be included in the tender. SMA will carry out a credit check with help of the Swedish CreditSafe (www.creditsafe.se), where tenderers will need a rating of "Kreditvärdig" or higher to satisfy the requirements. If the tenderer is aware of, or suspects that up-to-date information is missing or incorrect (for example for a newly created business that has not yet submitted an annual report), or that requirements are not satisfied, then an explanation should be provided so that SMA can make an overall assessment of the tenderer, to determine whether or not the requirements for a stable financial position have been fulfilled.

If the Tenderer is a foreign Company, the tenderer shall provide a certificate of financial status, not older than 2 months, from CreditSafe (www.creditsafe.se) or other finance Company. The credit rating, to be approved, shall be at the minimum creditworthy.
b. If the tenderer is a foreign company, the requested certificate shall be attached

2.1.7 Pension Insurances, collective agreement and occupational healthcare

The contracting partner shall before contract signing supply information and certificates described below that are no older than three (3) months:

- Certificates of pension insurances arranged for employees and of pension insurance premiums paid, or an account that a payment agreement on outstanding pension insurance premiums has been made
- An account of the collective agreement or the principal terms of employment applicable to the work
- An account of provided occupational healthcare

These requirements are included as this is a procurement funded by funds from the EU via Central Baltic.

Tender hold Pension Insurances, collective agreement and occupational healthcare

Yes/No. Yes is required

2.1.8 Technical and professional capacity

The tenderer shall have the technical and professional capacity required to fulfill their contractual obligations.

The tender shall include:

- A brief description of tenderer’s organisation, number of employees, operations, history and ownership, as well as geographical location and resources within the relevant field.
- A brief description of the staffing plans for the contract, in particular with regard to replacements if key staff are absent.
- The tenderer’s historic and current work on development and research and cooperation with industry organizations and authorities.

Please attach requested documents

2.1.9 Experience of ECDIS
To be qualified for this procurement you need to be:

1. A manufacturer of type approved ECDIS equipment or have a planning station that is connected with ECDIS.*
2. Ships equipped shall be either/or
   1. Tanker DW, minimum 3000 GT,
   2. Ferries 500 GT, trading Gulf of Finland.
   3. Ships assisting in Winter navigation along the Estonian coast.
3. The ships equipped shall be planned to trade the Baltic Sea, preferably Gulf of Finland.

*Route in ECDIS shall be possible to be exchanged with planning station without the need for USB-drives.

**Attach documents which certifies above experience**

**2.1.10 Quality**
Tenderers shall apply quality control procedures to ensure that work is carried out in such a way that the agreed scope and quality is achieved and maintained. The quality assurance work shall be conducted with the support of tools and/or written procedures so that the work is monitored and the result is measured against set targets.

**Requirements for evidence**
The tender shall include:
- A summary describing how the tenderer will work with quality assurance and other controls, including the procedures to document them and/or a copy of quality certification.

**Please attach requested documents**

**2.1.11 Liability Insurance**
In case of a contractual signing, the tenderer shall have a liability insurance for the commitment. The tenderer shall hold liability insurance for his business which includes the commitment under this contract.

Liability Insurance shall be valid throughout the contract period. Insurance certificates shall be submitted to SMA on request.

**Tenderer hold liability insurance for his business which includes the commitment under this contract**
Yes/No. Yes is required
2.1.12 Technical requirement

Technical Requirements, requested functionality and prerequisites for the system is described in appendix 1.

All requirements in the Appendix 1 shall be answered and be attached with the tender.

<table>
<thead>
<tr>
<th>a. All shall requirements in Appendix 1 are met</th>
<th>General part (1)</th>
</tr>
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<tbody>
<tr>
<td>Yes/No. Yes is required</td>
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<tr>
<th>b. Answered Appendix 1, technical requirements of the system shall be attached</th>
<th>General part (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attachment</td>
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</table>

2.1.13 Project and timeplan

The tenderer must attach a preliminary project and timetable, linked to the mentioned milestones in 1.1.7, that clearly describes the implementation Project scope and length, area of responsibility for each party and measurable milestones.

Explanation and definition of some of the milestones that shall be included in the timeplan.

**System design review.** A technical description of the planned system shall be presented for and reviewed by SMA.

**FAT** The STM compatible system shall be fully developed and presented for SMA. SMA will follow a preset test procedure.

**SAT** The STM compatible system shall be installed onboard a ship and presented to SMA. SMA will follow a preset test procedure.

All ships systems installed. When the contractor have installed systems in all ships that was agreed upon in the contract.

**Final acceptance** The project have come to an end and all agreed ships have been installed. The bridge officers have gotten due training and the technical support have been up and running.

Documentation regarding usecases, FAT and SAT protokoll will be published at https://www.stmvalidation.eu/projects/stm-balt-safe/

The project must be done according to an iterative implementation, where SMA and the supplier have frequent reconciliations during the process.
The project plan must very clearly emphasize the requirements that the tenderer places on SMA and the dates which the client is expected to satisfy these.

The preliminary timetable will be fundamental to the detailed project and timetable to be produced and approved by both the client and tenderer after the agreement has been signed. A detailed project and time schedule must be produced as soon as possible after signing of agreement.

### 2.1.14 Qualification requirements - espd

The European Single Procurement Document (ESPD) is a standardised self-declaration that tenderers may use as a preliminary evidence of their possibility to participate in a procurement. In an ESPD, tenderers and applicants certify that they should not be excluded from the procurement according to Chapter 13, Sections 1-3 of the Public Procurement Act (2016: 1145) and that they can provide evidence for this. If a tenderer has not attached the specified verifications together with the tender, or if the contracting authority itself can retrieve the verifications from a third party, the authority can request that the verifications are submitted during the evaluation process.

Tenderers who wishes to use an ESPD form for qualification instead of the requirements stated by the SMA in the Section Qualification shall use the ESPD form, with requirements relevant to the procurement. Please note that tenderers using an ESPD form also must fill in ESPD forms for every stated subcontractor, and on request from the university also submit the specified verifications for each subcontractor.

### 2.1.14.1 ESPD or requirements for tenderer

The tenderer shall state whether the tenderer uses the specifications of the tenderer for the tenderer or the ESPD documents.

If the tenderer make use of the tender documents, the tenderer writes 'tender documents' below.
If the tenderer make use of the ESPD file, attach it in the Tendsign's system and the tenderer writes 'ESPD' below.
3. Drafted Agreement

3.1 Agreement (Draft)

3.1.1 Introduction

The following Agreement has been entered into by and between The Swedish Maritime Administration (SMA) with organization number 202100-0654, and ______, hereinafter referred to as the Contractor/Supplier, with organization number______. The Contractor commits itself to performing the assignment according to the tender (hereinafter “the Assignment”) in accordance with the provisions in this agreement.

3.1.2 Agreement

3.1.3 Subcontractors

Approved subcontractors are:

The engagement by the Supplier of any subcontractor shall not relieve the Supplier from any liabilities or obligations under this Contract and the Supplier shall be responsible for any acts or omissions of any subcontractor as if they were acts or omissions of the Supplier.

The Supplier shall ensure that the terms and conditions of this Contract are reflected in all subcontracts, if any, to the extent necessary to enable the Supplier to fully meet his obligations to SMA. Such terms and conditions include, but are not limited to, technical, functional and operational requirements and technical specifications; time of delivery; warranty terms; and quality Control.

Only subcontractors approved by SMA can be used.

3.1.4 Period of contract

The contract is valid from the time of both parties have signed and will ends when the project ends, but no longer than until June 21, 2021.

3.1.5 Contact

Each Party shall appoint a primary contact person whose responsibilities and obligations during the Term of the Contract are defined in this contract.

For SMA: Cajsa Jersler Fransson

For the Supplier: XXXXX
3.1.6 Agreed Specifications

This agreement covers all software and support services for a STM compatible system in the STM Balt Safe Project.

3.1.7 Scope

A STM compatible system shall in the STM Balt Safe project be a system that fulfill the requirements in the attached list. A system might be a software upgrade to an ECDIS or a stand alone unit compatible to an ECDIS with the capability to retrieve and send RTZ.

3.1.8 Security agreement

3.1.9 Agreement documents

In the event of the documents relating to the Agreement refers to or contains conflicting general terms and conditions, these documents shall prevail as follows:

1. Written changes and additions to this Framework
2. This Framework with accompanying appendices
3. The request for a tender with accompanying appendices
4. The tender, including any clarifications
5. IT & Telekomföretagens - IT Project, version 2014, General terms and conditions, applies unless otherwise stipulated in this agreement

No other documents besides the above apply.

If the Supplier has and/or applies any “General terms and conditions of contract” or equivalent, these have been rejected by the SMA, meaning that through this Contract the Parties have expressly agreed to exclude all such terms and conditions.

3.1.10 Changes and additions

All changes and additions must be in writing and agreed by all parts.

Notices required to be given by one party to another shall be in the English language unless expressly agreed otherwise and shall be deemed properly given if reduced to writing and personally delivered or sent by registered or certified post to the address below, postage prepaid, or by fax or e-mail with confirmation of receipt in the same manner and shall be effective upon receipt.

Unless specified elsewhere in the Contract, all notices and requests shall be addressed as follows:

| SMA          | Supplier |
3.1.11 Suppliers undertakings and system responsibility

3.1.11.1 "System" responsibility
The Supplier shall have responsibility for the fully satisfactory function of the complete "system" throughout the test period. The Supplier shall have full responsibility for design even if design proposals are put forward by SMA. SMA's approval of drawings, designs or products and services does not constitute a discharge of the Supplier from his design and System responsibility.

3.1.11.2 Suppliers undertakings
The Supplier undertakes to design, develop, install and supply the "system", fully compliant with the tendering documentation, educate vessels command and to maintain those systems operational throughout the project time. The undertaking includes all undertaking described in the tender documents. The Supplier is also responsible for managing any required implementation activities, training and giving advice in how the System should be used to reach the best quality and efficiency. The scope of delivery (as set forth in Supplier’s Draft Project Management Plan) should include support and maintenance. The Supplier is fully responsible for a fully setup System ready for deployment, and fully responsible for deploying the System. The delivery includes all components, software, for the System. The Supplier is fully responsible for support during project time.

3.1.11.3 Specifications
The Supplier shall deliver the "system" in accordance with this Contract.

3.1.12 Delivery requirements
The Supplier will cooperate with all parties involved in the Implementation Project as well as SMA. The Implementation Project will be executed in close cooperation with SMA to assure that the high
quality in the System and deployment is achieved.

In no event shall Supplier be liable for any acts or commissions of any third party under the present Contract other than Supplier’s subcontractors.

3.1.13 SMA:s undertaking and responsibilities

The Swedish Maritime Administration will provide VIS (Voyage Information Service) instance, expertise and documentation on how to use the private side for integration.

SMA is responsible for the following undertakings:

SeaSWIM central services
- Service Registry including examples, templates and descriptions for use
- Identity Registry including examples, templates and descriptions for use

SeaSWIM connector (SSC) (three alternatives depending on tenders preference)
- SSC implementation run by SMA (to facilitate the test bed), requires SMA VIS or SPIS (Ship and Port Information Service)

Voyage Information Service (three alternatives depending on tenders preference)
- VIS implementation run by SMA (to facilitate the test bed)

During the project we will keep up support for the ships through the Gothenburg Shore Center. There will be a special instance called Baltic Shore center during the STM Balt Safe project period.

Baltic shore center
- Are a possible test partner.

Will encourage the connected ships to use the services available for each ship.
- Can be a support in usage if an ECDIS is placed in Gothenburg.

Gothenburg shore center Baltic shore center
- Are a possible test partner.

- Will encourage the connected ships entering to the Baltic, to use the services available in The Baltic

- Support how to use the different STM services available in the Baltic.
Technical support.
- Host developers forum
- Maintain and update Developers Forum online with all technical specifications.
- Analyse log files and put together statistics.

3.1.14 Project overview
The Implementation Project includes all activities to reach final acceptance. It includes Project management, product training and solving problems identified during acceptance tests.

3.1.15 Milestone 1

3.1.16 Milestone 2

3.1.17 Milestone 3

3.1.18 Milestone 4: Final acceptance

3.1.19 Milestone 5

3.1.20 Delivery and Payment

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<tr>
<td>Milestone 4</td>
<td>Final acceptance</td>
<td>2020-09-01</td>
<td>70%</td>
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3.1.21 Actual acceptance date
Provided that SMA does not reject the system or part thereof, the actual acceptance date shall be
3.1.22 Ownership after acceptance
Ownership after acceptance shall be the property of the supplier.

3.1.23 Delay
If deliveries are delayed according to the stated times in the timetable, and these delays are caused by the supplier, a discussion will be held between the parties. If the supplier cannot perform the deliveries within a reasonable time after that, SMA has the right to terminate the contract.

3.1.24 Release notes, test reports and installation guide
Release notes shall include, but not limited to; platform releases feature releases, bug fix releases and upgrade notes, test reports and installation guide shall always be attached to deliveries of software, new releases and patches.

3.1.25 Price
Prices are given in the Tender from the supplier.
All local taxes and duties, if any, are included in the prices as listed in the Contract. VAT is excluded.
Total price for the system: XXXEUR
Price per hour for consulting: XXX EUR

3.1.26 Invoicing
Payment shall be made in Euro (EUR)
Invoices from the Supplier shall be accompanied by relevant and detailed specifications clearly identifying on an item-by-item basis the purpose and scope of the delivery including the description, delivered quantity, agreed price and delivery time of each product and service.
Invoices shall always specify SMA’s Contract reference number as well as a reference number.

3.1.27 Invoice adress
Payment must be made 30 days after the invoice approved by SMA.

The supplier is not entitled to charge invoicing fees, handling fees or other fees which are not subject to law.

Invoice address is:

GSF
Sjöfartsverket
601 78 Norrköping

The invoice must state:
- which agreement / order the invoice refers to and reference number,
- the contractor's organizational and VAT registration number, the company's registered office and information on the F-tax identification, and
- the contractor's plusgiro, bankgiro or payment address.

Invoices that do not contain the above information will not be approved by SMA and will be returned.

### 3.1.28 Title, right of use, personal data, etc.

#### 3.1.28.1 Title

All technical data of whatever kind, including all software and source codes with documentation necessary for operation, correction, modification and expansion produced by the Supplier or its subcontractor during the performance of this Contract shall be the property of the supplier.

#### 3.1.28.2 Non-disclosure

If not stipulated otherwise in the agreement all Data and information relating to a Party’s business and activities that is disclosed by one Party to the other Party under this Contract shall be treated as confidential and proprietary by the other Party. Neither Party shall disclose such Data or information to any subcontractor, consultant or other third party unless such subcontractor, consultant or other third party has executed a confidentiality agreement with the Party for the direct benefit of the other Party protecting such Data and information.

The foregoing shall not apply to any information:
- in the public domain; or
- which has been legally acquired from sources other than the other Party without confidentiality restrictions; or
- which is required to be disclosed under applicable mandatory law, final and legally enforceable.
3.1.28.3 Infringement of intellectual property rights

If not stipulated otherwise in the agreement the supplier shall indemnify and hold SMA harmless in respect of any damages, costs and other expenses, which may arise for SMA as a result of any claim due to any alleged infringement of intellectual property rights as a consequence of manufacture or use of the system.

The supplier shall not be liable for infringement pursuant to the preceding paragraph to the extent that such infringement is directly attributable to materiel supplied by SMA or to solutions or procedures prescribed by SMA contrary to the Supplier’s written objection.

The Supplier and SMA shall keep each other informed of claims arising from intellectual property rights. If infringement occurs, the Supplier shall, in addition to what is stated in the first paragraph, at its own expense either modify the System so that infringement no longer occurs, or reach an agreement with the holder of the infringed upon intellectual property rights.

If the system is modified, the Supplier shall be responsible for ensuring that its agreed function, performance and utility remains unaffected and that there will be no cost increase for its future use.

If a claim is made against SMA in respect of an alleged infringement of any third party’s intellectual property rights, the Supplier shall at its own expense participate in any court proceedings where an action is brought against SMA and for such purpose, as well as otherwise, assist SMA to the best of its ability in the case of alleged infringement of any intellectual property rights.

Supplier will have no obligation to indemnify SMA with respect to any infringement claim based upon any use of the system in combination with other products, equipment, software, or data not supplied by the supplier, unless the infringement is attributable to the System itself and not the act of combination stated above.

3.1.29 Use of software Products

3.1.30 Liability

Unless otherwise provided by other paragraphs in this contract, each Party shall be liable for loss or damage to its property, injury to or death of any of its employees or other person for whom the Party is responsible.

Each Party shall be liable for direct damage to property of third parties or personal injury, including death, in accordance with the applicable law, if caused by the Party, its personnel and/or its subcontractor(s) engaged in carrying out this Contract and shall indemnify and hold harmless the other Party accordingly.

If claim for damages pursuant to this Clause is made by a third party against either of the parties, said party shall immediately so notify the other party in writing. Neither Party shall be liable to pay any
compensation to the other Party either for loss of profit, production drop-out or any other consequential or indirect loss.

The Supplier's maximum liability under this Contract shall be limited to the Contract Price.

No party shall be responsible for any indirect or consequential loss or similar damages such as, but not limited to, loss of profit, loss of revenue or loss of contracts, provided such damages was not caused by a wilful act or gross negligence.

3.1.31 Insurance

The supplier shall hold adequate liability insurance for its operations throughout the agreement. The insurance amount should be at least the total value of this agreement.

3.1.32 Force Majeure

The following circumstances shall be deemed to constitute grounds for discharge from performing the Supplier's obligations under this Contract if they occur after the Contract has been entered into and the due performance of the Contract is thereby prevented and it may not be considered that the Supplier ought to have taken such circumstances into account at the time of entering into the Contract whose consequences could not reasonably have been avoided or circumvented by the Supplier: general labour conflict and any other circumstances, such as fire, war, mobilization or unforeseen military callup of corresponding extent, requisition, seizure, insurrection and riot, general shortage of qualified labour, general scarcity of means of transport, general shortage of goods, general and enduring restrictions on the supply of motive power, as well as delay in deliveries from Subcontractors as a consequence of circumstances falling within the scope of this Clause, where the Supplier or subcontractor has not caused or contributed to such obstacle.

The aforesaid shall also apply in respect of undertakings, which it is SMA's duty to perform.

In the event that a Force Majeure event described above prevents a Party from performing its obligations under this Contract for a period exceeding three (3) months, each Party shall be entitled to terminate the Contract and the following shall apply: SMA shall pay to the Supplier the Contract price for work completed as well as the costs of material and labour used for work uncompleted at the time of such termination, less any payments received for such work; and the Contract or shall deliver to SMA upon request any work so paid for.

3.1.33 Disputes

3.1.33.1 Applicable law

This Contract shall be governed by and interpreted in accordance with the laws of Sweden.

Any dispute, controversy or claim arising out of or in connection with this Contract shall be settled by
Swedish court of law in accordance with the laws of Sweden.

3.1.34 Amendments
Amendments or alterations have to be made in writing and signed by both Parties in order to be valid.

3.1.35 Transfer of agreement
The Supplier does not have the right to fully or partly transfer the agreement to a third party without the SMA's written consent.

The Supplier does not have the right, without the SMA's written permission, to transfer debts or other claims (including, inter alia, claims for damages) related to this agreement to any third party.

3.1.36 Subcontractors
The supplier may obtain written consent from the customer to engage subcontractors to carry out part of the work if necessary. Consent requires that the subcontracting company satisfies all the subcontractor requirements made by the customer. The supplier is responsible for the subcontractor's work as well as for their own.

3.1.37 Termination
SMA shall be entitled to terminate all or part of this Contract with immediate effect if:

a) The acceptance of the Milestones occurs later than the agreed dates and the delay for an individual Contractual Milestone has lasted more than three (3) months or the aggregate delay has lasted more than six (6) months and this is not due to Force Majeure, SMA or circumstances for which SMA is responsible and if such delay is attributable to the Supplier, or.

b) enforcement by a legal authority of a judgement or an enforceable decision of any other kind has shown the Supplier to be lacking the means of making full payment of a claim which is the subject of the judgement or decision, has suspended payments, a system has been made to a court or a public authority for corporation restructuring regarding the Supplier pursuant to a legislation act or the Supplier has been declared bankrupt, or

c) the Supplier fails to comply with any other obligation of this Contract and this may be regarded as constituting a substantial breach of Contract. In case of termination for default, SMA shall be entitled to claim damage compensation in accordance with this contract and to a refund of payments made prior to the termination for default.

The Supplier may terminate this Contract in whole or in part if SMA substantially fails to perform its obligations under the Contract. Any Supplier termination for default shall become effective 90 (ninety) days following written notice of the event, unless the event has been cured within such notice period.

In case of termination for default, the Supplier shall be entitled to claim damage compensation in accordance with this Contract.
Any Party claiming breach of Contract shall take all measures necessary to limit the loss or damage arising insofar as this is possible without incurring unreasonable expense and inconvenience.

SMA also have the right to terminate this Contract with immediate effect if:

- the Contract has been changed in way that is prohibited according to the Swedish Public Procurement Act (2016:1145) chapter 17 §§ 9-14,

- at the time of Contract assignment the Contractor meet any of the obligatory grounds for exclusion according to the Swedish Public Procurement Act (2016:1145) chapter 13 §1 and thus should have been excluded from the procurement, or

- The Court of Justice of the European Union in a procedure according to article 258 of the Treaty on the Functioning of the European Union declares that Sweden, by way of allowing SMA to enter into the Contract, has violated its obligations regarding the European Union, the Treaty on the Functioning of the European Union or 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.

### 3.2 Assignment

Neither Party shall be entitled without the other Party's written consent to put another party in its place, with the proviso, however, that SMA shall be entitled to assign all or part of the Contract to its legal successor(s) or an authority, agency, state enterprise or company wholly or partly owned by the Swedish State.

### 3.3 Signing

This Contract is executed in two (2) originals, whereof each Party shall keep one.
4. European Single Procurement Document (ESPD)

Part I: Information concerning the procurement procedure and the contracting authority or contracting entity

Part II: Information concerning the economic operator

Part III: Exclusion grounds

A: Grounds relating to criminal convictions

Article 57(1) of Directive 2014/24/EU sets out the following reasons for exclusion

Participation in a criminal organisation

Has the economic operator itself or any person who is a member of its administrative, management or supervisory body or has powers of representation, decision or control therein been the subject of a conviction by final judgment for participation in a criminal organisation, by a conviction rendered at the most five years ago or in which an exclusion period set out directly in the conviction continues to be applicable? As defined in Article 2 of Council Framework Decision 2008/841/JHA of 24 October 2008 on the fight against organised crime (OJ L 300, 11.11.2008, p. 42).

a. Your answer?
Yes/No. No is required

b. Is this information available at no cost to the authorities from an EU Member State database?
Yes/No. No is desired

c. Who has been convicted
Text field

d. Date of conviction
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e. Reason
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f. Who has been convicted
Text field
### d. Length of the period of exclusion

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### e. Have you taken measures to demonstrate your reliability ("Self-Cleaning")

Yes/No

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**Corruption**

Has the economic operator itself or any person who is a member of its administrative, management or supervisory body or has powers of representation, decision or control therein been the subject of a conviction by final judgment for corruption, by a conviction rendered at the most five years ago or in which an exclusion period set out directly in the conviction continues to be applicable? As defined in Article 3 of the Convention on the fight against corruption involving officials of the European Communities or officials of Member States of the European Union, OJ C 195, 25.6.1997, p. 1, and in Article 2(1) of Council Framework Decision 2003/568/JHA of 22 July 2003 on combating corruption in the private sector (OJ L 192, 31.7.2003, p. 54). This exclusion ground also includes corruption as defined in the national law of the contracting authority (contracting entity) or the economic operator.

### a. Your answer?

Yes/No. No is required

### b. Is this information available at no cost to the authorities from an EU Member State database?

Yes/No. No is desired
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**Fraud**

Has the economic operator itself or any person who is a member of its administrative, management or supervisory body or has powers of representation, decision or control therein been the subject of a conviction by final judgment for fraud, by a conviction rendered at the most five years ago or in which an exclusion period set out directly in the conviction continues to be applicable? Within the meaning of Article 1 of the Convention on the protection of the European Communities’ financial interests (OJ C 316, 27.11.1995, p. 48).
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Terrorist offences or offences linked to terrorist activities

Has the economic operator itself or any person who is a member of its administrative, management or supervisory body or has powers of representation, decision or control therein been the subject of a conviction by final judgment for terrorist offences or offences linked to terrorist activities, by a conviction rendered at the most five years ago or in which an exclusion period set out directly in the conviction continues to be applicable? As defined in Articles 1 and 3 of Council Framework Decision of 13 June 2002 on combating terrorism (OJ L 164, 22.6.2002, p. 3). This exclusion ground also includes inciting or aiding or abetting or attempting to commit an offence, as referred to in Article 4 of that Framework Decision.

a. Your answer?  
Yes/No. No is required

b. Is this information available at no cost to the authorities from an EU Member State database?  
Yes/No. No is desired

c. Date of conviction  
Text field

d. Reason  
Text field

e. Who has been convicted  
Text field

d. Length of the period of exclusion  
Text field

e. Have you taken measures to demonstrate your reliability ("Self-Cleaning")  
Yes/No
**Money laundering or terrorist financing**

Has the economic operator itself or any person who is a member of its administrative, management or supervisory body or has powers of representation, decision or control therein been the subject of a conviction by final judgment for money laundering or terrorist financing, by a conviction rendered at the most five years ago or in which an exclusion period set out directly in the conviction continues to be applicable? As defined in Article 1 of Directive 2005/60/EC of the European Parliament and of the Council of 26 October 2005 on the prevention of the use of the financial system for the purpose of money laundering and terrorist financing (OJ L 309, 25.11.2005, p. 15).

**a. Your answer?**

Yes/No. No is required

**b. Is this information available at no cost to the authorities from an EU Member State database?**

Yes/No. No is desired

**a. Date of conviction**

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**b. Reason**

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**Child labour and other forms of trafficking in human beings**

Has the economic operator itself or any person who is a member of its administrative, management or supervisory body or has powers of representation, decision or control therein been the subject of a conviction by final judgment for child labour and other forms of trafficking in human beings, by a conviction rendered at the most five years ago or in which an exclusion period set out directly in the conviction continues to be applicable? As defined in Article 2 of Directive 2011/36/EU of the European Parliament and of the Council of 5 April 2011 on preventing and combating trafficking in human beings and protecting its victims, and replacing Council Framework Decision 2002/629/JHA (OJ L 101, 15.4.2011, p. 1).

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b. Is this information available at no cost to the authorities from an EU Member State database? Yes/No. No is desired

a. Date of conviction
Text field

b. Reason
Text field

c. Who has been convicted
Text field

d. Length of the period of exclusion
Text field

e. Have you taken measures to demonstrate your reliability ("Self-Cleaning") Yes/No

Please describe them
Text field

a. URL
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b. Reference/Code
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c. Issuer
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B: Grounds relating to the payment of taxes or social security contributions
Article 57(2) of Directive 2014/24/EU sets out the following reasons for exclusion
Payment of taxes

Has the economic operator breached its obligations relating to the payment of taxes, both in the country in which it is established and in Member State of the contracting authority or contracting entity if other than the country of establishment?

a. Your answer?  
Yes/No. No is required

b. Is this information available at no cost to the authorities from an EU Member State database?  
Yes/No. No is desired

c. Has this breach of obligations been established by means other than a judicial or administrative decision?  
Yes/No. No is desired

a. Please describe which means were used  
Text field

b. Has the economic operator fulfilled its obligations by paying or entering into a binding arrangement with a view to paying the taxes or social security contributions due, including, where applicable, any interest accrued or fines?  
Yes/No. No is desired

Please describe them  
Text field
### Payment of social security

Has the economic operator breached its obligations relating to the payment social security contributions, both in the country in which it is established and in Member State of the contracting authority or contracting entity if other than the country of establishment?

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<td>b. Is this information available at no cost to the authorities from an EU Member State database?</td>
<td>Yes/No. No is desired</td>
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<td>a. Country or Member State concerned</td>
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b. Amount concerned
Text field

Has this breach of obligations been established by means other than a judicial or administrative decision?
Yes/No. No is desired

Please describe which means were used
Text field

If this breach of obligations was established through a judicial or administrative decision, was this decision final and binding?
Yes/No. No is desired

Please indicate the date of conviction or decision
Text field

In case of a conviction, insofar as established directly therein, the length of the period of exclusion
Text field

Has the economic operator fulfilled its obligations by paying or entering into a binding arrangement with a view to paying the taxes or social security contributions due, including, where applicable, any interest accrued or fines?
Yes/No. No is desired

Please describe them
Text field

a. URL
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C: Grounds relating to insolvency, conflicts of interests or professional misconduct

Article 57(4) of Directive 2014/24/EU sets out the following reasons for exclusion

Breaching of obligations in the field of environmental law

Has the economic operator, to its knowledge, breached its obligations in the field of environmental law? As referred to for the purposes of this procurement in national law, in the relevant notice or the procurement documents or in Article 18(2) of Directive 2014/24/EU.

Your answer? Yes/No. No is required

Please describe them

Breaching of obligations in the field of social law

Has the economic operator, to its knowledge, breached its obligations in the field of social law? As referred to for the purposes of this procurement in national law, in the relevant notice or the procurement documents or in Article 18(2) of Directive 2014/24/EU.

Your answer? Yes/No. No is required

Please describe them
Please describe them

Have you taken measures to demonstrate your reliability ("Self-Cleaning")

Yes/No. No is desired

Please describe them

Breaching of obligations in the fields of labour law

Has the economic operator, to its knowledge, breached its obligations in the field of labour law? As referred to for the purposes of this procurement in national law, in the relevant notice or the procurement documents or in Article 18(2) of Directive 2014/24/EU.

Your answer?

Yes/No. No is required

Please describe them

Have you taken measures to demonstrate your reliability ("Self-Cleaning")

Yes/No. No is desired

Please describe them

Bankruptcy

Is the economic operator bankrupt? This information needs not be given if exclusion of economic operators in this case has been made mandatory under the applicable national law without any possibility of derogation where the economic operator is nevertheless able to perform the contract.

a. Your answer?

Yes/No. No is required
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<td>b. Indicate reasons for being able nevertheless to perform the contract</td>
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**Insolvency**

Is the economic operator the subject of insolvency or winding-up? This information needs not be given if exclusion of economic operators in this case has been made mandatory under the applicable national law without any possibility of derogation where the economic operator is nevertheless able to perform the contract.

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<td>b. Is this information available at no cost to the authorities from an EU Member State database?</td>
<td>Yes/No. No is desired</td>
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<tr>
<td>a. Please describe them</td>
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Arrangement with creditors

Is the economic operator in arrangement with creditors? This information needs not be given if exclusion of economic operators in this case has been made mandatory under the applicable national law without any possibility of derogation where the economic operator is nevertheless able to perform the contract.

a. Your answer?
Yes/No. No is required

b. Is this information available at no cost to the authorities from an EU Member State database?
Yes/No. No is desired
Analogous situation like bankruptcy under national law

Is the economic operator in any analogous situation like bankruptcy arising from a similar procedure under national laws and regulations? This information needs not be given if exclusion of economic operators in this case has been made mandatory under the applicable national law without any possibility of derogation where the economic operator is nevertheless able to perform the contract.

a. Your answer?  
Yes/No. No is required

b. Is this information available at no cost to the authorities from an EU Member State database?  
Yes/No. No is desired

a. Please describe them  
Text field

b. Indicate reasons for being able nevertheless to perform the contract  
Text field
c. Issuer
Text field

**Assets being administered by liquidator**
Are the assets of the economic operator being administered by a liquidator or by the court? This information needs not be given if exclusion of economic operators in this case has been made mandatory under the applicable national law without any possibility of derogation where the economic operator is nevertheless able to perform the contract.

a. Your answer?
Yes/No. No is required

b. Is this information available at no cost to the authorities from an EU Member State database?
Yes/No. No is desired

a. Please describe them
Text field

b. Indicate reasons for being able nevertheless to perform the contract
Text field

a. URL
Text field

b. Reference/Code
Text field

c. Issuer
Text field

**Business activities are suspended**
Are the business activities of the economic operator suspended? This information needs not be given if exclusion of economic operators in this case has been made mandatory under the applicable national
law without any possibility of derogation where the economic operator is nevertheless able to perform the contract.

a. Your answer? Yes/No. No is required

b. Is this information available at no cost to the authorities from an EU Member State database? Yes/No. No is desired

a. Please describe them Text field

b. Indicate reasons for being able nevertheless to perform the contract Text field

a. URL Text field

b. Reference/Code Text field

c. Issuer Text field

Agreements with other economic operators aimed at distorting competition

Has the economic operator entered into agreements with other economic operators aimed at distorting competition?

Your answer? Yes/No. No is required
Guilty of grave professional misconduct

Is the economic operator guilty of grave professional misconduct? Where applicable, see definitions in national law, the relevant notice or the procurement documents.

Your answer?
Yes/No. No is required

Conflict of interest due to its participation in the procurement procedure

Is the economic operator aware of any conflict of interest, as indicated in national law, the relevant notice or the procurement documents due to its participation in the procurement procedure?

Your answer?
Yes/No. No is required
Early termination, damages or other comparable sanctions

Has the economic operator experienced that a prior public contract, a prior contract with a contracting entity or a prior concession contract was terminated early, or that damages or other comparable sanctions were imposed in connection with that prior contract?

Your answer?
Yes/No. No is required

Have you taken measures to demonstrate your reliability ("Self-Cleaning")

Yes/No

Guilty of misinterpretation, withheld information, unable to provide required documents and obtained confidential information of this procedure

Can the economic operator confirm that:

a) It has been guilty of serious misrepresentation in supplying the information required for the verification of the absence of grounds for exclusion or the fulfilment of the selection criteria,

b) It has withheld such information,

c) It has not been able, without delay, to submit the supporting documents required by a contracting authority or contracting entity, and

d) It has undertaken to unduly influence the decision making process of the contracting authority or contracting entity, to obtain confidential information that may confer upon it undue advantages in the procurement procedure or to negligently provide misleading information that may have a material influence on decisions concerning exclusion, selection or award?
Direct or indirect involvement in the preparation of this procurement procedure

Has the economic operator or an undertaking related to it advised the contracting authority or contracting entity or otherwise been involved in the preparation of the procurement procedure?

Your answer?
Yes/No. No is required

Please describe them
Text field

D: Purely national exclusion grounds

Do the purely national grounds of exclusion, which are specified in the relevant notice or in the procurement documents, apply?

Purely national exclusion grounds

Other exclusion grounds that may be foreseen in the national legislation of the contracting authority’s or contracting entity’s Member State. Has the economic operator breached its obligations relating to the purely national grounds of exclusion, which are specified in the relevant notice or in the procurement documents?

a. Your answer?
Yes/No. No is required

b. Is this information available at no cost to the authorities from an EU Member State database?
Yes/No. No is desired

a. Please describe them
Text field
b. Have you taken measures to demonstrate your reliability ("Self-Cleaning")

Yes/No. No is desired

Please describe them

Text field

a. URL

Text field

b. Reference/Code

Text field

c. Issuer

Text field

Part IV: Selection criteria

α: Global indication for all selection criteria

Concerning the selection criteria the economic operator declares that

It satisfies all the required selection criteria

It satisfies all the required selection criteria indicated in the relevant notice or in the procurement documents referred to in the notice.

Your answer?

Yes/No. Yes is desired

A: Suitability

Article 58(2) of Directive 2014/24/EU sets out the following selection criteria

Enrolment in a relevant professional register

It is enrolled in relevant professional registers kept in the Member State of its establishment as described in Annex XI of Directive 2014/24/EU; economic operators from certain Member States may have to comply with other requirements set out in that Annex.
Enrolment in a trade register

It is enrolled in trade registers kept in the Member State of its establishment as described in Annex XI of Directive 2014/24/EU; economic operators from certain Member States may have to comply with other requirements set out in that Annex.

a. Your answer?
Yes/No. Yes is desired

b. Is this information available at no cost to the authorities from an EU Member State database?
Yes/No. No is desired

a. URL
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b. Reference/Code
Text field
### For service contracts: authorisation of particular organisation needed

Is a particular authorisation of a particular organisation needed in order to be able to perform the service in question in the country of establishment of the economic operator?

**a. Your answer?**
- Yes/No. Yes is desired

**b. Is this information available at no cost to the authorities from an EU Member State database?**
- Yes/No. No is desired

**Please describe them**

**a. URL**
- Text field

**b. Reference/Code**
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**c. Issuer**
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### For service contracts: membership of particular organisation needed

Is a particular membership of a particular organisation needed in order to be able to perform the service in question in the country of establishment of the economic operator?

**a. Your answer?**
- Yes/No. Yes is desired
b. Is this information available at no cost to the authorities from an EU Member State database?
Yes/No. No is desired

Please describe them

a. URL

b. Reference/Code

c. Issuer

B: Economic and financial standing

Article 58(3) of Directive 2014/24/EU sets out the following selection criteria

General yearly turnover
Its general yearly turnover for the number of financial years required in the relevant notice, the procurement documents or the ESPD is as follows:

Average yearly turnover
Its average yearly turnover for the number of years required in the relevant notice, the procurement documents or the ESPD is as follows:

Specific yearly turnover
Its specific yearly turnover in the business area covered by the contract for the number of financial years required in the relevant notice, the procurement documents or the ESPD is as follows:

Specific average turnover
Its specific average yearly turnover in the business area covered by the contract for the number of years required in the relevant notice, the procurement documents or the ESPD is as follows:

Set up of economic operator
In case the information concerning turnover (general or specific) is not available for the entire period required, please state the date on which the economic operator was set up or started trading:
Financial ratio
Concerning the financial ratios specified in the relevant notice, the procurement documents or the ESPD, the economic operator declares that the actual values for the required ratios are as follows:

Professional risk indemnity insurance
The insured amount in its professional risk indemnity insurance is the following:

Other economic or financial requirements
Concerning the other economic or financial requirements, if any, that may have been specified in the relevant notice or the procurement documents, the economic operator declares that:

C: Technical and professional ability
Article 58(4) of Directive 2014/24/EU sets out the following selection criteria

For works contracts: performance of works of the specified type
For public works contracts only: During the reference period, the economic operator has performed the following works of the specified type. Contracting authorities may require up to five years and allow experience dating from more than five years.

For supply contracts: performance of deliveries of the specified type
For public supply contracts only: During the reference period, the economic operator has delivered the following principal deliveries of the type specified. Contracting authorities may require up to three years and allow experience dating from more than three years.

For service contracts: performance of services of the specified type
For public service contracts only: During the reference period, the economic operator has provided the following main services of the type specified. Contracting authorities may require up to three years and allow experience dating from more than three years.

Technicians or technical bodies for quality control
It can call upon the following technicians or technical bodies, especially those responsible for quality control. For technicians or technical bodies not belonging directly to the economic operator's undertaking but on whose capacities the economic operator relies as set out under Part II, Section C, separate ESPD forms must be filled in.

For works contracts: technicians or technical bodies to carry out the work
In the case of public works contracts, the economic operator will be able to call on the following technicians or technical bodies to carry out the work:

Technical facilities and measures for ensuring quality
It uses the following technical facilities and measures for ensuring quality and its study and research
facilities are as follows:

**Study and research facilities**
It uses the following study and research facilities:

**Supply chain management**
It will be able to apply the following supply chain management and tracking systems when performing the contract:

**Allowance of checks**
For complex products or services to be supplied or, exceptionally, for products or services which are required for a special purpose: The economic operator will allow checks to be conducted on the production capacities or the technical capacity of the economic operator and, where necessary, on the means of study and research which are available to it and on the quality control measures? The check is to be performed by the contracting authority or, in case the latter consents to this, on its behalf by a competent official body of the country in which the supplier or service provider is established.

**Educational and professional qualifications**
The following educational and professional qualifications are held by the service provider or the contractor itself, and/or (depending on the requirements set out in the relevant notice or the procurement documents) by its managerial staff.

**Environmental management measures**
The economic operator will be able to apply the following environmental management measures when performing the contract:

**Number of managerial staff**
The economic operator's number of managerial staff for the last three years were as follows:

**Average annual manpower**
The economic operator's average annual manpower and the number of managerial staff for the last three years were as follows:

**Tools, plant or technical equipment**
The following tools, plant or technical equipment will be available to it for performing the contract:

**Subcontracting proportion**
The economic operator intends possibly to subcontract the following proportion (i.e. percentage) of the
contract. Please note that if the economic operator has decided to subcontract a part of the contract and relies on the subcontractor's capacities to perform that part, then please fill in a separate ESPD for such subcontractors, see Part II, Section C above.

For supply contracts: samples, descriptions or photographs without certification of authenticity

For public supply contracts: The economic operator will supply the required samples, descriptions or photographs of the products to be supplied, which do not need to be accompanied by certifications of authenticity.

a. Your answer?
Yes/No. Yes is desired

b. Is this information available at no cost to the authorities from an EU Member State database?
Yes/No. No is desired

a. URL
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b. Reference/Code
Text field

c. Issuer
Text field

For supply contracts: samples, descriptions or photographs with certification of authenticity

For public supply contracts: The economic operator will supply the required samples, descriptions or photographs of the products to be supplied and will provide certifications of authenticity where applicable.

a. Your answer?
Yes/No. Yes is desired
For supply contracts: certificates by quality control institutes

Can the economic operator provide the required certificates drawn up by official quality control institutes or agencies of recognised competence attesting the conformity of products clearly identified by references to the technical specifications or standards, which are set out in the relevant notice or the procurement documents?

a. Your answer?
Yes/No. Yes is desired

b. Is this information available at no cost to the authorities from an EU Member State database?
Yes/No. No is desired

If not, please explain why and state which other means of proof can be provided:

Text field

a. URL
Text field

b. Reference/Code
Text field
D: Quality assurance schemes and environmental management standards

Article 62(2) of Directive 2014/24/EU sets out the following selection criteria

Certificates by independent bodies about quality assurance standards

Will the economic operator be able to produce certificates drawn up by independent bodies attesting that the economic operator complies with the required quality assurance standards, including accessibility for disabled persons?

a. Your answer?
Yes/No. Yes is desired

b. Is this information available at no cost to the authorities from an EU Member State database?
Yes/No. No is desired

If not, please explain why and specify which other means of proof concerning the quality assurance scheme can be provided:

Text field

Certificates by independent bodies about environmental management systems or standards

Will the economic operator be able to produce certificates drawn up by independent bodies attesting that the economic operator complies with the required environmental management systems or
standards?

a. Your answer? Yes/No. Yes is desired

b. Is this information available at no cost to the authorities from an EU Member State database? Yes/No. No is desired

If not, please explain why and specify which other means of proof concerning the environmental management systems or standards can be provided:

Text field

a. URL Text field

b. Reference/Code Text field

c. Issuer Text field

Finish

Part V: Reduction of the number of qualified candidates

The economic operator declares that:

It meets the objective and non discriminatory criteria or rules to be applied in order to limit the number of candidates in the following way: In case certain certificates or other forms of documentary evidence are required, please indicate for each whether the economic operator has the required documents:

If some of these certificates or forms of documentary evidence are available electronically, please indicate for each:

a. Your answer? Yes/No. Yes is desired
b. Is this information available at no cost to the authorities from an EU Member State database?
Yes/No. No is desired

Please describe them

a. URL

b. Reference/Code

c. Issuer

Part VI: Concluding statements

Concluding statements
The undersigned formally declare that the information stated under Parts II - V above is accurate and correct and that it has been set out in full awareness of the consequences of serious misrepresentation.

The undersigned formally declare to be able, upon request and without delay, to provide the certificates and other forms of documentary evidence referred to, except where:

a) The contracting authority or contracting entity has the possibility of obtaining the supporting documentation concerned directly by accessing a national database in any Member State that is available free of charge (on condition that the economic operator has provided the necessary information (web address, issuing authority or body, precise reference of the documentation) allowing the contracting authority or contracting entity to do so. Where required, this must be accompanied by the relevant consent to such access), or

b) As of 18 October 2018 at the latest (depending on the national implementation of the second subparagraph of Article 59(5) of Directive 2014/24/EU), the contracting authority or contracting entity already possesses the documentation concerned.

The undersigned formally consent to [identify the contracting authority or contracting entity as set out in Part I, Section A], gaining access to documents supporting the information, which has been provided in [identify the Part/Section/Point(s) concerned] of this European Single Procurement Document for the purposes of [identify the procurement procedure: (summary description, reference of publication in the
### 1.1 General

This document contains the technical requirement for the procurement of STM ship system within the scope of the STM Validation Project. The document describes the scope of the required functional and technical characteristics of the systems. The technical specifications, APIs and xml-codes are anticipated to be accurate but some are yet to be prototyped. This means that minor updates might be necessary. Latest updates to the specifications will be presented at the latest before the negotiation phase of the tender is commenced in order to tenderers to take updates into consideration in their final bid.

### 1.2 Definitions

#### 1.2.1 Terminology for denoting a requirement

The following requirement is valid throughout this document:

- **A mandatory requirement** is denoted with the word "**shall**" and must be fulfilled.
- **A criteria** is denoted with the word "**should**" and gives added value in the evaluation if fulfilled.

**NB**: Other requirement specifications referring to this specification might stipulate that a **should** requirement is changed to a **shall** requirement.

All requirements are labeled with R-X.Y:Z, where X.Y is the current chapter number and Z is a consecutive numbering to separate each requirement within the chapter. There can be several "shall" or "should" in one numbered requirement, which means that all must be fulfilled in order for the requirement to be fulfilled. Descriptive text occurs throughout the document but is not labeled.

#### 1.2.2 Select, turn-on, set etc.

All functions that are said to be selectable, turned-on, set, etc. will implicitly also be said to be the reverse, i.e. de-selected, turned-off, de-set, etc. unless specified explicitly to something else.

### 2 General requirements on the STM ship system

In this chapter the requirements that cannot be categorized into one or more of the 5 different components of the STM ship system as depicted in Figure 1 below, is stated.

#### 2.1.1 The Tenderer of STM ship system **shall** at milestone 2 prove that the STM ship system can exchange relevant payload formats defined in reference SeaSWIM specification.

#### 2.1.2 The tenderer **should** be able to adopt to external standards and requirements i.e. RTZ that is being updated to S-421. See reference Standard forecast.

#### 2.1.3 The tenderer **shall** assure that the delivered system adheres to all relevant requirements regarding normal functionality in all navigational equipment, The Supplier is fully responsible that all installations of software and/or hardware, fulfilling the tender specifications, does not interfere with existing navigational systems and that the System is compliant with existing rules and regulations including but not limited to SOLAS Ch V reg 17 on electromagnetic compatibility.

#### 2.1.4 The Tenderer **shall** conduct appropriate training and provide documentation (manual) for onboard equipment users. The tenderer shall deliver all educational material to the ship in hard copy, CBT etc. The training material shall be held updated during the project period. Planned training shall be presented at SAT.

#### 2.1.5 The Tenderer **shall** provide shipping companies included in the testbed sufficient information including a meeting presenting the STM-concept and demo the equipment updates introduced.
### 3 Functional/Technical Requirements

#### 3.1 STM Ship system overall description

<table>
<thead>
<tr>
<th>Requirement fulfills</th>
<th>comment/describe</th>
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<tbody>
<tr>
<td><strong>3.1.1</strong> At least one navigation system workstation on the ship’s bridge shall be able to interact with the STM Module. The main functions are: to receive voyage plan (VP) for further processing until used for navigation, to send the VP used for navigation to the STM Module, to send ETA to the STM Module. Communication between the navigation system and the STM Module will ensure that the maximum possible degree of consistency is upheld between information held in the navigation system and the STM Module. If information consistency decreases due to the status of communication link between the navigation system and the STM Module, the communication status shall be known by both ends. The STM Module is a set of software functions on some hardware that presumably is located on the ship. The STM Module may be integrated in the navigation system, if certification allows, it may be integrated into an existing planning station or it may be running on a dedicated device which is supplied by the supplier. If information consistency can be assured, the STM module can be placed ashore.</td>
<td>shall</td>
</tr>
</tbody>
</table>

| **3.1.2** Communication between the STM Module and Online access point will ensure that the maximum possible degree of consistency is upheld between information held in the STM Module and at the Online access point, depending on the online status of the ship. If information consistency decreases due to the status of communication links with the ship, the communication status and the age of information shall be known by both ends. The online access point is constantly and stably connected to the internet and represents the ship towards other actors and services. The main functions in the online access point are the VIS, Port Information Service (optional) and the SeaSWIM Connector (SSC). The Online access point may be implemented onboard the ship or at another location. Each VIS is attached to a SSC and each ship has one (1) VIS instance. | shall |

---

**Figure 1**

- 3.2 Navigation system functionality
- 3.3 Com. to navigation system
- 3.4 STM Module
- 3.5 Com. to access point
- 3.6 Online access point (VIS/SSC)
<table>
<thead>
<tr>
<th>3.2 Navigation system functionality</th>
<th>requirement fulfills</th>
<th>comment/describe</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3.2.1</strong></td>
<td>The STM ship system <strong>shall</strong> be able to send and receive route segment via AIS, ASM message (8), according to Appendix 2: Route Message system requirements, F1.</td>
<td>shall</td>
</tr>
<tr>
<td><strong>3.2.2</strong></td>
<td>The STM ship system <strong>shall</strong> be able to present route segment accordingly in navigation system.</td>
<td>shall</td>
</tr>
<tr>
<td><strong>3.2.3</strong></td>
<td>The STM ship systems <strong>shall</strong> able to include legspeed in route message format.</td>
<td>shall</td>
</tr>
<tr>
<td><strong>3.2.4</strong></td>
<td>Not applicable (As the list of specifications are used in several projects, there might be specifications that does not apply to a project)</td>
<td>shall</td>
</tr>
<tr>
<td><strong>3.2.5</strong></td>
<td>In the STM ship system it <strong>shall</strong> be possible to make a default choice that the route message (and/or RTZs) will be shared or not, with other STM ships.</td>
<td>shall</td>
</tr>
<tr>
<td><strong>3.2.6</strong></td>
<td>The STM ship system <strong>shall</strong> be able to present, via ASM message (8), according to appendix 3: Route message format (version 1.0), info/flag on AIS targets that participates in STM test beds.</td>
<td>shall</td>
</tr>
<tr>
<td><strong>3.2.7</strong></td>
<td>The STM ship systems <strong>shall</strong> be able to calculate CPA and intersection points between own/other-ships route segments (including leg speed), even if the routes are not crossing each other. The operator should have the option to chose between legspeed or actual speed.</td>
<td>shall</td>
</tr>
<tr>
<td><strong>3.2.8</strong></td>
<td>If a ship is deviating from its intended route (exceeding pre-set limits, geographically and in time, set by own ship), that <strong>shall</strong> be presented on own ships STM ship systems.</td>
<td>shall</td>
</tr>
<tr>
<td><strong>3.2.9</strong></td>
<td><strong>It shall</strong> be possible to do “Route Trail Manouevre” including own and other ships routes. The operator should have the option to chose between legspeed or actual speed.</td>
<td>shall</td>
</tr>
<tr>
<td><strong>3.2.10</strong></td>
<td><strong>It shall</strong> be possible for the operator to activate other ships routes on a case by case basis. Eg. Acquire them manually in the navigation system. Manual activation of routes should be the default setting.</td>
<td>shall</td>
</tr>
<tr>
<td><strong>3.2.11</strong></td>
<td>Alerts for low route CPA/TCPA <strong>should</strong> be easy to set and optional for the operator. If limits are exceeded other ships route might be triggered to show in the display.</td>
<td>shall</td>
</tr>
<tr>
<td><strong>3.2.12</strong></td>
<td>The STM ship system <strong>shall</strong> be able to calculate CPA and intersection points between own/other-ships route segments (including leg speed), even if the routes are not crossing each other. The operator should have the option to chose between legspeed or actual speed.</td>
<td>shall</td>
</tr>
<tr>
<td><strong>3.2.13</strong></td>
<td><strong>It should</strong> be clearly visible that only the schedule has been changed and which waypoint are affected by the change.</td>
<td>should</td>
</tr>
<tr>
<td><strong>3.2.14</strong></td>
<td>Area received in STM text message format shall be possible to display in navigation system.</td>
<td>shall</td>
</tr>
</tbody>
</table>

**STM Ship System functionality in Navigation System**

<table>
<thead>
<tr>
<th>requirement fulfills</th>
<th>comment/describe</th>
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</thead>
<tbody>
<tr>
<td><strong>3.3.1</strong></td>
<td>The communication between the STM Module and navigation system <strong>shall</strong> have Information consistency (e.g. ship receives a VP in the STM module, accepts it, then the operator shall be able to choose it for monitoring in navigation system, it shall then be identical to the one in the STM module).</td>
</tr>
</tbody>
</table>
### 3.4 STM Module

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Requirement fulfills</th>
<th>Comment/Describe</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.4.1 STM module shall be able to send, receive and show text messages to/from other STM actor according to &quot;STM text format&quot;, in SeaSWIM specification, appendix 4 (e.g. Text body, Message subject, receiver id (actor id), sender id (actor id), reference to information object ID (e.g. UVID)).</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>3.4.2 The STM module shall include the functionality to communicate the following (but not limited to) to and from VIS/Online access point.</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>- Publish VP to VIS / Online access point.</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>- Retrieve VP proposals from VIS / Online access point.</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>- RefD0621BSend and receive VP, Area- and text messages to other STM services through VIS / Online access point.</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>3.4.3 The STM module shall include the functionality to show, create, edit and save VP. It shall be possible to graphically clearly distinguish received VP updates, e.g. route suggestions.</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>3.4.4 Not applicable</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>3.4.5 If an appropriate schedule is not attached to the monitored VP, operator shall get notified.</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>3.4.6 The STM module shall be able to set route status according to RTZ format in SeaSWIM specification.</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>3.4.7 The route status &quot;inactive&quot; shall only be shared with other STM actors when the voyage is completed or cancelled.</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>3.4.8 OOW shall be made aware of relevant events such as incoming messages (VP updates, text messages new RTA etc.). The event shall be detectable from ships conning position. Above events shall not interfere with navigational information.</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>3.4.9 The STM Module shall be able to upload/download VP and S-124 to/from the ships navigation system.</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>3.4.10 Operator shall be able to search for service instances in STM module according to SeaSWIM specification, based on attributes available in service registry.</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>3.4.11 Operator shall be able to search for services by means of Geometry (e.g. area search and/or Voyageplan search).</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>3.4.12 STM module shall be able to present the service descriptions included in service registration.</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>3.4.13 STM module should be able to present all relevant information available in instance descriptions as document (PDF, HTML).</td>
<td>should</td>
<td></td>
</tr>
<tr>
<td>3.4.14 STM module shall be able to store lists of services (for offline purposes).</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>3.4.15 The STM module should be able to support offline work when connectivity goes down, e.g. search for services and call them and when connectivity returns the &quot;call&quot; shall be processed.</td>
<td>should</td>
<td></td>
</tr>
<tr>
<td>3.4.16 If stored service list is used, the list shall be updated minimum once per day and/or when service is called to prevent old entries to be used.</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>3.4.17 If search fails, the operator shall get an error message within 30 seconds.</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>3.4.18</td>
<td>Operator <strong>should</strong> be made aware if messages have been sent or not, due to connectivity or other issues.</td>
<td>should</td>
</tr>
<tr>
<td>3.4.19</td>
<td>Operator <strong>shall</strong> in the STM module be able to assign/remove access rights on information objects (VP) to services.</td>
<td>shall</td>
</tr>
<tr>
<td>3.4.20</td>
<td>STM module <strong>shall</strong> be able to present for the operator which actors have been given access rights to VP.</td>
<td>shall</td>
</tr>
<tr>
<td>3.4.21</td>
<td>Operator <strong>shall</strong> in the STM module be able to share VP to selected services. It <strong>shall</strong> be possible to share a VP once or to set a service as a subscriber (i.e. automatically send future updates of VP).</td>
<td>shall</td>
</tr>
<tr>
<td>3.4.22</td>
<td>Operator <strong>should</strong> in the STM module be able to subscribe on a service.</td>
<td>should</td>
</tr>
<tr>
<td>3.4.23</td>
<td>There <strong>should</strong> be a functionality in the STM Module to present relationship between different payload formats, e.g. a text message can be correlated to a VP.</td>
<td>should</td>
</tr>
<tr>
<td>3.4.24</td>
<td>The STM Module <strong>shall</strong> be able to show navigational warning according to S-124 [See SeaSWIM specification].</td>
<td>shall</td>
</tr>
<tr>
<td>3.4.25</td>
<td>The STM Module <strong>should</strong> be able to show area in STM text format.</td>
<td>shall</td>
</tr>
<tr>
<td>3.4.26</td>
<td>The STM Module <strong>should</strong> handle real-time calculation (including preplanned speeds) of ETA and or STG (Speed To Go to reach a WP at a given time) to one or more selected WPs (e.g. arrival traffic area or Pilot Boarding Position) along the route, not necessarily the last waypoint in the route.</td>
<td>shall</td>
</tr>
<tr>
<td>3.4.27</td>
<td>The STM ship system <strong>shall</strong> automatically give the VP an Unique Voyage ID (UVID) using the maritime resource name (mrn) structure (see SeaSWIM specification).</td>
<td>shall</td>
</tr>
<tr>
<td>3.4.28</td>
<td>When a STM actor has sent e.g. a VP to another STM actor (e.g. Ship-Shore, Shore-Ship) the sender <strong>shall</strong> get information regarding that that message is &quot;read&quot; by the receiver. (Requires update of VS technical design as an intermediary before the standardized service interface).</td>
<td>shall</td>
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</tbody>
</table>

### 3.5 Communications between the STM Module and Online access point

<table>
<thead>
<tr>
<th>Requirement fulfills</th>
<th>yes/no</th>
<th>comment/describe</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5.1</td>
<td>Each ship <strong>shall</strong> have data link connectivity between the STM Module and the Online access point. The connectivity has the ability to be continuous with adequate capacity according to the following: Communication between the STM Module and Online access point ensures that the maximum possible degree of consistency is upheld between information held in the STM Module and at the Online access point, depending on the online connectivity status of the ship. (Quantifying of above will be done in separate projects).</td>
<td>shall</td>
</tr>
</tbody>
</table>
### 3.6 Online access point (Service Instance)

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Requirement fulfills</th>
<th>Comment/Describe</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.6.1 The online access point <strong>shall</strong> hold a service instance that is the internet connected representation of the ship, the service instance shall represent the ship towards other actors via a SSC (service instance shall be based on latest service design VIS).</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>3.6.2 The online access point <strong>should</strong> hold a service instance that is the internet connected representation of the ship, the service instance should represent the ship in receiving port call messages (PCMF) in port-call synchronization interactions towards other actors via a SSC.</td>
<td>should</td>
<td></td>
</tr>
<tr>
<td>3.6.3 Online access point <strong>shall</strong> be able to expose and consume (to other STM actors) RTZ-format, S124-format and text format using VIS (See SeaSWIM specification).</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>3.6.4 Online access point <strong>should</strong> be able to exchange PCM-format with other STM actors (See SeaSWIM specification).</td>
<td>should</td>
<td></td>
</tr>
<tr>
<td>3.6.5 Online access point <strong>shall</strong> be permanently and stably internet connected.</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>3.6.6 External events (according to service log specification) in and out to/from the system <strong>should</strong> be stored and logged for traceability. Events could include, but are not limited to: Exchange of VP and received S-124.</td>
<td>should</td>
<td></td>
</tr>
<tr>
<td>3.6.7 Service <strong>shall</strong> be registered in service registry according to guideline (See SeaSWIM specification).</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>3.6.8 All messages, sent and received, <strong>shall</strong> be validated against payload schema.</td>
<td>shall</td>
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</table>

### 4 STM Cyber security requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Requirement fulfills</th>
<th>Comment/Describe</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1.1 Service instance in online access point <strong>shall</strong> adhere to requirements stated in SeaSWIM Connector Specification and SeaSWIM Connector Design.</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>4.1.2 Each ship <strong>shall</strong> be individually identifiable for the receiver of information, hence a unique certificate for the ship shall be used as client certificate.</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>4.1.3 The information owner <strong>shall</strong> implement authorization mechanism for external actors, that ensures only authorized external actors have access to its information (See also requirement R-3.4.19).</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>4.1.4 Security events <strong>should</strong> be logged for traceability (time, denied access etc.) in Online access point.</td>
<td>should</td>
<td></td>
</tr>
<tr>
<td>4.1.5 The communication between STM Module and Online Access Point <strong>shall</strong> be secured to hinder unauthenticated requests and unauthorized access to information. (e.g. VPN).</td>
<td>shall</td>
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</table>

### 5 Non-Functional/Technical Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Requirement fulfills</th>
<th>Comment/Describe</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1.1 Information <strong>shall</strong> not be lost due to restart or due to no connection to internet.</td>
<td>shall</td>
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</tr>
<tr>
<td>5.1.2 Information shared <strong>not</strong> overseed 400kb</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>5.1.3 The online access point <strong>shall</strong> be available at least 99% of the time.</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>5.1.4 The status of service call <strong>shall</strong> be clearly indicated (e.g. by symbols for OK, Error) to the operator. Reason for the error <strong>shall</strong> be presented in text. See VIS Technical Design for details.</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>5.1.5 The response message from service call <strong>shall</strong> be possible for an operator to read. The response message may contain information regarding the service call even if it was technically a success, such as missing information in the voyage plan.</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>5.1.6 The Online access point VIS-based instance <strong>shall</strong> return HTTP response (code and message/information) according to VIS Technical Design.</td>
<td>shall</td>
<td></td>
</tr>
</tbody>
</table>

### 6 GDPR

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Requirement fulfills</th>
<th>Comment/Describe</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1.1 General Data Protection Regulation (GDPR) <strong>shall</strong> be applied.</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>6.1.2 Personal information <strong>shall</strong> be avoided in the system.</td>
<td>shall</td>
<td></td>
</tr>
<tr>
<td>6.1.3 GDPR handling required in MCP <strong>shall</strong> be followed (See SeaSWIM specification).</td>
<td>shall</td>
<td></td>
</tr>
</tbody>
</table>
Route Message system requirements, G1.docx
Date 2019-05-28
# DOCUMENT STATUS

## Authors

<table>
<thead>
<tr>
<th>Name</th>
<th>Organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Johan Lindborg (JL)</td>
<td>Saab AB</td>
</tr>
<tr>
<td>Daniel Ferm (DF)</td>
<td>Saab AB</td>
</tr>
<tr>
<td>Mikhail Andrianov (MA)</td>
<td>Transas Marine Limited</td>
</tr>
</tbody>
</table>

## Review

<table>
<thead>
<tr>
<th>Name</th>
<th>Organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Håkan Heurlin (HH)</td>
<td>SMA</td>
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## Approval

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<th>Signature</th>
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## Document History

<table>
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<td>B</td>
<td>2016-03-23</td>
<td>HH</td>
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<td>AIS DAC and FI defined</td>
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<td>D</td>
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<td>E</td>
<td>2017-09-01</td>
<td>HH/DF/P</td>
<td></td>
<td>Annex A and Annex B revised regarding passing of waypoint criteria</td>
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<td>HH/DF/P</td>
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<tr>
<td>G1</td>
<td>2019-05-28</td>
<td>BA</td>
<td></td>
<td>To stop broadcast if speed &lt;1knot for more than 6 min added</td>
</tr>
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1 Sharing and receiving Monitored Routes

This document describes a method for sharing route data between ships, with an STM compliant system using VDES or AIS equipment for communication.

The Route Message Broadcast is used as a means to indicate intended navigation and route information to nearby ships, allowing ships to avoid ending up in a close quarter situation where the involved ships have to comply with the COLREG rules. The current and a fixed number of coming route legs of the monitored route is shared with other ships.

The use of this message requires that both the receiving and transmitting ship has the appropriate communication equipment as well as presentation and navigation systems.
2 System components

2.1 HMI and operational equipment
The Route Message sharing system presentation and is done through an ECDIS or similar system. The ECDIS is also responsible for assembly, disassembly, and interpretation of Route Message data.

*Note: ECDIS in all parts of this document may also be INS or other systems with the STM functional module integrated.*

2.2 Communication Device
The ECDIS shall be connected to a VDES unit supporting both AIS and ASM-channel communication*. This communication device will function only as a modem in this system. The VDES unit shall employ a carrier sense technique to avoid VHF broadcast at the same time and channel as coastal VHF stations. The maximum length of one broadcast shall not exceed three AIS TDMA slots (<80 ms), to ensure compliance to AIS and VDES equipment standards.

*Note: Standalone AIS may be used where VDES is not available. Loss of route message data fidelity will occur (fewer legs and no leg XTD values).*

2.3 Interfaces
The ECDIS shall communicate with the Communication Device using IEC 61162-2 or IEC 61162-450 compliant interfaces.

2.3.1 Data formats
Incoming Data will be presented to the ECDIS using standard VDM messages as defined in above referenced interface standards.

Data sent from ECDIS to the communication device unit shall be using ABM and BBM messages, as defined in the same interface standards.
3 Route Messages

3.1 On-board message flow
The ECDIS initiates any Route Message broadcast to be transmitted by the Communication Device, as well as any Route Message interrogations. The ECDIS will compile the Route Message data payload, or interrogation message payload, as defined in section 4, and send a BBM or ABM message with the payload to the Communication Device.

The Communication Device will provide the ECDIS with VDM-message data as they are received on the VHF data links.

VDM message payloads may be:
- Remote AIS target dynamic, static and voyage data (AIS Msg 1,2,3,5,9,18,19,24A,24B)
- Remote ship route message data (AIS msg 8 or VDES ASM msgs)
- Route Message interrogation messages (AIS msg 6 or VDES ASM msgs)

3.2 Message broadcast trigger events
The message shall be broadcast so that ships in receiving range has accurate information at a reasonable delay, without creating unnecessary load on the VHF datalinks.

A new Route Message broadcast shall be initiated by ECDIS when any of the below events occurs:
- Six minutes have passed since last Route Message broadcast
- A Route Message interrogation was received and over one minute has passed since last Route Message broadcast on that channel
- Any of the data in the last Route Message broadcast has been changed
- When passing a waypoint (after completing the turn, see Annex A for definition)
- The Monitored Route has been deactivated
- A Monitored Route is activated

The Route Message broadcast shall be initiated by the ECDIS as soon as possible after any of the above broadcast triggers.

There shall be no autonomous Route Message broadcasts when there is no Monitored Route active in ECDIS, except for one additional Route Message transmission after stopping a Monitored Route. The system shall however respond to interrogations, with an empty route message. If the ship has had a speed below 1 (one) knot for more than 6 minutes no route message shall be broadcasted

3.3 Route segmentation for AIS broadcasts
The Route Message-payload is defined such that up to seven legs can be shared. The first leg shared during a turn shall be the leg leading up to the turn, otherwise it shall be the current leg. If any of the waypoints within the seven legs are over 200 NM (max ±209.7151°) from the previous waypoint, this will be treated as the last WP in the currently shared monitored route segment, or a virtual FROM waypoint inserted (see 5.2 in Annex A for details).
3.4 Route segmentation for VDES ASM broadcasts

The Route Message-payload is defined such that the current leg as well as up to twelve additional legs can be shared, with Cross Track Distance (XTD) parameters for each leg.
4 Route Message structure

The Route Message structures are defined in the following tables. When no Monitored Route is active, the Route Message shall have an empty payload. Two Route Messages are defined, depending on the communication system used. VDES ASM channel communication allows for a higher bitrate, and more data within the three timeslot limit.

Leg parameters (planned speed, XTD, geometry) are for the leg ending at the waypoint following those parameters. Turn radius is for the next waypoint.

4.1 AIS Route Message

The first and last waypoints are fully qualified, while intermediate waypoints are defined as the difference from the previous waypoint in the route. This way of defining intermediate waypoints saves bits but limits the maximum length of those legs. In cases where representable length is insufficient, the total route segment reported in a message is cut short and the “intermediate” waypoint becomes the last waypoint in the message.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Bits</th>
<th>Description</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message ID</td>
<td>6</td>
<td>Identifier for Message 8; always 8</td>
<td></td>
</tr>
<tr>
<td>Repeat indicator</td>
<td>2</td>
<td>Used by the repeater to indicate how many times a message has been repeated.</td>
<td></td>
</tr>
<tr>
<td>Source ID</td>
<td>30</td>
<td>MMSI number of source station</td>
<td></td>
</tr>
<tr>
<td>Spare</td>
<td>2</td>
<td>Not used. Should be set to zero. Reserved for future use</td>
<td></td>
</tr>
<tr>
<td>DAC</td>
<td>10</td>
<td>DAC = 26510 = 01000010012</td>
<td></td>
</tr>
<tr>
<td>FI</td>
<td>6</td>
<td>Function identifier = 110 = 0000012</td>
<td></td>
</tr>
</tbody>
</table>

If no monitored route is available the message ends here

<table>
<thead>
<tr>
<th>First waypoint type</th>
<th>1</th>
<th>0 = Navigating away from first waypoint (on route) 1 = Navigating towards first waypoint (start of route)</th>
</tr>
</thead>
<tbody>
<tr>
<td>First waypoint longitude</td>
<td>28</td>
<td>Longitude in 1/10 000 min (±180°). East = positive (as per 2's complement), West = negative (as per 2's complement). 181° (6791AC0h) = not available = default)</td>
</tr>
<tr>
<td>First waypoint latitude</td>
<td>27</td>
<td>Latitude in 1/10 000 min (±90°). North = positive (as per 2's complement), South = negative (as per 2's complement). 91° (3412140h) = not available = default)</td>
</tr>
</tbody>
</table>

Intermediate legs (64) Repeats 0 … 6 times depending on total number of legs

<table>
<thead>
<tr>
<th>Leg geometry</th>
<th>1</th>
<th>0 = Loxodrome (Rhumb line) 1 = Orthodrome (Great circle)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planned speed</td>
<td>10</td>
<td>Planned speed over ground in 1/10 knot steps (0-102.2 knots) 1 023 = not available, 1 022 = 102.2 knots or higher</td>
</tr>
<tr>
<td>Turn radius</td>
<td>9</td>
<td>Turn radius in 1/100 NM. 0 = not available Max 5.11 NM</td>
</tr>
<tr>
<td>Longitude delta</td>
<td>22</td>
<td>Longitude difference from previous waypoint in 1/10 000 min. East = positive, West = negative (as per 2's complement). Max ±209.7151'</td>
</tr>
<tr>
<td>Latitude delta</td>
<td>22</td>
<td>Latitude difference from previous waypoint in 1/10 000 min. East = positive, West = negative (as per 2's complement). Max ±209.7151'</td>
</tr>
</tbody>
</table>

Final reported leg (66)

<table>
<thead>
<tr>
<th>Leg geometry</th>
<th>1</th>
<th>0 = Loxodrome (Rhumb line) 1 = Orthodrome (Great circle)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planned speed</td>
<td>10</td>
<td>Planned speed over ground in 1/10 knot steps (0-102.2 knots) 1 023 = not available, 1 022 = 102.2 knots or higher</td>
</tr>
</tbody>
</table>
### Parameter Bits Description Comment

<table>
<thead>
<tr>
<th>Last waypoint longitude</th>
<th>28</th>
<th>Longitude in 1/10 000 min (±180°, East = positive (as per 2’s complement), West = negative (as per 2’s complement). 181° = (6791AC0h) = not available = default)</th>
<th>Standard AIS format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last waypoint latitude</td>
<td>27</td>
<td>Latitude in 1/10 000 min (±90°, North = positive (as per 2’s complement), South = negative (as per 2’s complement). 91° (3412140h) = not available = default)</td>
<td>Standard AIS format</td>
</tr>
</tbody>
</table>

| Steering mode | 2 | 0 = Manual (default)  
1 = Heading control  
2 = Track control  
3 = Reserved for future use |  |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Spare</td>
<td>4</td>
<td>Padding to bring total message length to a byte boundary. Always 0</td>
<td>Required for AIS</td>
</tr>
</tbody>
</table>

### 4.2 VDES ASM Route Message

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Bits</th>
<th>Description</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message ID</td>
<td>6</td>
<td>Identifier for Message 8; always 8</td>
<td>To be defined by VDES standard</td>
</tr>
<tr>
<td>Repeat indicator</td>
<td>2</td>
<td>Used by the repeater to indicate how many times a message has been repeated.</td>
<td></td>
</tr>
<tr>
<td>Source ID</td>
<td>30</td>
<td>MMSI number of source station</td>
<td></td>
</tr>
<tr>
<td>Spare</td>
<td>2</td>
<td>Not used. Should be set to zero. Reserved for future use</td>
<td></td>
</tr>
<tr>
<td>DAC</td>
<td>10</td>
<td>DAC = 26510 = 01000010012</td>
<td></td>
</tr>
<tr>
<td>FI</td>
<td>6</td>
<td>Function identifier = 210 = 000010 2</td>
<td></td>
</tr>
</tbody>
</table>

**If no monitored route is available the message ends here**

| First waypoint type       | 1   | 0 = Navigating away from first waypoint (on route)  
1 = Navigating towards first waypoint (start of route) | Standard AIS format |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>First waypoint longitude</td>
<td>28</td>
<td>Longitude in 1/10 000 min (±180°, East = positive (as per 2’s complement), West = negative (as per 2’s complement). 181° = (6791AC0h) = not available = default)</td>
<td>Standard AIS format</td>
</tr>
<tr>
<td>First waypoint latitude</td>
<td>27</td>
<td>Latitude in 1/10 000 min (±90°, North = positive (as per 2’s complement), South = negative (as per 2’s complement). 91° (3412140h) = not available = default)</td>
<td>Standard AIS format</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intermediate legs (97)</th>
<th>Repeats 0 … 12 times depending on total number of legs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>XTD port side</td>
<td>11</td>
<td>XTD port side in 1/1000 NM. 0 = not available</td>
</tr>
<tr>
<td>XTD starboard</td>
<td>11</td>
<td>XTD starboard in 1/1000 NM. 0 = not available</td>
</tr>
</tbody>
</table>
| Leg geometry          | 1   | 0 = Loxodrome (Rhumb line)  
1 = Orthodrome (Great circle) | Standard AIS format |
| Planned speed          | 10  | Planned speed over ground in 1/10 knot steps (0-102.2 knots)  
1 023 = not available, 1 022 = 102.2 knots or higher | Standard AIS format |
| Turn radius            | 9   | Turn radius in 1/100 NM. 0 = not available | Max 5.11 NM                                |
| Waypoint longitude     | 28  | Longitude in 1/10 000 min (±180°, East = positive (as per 2’s complement), West = negative (as per 2’s complement). 181° = (6791AC0h) = not available = default) | Standard AIS format |
| Waypoint latitude      | 27  | Latitude in 1/10 000 min (±90°, North = positive (as per 2’s complement), South = negative (as per 2’s complement). 91° (3412140h) = not available = default) | Standard AIS format |

| Final reported leg (88) |                                              |                                              |
### Parameter Table

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Bits</th>
<th>Description</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>XTD port side</td>
<td>11</td>
<td>XTD port side in 1/1000 NM. 0 = not available</td>
<td>Max 2.047 NM</td>
</tr>
<tr>
<td>XTD starboard</td>
<td>11</td>
<td>XTD starboard in 1/1000 NM. 0 = not available</td>
<td>Max 2.047 NM</td>
</tr>
<tr>
<td>Leg geometry</td>
<td>1</td>
<td>0 = Loxodrome (Rhumb line)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 = Orthodrome (Great circle)</td>
<td></td>
</tr>
<tr>
<td>Planned speed</td>
<td>10</td>
<td>Planned speed over ground in 1/10 knot steps (0-102.2 knots)</td>
<td>Standard AIS format</td>
</tr>
<tr>
<td>Last waypoint longitude</td>
<td>28</td>
<td>Longitude in 1/10 000 min (±180°, East = positive (as per 2’s complement), West = negative (as per 2’s complement). 181° = (6791AC0h) = not available = default)</td>
<td>Standard AIS format</td>
</tr>
<tr>
<td>Last waypoint latitude</td>
<td>27</td>
<td>Latitude in 1/10 000 min (±90°, North = positive (as per 2’s complement), South = negative (as per 2’s complement). 91° = (3412140h) = not available = default)</td>
<td>Standard AIS format</td>
</tr>
<tr>
<td>Steering mode</td>
<td>2</td>
<td>0 = Manual (default)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 = Heading control</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 = Track control</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 = Reserved for future use</td>
<td></td>
</tr>
<tr>
<td>Spare</td>
<td>0..7</td>
<td>Padding to bring total message length to a byte boundary. Always 0</td>
<td>For byte alignment</td>
</tr>
</tbody>
</table>

### 4.3 Interrogation

Standard AIS/VDES interrogation for a specific functional message shall be used to initiate a request of a Route Message from a remote ship. The reply shall always be as defined above (broadcast), to allow all ships within range to receive the message. The reply should be sent with empty content when there is no monitored route in use.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Bits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message ID</td>
<td>6</td>
<td>Identifier for Message 6; always 6</td>
</tr>
<tr>
<td>Repeat indicator</td>
<td>2</td>
<td>Used by the repeater to indicate how many times a message has been repeated.</td>
</tr>
<tr>
<td>Source ID</td>
<td>30</td>
<td>MMSI number of source station</td>
</tr>
<tr>
<td>Sequence number</td>
<td>2</td>
<td>0-3</td>
</tr>
<tr>
<td>Destination ID</td>
<td>30</td>
<td>MMSI number of destination station</td>
</tr>
<tr>
<td>Retransmit flag</td>
<td>1</td>
<td>Retransmit flag should be set upon retransmission: 0 = no retransmission = default; 1 = retransmitted</td>
</tr>
<tr>
<td>Spare</td>
<td>1</td>
<td>Not used. Should be zero</td>
</tr>
<tr>
<td>DAC</td>
<td>10</td>
<td>International DAC = 1_{10} = 00000000001_{2}</td>
</tr>
<tr>
<td>FI</td>
<td>6</td>
<td>Function identifier = 2_{10} = 000001_{2}</td>
</tr>
<tr>
<td>Requested DAC code</td>
<td>10</td>
<td>DAC = 265_{10} = 01000010001_{2}</td>
</tr>
<tr>
<td>Requested FI code</td>
<td>6</td>
<td>Function identifier = 1_{10} = 000001_{2} or Function identifier = 2_{10} = 000010_{2}</td>
</tr>
<tr>
<td>Total length</td>
<td>104</td>
<td>The resulting Message 6 occupies 1 slot.</td>
</tr>
</tbody>
</table>
5 ANNEX A – AIS Route Broadcast Logic

5.1 Standard AIS Route Broadcasts

Standard AIS route broadcast are used when all route segments are less than delta LAT & LON limits (max ±209.7151°), otherwise see 5.2 nedan.

Regular Conditions

Transmitter (ECDIS)

Receiver (ECDIS): Transmitting ship at step 1

Legend:

- WP1, WP2, WP3, WP4: Waypoint ID
- SOT Line: ‘Start Of Turn’ point
- EOT Line: ‘End of Turn’ point
- Curve (Turn Radius) segment

Step 1. Own ship position is on the straight part of leg. Transmitter (ECDIS) uses the standard broadcast trigger events:
- FIRST WP: “WP0”
- Following WPs: Max 7 Waypoints / 6 Route legs ahead, including turn radiiuses (if available).

Step 2. Own ship passing ‘SOT’ (Start Of Turn line):
- No additional broadcast event.
Step 3. Own ship sailing on curve (i.e. on turn radius). No additional broadcast events, except the periodic broadcast interval (*every 6 minutes*) which may be reached since last Route Message broadcast, in that case (same as Step 1):
- FIRST WP: “WP0”
- Following WPs: Max 7 Waypoints / 6 Route legs ahead, including turn radiiuses (if available).

**Receiver (ECDIS): Transmitting ship at step 3**

Step 4. Own ship passing ‘EOT’ (End Of Turn line). The ‘WP passing’ event is triggered, resulting in:
- FIRST WP: “WP1”
- Following WPs: Max 7 Waypoints / 6 Route legs ahead, including turn radiiuses (if available).
- Previous “WP0” is not broadcast anymore and removed from the receiver ECDIS chart area including the WP1 radius.

**Receiver (ECDIS): Transmitting ship at step 5**

Step 5. Same as Step 1 above.
5.2 AIS Route Exceptions for Long Legs

Due to the AIS Route message representation of intermediate waypoints in delta LAT & LON format very long legs (> ±209.7151') must be reported differently. Depending on the ship position either the broadcast AIS route contains fewer legs, or a virtual waypoint on the current leg is used to allow additional legs to be reported, in accordance the sections below. The virtual waypoint shall be inserted on the current leg so that future legs can be reported in ample time before reaching them, ideally as far away from the leg end waypoint as the delta LAT & LON format (≤ ±209.7151') allows.

5.2.1 Length of the current route leg is more than delta LAT & LON limits. Own ship distance to WP1 is more than delta LAT & LON limits.

**WP0-WP1: Delta LAT & LON > ±209.7151’**

**Transmitter (ECDIS)**

**Step 1.** Own ship position is on the straight leg, WP0-WP1 delta LAT & LON > ±209.7151’. Ship’s distance to WP1 is also more than LAT & LON > ±209.7151’. Transmitter (ECDIS) uses the standard broadcast trigger events *(every 6 minutes)*. AIS Route Message broadcast:
- FIRST WP: "WP0"
- LAST WP: "WP1"
5.2.2 Length of the current route leg is more than delta LAT & LON limits. Own ship distance to WP1 is less than delta LAN & LON limits. WP1-WP2 delta LAT & LON > ±209.7151’ limits.

\[ \text{WP0-WP1: Delta LAT & LON > ±209.7151’} \]
\[ \text{WP1-WP2: Delta LAT & LON > ±209.7151’} \]

**Transmitter (ECDIS)**

**Receiver (ECDIS): Transmitting ship at step 1**

**Step 1.** A regular broadcast event occurs and the own ship has passed the Virtual Waypoint (the ship’s distance to Waypoint 1 is less than LAT & LON ±209.7151’). There shall be no additional broadcast due to passing the Virtual Waypoint, but any broadcast after passing the waypoint shall use the Virtual Waypoint as the FIRST WP:

- FIRST WP: “VWP”
- SECOND WP: “WP1”, delta LAT & LON between VWP and WP1 is less than ±209.7151’
- LAST WP: “WP2”

**Step 2.** Own ship passing ‘SOT’ (Start Of Turn line):

- No additional broadcast event.

**Step 3.** Own ship sailing on curve (i.e. on turn radius). No additional broadcast events, except the periodic broadcast interval (every 6 minutes) which may be reached since last Route Message broadcast, in that case:

- FIRST WP: “VWP”
- SECOND WP: “WP1”, delta LAT & LON between VWP and WP1 is less than ±209.7151’
- LAST WP: “WP2”

**Step 4.** Own ship passing ‘EOT’ (End Of Turn line). The ‘WP passing’ event is triggered resulting in:

- FIRST WP: “WP1”
- LAST WP: “WP2”, no more waypoints because delta LAT & LON between WP1 and WP2 is more than ±209.7151’
- Previous “VWP” is not broadcast anymore and removed from the receiver ECDIS chart area including the WP1 radius.

**Step 5.** Same as 5.2.1 ovan.

**5.2.3 Length of the current route leg is more than delta LAT & LON limits.**
**Own ship distance to WP1 is less than delta LAT & LON limits.**
WP1-WP2 delta LAT & LON is less than ±209.7151’ limits.

**WP0-WP1: Delta LAT & LON > ±209.7151’**

**Transmitter (ECDIS)**

**Receiver (ECDIS): Transmitting ship at step 1**

**Step 1.** A regular broadcast event occurs and the own ship has passed the Virtual Waypoint (the ship’s distance to Waypoint 1 is less than LAT & LON ±209.7151’). There shall be no additional broadcast due to passing the Virtual Waypoint, but any broadcast after passing the waypoint shall use the Virtual Waypoint as the FIRST WP:
- FIRST WP: “VWP”
- Following WPs: Max 7 Waypoints / 6 Route legs ahead, including turn radiuses (if available).

**Step 2.** Own ship passing ‘SOT’ (Start Of Turn line):
- No additional broadcast event.

**Step 3.** Own ship sailing on curve (i.e. on turn radius). No additional broadcast event, except the periodic broadcast interval (every 6 minutes) which may be reached since last Route Message broadcast, in that case:
- FIRST WP: “VWP”
- Following WPs: Max 7 Waypoints / 6 Route legs ahead, including turn radiuses (if available).
Step 4. Own ship passing ‘EOT’ (End Of Turn line). The ‘WP passing’ event is triggered, resulting in:
- FIRST WP: “WP1”
- Following WPs: Max 7 Waypoints / 6 Route legs ahead, including turn radiuses (if available).
- Previous “VWP” is not broadcast anymore and removed from the receiver ECDIS chart area including the WP1 radius.

Receiver (ECDIS): Transmitting ship at step 5

Step 5. Standard broadcast rules, see 5.1 ovan.
6 ANNEX B – VDES ASM Route Broadcast Logic

Regular Conditions

Transmitter (ECDIS)

Receiver (ECDIS): Transmitting ship at step 1

Legend:

<table>
<thead>
<tr>
<th>WP1</th>
<th>WP1</th>
<th>Waypoint ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOT Line</td>
<td>EOT Line</td>
<td></td>
</tr>
<tr>
<td>Curve (Turn Radius) segment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ownship positions (Steps)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Step 1.** Own ship position is on the straight leg. Transmitter (ECDIS) uses the standard broadcast trigger events.
- FIRST WP: “WP0”
- Following WPs: Max 13 Waypoints / 12 Route legs ahead, including Port & Starboard cross track distances and turn radiuses (if available).

**Step 2.** Own ship passing ‘SOT’ (Start Of Turn line):
- No additional broadcast event.

**Step 3.** Own ship sailing on curve (i.e. on turn radius). No additional broadcast event, except the periodic broadcast interval (*every 6 minutes*) which may be reached since last Route Message broadcast, in that case:
- FIRST WP: “WP0”
- Following WPs: Max 13 Waypoints / 12 Route legs ahead, including Port & Starboard cross track distances and turn radiuses (if available).
Receiver (ECDIS): Transmitting ship at step 3

**Step 4.** Own ship passing ‘EOT’ (End Of Turn line). The ‘WP passing’ event is triggered, resulting in:
- FIRST WP: “WP1”
- Following WPs: Max 13 Waypoints / 12 Route legs ahead, including Port & Starboard cross track distances and turn radiuses (if available).
- Previous “WP0” is not broadcast anymore and removed from the receiver ECDIS chart area including the WP1 radius.

Receiver (ECDIS): Transmitting ship at step 5

**Step 5.** Same as Step 1 above.
39 partners from 13 countries containerising maritime information

Demonstrating the function and business value of the Sea Traffic Management concept and its services.

Seaing is believing!

SAFETY - ENVIRONMENT - EFFICIENCY

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Connecting Europe Facility
Authors

<table>
<thead>
<tr>
<th>Name</th>
<th>Organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per Löfbom</td>
<td>SMA</td>
</tr>
<tr>
<td>Mikael Olofsson</td>
<td>SMA</td>
</tr>
<tr>
<td>Per de Flon</td>
<td>SMA</td>
</tr>
<tr>
<td>Mattias Johansson</td>
<td>SMA</td>
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</tbody>
</table>

Document History

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Initials</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Version 1.1</td>
<td>20160914</td>
<td>MO, PL, PD</td>
<td>Created based on VIS Specification 2.0</td>
</tr>
<tr>
<td>Version 1.2</td>
<td>20170105</td>
<td>MO, PL, PD, MJ</td>
<td>Modified to align with VIS Specification 2.1</td>
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<tr>
<td>Version 1.3</td>
<td>20170518</td>
<td>MO, PL, PD, MJ</td>
<td>Added the following elements:</td>
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<td></td>
<td></td>
<td></td>
<td>informationObjectReferenceType</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>validityPeriodStart</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>validityPeriodStop</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Added textMessageId regex condition in MRN format</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Added surface element to cope with circle</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Minor patches to above changes.</td>
</tr>
</tbody>
</table>

Review

<table>
<thead>
<tr>
<th>Name</th>
<th>Organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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1 Introduction

1.1 Release Notes
The text message schema is modified not to reference S100/ S124 schema for describing area element. This aims to reduce the complexity of implementing the text message. The naming, formats and constraints of included area elements are limited to only use point, polygon and circle element identical to what is specified in S100/ S124 schema.

1.2 Intended use
The text message is a lightweight message intended to be used in communication between Voyage Information Services implemented in STM. Normally a text message is submitted as a complement in sending voyage plans between different parties in STM.

1.3 Description
The contents of a text message is similar to that of a normal email where optionally position and/ or area information are added in a structured way.

The structure of the textMessageId follows MRN guideline.

\[urn:mm:<governing organization>:txt:<own organization>:identity number\]

Example:

\[urn:mm:stm:txt:sma:20170510104400-1\]
2 Text Message Schema

schema location: http://s3-eu-west-1.amazonaws.com/stm-stmvalidation/uploads/20161118115716/textMessageSchema_1.3.xsd

attributeFormDefault: qualified
elementFormDefault: qualified
targetNamespace: http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd

Elements
- textMessage

Complex types
- GM_Point
- GM_Surface
- S100_CircleByCenterPointType

Simple types
- BearingType
- DateTimeUTC
- informationObjectTypeEnum
- LatitudeType
- LongitudeType
- positiveDouble
- textMessageURN

element textMessage
<table>
<thead>
<tr>
<th>property</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>namespace</td>
<td><a href="http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd">http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd</a></td>
</tr>
<tr>
<td>properties</td>
<td>content complex</td>
</tr>
<tr>
<td>children</td>
<td>textMessageId informationObjectReferenceId informationObjectReferenceType validityPeriodStart validityPeriodStop author from serviceType createdAt subject body position area</td>
</tr>
</tbody>
</table>

```xml
<xs:element name="textMessage">
  <xs:complexType>
    <xs:sequence>
      <xs:element name="textMessageId" type="textMessageURN" minOccurs="1" maxOccurs="1">
        <xs:annotation>
          <xs:documentation>Identifier of the text message, mandatory.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="informationObjectReferenceId" type="xs:string" minOccurs="0" maxOccurs="1">
        <xs:annotation>
          <xs:documentation>A reference to an information object, optional.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="informationObjectReferenceType" type="informationObjectTypeEnum" minOccurs="0" maxOccurs="1">
        <xs:annotation>
          <xs:documentation>STM payload format reference, optional.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="validityPeriodStart" type="DateTimeUTC" minOccurs="0" maxOccurs="1">
        <xs:annotation>
          <xs:documentation>Start of validity period in ISO 8601 format, optional.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="validityPeriodStop" type="DateTimeUTC" minOccurs="0" maxOccurs="1">
        <xs:annotation>
          <xs:documentation>Stop of validity period in ISO 8601 format, optional.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="author" type="xs:string" minOccurs="1">
        <xs:annotation>
          <xs:documentation>The message author, mandatory.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="from" type="xs:string" minOccurs="1">
        <xs:annotation>
          <xs:documentation>Document not provided.</xs:documentation>
        </xs:annotation>
      </xs:element>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```
<xs:documentation>The sending actor, mandatory.</xs:documentation>
</xs:element>
<xs:element name="serviceType" type="xs:string" minOccurs="0" maxOccurs="1">
<xs:annotation>
<xs:documentation>The service type of the sender, optional.</xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="createdAt" type="DateTimeUTC">
<xs:annotation>
<xs:documentation>The message creation dateTime, mandatory.</xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="subject" type="xs:string">
<xs:annotation>
<xs:documentation>The message subject, mandatory.</xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="body" type="xs:string">
<xs:annotation>
<xs:documentation>The message body, mandatory.</xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="position" type="GM_Point" minOccurs="0" maxOccurs="1">
<xs:annotation>
<xs:documentation>Geographic point, optional.</xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="area" type="GM_Surface" minOccurs="0" maxOccurs="1">
<xs:annotation>
<xs:documentation>Geographic area, optional.</xs:documentation>
</xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>

<table>
<thead>
<tr>
<th>element</th>
<th>textMessage/textMessageId</th>
</tr>
</thead>
<tbody>
<tr>
<td>diagram</td>
<td><a href="http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd">http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd</a></td>
</tr>
<tr>
<td>type</td>
<td>textMessageURN</td>
</tr>
<tr>
<td>properties</td>
<td>content simple</td>
</tr>
<tr>
<td>facets</td>
<td>Kind  Value Annotation</td>
</tr>
<tr>
<td>maxLength</td>
<td>120</td>
</tr>
<tr>
<td>-----------</td>
<td>-----</td>
</tr>
<tr>
<td>pattern</td>
<td>urn:mm:stm:bt:[0-9a-zA-Z:+_-]+</td>
</tr>
</tbody>
</table>

**annotation documentation**
Identifier of the text message, mandatory.

**source**
```xml
<xs:element name="textMessageId" type="textMessageURN" minOccurs="1" maxOccurs="1">
    <xs:annotation>
        <xs:documentation>Identifier of the text message, mandatory.</xs:documentation>
    </xs:annotation>
</xs:element>
```

**element** `textMessage/informationObjectReferenceId`

**diagram**
![Diagram](http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd)

**namespace**
http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd

**type** xs:string

**properties**
- minOccurs: 0
- maxOccurs: 1
- content: simple

**annotation documentation**
A reference to an information object, optional.

**source**
```xml
<xs:element name="informationObjectReferenceId" type="xs:string" minOccurs="0" maxOccurs="1">
    <xs:annotation>
        <xs:documentation>A reference to an information object, optional.</xs:documentation>
    </xs:annotation>
</xs:element>
```

**element** `textMessage/informationObjectReferenceType`

**diagram**
![Diagram](http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd)

**namespace**
http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd

**type** informationObjectTypeEnum

**properties**
- minOccurs: 0
- maxOccurs: 1
- content: simple

**facets**
- Kind: Value Annotation
  - enumeration: RTZ
  - enumeration: S124
  - enumeration: TXT

**annotation documentation**
STM payload format reference, optional.

**source**
```xml
<xs:element name="informationObjectReferenceType" type="informationObjectTypeEnum" minOccurs="0" maxOccurs="1">
    <xs:annotation>
</xs:annotation>
```
element `textMessage/validityPeriodStart`

<table>
<thead>
<tr>
<th>diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Diagram" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>namespace</th>
<th><a href="http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd">http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>type</td>
<td><code>DateTimeUTC</code></td>
</tr>
<tr>
<td>properties</td>
<td><code>minOcc</code> 0, <code>maxOcc</code> 1, <code>content</code> simple</td>
</tr>
<tr>
<td>facets</td>
<td>Kind: Value, Annotation: pattern: <code>.*Z</code></td>
</tr>
<tr>
<td>annotation</td>
<td>documentation, Start of validity period in ISO 8601 format, optional.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>source</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>&lt;xs:element name=&quot;validityPeriodStart&quot; type=&quot;DateTimeUTC&quot; minOcc=&quot;0&quot; maxOcc=&quot;1&quot;&gt;</code></td>
</tr>
<tr>
<td><code>&lt;xs:annotation&gt;</code></td>
</tr>
<tr>
<td><code>&lt;xs:documentation&gt;</code></td>
</tr>
<tr>
<td>Start of validity period in ISO 8601 format, optional.</td>
</tr>
<tr>
<td><code>&lt;xs:documentation&gt;</code></td>
</tr>
<tr>
<td><code>&lt;xs:annotation&gt;</code></td>
</tr>
<tr>
<td><code>&lt;/xs:element&gt;</code></td>
</tr>
</tbody>
</table>

---

element `textMessage/validityPeriodStop`

<table>
<thead>
<tr>
<th>diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Diagram" /></td>
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</table>

<table>
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<tr>
<th>namespace</th>
<th><a href="http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd">http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>type</td>
<td><code>DateTimeUTC</code></td>
</tr>
<tr>
<td>properties</td>
<td><code>minOcc</code> 0, <code>maxOcc</code> 1, <code>content</code> simple</td>
</tr>
<tr>
<td>facets</td>
<td>Kind: Value, Annotation: pattern: <code>.*Z</code></td>
</tr>
<tr>
<td>annotation</td>
<td>documentation, Stop of validity period in ISO 8601 format, optional.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>source</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>&lt;xs:element name=&quot;validityPeriodStop&quot; type=&quot;DateTimeUTC&quot; minOcc=&quot;0&quot; maxOcc=&quot;1&quot;&gt;</code></td>
</tr>
<tr>
<td><code>&lt;xs:annotation&gt;</code></td>
</tr>
<tr>
<td><code>&lt;xs:documentation&gt;</code></td>
</tr>
<tr>
<td>Stop of validity period in ISO 8601 format, optional.</td>
</tr>
<tr>
<td><code>&lt;xs:documentation&gt;</code></td>
</tr>
<tr>
<td><code>&lt;xs:annotation&gt;</code></td>
</tr>
<tr>
<td><code>&lt;/xs:element&gt;</code></td>
</tr>
</tbody>
</table>
element `textMessage/author`

```xml
<xs:element name="author" type="xs:string" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>The message author, mandatory.</xs:documentation>
  </xs:annotation>
</xs:element>
```

**Diagram**

```
name
```

**Namespace**

http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd

**Type**

`xs:string`

**Properties**

- content: simple

**Annotation**

Documentation: The message author, mandatory.

**Source**

```xml
<xs:element name="author" type="xs:string" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>The message author, mandatory.</xs:documentation>
  </xs:annotation>
</xs:element>
```

element `textMessage/from`

```xml
<xs:element name="from" type="xs:string" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>The sending actor, mandatory.</xs:documentation>
  </xs:annotation>
</xs:element>
```

**Diagram**

```
name
```

**Namespace**

http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd

**Type**

`xs:string`

**Properties**

- content: simple

**Annotation**

Documentation: The sending actor, mandatory.

**Source**

```xml
<xs:element name="from" type="xs:string" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>The sending actor, mandatory.</xs:documentation>
  </xs:annotation>
</xs:element>
```

element `textMessage/serviceType`

```xml
<xs:element name="serviceType" type="xs:string">
  <xs:annotation>
    <xs:documentation>The service type of the message, mandatory.</xs:documentation>
  </xs:annotation>
</xs:element>
```

**Diagram**

```
name
```

**Namespace**

http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd

**Type**

`xs:string`

**Properties**

- minOccurs: 0
- maxOccurs: 1
- content: simple

**Annotation**

Documentation: The service type of the message, mandatory.
The service type of the sender, optional.

```xml
<xs:element name="serviceType" type="xs:string" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>The service type of the sender, optional.</xs:documentation>
  </xs:annotation>
</xs:element>
```

**element** `textMessage/createdAt`

**namespace** http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd

**type** `DateTimeUTC`

**properties**
- content `simple`

**facets**
- Kind: Annotation
- Pattern: Z

**annotation**
- documentation: The message creation dateTime, mandatory.

```xml
<xs:element name="createdAt" type="DateTimeUTC">
  <xs:annotation>
    <xs:documentation>The message creation dateTime, mandatory.</xs:documentation>
  </xs:annotation>
</xs:element>
```

**element** `textMessage/subject`

**namespace** http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd

**type** `xs:string`

**properties**
- content `simple`

**annotation**
- documentation: The message subject, mandatory.

```xml
<xs:element name="subject" type="xs:string">
  <xs:annotation>
    <xs:documentation>The message subject, mandatory.</xs:documentation>
  </xs:annotation>
</xs:element>
```

**element** `textMessage/body`

**diagram**

**namespace** http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd

**type**

**properties**
- content `simple`

**annotation**
- documentation: The message body, mandatory.

```xml
<xs:element name="body">
  <xs:annotation>
    <xs:documentation>The message body, mandatory.</xs:documentation>
  </xs:annotation>
</xs:element>
```
namespace http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd
type xs:string
properties content simple
annotation documentation The message body, mandatory.
source
  <xs:element name="body" type="xs:string">
    <xs:annotation>
      <xs:documentation>The message body, mandatory.</xs:documentation>
    </xs:annotation>
  </xs:element>

element textMessage/position
diagram

namespace http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd
type GM_Point
properties minOcc 0 maxOcc 1 content complex
attributes Name lat Type LatitudeType Use required Default Required Fixed Annotation documentation Latitude in degrees.
lon Type LongitudeType required
annotation documentation Geographic point, optional.
source
  <xs:element name="position" type="GM_Point" minOccurs="0" maxOccurs="1">
    <xs:annotation>
      <xs:documentation>Geographic point, optional.</xs:documentation>
    </xs:annotation>
  </xs:element>

element textMessage/area
diagram

namespace http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd
type GM_Surface
properties minOcc 0 maxOcc 1 content complex
### complexType `GM_Point`

<table>
<thead>
<tr>
<th>diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Diagram" /></td>
</tr>
</tbody>
</table>

#### namespace

http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd

#### used by
elements: `textMessage/position S100_CircleByCenterPointType/position`

#### attributes

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Use</th>
<th>Default</th>
<th>Fixed</th>
<th>Annotation</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>lat</code></td>
<td><code>LatitudeType</code></td>
<td>required</td>
<td>Fixed</td>
<td>Annotation documentation</td>
<td>Longitude in degrees.</td>
</tr>
<tr>
<td><code>lon</code></td>
<td><code>LongitudeType</code></td>
<td>required</td>
<td>Fixed</td>
<td>Annotation documentation</td>
<td>Longitude in degrees.</td>
</tr>
</tbody>
</table>

#### source

```xml
<xs:complexType name="GM_Point">
  <xs:attribute name="lat" type="LatitudeType" use="required">
    <xs:annotation>
      <xs:documentation>Latitude in degrees.</xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="lon" type="LongitudeType" use="required">
    <xs:annotation>
      <xs:documentation>Longitude in degrees.</xs:documentation>
    </xs:annotation>
  </xs:attribute>
</xs:complexType>
```

### attribute `GM_Point/@lat`

<table>
<thead>
<tr>
<th>type</th>
<th><code>LatitudeType</code></th>
</tr>
</thead>
</table>

#### properties

<table>
<thead>
<tr>
<th>use</th>
<th>required</th>
</tr>
</thead>
</table>

#### facets

<table>
<thead>
<tr>
<th>Kind</th>
<th>Value</th>
<th>Annotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>minInclusive</td>
<td>-90.0</td>
<td>Longitude in degrees.</td>
</tr>
<tr>
<td>maxInclusive</td>
<td>90.0</td>
<td>Longitude in degrees.</td>
</tr>
</tbody>
</table>

#### annotation
documentation
Longitude in degrees.

#### source

```xml
<xs:attribute name="lat" type="LatitudeType" use="required">
  <xs:annotation>
    <xs:documentation>Latitude in degrees.</xs:documentation>
  </xs:annotation>
</xs:attribute>
```
attribute `GM_Point/@lon`

<table>
<thead>
<tr>
<th>type</th>
<th>LongitudeType</th>
</tr>
</thead>
<tbody>
<tr>
<td>properties</td>
<td></td>
</tr>
<tr>
<td>use</td>
<td>required</td>
</tr>
<tr>
<td>facets</td>
<td></td>
</tr>
<tr>
<td>Kind</td>
<td>Value</td>
</tr>
<tr>
<td>minInclusive</td>
<td>-180.0</td>
</tr>
<tr>
<td>maxInclusive</td>
<td>180.0</td>
</tr>
<tr>
<td>annotation</td>
<td>documentation</td>
</tr>
<tr>
<td></td>
<td>Longitude in degrees.</td>
</tr>
</tbody>
</table>

source

```xml
<xs:attribute name="lon" type="LongitudeType" use="required">
  <xs:annotation>
    <xs:documentation>
      Longitude in degrees.
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
```

complexType `GM_Surface`

namespace `http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd`

children

- Polygon
- Circle

used by

- `textMessage/area`

source

```xml
<xs:complexType name="GM_Surface">
  <xs:sequence>
    <xs:element name="Polygon" minOccurs="0">
      <xs:complexType>
        <xs:sequence>
          <xs:element name="posList" type="xs:string">
            <xs:annotation>
              <xs:documentation>
                posList instances (and other instances with the content model specified by DirectPositionListType) hold the coordinates for a sequence of direct positions within the same coordinate reference system (CRS). If no srsName attribute is given, the CRS shall be specified as part of the larger context this geometry element is part of, typically a geometric object like a point, curve, etc. The optional attribute count specifies the number of direct positions in the list. If the attribute count is present then the attribute srsDimension shall be present, too. The number of entries in the list is equal to the product of the attribute count and the attribute srsDimension.
              </xs:documentation>
            </xs:annotation>
          </xs:element>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```
of the dimensionality of the coordinate reference system (i.e. it is a derived value of the coordinate reference system definition) and the number of direct positions.

.XML element

The attribute gml:id supports provision of a handle for the XML element representing a GML Object. Its use is optional for all GML objects.

Positive integer

Any URI

Circle type="S100_CircleByCenterPointType" minOccurs="0"/>
element GM_Surface/Polygon

namespace http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd

properties
- minOcc: 0
- maxOcc: 1
- content: complex

children
- posList

attributes
- id: xs:string
  - The attribute gml:id supports provision of a handle for the XML element representing a GML Object. Its use is optional for all GML objects.
- count: xs:unsignedInt
  - The number of direct positions in the list
source

```xml
<xs:element name="Polygon" minOccurs="0">
  <xs:complexType>
    <xs:sequence>
      <xs:element name="posList" type="xs:string">
        <xs:annotation>
          <xs:documentation>
            posList instances (and other instances with the content model specified by DirectPositionListType) hold the coordinates for a sequence of direct positions within the same coordinate reference system (CRS). If no srsName attribute is given, the CRS shall be specified as part of the larger context this geometry element is part of, typically a geometric object like a point, curve, etc. The optional attribute count specifies the number of direct positions in the list. If the attribute count is present then the attribute srsDimension shall be present, too. The number of entries in the list is equal to the product of the dimensionality of the coordinate reference system (i.e. it is a derived value of the coordinate reference system definition) and the number of direct positions.
          </xs:documentation>
        </xs:annotation>
      </xs:element>
    </xs:sequence>
    <xs:attribute name="id" type="xs:string">
      <xs:annotation>
        <xs:documentation>
          The attribute gml:id supports provision of a handle for the XML element representing a GML Object. Its use is optional for all GML objects.
        </xs:documentation>
      </xs:annotation>
    </xs:attribute>
    <xs:attribute name="count" type="xs:unsignedInt">
      <xs:annotation>
      </xs:annotation>
    </xs:attribute>
  </xs:complexType>
</xs:element>
```
attribute GM_Surface/Polygon/@id

type  | xs:string

annotation  
documentation  
The attribute gml:id supports provision of a handle for the XML element representing a GML Object. Its use is optional for all GML objects.

source  
<xs:attribute name="id" type="xs:string">
  <xs:annotation>
    <xs:documentation>
      The attribute gml:id supports provision of a handle for the XML element representing a GML Object. Its use is optional for all GML objects.
    </xs:documentation>
  </xs:annotation>
</xs:attribute>

attribute GM_Surface/Polygon/@count

type  | xs:unsignedInt

annotation  
documentation  
The number of direct positions in the list

source  
<xs:attribute name="count" type="xs:unsignedInt">
  <xs:annotation>
    <xs:documentation>
      The number of direct positions in the list
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
The number of direct positions in the list
  </xs:documentation>
</xs:annotation>
</xs:attribute>

attribute GM_Surface/Polygon/@srsDimension

<table>
<thead>
<tr>
<th>type</th>
<th>xs:unsignedShort</th>
</tr>
</thead>
<tbody>
<tr>
<td>properties</td>
<td>default 2</td>
</tr>
<tr>
<td>annotation</td>
<td>documentation</td>
</tr>
<tr>
<td></td>
<td>Positive integer</td>
</tr>
</tbody>
</table>

source

<x:s:attribute name="srsDimension" type="xs:unsignedShort" default="2">
  <xs:annotation>
    <xs:documentation>
      Positive integer
    </xs:documentation>
  </xs:annotation>
</xs:attribute>

attribute GM_Surface/Polygon/@srsName

<table>
<thead>
<tr>
<th>type</th>
<th>xs:string</th>
</tr>
</thead>
<tbody>
<tr>
<td>annotation</td>
<td>documentation</td>
</tr>
<tr>
<td></td>
<td>Any URI</td>
</tr>
</tbody>
</table>

source

<x:s:attribute name="srsName" type="xs:string">
  <xs:annotation>
    <xs:documentation>
      Any URI
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
element GM_Surface/Polygon/posList

posList instances (and other instances with the content model specified by DirectPositionListType) hold the coordinates for a sequence of direct positions within the same coordinate reference system (CRS). If no srsName attribute is given, the CRS shall be specified as part of the larger context this geometry element is part of, typically a geometric object like a point, curve, etc. The optional attribute count specifies the number of direct positions in the list. If the attribute count is present then the attribute srsDimension shall be present, too. The number of entries in the list is equal to the product of the dimensionality of the coordinate reference system (i.e. it is a derived value of the coordinate reference system definition) and the number of direct positions.
reference system definition) and the number of direct positions.

</xs:documentation>
</xs:annotation>
</xs:element>

**element GM_Surface/Circle**

<table>
<thead>
<tr>
<th>Diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Diagram of GM_Surface/Circle]</td>
</tr>
</tbody>
</table>

**namespace** http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd

**type** S100_CircleByCenterPointType

**properties**
- minOcc 0
- maxOcc 1
- content complex

**children**
- position
- radius

**attributes**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Use</th>
<th>Default</th>
<th>Fixed</th>
<th>Annotation documentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>xs:string</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The attribute gml:id supports provision of a handle for the XML element representing a GML Object. Its use is optional for all GML objects.

**source**

```xml
<xs:element name="Circle" type="S100_CircleByCenterPointType" minOccurs="0"/>
```
**complexType S100_CircleByCenterPointType**

```xml
<xs:complexType name="S100_CircleByCenterPointType">
  <xs:annotation>
    <xs:documentation>Type for S-100 arc by center point geometry using interpolation circularArcCenterPointWithRadius</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="position" type="GM_Point"/>
    <xs:element name="radius" type="positiveDouble"/>
    <xs:annotation>
      <xs:documentation>The radius is a double greater than zero and its unit is assumed to be nautical miles (nm).</xs:documentation>
    </xs:annotation>
  </xs:sequence>
  <xs:attribute name="id" type="xs:string"/>
  <xs:annotation>
    <xs:documentation>The attribute gml:id supports provision of a handle for the XML element representing a GML Object. Its use is optional for all GML objects.</xs:documentation>
  </xs:annotation>
</xs:complexType>
```

**namespace** http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd

**children** position radius

**used by** element GM_Surface/Circle

**attributes**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Use</th>
<th>Default</th>
<th>Fixed</th>
<th>Annotation documentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>xs:string</td>
<td></td>
<td></td>
<td></td>
<td>The attribute gml:id supports provision of a handle for the XML element representing a GML Object. Its use is optional for all GML objects.</td>
</tr>
</tbody>
</table>
attribute **S100_CircleByCenterPointType/@id**

<table>
<thead>
<tr>
<th>type</th>
<th>xs:string</th>
</tr>
</thead>
</table>

**documentation**
The attribute gml:id supports provision of a handle for the XML element representing a GML Object. Its use is optional for all GML objects.

**source**

```xml
<xs:attribute name="id" type="xs:string">
  <xs:annotation>
    <xs:documentation>
      The attribute gml:id supports provision of a handle for the XML element representing a GML Object. Its use is optional for all GML objects.
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
```

**element S100_CircleByCenterPointType/position**

<table>
<thead>
<tr>
<th>namespace</th>
<th><a href="http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd">http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>type</td>
<td>GM_Point</td>
</tr>
</tbody>
</table>

**properties**

<table>
<thead>
<tr>
<th>attributes</th>
<th>Name</th>
<th>Type</th>
<th>Use</th>
<th>Default</th>
<th>Fixed</th>
<th>Annotation documentation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lat</td>
<td>LatitudeType</td>
<td>required</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>lon</td>
<td>LongitudeType</td>
<td>required</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**source**

```xml
<xs:element name="position" type="GM_Point"/>
```

**element S100_CircleByCenterPointType/radius**

<table>
<thead>
<tr>
<th>namespace</th>
<th><a href="http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd">http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>type</td>
<td>positiveDouble</td>
</tr>
</tbody>
</table>

**properties**

| content | simple |

```xml
</xs:complexType>
```
The radius is a double greater than zero and its unit is assumed to be nautical miles (nm).

```xml
<xs:element name="radius" type="positiveDouble">
  <xs:annotation>
    <xs:documentation>The radius is a double greater than zero and its unit is assumed to be nautical miles (nm).</xs:documentation>
  </xs:annotation>
</xs:element>
```

**simpleType** BearingType

<table>
<thead>
<tr>
<th>namespace</th>
<th><a href="http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd">http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>type</td>
<td>restriction of xs:decimal</td>
</tr>
<tr>
<td>properties</td>
<td>base xs:decimal</td>
</tr>
<tr>
<td>facets</td>
<td>Kind Value Annotation</td>
</tr>
<tr>
<td>minInclusive</td>
<td>0.0</td>
</tr>
<tr>
<td>maxInclusive</td>
<td>360.0</td>
</tr>
<tr>
<td>fractionDigits</td>
<td>1</td>
</tr>
</tbody>
</table>

```xml
<xs:simpleType name="BearingType">
  <xs:restriction base="xs:decimal">
    <xs:fractionDigits value="1"/>
    <xs:minInclusive value="0.0"/>
    <xs:maxInclusive value="360.0"/>
  </xs:restriction>
</xs:simpleType>
```

**simpleType** DateTimeUTC

<table>
<thead>
<tr>
<th>namespace</th>
<th><a href="http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd">http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>type</td>
<td>restriction of xs:dateTime</td>
</tr>
<tr>
<td>properties</td>
<td>base xs:dateTime</td>
</tr>
<tr>
<td>used by</td>
<td>textMessage/createdAt textMessage/validityPeriodStart textMessage/validityPeriodStop</td>
</tr>
<tr>
<td>facets</td>
<td>Kind Value Annotation</td>
</tr>
<tr>
<td>pattern</td>
<td>.*Z</td>
</tr>
<tr>
<td>annotation</td>
<td>documentation UTC time.</td>
</tr>
</tbody>
</table>

```xml
<xs:simpleType name="DateTimeUTC">
  <xs:annotation>
    <xs:documentation>UTC time.</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:dateTime">
    <xs:pattern value=".*Z"/>
  </xs:restriction>
</xs:simpleType>
```
**simpleType** `informationObjectTypeEnum`  

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>namespace</td>
<td><a href="http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd">http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd</a></td>
</tr>
<tr>
<td>type</td>
<td>restriction of xs:string</td>
</tr>
<tr>
<td>properties</td>
<td>base xs:string</td>
</tr>
<tr>
<td>used by</td>
<td><code>textMessage/informationObjectReferenceType</code></td>
</tr>
<tr>
<td>facets</td>
<td>Kind</td>
</tr>
<tr>
<td></td>
<td>enumeration</td>
</tr>
<tr>
<td></td>
<td>enumeration</td>
</tr>
<tr>
<td></td>
<td>enumeration</td>
</tr>
</tbody>
</table>

**simpleType** `LatitudeType`  

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>namespace</td>
<td><a href="http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd">http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd</a></td>
</tr>
<tr>
<td>type</td>
<td>restriction of xs:decimal</td>
</tr>
<tr>
<td>properties</td>
<td>base xs:decimal</td>
</tr>
<tr>
<td>used by</td>
<td>attribute <code>GM_Point/@lat</code></td>
</tr>
<tr>
<td>facets</td>
<td>Kind</td>
</tr>
<tr>
<td></td>
<td>minInclusive</td>
</tr>
<tr>
<td></td>
<td>maxInclusive</td>
</tr>
<tr>
<td>annotation</td>
<td>documentation</td>
</tr>
<tr>
<td></td>
<td>The latitude of the point. Decimal degrees, WGS84 datum.</td>
</tr>
</tbody>
</table>

**simpleType** `LongitudeType`  

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>namespace</td>
<td><a href="http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd">http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd</a></td>
</tr>
<tr>
<td>type</td>
<td>restriction of xs:decimal</td>
</tr>
<tr>
<td>properties</td>
<td>base xs:decimal</td>
</tr>
<tr>
<td>used by</td>
<td>attribute <code>GM_Point/@lon</code></td>
</tr>
<tr>
<td>facets</td>
<td>Kind</td>
</tr>
<tr>
<td></td>
<td>minInclusive</td>
</tr>
<tr>
<td></td>
<td>maxInclusive</td>
</tr>
<tr>
<td>annotation</td>
<td>documentation</td>
</tr>
<tr>
<td></td>
<td>The longitude of the point. Decimal degrees, WGS84 datum.</td>
</tr>
</tbody>
</table>
### LongitudeType

<table>
<thead>
<tr>
<th>facets</th>
<th>Kind</th>
<th>Value</th>
<th>Annotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>minInclusive</td>
<td>-180.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>maxInclusive</td>
<td>180.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Annotation documentation**

The longitude of the point. Decimal degrees, WGS84 datum.

**Source code**

```xml
<xs:simpleType name="LongitudeType">
  <xs:annotation>
    <xs:documentation>
      The longitude of the point. Decimal degrees, WGS84 datum.
    </xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:decimal">
    <xs:minInclusive value="-180.0"/>
    <xs:maxInclusive value="180.0"/>
  </xs:restriction>
</xs:simpleType>
```

---

### positiveDouble

**Namespace**

http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd

**Type**

restriction of `xs:double`

**Properties**

base `xs:double`

**Used by**

element `S100_CircleByCenterPointType/radius`

**Facets**

<table>
<thead>
<tr>
<th>facets</th>
<th>Kind</th>
<th>Value</th>
<th>Annotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>minExclusive</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Source code**

```xml
<xs:simpleType name="positiveDouble">
  <xs:restriction base="xs:double">
    <xs:minExclusive value="0"/>
  </xs:restriction>
</xs:simpleType>
```

---

### textMessageURN

**Namespace**

http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd

**Type**

restriction of `xs:string`

**Properties**

base `xs:string`

**Used by**

element `textMessage/textMessageId`

**Facets**

<table>
<thead>
<tr>
<th>facets</th>
<th>Kind</th>
<th>Value</th>
<th>Annotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>maxLength</td>
<td></td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>pattern</td>
<td></td>
<td>urn:mrn:stm:txt:[0-9a-zA-Z+:_]+</td>
<td></td>
</tr>
<tr>
<td>annotation</td>
<td>Text message Id in STM URN format.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>-----------------------------------</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

```xml
<xs:simpleType name="textMessageURN">
  <xs:annotation>
    <xs:documentation>
      Text message Id in STM URN format.
    </xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:string">
    <xs:maxLength value="120"/>
    <xs:pattern value="urn:mrn:stm:txt:[0-9a-zA-Z:+_]+/"/>
  </xs:restriction>
</xs:simpleType>
```
3  References

<table>
<thead>
<tr>
<th>Nr</th>
<th>Version</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.2</td>
<td>VIS Service Specification Documentation</td>
</tr>
</tbody>
</table>

4  Acronyms and Terminology

<table>
<thead>
<tr>
<th>Type</th>
<th>Term</th>
<th>Definition/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acronym</td>
<td>SeaSWIM</td>
<td>Sea System Wide Information Management</td>
</tr>
<tr>
<td>Acronym</td>
<td>UVID</td>
<td>Unique Voyage Plan Identity</td>
</tr>
<tr>
<td>Maritime</td>
<td>VIS</td>
<td>Voyage Information Service</td>
</tr>
<tr>
<td>Maritime</td>
<td>VP</td>
<td>Voyage Plan</td>
</tr>
<tr>
<td>Acronym</td>
<td>XML</td>
<td>Extendible Mark-up Language</td>
</tr>
<tr>
<td>Acronym</td>
<td>XSD</td>
<td>XML Schema Definition</td>
</tr>
</tbody>
</table>
5 Appendix A textMessage - example

<?xml version="1.0" encoding="UTF-8"?>
<textMessage xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmns="http://stmvalidation.eu/schemas/textMessageSchema_1_3.xsd">
  <textMessageId>urn:mrn:stm:txt:sma:20170510104400-1</textMessageId>
  <informationObjectReferenceId>urn:mrn:stm:voyage:id:test:100</informationObjectReferenceId>
  <informationObjectReferenceType>RTZ</informationObjectReferenceType>
  <validityPeriodStart>2017-05-01T01:00:00Z</validityPeriodStart>
  <validityPeriodStop>2017-06-10T01:00:00Z</validityPeriodStop>
  <author>urn:mrn:stm:user:sma:mikolo</author>
  <from>urn:mrn:stm:org:sma</from>
  <serviceType>SHIP-VIS</serviceType>
  <createdAt>2017-05-10T01:00:00Z</createdAt>
  <subject>Test message</subject>
  <body>Test message Hanöbukten</body>
  <position lat="55.50668" lon="14.29825"/>
  <area>
    <Polygon>
    </Polygon>
    <Circle>
      <position lat="55.50668" lon="14.29825"/>
      <radius>1</radius>
    </Circle>
  </area>
</textMessage>
**DOCUMENT STATUS**

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**Review**

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<table>
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1. Introduction

This appendix document is intended to provide information on what is required to integrate with STM’s maritime digital infrastructure “Sea System Wide Information Management” (SeaSWIM). This document is solely focused on the STM testbed implementation of SeaSWIM, which represents a subset of services and functionality intended for the full STM concept scope.

The document provides two perspectives; one for interacting with SeaSWIM through a support interface, which hides the full complexity of the different support services (Section 2), and one for building and integrating SeaSWIM compliant services in house (Section 3). General prerequisites and standards that have to be adhered to is described in Section 4, Section 5 and the Data Models Reference List.

1.1. Sea System Wide Information Management (SeaSWIM)

Unifying the way maritime stakeholders communicate, enables a shared understanding and a new level of potential interaction and integration. The fundamental goal for SeaSWIM is to provide and maintain a harmonized way of communicating within the maritime industry. This implies that open and accessible standards are promoted.

The SeaSWIM environment enables maritime stakeholders to share certain data and information, in real time and without interpretation over organizational boundaries. In order to achieve this level of interoperability while including a wide range of stakeholders, the scope of what can be communicated is limited to what complies with the SeaSWIM concept. The SeaSWIM concept recognizes that new and customized exchanges of information between certain actors are necessary. However, customization and testing will happen outside of the stable SeaSWIM environment. The focus of the SeaSWIM environment is primarily to ensure semantic interoperability for the most critical and purposeful communication.

To achieve the inclusive scope of the SeaSWIM environment entry barriers to develop, produce and consume data and information in the environment should be as low as possible. The SeaSWIM Connector (SSC) is implemented for this purpose – to assist developers by instantiating generic functionality that is needed by most services in the SeaSWIM environment.

The use of the SSC is voluntary; compliance with the functionality that the SSC exemplifies is not. Any industry stakeholder is free to develop its own equivalent version as long as it follows the SeaSWIM technical specification it is based on.
should be noted that while the SSC assists developers to access the SeaSWIM environment in a compliant way there are more requirements, beyond the SSC, to become compliant with the SeaSWIM environment (e.g. accepted standards, identities, interface specifications, etc.).

In the STM testbed the provided support services will be limited to the core functionality described in this document. For example, access management is recognized as a common need that should be defined with a SeaSWIM reference implementation. However, as the specific needs and potential implementation alternatives for this support service is currently unclear it will not be provided as part of the STM testbed. Instead, application service-providers are encouraged to evaluate their needs by testing alternative solutions.

### 1.2. SeaSWIM Principles and Architecture

SeaSWIM consists of specific support services that will ensure interoperability of the STM application services by facilitating data sharing in a common information environment and structure. The specification of SeaSWIM is developed to adhere to some important STM principles:

1. Only authenticated actors can provide and consume STM services, where authentication is the process of determining whether someone or something is, in fact, who or what it is declared to be.
2. The owner of data is the actor responsible for the original creation and provision. The owner has full control over the access management for this data.
3. STM strives after a service oriented and highly decentralized architecture.
4. Usage of open and widely accepted industry standards wherever these exist.

The various maritime actors extract specific data or information and translate it to the appropriate STM standard format (see Appendix: Reference List).

To simplify the run time connection with the SeaSWIM environment the SeaSWIM Connector (SSC) is provided. The SSC is developed as a reference and example that handles the interaction with the core SeaSWIM support services according to the SeaSWIM specification. There exists two potential ways to incorporate the SeaSWIM Connector functionality.

- The first option is to host the reference as is and use its interface to reach the SeaSWIM environment and its connected actors and services.
- The second option is to integrate the functions of the SeaSWIM connector service to replicate its functionality. All function calls to the core SeaSWIM support services will be accepted as long as they adhere to the same standard as the SeaSWIM reference connector. It should be noted that only very limited support can be given if a vendor chooses to build their own SeaSWIM
connector functionality. Both options will be described in Section 2 (Using SeaSWIM Connector) and Section 3 (Building a SeaSWIM Connector) respectively.

The SSC or its integrated equivalent is hosted both by the providing and consuming Application Service (cf. Figure 1). This way the SSC or its equivalent support communication according to the STM principles with minimal development and implementation efforts.

Behind the connector, SeaSWIM consists of two central components; the **Identity Registry** and the **Service Registry** (cf. Figure 2). The Identity Registry enables identity management and authentication mechanisms, while the Service Registry provides functionality to publish and find services, including their functionality and endpoints. Both services will be further detailed in sections 2 and 3.
Unique identifiers play a crucial role in SeaSWIM and are mandatory for avoiding conflicts and provide unique references.

1.3. Interacting with SeaSWIM

This section will give an overview of the interaction with the SeaSWIM Support Services; the SeaSWIM Connector, the Identity Registry and the Service Registry. To understand how the SeaSWIM registers will interact with the connector a generic scenario description is provided. More details and descriptions about the technical interfaces and standards will be provided in the subsequent chapters in this document.

1.3.1. Setup and Discovery

To provide a service the data or information provider register with the STM identity registry, which is shown as Step 1 (Figure 3) and explained more in depth in Section 4. The identity registry ensures unique identities that can be authenticated. Without a valid STM user identity, a user will not be able to provide or consume data within STM.
With a STM user identity the service provider can be authenticated as such and register a service in the service registry, shown in Step 2 (Figure 3). Registering a service entails publishing metadata of a service specification and then registering deployed instances of that service (Step 3 in Figure 3). This registration process can be done by separate parties and one service specification can have several deployed instances registered. The service specification and deployment description can subsequently be used by other STM users to interact with the service. It is important to note that published services can be simple data provision services, aggregated information services that consist of several sources of data or data consumer endpoints where data can be sent for processing.

Registering to become a STM member is also required to search and consume services, which is shown in Step 1 (Figure 4). With a STM identity the user can be authenticated by the service registry and search the published service specifications and/or deployed instances (Step 2 in Figure 4).
Developers find the appropriate functionality among service specifications through the initial search in Step 2. When a match has been found and an appropriate service has been built to interact with the specified service it is only relevant to search within its deployed instances. Step 3 (Figure 4) shows the interaction to search to list and choose between deployed service instances and how it is supported by the SSC. The service registry responds to the request with a list of deployed instances that matches the service deployment attributes (e.g. closest in proximity or current license).

1.3.2. Interaction

The user locates the service, its description and how to make use of it. For example, this could be a link to a graphical user interface that can be opened in a web browser or it could be a specification of the API that can be used to request a data point, machine to machine without user interaction. In any case, the consumer uses the metadata to establish a connection to the service producer directly.

The interaction requires that STM identities are used and are valid. By uploading the user credentials to the SeaSWIM connector, it provides support to ensure that tokens and certificates can be authenticated (Step 1 in Figure 5).
Based on the service description and the found deployed instance the service endpoint can then be called. The request is compiled with the user identity and credentials (supported by the SSC) and sends it to the receiving connector. The Provider SeaSWIM connector (on the left in Figure 5) authenticates the request and “works” on it (e.g. checks authorization, performs optimization) and responds as shown in Step 2 (Figure 5). Depending on the service and the completeness of the request this response could be the requested payload, a notification callback or an error message.
2. Using SeaSWIM Connector (SSC)

2.1. Introduction to SSC

The SeaSWIM Connector/SSC is a software component that enables the use of IR and SR, developed by STM/E2. To achieve the inclusive scope of the SeaSWIM environment, entry barriers to develop, produce and consume data and information in the environment should be as low as possible. The SeaSWIM Connector is implemented for this purpose – to assist developers by instantiating generic functionality that is needed by most services in the SeaSWIM/MCP environment.

To simplify the run time connection with the SeaSWIM environment the SSC is provided, which can be described as a standardized interface to the more generic MCP registers. The SSC is developed as a reference service that handles the interaction with the core SeaSWIM support services according to the SeaSWIM specification.

The SSC is described in further detail in the technical design/service specification document. This specification is intended to be read by architects, system engineers and developers in charge of designing and developing an instance of the connector. It is based on the following structure/content sketched in Figure 1.

![Figure 1: SeaSWIM Connector documentation and implementations](image)

The use of the SSC technical specification and core functionality is mandatory, which ensures all partners have a compliant way to communicate within the SeaSWIM environment. Any industry stakeholder is free to develop its own equivalent version/implementation as long as it follows the SeaSWIM Specification (Figure 1).

It should be noted that while the SSC assists developers to access the SeaSWIM environment in a compliant way, there are more requirements beyond the SSC, to
become compliant with the SeaSWIM environment (e.g. adherence to accepted standards, identities and interface specifications).

There are two potential ways to incorporate the SeaSWIM Connector functionality:

1. The first option is to host the example implementation as a proxy service and use its interface to reach the SeaSWIM environment and its connected actors and services.
2. The second option is to integrate the functions of the SeaSWIM Connector service to replicate its functionality. All function calls to the core SeaSWIM support services will be accepted as long as they adhere to the same standard as the SeaSWIM reference connector.

As pictured in Figure 2, the SSC is designed to facilitate the communication between services. The function will call a generic web service part of the STM infrastructure, checking the certificates authentications. The SSC will also facilitate the communication with the identity service in order to discover that the organization is part of the STM infrastructure. Finally, the SSC handles the communication with the Service Registry service in order to discover services of the STM infrastructure.

This means, that the SSC support service intercepts the incoming service request, handles authentication and, if source is authenticated, forwards the service call to the "master" service endpoint. Authentication and encryption (SSL/TLS) is added to all outgoing messages and checked on all incoming messages.

**General Architecture**

*Figure 2: SeaSWIM Connector architectural overview*
2.2. **SSC as a Proxy**

SSC example implementation is a software service component that works like a proxy web server, i.e. listens on a configurable port and intercepts the incoming calls. The SSC proxy is hosted both by the providing and consuming application service (Figure 3). This way the SSC or its equivalent support communication according to the STM principles with minimal development and implementation efforts.

The following functions are fulfilled as part of runtime SeaSWIM compliance (Figure 3):

- SSC provides functions and design constraints that applies to every service- or client interface, i.e. to comply with the SeaSWIM specifications.
- SSC is intended to hide the complexity of interacting and complying with the STM support services.
- SSC offers standardized means of defining communication end-points (API) and ensures encryption of all data transferred between the end-points.
- SSC is defined as an explicit service (stand-alone or integrated into a parental service).

![Figure 3: SeaSWIM Connector functionalities](image)

SSC is designed in order to support inbound and outbound communications. Inbound receive information from other services offering an out of the box, while outbound communications send information to core services (IR and SR) and application services.
2.3. SSC as a Function Library

The SeaSwim Connector can also be integrated as a function library that manage the functions implemented in the reference implementation as a proxy. In that way a parent service that works over the SSC such as a Voyage Information Service can be implemented in an integrated and simpler way.

The main responsibilities of the library are:
- support the application service to communicate with the Service Registry and Identity Registry
- support the communication between services part of the STM infrastructure
- decrease the integration barrier for an application service that want to join to STM infrastructure

SSC library supports two operational schemas:
- Inbound communications: Receive information from other services
- Outbound communications: Send information to core services and application services

Where the “App service” below is later referred to the “parent” of the SeaSWIM Connector.

The main operational activities are;
- Search for service instance(s)
- Consume service instance
- Search for (retrieve) global identities (mainly organizations)
- Authentication and identification of consumer and provider of service
2.4. Identity Management, Authentication and Encryption

Establishing connections with a SeaSWIM connector will be based on either digital certificates based on the global X.509 standard, or ‘single sign on’ to a web service based on the OpenID Connect standard, which is based on OAuth2.

Service providers or other actors that need the ability to be authenticated in the testbed of the STM project, will be registered in the Identity Registry. The actors participating in the testbed can contact the Swedish Maritime Administration, who will assist in completing the registration in the Portal for the Identity and Service registries, for the STM testbed. Please consult Section 4 of this document.

The SeaSWIM connector will assist its parent service or consumer application in establishing secure and authenticated connections, allowing only interactions with actors who are registered users or service providers with an identity that can be authenticated. The connector will only allow outbound connections to endpoints at services with a valid certificate. Inbound connections will be accepted from other SeaSWIM connectors, that also hold a valid certificate, or where logon can be authenticated based on a trusted identity provider.

If a service provider on land uses the SeaSWIM connector, a certificate for a service should be issued from the Identity Registry. For a SeaSWIM connector to represent a particular ship, that ship must have an individual certificate issued. Each entity that need to be authenticated (e.g. a service, a ship) must have its own certificate, multiple entities cannot be tied to the same certificate. The attributes of this certificate is further detailed here [http://developers.maritimecloud.net/identity/](http://developers.maritimecloud.net/identity/).

The SeaSWIM connector will be able to provide the parent application or service with the attributes associated with the actor involved in an external connection, based on the content of the certificate or the attributes stored for a user in the Identity Registry, such as name, organizational belonging, etc. For more detail, consult Section 3.1.2.

Once the ‘owner’ of the SeaSWIM connector has downloaded the digital certificate and the private key, they must be stored in a predestined place in the installation of the SeaSWIM connector, together with the root certificate(s) of the certificate provider(s) that the SeaSWIM connector should trust.

Once the certificate is securely stored the SeaSWIM connector will use it whenever it attempts to securely connect to remote hosts, or present it to any remote host trying to connect to the SeaSWIM connector. It could also be used for digitally signing documents and messages being transferred to other SeaSWIM compliant actors, using a SeaSWIM compliant connector.
3. Building a SeaSWIM Connector

The SeaSWIM Connector (SSC) presented in Section 2 is intended to hide the complexity of interacting and complying with the STM support services. This section, instead, provides the detail how the central registers and common support services function. The purpose is to provide transparency and to enable potential integration of SeaSWIM support services with the application services.

3.1. Identity Registry Integration

In SeaSWIM, the Resource Provider does not need to implement its own workflow to support identification of Clients. It can be assumed that Clients are registered via the Identity Registry, and that a PKI (Public Key Infrastructure) infrastructure supporting certificate validation or that the Authentication request can be facilitated by a trusted Identity Manager via the MCP Identity Registry.

Registration in the Identity Registry and issuing of certificates in the STM testbed is conducted through a workflow that does not involve the SeaSWIM connector.

When deciding to construct a SeaSWIM connector, functions that are relevant to the parent service or application must be considered. The technical details on implementing interactions between the SeaSWIM connector and another SeaSWIM connector or the central functions related to Identity management and authentication are described below.


3.1.1. Conceptual Description

Once the ‘owner’ of the SeaSWIM connector has downloaded the digital certificate and the private key they must be stored in a predestined place in the installation of the SeaSWIM connector. For added security the SeaSWIM connector should store them accordingly to the PKCS#8 standard or using a hardware security module (HSM).

The main interaction with the Identity Registry are related to validation of certificates and lookup of public keys of other actors based on the global X.509 standard or execution of an online authentication process based on OpenID Connect.
3.1.2. Technical Description

The authentication mechanism in the Maritime Connectivity Platform is based on open and proven standards, and their usages will be described below.

**X.509 Certificates - Machine to Machine**

For the machine-to-machine (M2M) communication primarily used in the STM setup the Maritime Connectivity Platform provides the ability to issue X.509 certificates for entities (users, vessels and devices). These certificates will enable entities to authenticate within the Public Key Infrastructure (PKI) provided by the Maritime Connectivity Platform. For services to be a part of this PKI they will need to be registered in the Maritime Connectivity Platform and obtain a certificate.

If an entity connects to a SeaSWIM service (via a SeaSWIM Connector) using a X.509 Certificate, the standard protocol for secure connection creation, automatically authenticates the entity, and therefore validates the information embedded in the certificate.

Besides authentication the X.509 certificates can be used for encrypting the communication between SeaSWIM Connectors, using standard SSL/TLS.

The X.509 certificate that is issued will contain basic information about the entity it is issued to. Each entity belongs to an Organization which is identified by an Organization Id. The Organization Id is also referred to as "shortname" of the organization, which consists of a minimum of 3 lowercase characters. Examples of an organization’s shortname could be "dma" (for the Danish Maritime Authority), "dmi" (for the Danish Meteorological Institute) or "maersk" (for Maersk Line).

The standard information that we currently envision to be included in the X.509 certificates for each entity category can be seen in the table below.

<table>
<thead>
<tr>
<th>Field</th>
<th>User</th>
<th>Vessel</th>
<th>Device</th>
<th>Service</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>CN (CommonName)</td>
<td>Full name</td>
<td>Vessel name</td>
<td>Device name</td>
<td>Service Domain Name</td>
<td>Organization Name</td>
</tr>
<tr>
<td>O (Organization)</td>
<td>Organization MRN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OU (Organizational Unit)</td>
<td>&quot;user&quot;</td>
<td>&quot;vessel&quot;</td>
<td>&quot;device&quot;</td>
<td>&quot;service&quot;</td>
<td>&quot;organization&quot;</td>
</tr>
<tr>
<td>E (Email)</td>
<td>User email</td>
<td></td>
<td></td>
<td></td>
<td>Organization email</td>
</tr>
<tr>
<td>C (Country)</td>
<td>Organization country code</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UID</td>
<td>Entity MRN</td>
<td></td>
<td></td>
<td>Organization MRN</td>
<td></td>
</tr>
</tbody>
</table>

An example of the fields for a vessel could look like this:
Besides the information stored in the standard X.509 attributes listed above, the X509v3 extension SubjectAlternativeName (SAN) extension is used to store extra information. There already exists some predefined fields for the SAN extension, but they do not match the need we have for maritime related fields. Therefore the “otherName” field is used, which allows for using an Object Identifier (OID) to define custom fields. The OIDs currently used are not registered at ITU, but is randomly generated using a tool provided by ITU (see [http://www.itu.int/en/ITU-T/asn1/Pages/UUID/uuids.aspx](http://www.itu.int/en/ITU-T/asn1/Pages/UUID/uuids.aspx)). See the table below for the fields currently defined, the OID of the fields and which kind of entity that uses the fields.

<table>
<thead>
<tr>
<th>Name</th>
<th>OID</th>
<th>Used by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flagstate</td>
<td>2.25.323100633285601570573910217875371967771</td>
<td>Vessels</td>
</tr>
<tr>
<td>Callsign</td>
<td>2.25.208070283325144527098121348946972755227</td>
<td>Vessels</td>
</tr>
<tr>
<td>IMO number</td>
<td>2.25.291283622413876360871493815653100799259</td>
<td>Vessels</td>
</tr>
<tr>
<td>MMSI number</td>
<td>2.25.328433707816814908768060331477217690907</td>
<td>Vessels</td>
</tr>
<tr>
<td>AIS shiptype</td>
<td>2.25.107857171638679641902842130101018412315</td>
<td>Vessels</td>
</tr>
<tr>
<td>Port of register</td>
<td>2.25.285632790821948647314354670918887798603</td>
<td>Vessels</td>
</tr>
<tr>
<td>MRN</td>
<td>2.25.27147759844977537367656021583931046283</td>
<td>Vessels, Users, Devices, Services</td>
</tr>
<tr>
<td>Name</td>
<td>OID</td>
<td>Used by</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Permissions</td>
<td>2.25.174437629172304915481663724171734402331</td>
<td>Vessels, Users, Devices, Services</td>
</tr>
</tbody>
</table>

The first 6 fields mentioned in the table are all vessel specific, and should be self explanatory in the maritime context, but the last 2 are specific to the Maritime Connectivity Platform domain:

- "permissions": A comma separated list of permissions or roles assigned to the entity by the organization it belongs to. Also see the section on Authorization below.
- "mrn": A comma separated lists of Maritime Resource Names of the entity, in prioritized order, the highest priority first.

The Maritime Resource Name (MRN) is a unique identifier for users, vessels, etc. in the maritime domain. In the Maritime Connectivity Platform during the test phase a MRN will look like below:

`urn:mrn:stm:identity:<entity type>:<Organization Id>:<entity id>`

Examples could be:

- `urn:mrn:stm:identity:user:DMA:tgc`

See Chapter 5 for more information regarding the Maritime Resource Name.

**OpenID Connect - browser based**

For browser based authentication the Maritime Connectivity Platform Identity Registry offers an OpenID Connect based solution with federated identity management. A central Maritime Connectivity Platform Identity Broker will point to organizations registered as Identity Providers in the Maritime Connectivity Platform. For the STM testbed a special STM Identity Provider will be set up to administrate STM testbed users.

When using OpenID Connect authentication the user is identified by a JWT ID token that contains various attributes that describes the users. The current attributes used in the Maritime Connectivity Platform are listed in the table below.
<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>preferred_username</td>
<td>The username of the user in the parent organization.</td>
</tr>
<tr>
<td>email</td>
<td>The email of the user.</td>
</tr>
<tr>
<td>given_name</td>
<td>Firstname of the user.</td>
</tr>
<tr>
<td>family_name</td>
<td>Lastname of the user.</td>
</tr>
<tr>
<td>name</td>
<td>Full name of the user.</td>
</tr>
<tr>
<td>org</td>
<td>The full Maritime Resource Name of the organization the user is a member of.</td>
</tr>
<tr>
<td>permissions</td>
<td>List of permissions for this user assigned by the organization the user is a member of.</td>
</tr>
<tr>
<td>mrn</td>
<td>The Maritime Resource Name of the user.</td>
</tr>
</tbody>
</table>

See the section on Certificates above for a description for the “mrn”, “org” and “permissions” attributes.

**Interface for the Identity Registry**

Besides a browser based interface, where entities can be managed, the Maritime Connectivity Platform Identity Registry will also offer a web based API that will make it possible for the SeaSWIM Connector to:

- Create/update/delete entities.
- Issue X.509 certificates for entities.
- Revoke entity certificates.
- Check for revoked certificates.
3.2. Service Registry Integration

3.2.1. Conceptual Description

This chapter below describes a sample implementation of a service registry. It is a resource that aims to provide controlled access to data necessary for governance of SOA (service-oriented architecture) projects, like the Maritime Connectivity Platform development. In effect, it is a constantly evolving catalogue of information about the available services in a SOA implementation (for the moment only some basic means to search for services are included in this chapter; it is intended to complement this list considering the needs of the services implementers later on). A service registry allows businesses to efficiently discover and communicate with each other using certain services. The ultimate goal is to allow fast and reliable communication and interoperability among diverse applications with minimal human oversight.

Services themselves and the service-based economy are a central part of the Maritime Connectivity Platform and SeaSWIM. In the context of service-oriented architecture, a service usually refers to a set of related software functionalities that can be reused for different purposes, together with policies that governs and controls its usage.

The service registry contains service specifications according to a Service Specification Standard and provisioned service instances implemented according to these service specifications. The service registry improves the visibility and accessibility of available maritime information and services. This enables service providers, consumers, and regulatory authorities to share a common view on service standards and provisioned services. The service registry does not provide actual maritime information, but a specification of various services, the information they carry, and the technical means to obtain it. The service registry also provides the mechanisms to manage the lifecycle of service specifications and service instances.

As depicted below, the service registry enables the “provider” to “publish” information related to its service instances so that the “consumer” is able to “discover” them and obtain everything (e.g. interface information) required to ultimately use these services.
The service registry is intended to facilitate or implement the Maritime Service Portfolio (MSP) concept by providing a repository for the specification of operational

<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Service Consumers</strong></td>
<td>Consumer uses service instances provided by service providers. All users within the maritime domain can be service consumers, e.g., ships and their crew, authorities, VTS stations, organizations (e.g., meteorological), commercial service providers, etc.</td>
</tr>
<tr>
<td><strong>Service Providers</strong></td>
<td>Provides instances of services according to a service specification, e.g. deploys the service to the Service Registry. All users within the maritime domain can be service providers, e.g., ships and their crew, authorities, VTS stations, organizations (e.g., meteorological), commercial service providers, etc.</td>
</tr>
<tr>
<td><strong>Service Specification Implementers</strong></td>
<td>Implementers of services from the service provider side and/or the service consumer side. Everybody can be a service implementer but mainly this will be commercial companies implementing solutions for shore and ship.</td>
</tr>
<tr>
<td><strong>Service Specification Producers</strong></td>
<td>Producers of service specifications in accordance with STM Governance procedures.</td>
</tr>
</tbody>
</table>

*Figure 4: General architecture of the service registry*
and technical services and provisioned service instances. The service registry is intended to comprise all maritime services, not only digital services, thereby making it a single reference point for provisioning and discovery.

When documenting services it has to be distinguished between service specification, service technical design and service implementation (see figure below).

![Diagram showing the distinction between Service Specification, Service Technical Design and Service Instance]

**Figure 5:** Distinction between Service Specification, Service Technical Design and Service Instance

The Service Specification describes one dedicated service at logical level in a technology-agnostic manner. On the other hand, the Service Technical Design describes the details about the actual realisation of a specific service with a dedicated technology.

It is possible to provide different technical designs, all being compliant with the same service specification. It is also possible to provide one technical design that conforms to several versions of the same service specification, for example, to allow backward compatibility to older versions of a certain specification.

A service implementation (implemented according to a given technical design) may be deployed at different locations by different service providers.

For further details about the process to be followed for describing services in a standardized way, please refer to the STM-Service-Documentation-Guidelines and individual templates¹.

¹ [http://stmvalidation.eu/service-registry/]
3.2.2. Technical Description

This section describes the operations for interacting with the runtime part of the Service Registry. The technical interface to the registry is based on the IETF RFC 5222 titled “LoST: A Location-to-Service Translation Protocol” ([https://tools.ietf.org/html/rfc5222](https://tools.ietf.org/html/rfc5222)), which describes a means to map the endpoint URI for a service (or services) within a given geographic region.

The standard above, that serves as baseline for the technical interface specification, has been developed for the public safety domain where a correlation of the availability of services to certain locations is essential and therefore this (temporary) mapping is reflected in the interface definition. Nevertheless, it is not mandatory to use this functionality and one (a service designer/implementer) can define services, which are not restricted to a certain region. From that perspective, the registry responds to queries with the required means to access one or more active services matching the query and operating in the specified region or at the specified position. This geographic mapping of services to locations is subject to timed expiration so as to reflect updates of service activity due to time of life cycle considerations.

A query may return one or more such mappings, if multiple services of the same type operate in overlapping regions. It is possible to define a default mapping which is returned in case specific service was found for a given point or area.

The queries are implemented as REST API calls via HTTP. The ability of a client to query the registry may be subject to authentication.

See Reference list for detailed documents describing the service interfaces to Service Registry.

4. STM Registration Processes

4.1. Registering Users in Identity Registry

In the STM testbed the registration of entities (users, vessels and devices) will be done using a browser based interface for Identity Registry. This interface is also called the “Maritime Connectivity Platform Portal”.

Organizations need to register in Identity Registry through the MCP Portal with selected checkbox STM.
Once an organization is created, the organization will be able to create and maintain entities and create the X.509 certificates needed for authenticating using the SeaSWIM Connector.

It is also provided as a REST based API that will make it possible to maintain entities and do bulk updates of users and vessels.

4.2. Registering Services with the Service Registry

In the STM testbed the registration of service instances in the Service Registry is done by each partner. Setting the status to “released” in Production is done when approved by STM.

5. Unique Identification

This section describes how unique identifiers are constructed for the STM validation project.

The syntax described in this section can be expected to be applied to identification of ships voyages (UVID – Unique Voyage ID) and Port Calls (UPCID – Unique Port Call ID), as well as Actor and Service instances in STM.

*Unique Voyage Identifier*

The MONALISA 2.0 project identified the unique voyage identifier (UVID) as necessary for an efficient and STM compliant information exchange among the different actors and the ship during a given voyage.
Figure 16: Current situation of information exchange during a voyage

**Unique Port Call Identifier**

The concept of Port Collaborative Decision Making (PortCDM) has identified that the synchronization of a Port Call requires a unique identification of the a particular Port Call, i.e. the sequence of events that needs to be coordinated, when a particular Vessel arrive at the port, visit the port, and departs from the port.
The maritime actors involved in a ship voyage (some of them are shown in Figure 3) or a Port Call (some are shown in Figure 4) need to commit their changes to the voyage or Port Call and get informed about the changes made by others, based on the authorization they have.

The unique identifiers identifying a voyage – or a port call – during its lifetime should satisfy following requirements:

1. It should serve as a unique identifier for binding related information being exchanged in STM. Each information object\(^2\) exchanged in STM that related to a Voyage or Port Call should contain the relevant identifier as reference.
2. Actors or systems who/which create or hold a Voyage or Port Call information object, should be able to decentrally generate a unique ID without requiring online access to a central function.
3. Life cycle or time dependency of the id's uniqueness should be clear and unambiguous.

\(^2\) Data model, data object or payload format

*Figure 17: A port call also consists of many stakeholder interactions.*
4. The syntax of the ID should not reveal actor specific information if they don’t approve. The syntax may however provide reference to where actors can seek specific information about a Voyage or Port Call, if authorized to access the information.

**The syntax of identifiers using ‘Maritime Resource Name’**

The (draft) IALA guideline on ‘Unique Identifiers for Maritime Resources’ currently underway defines the syntax for Maritime Resource Names like this:

Uniform Resource Names (URNs) as defined by the IETF (Internet Engineering Task Force) are intended to serve as persistent, location-independent, resource identifiers and are designed to make it easy to map other namespaces (which share the properties of URNs) into URN-space. Therefore, the URN syntax provides a mean to encode character data in a form that can be sent in existing protocols (like ASCII), transcribed on most keyboards, etc.

The URN syntax provides a mechanism to ensure the uniqueness of the name of a resource, which is already widely used in different domains such as supply chain management, unique identification of books or laws. Furthermore, this structure (syntax) approach enables delegation of the authority and gives a very large contribution in decentralization as one of the main principles of STM and SeaSWIM.

The Syntax of a Maritime Resource Name (MRN) is based on [RFC 2141](https://tools.ietf.org/html/rfc2141) published by the Internet Engineering Task Force (IETF). The basic syntax of a MRN identifier is a string with a hierarchical structure as follows:

"urn:mrn":"<NSS>

The “urn” identifies this to be a special case of a Universal Resource Name (URN), while the “mrn” identify a unique namespace within the URN. Efforts to register the "urn:mrn:" namespace with the [Internet Assigned Numbers Authority (IANA)](https://www.iana.org) are ongoing. <NSS> is the Namespace Specific String composed as follows:

<NSS>::=<governing-organization>"":"<type>"":"<type-specific-part>

**Delegation of authority**

The Maritime Resource Name is intended to be an extendable mechanism allowing delegation of authority to issue unique identifiers, yet making sure that these identifiers are unique right across the maritime domain, simply by adding a structured prefix to a unique identifier inside any system.

In other words – if two different ports use simple serial numbers to identify port calls in their own system, then putting a prefix that identifies the port in front of the serial
number when referencing a particular port call outside the context of the port’s own system, will ensure that the identifier of any port call becomes globally unique.

**Purpose and construction of identifiers**

The primary purpose of ‘identifiers’ is to (uniquely) identify something. Sometimes identifiers are constructed in a way, which embeds information directly into the identifier. For instance, a phone number, 72196000 may represent the main phone number of the Danish Maritime Authority, when used in a Danish context, but the number may be identical to the phone number of another organization or individual in another country. Internationally it is represented using an international dialing code in front of the national number (+45 72196000), to ensure universal uniqueness. This international dialing code constitutes an embedded piece of information, revealing the (national) belonging of the (national) identifier. Exceptions to the rule may apply, as for instance when buying a satellite phone: the ‘international dialing code’ will identify the satellite system, rather than a national telephone exchange. Similarly, it may be possible to derive certain information from an IP address or web address in the internet domain. Embedding information into the construction of a unique identifier, may serve two purposes:

1. It may achieve a simple way to **delegate authority** to issue identifiers that only need to be unique within your own domain (like national telephone numbers), providing a way to represent your identifier in a globally unique way.
2. It may enable **transfer of information needed** to discover or route information to the ‘owner’ of the entity, which the identifier is intended to identify.

For option B to be useful, it requires the ability to decipher the information embedded in the identifier, which in turn requires a stable (standardized) definition of the identifier structure (a well defined way to decode the international dialing code). Otherwise it would be more safe, to embed the information to be transferred, in the *payloads* being exchanged between identities, rather than the identifier.

The STM validation project will apply a prefix structure for issuing identifiers, that separates responsibility of defining and utilizing identifiers in a project centric way (option A above), but also apply option B to embed information that promotes discoverability of the origin of an identifier, and thus validate the appropriateness of these approaches as part of the project. This structure is based on the resource name approach presented above.

**Use of 'Maritime Resource Name' in STM**

The STM validation project will apply the Maritime Resource Name methodology to validate the concepts of Unique Voyage ID and Unique Port Call ID in the maritime context, before bringing them to relevant standardization bodies. The project has requested IALA to be registered as `<governing-organization>` for namespace:

```
"urn:mrn:stm:"
```
The intention is to subdivide this namespace into four categories:

**ID’s related to PortCDM (STM Activity 1)**

urn:mrn:stm:portcdm:<someID_type_relating_to_PortCDM>

**ID’s related to Voyage Management (STM Activity 2)**

urn:mrn:stm:voyage:<someID_type_relating_to_Voyage_Management>

**ID’s related to Actor Identity Management and Service Management (STM Activity 4)** will use a similar syntax:

urn:mrn:stm:org:<someID_type_relating_to_Actor_Identity_Management>

and

urn:mrn:stm:service:<someID_type_relating_to_Service_Management>

(or a similar URN construction with a different prefix, noting that the actor and service identity concepts are being developed in collaboration with other projects, but ultimately based on the same URN based syntax.)

The division of the namespace urn:mrn:stm into these subspaces enables a higher degree of freedom in generating unique identifiers and supporting decentralization.

### 5.1. Unique Voyage_ID (UVID)

The update of IEC 61174 test standard for ECDIS in 2015, introduced a standardized data format for representation of a ship’s voyage plan (the RTZ format).

This format includes an identifier field, which can be used to uniquely identify an instance of a ship’s planned voyage, during the lifecycle of the voyage from strategic planning, through the dynamic updates underway, until completion. For unique identification of this instance of the voyage, when communicating updates between any group of stakeholders, a globally unique identifier is needed, and methods to manage the version history of changes applied.

The STM project will establish the concept of a ‘Voyage Information Service’ as the point of contact to enable authorized parties (authorized collaborators such as agents, pilots, ports, VTSs etc.) to interact electronically with information related to a ship’s voyage. The definition of the UVID is closely related to the definition of the Voyage Information Service by Activity 2 of the STM project, and thus Activity 2 ‘owns’ this definition.

It has been observed that centralized methods for issuing unique identifiers (such as Global Unique Flight Identifiers in the aviation industry) demand connectivity at the time of creation. This is seen as an undesirable requirement and possible point of failure. Instead a delegated approach is desired, where each registered provider of a Voyage Information Service is delegates the ability to issue their own identifiers is desired.
The following definition of the UVID has been proposed, and is provided for explanation of the syntax. The final definition of the UVID is part of the documentation of the Voyage Information Service:

“urn:mrn:stm:voyage:id:”<org>:”<localid>”

Where “urn:mrn:stm:voyage:id:” is the prefix, that identifies a UVID in the Voyage Management activity of the STM validation project.

<org> denotes a Voyage Information Service Provider and/or owner of the voyage id, and it’s purpose is to help discover the service endpoint (the address of the technical interface) of the Voyage Information Service were information related to this UVID can be found, via the Service Registry.

<localid> is a locally generated ID (syntax: a string of alphanumeric values (a-z, A-Z, 0-9), possibly characters ‘-’ or ‘_’, but no space or other special characters). It could be a serial number, UUID or something else. It is generated by the provider of the Voyage Information Service, and must be unique within the context of this particular instance of a Voyage Information Service.

Example

This is provided as an explanatory example, not stating additional requirements.

Shipping company A (operating Ship A) has internally established their own Voyage Information Service to manage its voyages, and it is registered in the Service Registry as Voyage Information Service “urn:mrn:stm:voyage:id:a:134”.

“urn:mrn:stm:voyage:id:a:134” denotes voyage number “134” held at Voyage Information Service Provider “a”.

The example above may also apply if shipping company A employs a third-party service to host its Voyage Information Service instance, since the naming of the unique identifier is rather a contractual matter between the parties than a consequence of the technical implementation.

Shipping Company B and C (operating Ships B and C) have both made a deal with Service Provider D to take care of representing their voyages electronically. Service Provider D operate the “urn:mrn:stm:voyage:id:stm-d” Voyage Information Service.

“urn:mrn:stm:voyage:id:stm-d:346” may denote the voyage number “346” of ship B held at Voyage Information Service Provider “stm-d”. Similarly “urn:mrn:stm:voyage:id:stm-d:134” may denote the latest version of voyage number “134” (could be ship B or C), but you don’t know the ship involved, unless you ask the
Voyage Information Service – and you must be nominated as a collaborator of this voyage – or request nomination - to retrieve any information about this voyage.

Holding the authority over the “urn:mrn:stm:voyage:id:stm-d” namespace allows the service provider, if so decided in the agreement with the client, to sub-divide the namespace into client-specific namespaces, which allows the clients to manage the issuing of UVIDs under the sub-namespace on their own.

The examples above illustrate how the precise usage of the “urn:mrn:stm:voyage:id” namespace is flexible and allow for different technical and contractual arrangements between shipping companies and service providers.

5.2. Unique Port Call ID (UPCID)

Issuing unique identifiers to identify a Port Call is very similar to issuing identifiers for a Voyage. The Port Call ID is owned by Activity 1 of the STM Validation project and described in the documentation of the Port Information Service. The following is provided to explain the similar syntax:

“urn:mrn:stm:portcdm:port_call:”<portCode>:“”<portspecificId>

Thus, the software developed for the STM testbeds, should accept both the prefix “urn:x-mrn”, “urn:mrnx” and “urn:mrn” as equivalent prefixes of testbed data. The prefix of future production data is to be determined depending on standardization, however the syntax of the URN notation will apply.

<portCode> denotes a Port Information Service of a particular port, identified through the UNLOCODE of a particular port – or another unique identification of the provider of a Port CDM service (syntax: a string of alphanumeric values (a-z, A-Z, 0-9), possibly characters ‘-‘ or ‘_’, but no space or other special characters).

<portspecificId> is a locally generated ID (syntax: a string of alphanumeric values (a-z, A-Z, 0-9), possibly characters ‘-‘ or ‘_’, but no space or other special characters). It could be a serial number, UUID or something else. It is generated by the Port system and must be unique within the context of this particular instance of a Voyage Information Service.

Example

“urn:mrn:stm:portcdm:port_call:SEGOT:b44928d8-0e93-46be-baf9-b824e0fdbe90” will denote a port call in the Port of Gothenburg (UNLOCODE: SEGOT) with a UUDI as a local reference.
Post project considerations for utilization of the UVID and UPCID identifiers

Assuming that the STM validation project successfully validates this way of handling UVIDs, UPCIDs - and associated Actor and Service Provider IDs, the construction of these identifiers will be brought forward as a proposal for a standard to be published by some relevant standardization organization.

Regardless of which standardization organization is identified as the relevant host of such a standard, the intention is to replace the prefix of the identifier construction (“urn:mrn:stm:”) with another prefix, identifying the relevant host organization. Possible results could be:

- “urn:gs1:” if the STM project ends up proposing the STM services to become GS1 standards
- Either way, the technical implementations of STM Services in the testbeds may be prepared through configuration to accept the “urn:mrn:stm:” prefix for the testbeds, but another prefix (To Be Determined) should be anticipated as the ‘production’ prefix of STM services for STM related identifiers and type definitions in the future.
6. Reference List

All data model schemas currently supported in STM can be found at the STM Validation Developer's forum webpage [http://stmvalidation.eu/schemas/](http://stmvalidation.eu/schemas/). The current listed STM standard formats are:

<table>
<thead>
<tr>
<th>Format</th>
<th>Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route Exchange Format (RTZ)</td>
<td>[<a href="http://stmvalidation.eu/schemas/">http://stmvalidation.eu/schemas/</a>]</td>
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<td>-RTZ Format</td>
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<tr>
<td>Text Message (TXT)</td>
<td>[<a href="http://stmvalidation.eu/schemas/">http://stmvalidation.eu/schemas/</a>]</td>
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<td>-Text Message Format</td>
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<tr>
<td>Area Exchange Format (S-124)</td>
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<td>-Area Exchange Format</td>
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<td>-Port Call Message Format</td>
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</tbody>
</table>

The documentation of the SeaSWIM Connector can be found at STM Validation Developer's forum webpage.

<table>
<thead>
<tr>
<th>Document</th>
<th>Link</th>
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</thead>
<tbody>
<tr>
<td>SeaSWIM L1 Connector Specification</td>
<td>[<a href="http://stmvalidation.eu/service-catalogue/">http://stmvalidation.eu/service-catalogue/</a>]</td>
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<td></td>
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<tr>
<td>SeaSWIM L2 Connector Technical Design</td>
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The documentation of the Voyage Information Service can be found at STM Validation Developer's forum webpage.

<table>
<thead>
<tr>
<th>Document</th>
<th>Link</th>
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<tbody>
<tr>
<td>Voyage Information Service (VIS) Specification</td>
<td>[<a href="https://www.stmvalidation.eu/developers-forum/vis/">https://www.stmvalidation.eu/developers-forum/vis/</a>]</td>
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<tr>
<td>Voyage Information Service (VIS) REST Technical Design</td>
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<td>[<a href="https://www.stmvalidation.eu/developers-forum/vis/">https://www.stmvalidation.eu/developers-forum/vis/</a>]</td>
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</tbody>
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The documentation of the Maritime Connectivity Platform can be found at STM Validation Developer's forum webpage.

<table>
<thead>
<tr>
<th>Document</th>
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<tr>
<td>MCP Service Registry</td>
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</tr>
</tbody>
</table>
39 partners from 13 countries
containerising maritime information

Demonstrating the function and business value of the Sea Traffic Management concept and its services.
Seing is believing!

SAFETY - ENVIRONMENT - EFFICIENCY

Swedish Maritime Administration ◦ SSPA ◦ Viktoria Swedish ICT ◦ Transas ◦ Chalmers University of Technology ◦ The Swedish Meteorological and Hydrological Institute ◦ Danish Maritime Authority ◦ Navicon ◦ Novia University of Applied Sciences ◦ Fraunhofer ◦ Jeppesen ◦ Carnival Corp. ◦ Italian Ministry of Transport ◦ SASEMAR ◦ Valencia Port Authority ◦ Valencia Port Foundation ◦ CINME ◦ University of Catalonia ◦ Norwegian Coastal Administration ◦ GS1 ◦ Cyprys University of Technology ◦ Port of Barcelona ◦ Costa Crociere ◦ Svitzer ◦ OFFIS ◦ Finnish Transport Agency ◦ Southampton Solent University ◦ Frequentis ◦ SAM Electronics ◦ University of Flensburg ◦ Signalis ◦ Maritiem Instituut Willem Barentsz ◦ SAAB TransponderTech AB ◦ University of Oldenburg ◦ Magellan ◦ Furuno Finland ◦ Rörvik ◦ University of Southampton ◦ HiQ

www.stmvalidation.eu
# 1.1 General

This document contains the technical requirements for the procurement of STM ship system within the scope of the STM Validation Project. The document describes the scope of the required functional and technical characteristics of the systems. The technical specifications, APIs and xml-codes are anticipated to be accurate but some are yet to be prototyped. This means that minor updates might be necessary. Latest updates to the specifications will be presented at the latest before the negotiation phase of the tender is commenced in order to tenderers to take updates into consideration in their final bid.

<table>
<thead>
<tr>
<th>info</th>
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<tbody>
<tr>
<td>to be filled in by the supplier</td>
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</table>

## 1.2 Definitions

### 1.2.1 Terminology for denoting a requirement

The following requirement is valid throughout this document:
- A mandatory requirement is denoted with the word “**shall**” and must be fulfilled.
- A criteria is denoted with the word “**should**” and gives added value in the evaluation if fulfilled.
- NB. Other requirement specifications referring to this specification might stipulate that a should requirement is changed to a shall requirement.

All requirements are labeled with R-X.Y.Z, where X.Y is the current chapter number and Z is a consecutive numbering to separate each requirement within the chapter. There can be several “shall” or “should” in one numbered requirement, which means that all must be fulfilled in order for the requirement to be fulfilled.

Descriptive text occurs throughout the document but is not labeled.

### 1.2.2 Select, turn-on, set etc.

All functions that are said to be selectable, turned-on, set, etc. will implicitly also be said to be the reverse, i.e. de-selected, turned-off, de-set, etc. unless specified explicitly to something else.

### 2 General requirements on the STM ship system

In this chapter the requirements that cannot be categorized into one or more of the 5 different components of the STM ship system as depicted in Figure 1 below, is stated.

#### 2.1.1 The Tenderer of STM ship system **shall** at milestone 2 prove that the STM ship system can exchange relevant payload formats defined in reference SeaSWIM specification.

#### 2.1.2 The tenderer **should** be able to adopt to external standards and requirements i.e. RTZ that is being updated to S-421. See reference Standard forecast.

This standard are not foreseen to be ready during the project period.
The tenderer **shall** assure that the delivered system adheres to all relevant requirements regarding normal functionality in all navigational equipment, The Supplier is fully responsible that all installations of software and/or hardware, fulfilling the tender specifications, does not interfere with existing navigational systems and that the System is compliant with existing rules and regulations including but not limited to SOLAS Ch V reg 17 on electromagnetic compatibility.

The Tenderer **shall** conduct appropriate training and provide documentation (manual) for onboard equipment users. The tenderer shall deliver all educational material to the ship in hard copy, CBT etc. The training material shall be held updated during the project period. Planned training shall be presented at SAT.

The Tenderer **shall** provide shipping companies included in the testbed sufficient information including a meeting presenting the STM-concept and demo the equipment updates introduced.

### 3 Functional/Technical Requirements

#### 3.1 STM Ship system overall description

At least one navigation system workstation on the ship’s bridge **shall** be able to interact with the STM Module. The main functions are; to receive voyage plan (VP) for further processing until used for navigation, to send the VP used for navigation to the STM Module, to send ETA to the STM Module.

Communication between the navigation system and the STM Module will ensure that the maximum possible degree of consistency is upheld between information held in the navigation system and the STM Module. If information consistency decreases due to the status of communication link between the navigation system and the STM Module, the communication status shall be known by both ends.

The STM Module is a set of software functions on some hardware that presumably is located on the ship. The STM Module may be integrated in the navigation system, if certification allows, it may be integrated into an existing planning station or it may be running on a dedicated device which is supplied by the supplier. If information consistency can be assured, the STM module can be placed ashore.
3.1.2 Communication between the STM Module and Online access point shall ensure that the maximum possible degree of consistency is upheld between information held in the STM Module and at the Online access point, depending on the online status of the ship. If information consistency decreases due to the status of communication links with the ship, the communication status and the age of information shall be known by both ends.

The online access point is constantly and stably connected to the internet and represents the ship towards other actors and services. The main functions in the online access point are the VIS, Port Information Service (optional) and the SeaSWIM Connector (SSC). The Online access point may be implemented onboard the ship or at another location. Each VIS is attached to a SSC and each ship has one (1) VIS instance.

3.2 Navigation system functionality

3.2.1 The STM ship system shall be able to send and receive route segment via AIS, ASM message (8), according to Appendix 2 - Route Message system requirements, F1.

3.2.2 The STM ship system shall be able to present route segment accordingly in navigation system.

3.2.3 STM ship systems shall able to include legspeed in route message format.

3.2.4 Not applicable (As the list of specifications are used in several projects, there might be specifications that does not apply to a project)

3.2.5 In the STM ship system it shall be possible to make a default choice that the route message (and/or RTZs) will be shared or not, with other STM-ships.

3.2.6 The STM ship system shall be able to present, via ASM message (8), according to appendix 3: Route message format (version1.0), info/flag on AIS targets that participates in STM test beds.

3.2.7 STM ship systems shall be able to calculate CPA and intersection points between own/other-ships route segments (including leg speed), even if the routes are not crossing each other. The operator should have the option to chose between legspeed or actual speed. Ready 2020-SDR Notice two demands in one. Shall in first should in second.

3.2.8 If a ship is deviating from its intended route (exceeding pre-set limits, geographically and in time, set by own ship), that shall be presented on own ships STM ship system.

3.2.9 It shall be possible to do “Route Trial Manoeuvre” including own and other ships routes. The operator should have the option to chose between legspeed or actual speed. Ready 2020-SDR Notice two demands in one. Shall in first should in second.

3.2.10 It shall be possible for the operator to activate other ships routes on a case by case basis. Eg. Acquire them manually in the navigation system. Manual activation of routes should be the default setting.

3.2.11 Alerts for low route CPA/TCPA should be easy to set and optional for the operator. If limits are exceeded other ships route might be triggered to show in the display.

STM Ship System functionality in Navigation System requiremnrt fulfills yes/no comment/describe
### 3.2.12 The navigation system shall be able to upload, download and display VP and S-124 to and from the STM Module. Communication between the navigation system and the STM Module will ensure that the maximum possible degree of consistency is upheld between information held in the navigation system and the STM Module.

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<tr>
<th>Requirement</th>
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<tr>
<td>3.2.12</td>
<td>shall</td>
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### 3.2.13 If information consistency decreases due to the status of communication link between the navigation system and the STM Module, the communication status shall be known by both ends. The communication status shall be displayed to the operator.

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<th>Requirement</th>
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<tbody>
<tr>
<td>3.2.13</td>
<td>shall</td>
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</table>

### 3.2.14 When difference between real time ETA and PTA (to a predefined waypoint) is more than a preset value the operator shall get a question if the operator wants to update the PTA. (New PTA must be easy to set.) If yes, schedule in RTZ shall automatically be updated and sent to relevant STM actors.

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<th>Requirement</th>
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<tbody>
<tr>
<td>3.2.14</td>
<td>shall</td>
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</table>

### 3.2.15 It shall be possible to define which waypoint that is used for ETA calculations by setting a PTA at that waypoint (ETA in manual schedule in RTZ) to mark it as “synchronization” WP.

<table>
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<tr>
<td>3.2.15</td>
<td>shall</td>
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</table>

### 3.2.16 When RTA is received from STM-actors, the PTA shall be possible to be updated, using the received RTA. The route shall not have to be safety checked due to only updated schedule. When new PTA is set, the VP shall be shared.

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<tr>
<td>3.2.16</td>
<td>shall</td>
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### 3.2.17 It should be clearly visible that only the schedule has been changed and which waypoint are affected by the change.

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<tr>
<th>Requirement</th>
<th>Fulfillment</th>
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<tbody>
<tr>
<td>3.2.17</td>
<td>should</td>
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</table>

### 3.2.18 Area received in STM text message format shall be possible to display in navigation system.

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Fulfillment</th>
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<tr>
<td>3.2.18</td>
<td>shall</td>
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### 3.3 Communication between STM Module and navigation system

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Fulfillment</th>
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<tr>
<td>3.3</td>
<td>shall</td>
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</table>

#### 3.3.1 The communication between the STM Module and navigation system shall have Information consistency (e.g. ship receives a VP in the STM module, accepts it, then the operator shall be able to choose it for monitoring in navigation system, it shall then be identical to the one in the STM module).

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<th>Requirement</th>
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<td>3.3.1</td>
<td>shall</td>
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### 3.4 STM Module

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Fulfillment</th>
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<tr>
<td>3.4</td>
<td>shall</td>
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</table>

#### 3.4.1 STM module shall be able to send, receive and show text messages to/from other STM actor according to "STM text format", in SeaSWIM specification, appendix 4 (e.g. Text body, Message subject, receiver id (actor id), sender id (actor id), reference to information object ID (e.g. UVID)).

<table>
<thead>
<tr>
<th>Requirement</th>
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<tbody>
<tr>
<td>3.4.1</td>
<td>shall</td>
</tr>
</tbody>
</table>

#### 3.4.2 The STM module shall include the functionality to communicate the following (but not limited to) to and from VIS/Online access point.

- Publish VP to VIS / Online access point.
- Retrieve VP proposals from VIS / Online access point.
- Ref2068218Send and receive VP, Area- and text messages to other STM services through VIS / Online access point.

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Fulfillment</th>
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<tbody>
<tr>
<td>3.4.2</td>
<td>shall</td>
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</table>

#### 3.4.3 The STM module shall include the functionality to show, create, edit and save VP. It shall be possible to graphically clearly distinguish received VP updates, e.g. route suggestions.

<table>
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<th>Requirement</th>
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<tbody>
<tr>
<td>3.4.3</td>
<td>shall</td>
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#### 3.4.4 Not applicable

<table>
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<tr>
<th>Requirement</th>
<th>Fulfillment</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.4.4</td>
<td>shall</td>
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</tbody>
</table>

#### 3.4.5 If an appropriate schedule is not attached to the monitored VP, operator shall get notified.

<table>
<thead>
<tr>
<th>Requirement</th>
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</thead>
<tbody>
<tr>
<td>3.4.5</td>
<td>shall</td>
</tr>
<tr>
<td>3.4.6</td>
<td>The STM module <strong>shall</strong> be able to set route status according to RTZ format in SeaSWIM specification.</td>
</tr>
<tr>
<td>3.4.7</td>
<td>The route status “inactive” <strong>shall</strong> only be shared with other STM actors when the voyage is completed or cancelled.</td>
</tr>
<tr>
<td>3.4.8</td>
<td>OOW <strong>shall</strong> be made aware of relevant events such as incoming messages (VP updates, text messages new RTA etc.) The event shall be detectable from ships conning position. Above events shall not interfere with navigational information.</td>
</tr>
<tr>
<td>3.4.9</td>
<td>The STM Module <strong>shall</strong> be able to upload/download VP and S-124 to/from the ships navigation system.</td>
</tr>
<tr>
<td>3.4.10</td>
<td>Operator <strong>shall</strong> be able to search for service instances in STM module according to SeaSWIM specification, based on attributes available in service registry.</td>
</tr>
<tr>
<td>3.4.11</td>
<td>Operator <strong>shall</strong> be able to search for services by means of Geometry (e.g. area search and/or Voyageplan search).</td>
</tr>
<tr>
<td>3.4.12</td>
<td>STM module <strong>shall</strong> be able to present the service descriptions included in service registration.</td>
</tr>
<tr>
<td>3.4.13</td>
<td>STM module <strong>should</strong> be able to present all relevant information available in instance descriptions as document (PDF, HTML).</td>
</tr>
<tr>
<td>3.4.14</td>
<td>STM module <strong>shall</strong> be able to store lists of services (for offline purposes).</td>
</tr>
<tr>
<td>3.4.15</td>
<td>The STM module <strong>should</strong> be able to support offline work when connectivity goes down, e.g. search for services and call them and when connectivity returns the “call” should be processed.</td>
</tr>
<tr>
<td>3.4.16</td>
<td>If stored service list is used, the list <strong>shall</strong> be updated minimum once per day and/or when service is called to prevent old entries to be used.</td>
</tr>
<tr>
<td>3.4.17</td>
<td>If search fails, the operator <strong>shall</strong> get an error message within 30 seconds.</td>
</tr>
<tr>
<td>3.4.18</td>
<td>Operator <strong>should</strong> be made aware if “messages” has been sent or not, due to connectivity or other issues.</td>
</tr>
<tr>
<td>3.4.19</td>
<td>Operator <strong>shall</strong> in the STM module be able to assign/remove access rights on information objects (VP) to services.</td>
</tr>
<tr>
<td>3.4.20</td>
<td>STM module <strong>shall</strong> be able to present for the operator which actors that have been given access rights to VP.</td>
</tr>
<tr>
<td>3.4.21</td>
<td>Operator <strong>shall</strong> in the STM module be able to share VP to selected services. It <strong>shall</strong> be possible to share a VP once or to set a service as a subscriber (i.e. automatically send future updates of VP).</td>
</tr>
<tr>
<td>3.4.22</td>
<td>Operator <strong>should</strong> in the STM module be able to subscribe on a service.</td>
</tr>
<tr>
<td>3.4.23</td>
<td>There <strong>should</strong> be a functionality in the STM Module to present relationship between different payload formats, e.g. a text message can be correlated to a VP.</td>
</tr>
<tr>
<td>3.4.24</td>
<td>The STM Module <strong>shall</strong> be able to show navigational warning according to S-124 (See SeaSWIM specification).</td>
</tr>
<tr>
<td>3.4.25</td>
<td>The STM Module <strong>shall</strong> be able to show area in STM text format.</td>
</tr>
<tr>
<td>3.4.26</td>
<td>The STM Module <strong>should</strong> handle real time calculation (including preplanned speeds) of ETA and or STG (Speed To Go to reach a WP at a given time) to one or more selected WP(s) (e.g. arrival traffic area or Pilot Boarding Position) along the route, not necessarily the last waypoint in the route.</td>
</tr>
</tbody>
</table>
3.4.27 The STM ship system **shall** automatically give the VP an Unique Voyage ID (UVID) using the maritime resource name (mm) structure (see SeaSWIM specification).

3.4.28 When a STM actor has sent e.g. a VP to another STM actor (e.g Ship-Shore, Shore-Ship) the sender **shall** get information regarding that that message is “read” by the receiver. (Requires update of VIS technical design as an intermediary before the standardized service interface).

### 3.5 Communications between the STM Module and Online access point

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Fulfillment</th>
<th>Comment/Describe</th>
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<tbody>
<tr>
<td>3.5.1 Each ship <strong>shall</strong> have data link connectivity between the STM Module and the Online access point. The connectivity has the ability to be continuous with adequate capacity according the following: Communication between the STM Module and Online access point ensures that the maximum possible degree of consistency is upheld between information held in the STM Module and at the Online access point, depending on the online connectivity status of the ship. (Quantifying of above will be done in separate projects).</td>
<td>Ready 2020-SDR</td>
<td>shall</td>
</tr>
</tbody>
</table>

### 3.6 Online access point (Service Instance)

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>3.6.1 The online access point <strong>shall</strong> hold a service instance that is the internet connected representation of the ship, the service instance shall represent the ship towards other actors via a SSC (service instance shall be based on latest service design VIS).</td>
<td>Ready 2020-SDR</td>
<td>shall</td>
</tr>
<tr>
<td>3.6.2 The online access point <strong>should</strong> hold a service instance that is the internet connected representation of the ship, the service instance should represent the ship in receiving port call messages (PCMF) in port-call synchronization interactions towards other actors via a SSC.</td>
<td>Ready 2020-SDR</td>
<td>should</td>
</tr>
<tr>
<td>3.6.3 Online access point <strong>shall</strong> be able to expose and consume (to other STM actors) RTZ-format, S124-format and text format using VIS (See SeaSWIM specification).</td>
<td></td>
<td>shall</td>
</tr>
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<td>3.6.4 Online access point <strong>should</strong> be able to exchange PCM-format with other STM actors (See SeaSWIM specification).</td>
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<td>3.6.5 Online access point <strong>shall</strong> be permanently and stably internet connected.</td>
<td></td>
<td>shall</td>
</tr>
<tr>
<td>3.6.6 External events (according to service log specification) in and out to/from the system <strong>should</strong> be stored and logged for traceability. Events could include, but are not limited to: Exchange of VP and received S-124.</td>
<td></td>
<td>should</td>
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<td>3.6.7 Service <strong>shall</strong> be registered in service registry according to guideline (See SeaSWIM specification).</td>
<td></td>
<td>shall</td>
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<td>3.6.8 All messages, sent and received, <strong>shall</strong> be validated against payload schema.</td>
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### 3.6 Online access point (Service Instance)

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### 4 STM Cyber security requirements

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<th>Requirement</th>
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<tbody>
<tr>
<td>4.1 Service instance in online access point <strong>shall</strong> adhere to requirements stated in SeaSWIM Connector Specification and SeaSWIM Connector Design.</td>
<td></td>
<td>shall</td>
</tr>
<tr>
<td>4.1.2 Each ship <strong>shall</strong> be individually identifiable for the receiver of information, hence a unique certificate for the ship shall be used as client certificate.</td>
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<td>shall</td>
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<tr>
<td>4.1.3 The information owner <strong>shall</strong> implement authorization mechanism for external actors, that ensures only authorized external actors have access to its information (See also requirement R-3.4.19).</td>
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<td>shall</td>
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</tbody>
</table>
4.1.4 Security events *should* be logged for traceability (time, denied access etc.) in Online access point.

<table>
<thead>
<tr>
<th>4.1.5</th>
<th>The communication between STM Module and Online Access Point <em>shall</em> be secured to hinder unauthenticated requests and unauthorized access to information. (e.g. VPN).</th>
</tr>
</thead>
</table>

## 5 Non-Functional/Technical Requirements

### 5.1 STM identified non-functional requirements

| 5.1.1 | Information *shall* not be lost due to restart or due to no connection to internet. |
| 5.1.2 | Information shared *shall* not overseed 400kb |
| 5.1.3 | The online access point *shall* be available at least 99% of the time. |
| 5.1.4 | The status of service call *shall* be clearly indicated (e.g. by symbols for OK, Error) to the operator. Reason for the error *shall* be presented in text. See VIS Technical Design for details. |
| 5.1.5 | The response message from service call *shall* be possible for an operator to read. The response message may contain information regarding the service call even if call was technically a success, such as missing information in the voyage plan. |
| 5.1.6 | The Online access point VIS-based instance *shall* return HTTP response (code and message/information) according to VIS Technical Design. |

## 6 GDPR

### 6.1 GDPR requirements

| 6.1.1 | General Data Protection Regulation (GDPR) *shall* be applied. |
| 6.1.2 | Personal information *shall* be avoided in the system. |
| 6.1.3 | GDPR handling required in MCP *shall* be followed (See SeaSWIM specification). |
1. Call for tender

1.1 Procurement

1.1.1 Invitation to tender

The Swedish Maritime Administration (hereinafter SMA) hereby grants you the opportunity to submit a tender regarding STM update on ECDIS or stand alone units connected to ECDIS.

1.1.2 About the Authority

SMA is a central administrative authority with a sector responsibility for shipping. This means a collective responsibility for achieving the government’s transport and economic policy goals in the field of shipping.

The goals of transport policy guiding our operations are to attain an accessible transport system, a high level of transport quality, secure shipping, a favourable environment, positive regional development and an equitable transport system. Regarding economic policy, SMA shall work to take advantage of the potential of shipping as a competitive export industry, and to look after the competitive conditions of the
merchant fleet. Of 1160 SMA’s employees, 240 are located in the head office located in Norrköping.

1.1.3 Purpose/Aim of the Tender

The higher purpose of the STM Balt Safe is to increase the safety in the Baltic Sea with the focus on tankers.

The aim of this tender is to expand the STM compliant fleet to be able to have a concentrated test bed in the Baltic Sea Region with special focus on Gulf of Finland and Bay of Riga.

1.1.4 Documents in the tender invitation

This invitation consists of the following documents:

- Call for tender (this document)
- Tender requirements
- Drafted agreement
- ESPD (European Single Procurement Document)

Attachments:

- Appendix_1_Technical requirements
- Appendix_2_Route-Message-system-requirements
- Appendix_3_textMessageSchema_Description_1_3
- Appendix_4_SeaSWIM-Specification-v3.0

Any complementary information, including question and answers, that might be published during the procurement process.

Please note that it is the responsibility of the tenderer to make sure that all procurement documents, questions and answers and other information have been obtained.

Documentation regarding usecases, FAT and SAT protokoll will be published at [https://www.stmvalidation.eu/projects/stm-balt-safe/](https://www.stmvalidation.eu/projects/stm-balt-safe/)

1.1.5 Background

STM BALT SAFE

The sensitive Baltic Sea region has one of the highest shipping intensities in the world. There are many tanker ships and crossing traffic of passenger ships and narrow passages. Shipping accidents happen and may in the worst-case scenario have an extreme impact on the environment. Measures in the field of safety of navigation are needed to reduce accident risks. There is a need to improve the exchange of information between ships and between ships and shore for increased situational awareness and as a catalyst for improved safety of navigation, optimized capacity utilization and just-in-time operations.
Increased safety in the Baltic Sea

STM BALT SAFE (2019-2021) will contribute to increased safety of navigation in the Baltic Sea by providing Sea Traffic Management (STM) enabled maritime services to the tanker traffic in the Baltic. The project will address the recently amended HELCOM recommendations 34 E/2 "Further testing and development of the concept of exchange of voyage plans as well as other e-navigation solutions to enhance safety of navigation and protection of the marine environment in the Baltic Sea region". Tanker ships will be made safer by making them STM compatible hence given the ability to send and receive voyage plans with other ships and with public authorities in Baltic Sea countries. By the STM BALT SAFE project, the institutional capacity of the public sector on supporting and developing safety of navigation services and efficiency of sustainable transport will be enhanced.

Enhanced monitoring and automated reporting

The project will build on the methods, results and the maritime service infrastructure developed in previous projects like EfficienSea II, MONALISA 2.0 and Sea Traffic Management Validation project and will encompass exchange of voyage plans and integration of STM functionalities in VTS shore centres. Services for enhanced monitoring of maritime traffic, different automatic reporting services to Ship Reporting Systems e.g. GOFREP and SOUNDREP as well as automated reporting to Maritime Single Windows, will be developed and tested in the project. Different services that optimize the ship’s voyage and decrease the administrative burden will also be developed and tested within the STM BALT SAFE.

New STM-clause enable just-in time for charter parties

The standard clauses for shipping are currently being developed to be efficient when using Sea Traffic Management to optimize the sea traffic. These new clauses for Charter Party contracts to enable just-in-time shipping will also be tested and validated in practice within the STM BALT SAFE.

A wide partnership around the Baltic Sea
The STM BALT SAFE project will be implemented by a Baltic Sea wide partnership of public administrations from Norway, Sweden, Finland and Estonia. The total budget amounts to appr. 4 million euro.

STM capability on board ships

STM BALT SAFE will provide the ships in the testbed with STM capable onboard system in order to facilitate ship-to-ship and ship-to-shore exchange of voyage plans. This is fully in line with the amended HELCOM Recommendation 34E/2 on further testing and development of the concept of exchange of voyage plans to enhance safety of navigation and protection of marine environment in the Baltic Sea region. The recommendation also mentions a number of different suitable services such as ice routing and winter navigation services as well as SAR information.

These STM enabled maritime services are also included in in other HELCOM recommendations. The aim is to involve tanker ships and regular ferries in crossing traffic in the Gulf of Finland in the testbed of the STM BALT SAFE project. The increase of the number of STM compatible tanker ships in the Baltic will contribute to increase navigational safety while at the same time increase efficiency and reducing environmental impact.

The STM concept supports ships in both the voyage planning phase and during the voyage e.g. route optimization services, providing pilot routes and Navigational Warnings directly to the navigational system of the ships, ship-to-ship route exchange etc. All services are supported and delivered via the Maritime Digital Infrastructure where the exchange of voyage plans is executed in a standardized way. This caters for that end-to-end interoperability in communication between systems from different manufactures regardless if they are shore based systems or ship based systems and with an ability to interact with maritime services enabled by STM.

By involving a large number of tanker ships in the STM BALT SAFE testbed, a good quantity of data can be collected for analyses and evaluations. The functional requirements for ship systems will also take into account the needs of other maritime services than exchange of voyage plans, i.a. automated ship reporting services etc.

1.1.6 Procurement procedure

The procurement is carried out according to the Swedish Public Procurement Act as an Negotiated procedure without publication

1.1.7 Overall timetable

<table>
<thead>
<tr>
<th>Action</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>This procurement is published</td>
<td>12/20/2019</td>
</tr>
<tr>
<td>Event</td>
<td>Date</td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Last day for questions</td>
<td>1/23/2020</td>
</tr>
<tr>
<td>Last tender day</td>
<td>1/31/2020 11:59 PM</td>
</tr>
<tr>
<td>Installation of STM 1.0</td>
<td>2020-07-01</td>
</tr>
<tr>
<td>System Design Review</td>
<td>2020-09-01</td>
</tr>
<tr>
<td>FAT</td>
<td>2020-10-31</td>
</tr>
<tr>
<td>SAT</td>
<td>2020-11-30</td>
</tr>
<tr>
<td>Final acceptance, all ships updated to 2.0</td>
<td>2021-01-31</td>
</tr>
</tbody>
</table>

Note this timetable is preliminary

1.1.8 Contract period
The contract is valid from the time of both parties have signed. Contract time starts when both parts signing the contract and ends when the Project ends.

1.1.9 Close of the tender period
The tender must be received by SMA by 1/31/2020 11:59 PM at the latest. Tenders received after this date will not be considered.

1.1.10 Validity of the tender
The tender should be valid until 5/31/2020

1.1.11 Extended validity of the tender
If the procurement is subject to a legal review, the validity of the tender may be extended until the contract can be signed, up until a maximum of six (6) months from the end of the validity period.

1.2 Administrative regulations

1.2.1 Submission of tenders in TendSign
Tenderers who want to participate in this procurement shall submit bids electronically via TendSign, tenders received by mail, email or fax will not be considered. If signed documents are requested they shall be scanned and uploaded and all required documents shall be in a legible format.

1.2.2 Instructions for structure

- All shall- and should requirements shall be answered. Answers left out are normally regarded as unmet requirements.
- All 'shall' requirements must be met for the tender to be considered.
- Should requirements are evaluated and used to obtain the tender that has the most advantageous relationship for the SMA between price and quality, see the section on evaluation.
- If proof in the form of appendices are required, these should generally be attached to the tender.
An exception applies for proof of compliance for grounds of exclusion and selection according to the European Single Procurement Document (ESPD) Regulation.

Please submit a complete and final tender.

1.2.3 Costs associated with tendering
No compensation will be provided for any costs associated with the invitation to tender.

1.2.4 Language
Submitted tender and attached document shall be written in English. Questions and answers shall be in English.

1.2.5 Pricing
Tendered prices must be given as follows:

State the price in the comment field below. The price shall be for a fully developed solution, installed in assigned vessels, technical support during the project period and training of bridge officers in the usage of the STM functionalities. The price shall refer to installation in one (1) vessel.

Prices must be stated in EUR and are assumed to be exclusive of VAT, including customs, shipping and handling fees unless otherwise stated in the terms of the agreement.

Budget price for each installation in vessels is max 4200eur/vessel, tenderer with prices above that will be rejected.

<table>
<thead>
<tr>
<th>a. Total price for the system, installed in one (1) vessel</th>
<th>General part (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Text field</td>
<td></td>
</tr>
<tr>
<td>EUR 9500 per ship system</td>
<td></td>
</tr>
</tbody>
</table>

1.2.6 Acceptance of drafted agreements
The tenderer shall accept the drafted agreements.

<table>
<thead>
<tr>
<th>a. accept of drafted agreements</th>
<th>General part (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes/No. Yes is required</td>
<td></td>
</tr>
<tr>
<td>Answer</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>
1.2.7 Standard agreements

Standard agreement IT & Telekomföretagens - IT Project, version 2014, General terms and conditions will form the basis of this agreement and must be accepted.

a. accept of standard agreements

<table>
<thead>
<tr>
<th>Yes/No. Yes is required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Answer</td>
</tr>
<tr>
<td>Yes</td>
</tr>
</tbody>
</table>

1.2.8 Evaluation of tenders

Qualification and evaluation is conducted as follows:

1. **Qualification of tenderers.** In this step, checks are performed to verify that the tenderers fulfil 'shall' requirements to qualify as a supplier, i.e., that tenderers have fulfilled their social obligations, have adequate finances and have the necessary expertise.

2. **Fulfilment of 'shall' requirements.** In this step, checks are performed to verify that 'shall requirements are fulfilled. Tenders that do not fulfil the 'must requirements are rejected.

3. Those tenders that fulfil all 'shall' requirements are evaluated according to the principle of the Most economically advantageous tender.

1.2.8.1 Price for evaluation

Tenderers stated prices, according to 1.2.5 will be used for evaluation.

1.2.8.2 Most economically advantageous tender

SMA will adopt the tenderers which is the most economically advantageous in consideration of the tenderers price. The tender with the **lowest** comparative price according to provided prices will get contracts. Maximum 5 tenderers will get contracts. The distribution will be made according to the matrix below based on the number of tenders accepted. If several tenderers end up at the same comparative value, lottery will be applied.

<table>
<thead>
<tr>
<th>Percentage of vessel amount depending on rankings according to tenderers comparative value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of accepted bids</td>
</tr>
<tr>
<td>----------------------------</td>
</tr>
<tr>
<td>1</td>
</tr>
</tbody>
</table>

Number of accepted bids.
1.3 Questions

1.3.1 Information management

The TendSign system is used for distribution of specifications and other information relevant to the procurement. Documents and information are distributed electronically via the internet address (URL link) provided in the Call for Tender.

In order to access the system, a username and password must be obtained by following the simple registration process on www.TendSign.com. Tenderers can use this system free of charge and gain immediate access to the system and specifications once registration has been carried out. TendSign’s support is open on working days between 07.00 – 17.00.

Questions concerning TendSign (how to post questions, tender etc.) shall be addressed to tendsignsupport@visma.com. TendSign answers the questions by telephone or e-mail.

1.3.2 Questions concerning the tender specification

If a tenderer finds the specifications unclear in any aspect then it is important to clarify the issue quickly to avoid any misunderstandings. Questions regarding this tender should be sent in writing via TendSign.

Questions and answers together with any other information about the tender specifications (such as clarifications and corrections) will be distributed via TendSign to all tenderers. Supplementary information is only binding if it is in writing from SMA.

Last date for questions 1/23/2020

1.4 Conflicts of interest

In order to avoid a possible situation of equality, the Swedish Maritime Administration wants information about the tenderer, its owner (with actual influence) or its employees are employed by the Swedish Maritime Administration, or if there is another link that may affect the procurement process or contractual relationship.

a. Enter if any connection to the Swedish Maritime Administration as described above. If no connection exist, then enter that in the text box.

Yes/No. Yes is required

Answer

Yes
1.5 Commercial Secrecy

In accordance with the Official Information and Secrecy Act (Offentlighets- och sekretesslag (2009:400)) all information pertaining to a procurement matter is subject to secrecy until an agreement has been entered into or procurement has otherwise been concluded.

Any information mentioned may be subject to secrecy even after the aforementioned time. Note however that only in exceptional cases, information and prices according to the evaluation of the tender are considered to be of such nature that they may be held secret for commercial reasons. With respect to commercial secrecy for the protection of a tenderer’s information, the requirement is that the information in question refers to the tenderer’s business or service conditions and that there is a specific reason to presume that the tenderer will suffer damages if the information is disclosed.

If a tenderer considers the information submitted in connection with this procurement matter fulfills the aforementioned requirements for commercial secrecy, the tenderer must submit a request for commercial secrecy, in writing, with clarification concerning the information referred to and what damage the tenderer would suffer if the information were disclosed. The decision whether or not the information submitted by the tenderer fulfills the requirements for commercial secrecy will be made by the Contracting Entity.

a. If the tenderer is to make the tender, or part of the tender confidential, please specify which information needs to be protected and the damage that could occur if the information is made public.

No, it is open.

1.6 Discontinuance of procurement

SMA reserves the right not to make an award and/or to cancel the invitation to tender, to issue a new invitation for tendering, to adapt the procedure for the invitation to tender and/or to introduce alterations to the nature of those according to unexpected economic, political or organizational changes. If offered price is over budget according to the goal of the project, SMA has the right to cancel the procurement.
2. Tenderer requirements

2.1 Tenderer requirements

2.1.1 Requirements for tenderers

Tenderers must meet all requirements in chapter 2.1 in order to qualify for their tender to be examined and evaluated.

2.1.2 Subcontractors

A tenderer may engage subcontractors for part of the work. This should be clearly shown in the tender, and the subcontractor must also meet all the requirements. Upon request by SMA, tenderer shall be able to present a cooperative agreement or similar, showing that each subcontractor agrees to make the necessary resources available.

a. If a subcontractor will be used, the name of the organization number and the part they intend to perform shall be stated. If no subcontractor is to be used write "not relevant"

2.1.3 Grounds for exclusion

Circumstances that will lead to exclusion of a tender: Examination according to the Swedish Public Procurement Act (2016:1145) 13 CH. § 1, 2 and 3.

Requirements for evidence

The tender shall include a statement certifying that situations described in the Swedish Public Procurement Act CH 1-3 § do not apply.

a. The tenderer certifies that there are no grounds for exclusion

Yes/No. Yes is required

Answer

Yes

2.1.4 Registration obligations, payment of taxes and fees

Tenderers shall satisfy the legal requirements of Sweden or their homeland concerning registration, tax
and obligatory fees. Tenderers may not have incurred any debts for social security fees or taxes, in
Sweden or in their homeland, if the debt has led to registration with the Swedish Enforcement Authority
or similar authority in the homeland.

Requirements for evidence
If the tenderer is registered in Sweden no evidence needs to be included. SMA will verify that the
requirements are satisfied and will contact the tenderer if any clarification is needed when the tenders
are being processed. If the tenderer is a foreign Company, certified copies of official documents issued
by a competent judicial or administrative authority shall be provided to SMA.

<table>
<thead>
<tr>
<th>a. Requirements are fulfilled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes/No. Yes is required</td>
</tr>
</tbody>
</table>

Answer
Yes

<table>
<thead>
<tr>
<th>b. If the tenderer is a foreign company, certified copies of official documents shall be attached</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attachment</td>
</tr>
</tbody>
</table>

0 attached documents

2.1.5 Company registration
The tenderer must meet the requirements on company registration (limited liability companies’ register,
partnerships register or a similar register) in the country where the tenderer’s business is registered.

To confirm requirement fulfillment, tenderers may already attach the following documentation in the
tender, but must upon request attach the documents as soon as possible.

- Document from a relevant official authority/equivalent that confirms that the company is registered.

<table>
<thead>
<tr>
<th>a. Requirements regarding company registration are fulfilled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes/No. Yes is required</td>
</tr>
</tbody>
</table>

Answer
Yes

2.1.6 Financial Position
Tenderers shall have a stable financial position, to ensure that all commitments can be fulfilled during the contract period.

Requirements for evidence
If the tenderer is registered in Sweden no evidence needs to be included in the tender. SMA will carry out a credit check with help of the Swedish CreditSafe (www.creditsafe.se), where tenderers will need a rating of "Kreditvärdig" or higher to satisfy the requirements. If the tenderer is aware of, or suspects that up-to-date information is missing or incorrect (for example for a newly created business that has not yet submitted an annual report), or that requirements are not satisfied, then an explanation should be provided so that SMA can make an overall assessment of the tenderer, to determine whether or not the requirements for a stable financial position have been fulfilled.

If the Tenderer is a foreign Company, the tenderer shall provide a certificate of financial status, not older than 2 months, from CreditSafe (www.creditsafe.se) or other finance Company. The credit rating, to be approved, shall be at the minimum creditworthy.

a. Tenderer approves with the requirement
   Yes/No. Yes is required

   Answer
   Yes

b. If the tenderer is a foreign company, the requested certificate shall be attached
   Attachment

   -

2.1.7 Pension Insurances, collective agreement and occupational healthcare
The contracting partner shall before contract signing supply information and certificates described below that are no older than three (3) months:

- Certificates of pension insurances arranged for employees and of pension insurance premiums paid, or an account that a payment agreement on outstanding pension insurance premiums has been made
- An account of the collective agreement or the principal terms of employment applicable to the work
- An account of provided occupational healthcare

These requirements are included as this is a procurement funded by funds from the EU via Central Baltic.
2.1.8 Technical and professional capacity

The tenderer shall have the technical and professional capacity required to fulfill their contractual obligations.

The tender shall include:

- A brief description of tenderer’s organisation, number of employees, operations, history and ownership, as well as geographical location and resources within the relevant field.

- A brief description of the staffing plans for the contract, in particular with regard to replacements if key staff are absent.

- The tenderer's historic and current work on development and research and cooperation with industry organizations and authorities.

2.1.9 Experience of ECDIS

To be qualified for this procurement you need to be:

1. A manufacturer of type approved ECDIS equipment or have a planning station that is connected with ECDIS.*
2. Ships equipped shall be either/or
   1. Tanker DW, minimum 3000 GT,
   2. Ferries 500 GT, trading Gulf of Finland.
   3. Ships assisting in Winter navigation along the Estonian coast.
3. The ships equipped shall be planned to trade the Baltic Sea, preferably Gulf of Finland.

*Route in ECDIS shall be possible to be exchanged with planning station without the need for USB-drives.
2.1.10 Quality
Tenderers shall apply quality control procedures to ensure that work is carried out in such a way that the agreed scope and quality is achieved and maintained. The quality assurance work shall be conducted with the support of tools and/or written procedures so that the work is monitored and the result is measured against set targets.

Requirements for evidence
The tender shall include:
- A summary describing how the tenderer will work with quality assurance and other controls, including the procedures to document them and/or a copy of quality certification.

2.1.11 Liability Insurance
In case of a contractual signing, the tenderer shall have a liability insurance for the commitment. The tenderer shall hold liability insurance for his business which includes the commitment under this contract.

Liability Insurance shall be valid throughout the contract period. Insurance certificates shall be submitted to SMA on request.

a. Tenderer hold liability insurance for his business which includes the commitment under this contract

Yes/No. Yes is required

Answer
Yes
2.1.12 Technical requirement

Technical Requirements, requested functionality and prerequisites for the system is described in appendix 1.

All requirements in the Appendix 1 shall be answered and be attached with the tender.

<table>
<thead>
<tr>
<th>a. All shall requirements in Appendix 1 are met</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes/No. Yes is required</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>b. Answered Appendix 1, technical requirements of the system shall be attached</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attachment</td>
</tr>
</tbody>
</table>

1 attached document

2.1.13 Project and timeplan

The tenderer must attach a preliminary project and timetable, linked to the mentioned milestones in 1.1.7, that clearly describes the implementation Project scope and length, area of responsibility for each party and measurable milestones.

Explanation and definition of Some of the milestones that shall be included in the timeplan.

**System design review.** A technical description of the planned system shall be presented for and reviewed by SMA.

**FAT** The STM compatible system shall be fully developed and presented for SMA. SMA will follow a preset test procedure.

**SAT** The STM compatible system shall be installed onboard a ship and presented to SMA. SMA will follow a preset test procedure.

**All ships systems installed.** When the contractor have installed systems in all ships that was agreed upon in the contract.

**Final acceptance** The project have come to an end and all agreed ships have been installed. The bridge officers have gotten due training and the technical support have been up and running.

Documentation regarding usecases, FAT and SAT protokoll will be published at [https://www.stmvalidation.eu/projects/stm-balt-safe/](https://www.stmvalidation.eu/projects/stm-balt-safe/)
The project must be done according to an iterative implementation, where SMA and the supplier have frequent reconciliations during the process.

The project plan must very clearly emphasize the requirements that the tenderer places on SMA and the dates which the client is expected to satisfy these.

The preliminary timetable will be fundamental to the detailed project and timetable to be produced and approved by both the client and tenderer after the agreement has been signed. A detailed project and time schedule must be produced as soon as possible after signing of agreement.

### a. Project and timeplan

Attachment

[2.1.3 Timeplan.docx]

---

#### 2.1.14 Qualification requirements - espd

The European Single Procurement Document (ESPD) is a standardised self-declaration that tenderers may use as a preliminary evidence of their possibility to participate in a procurement. In an ESPD, tenderers and applicants certify that they should not be excluded from the procurement according to Chapter 13, Sections 1-3 of the Public Procurement Act (2016: 1145) and that they can provide evidence for this. If a tenderer has not attached the specified verifications together with the tender, or if the contracting authority itself can retrieve the verifications from a third party, the authority can request that the verifications are submitted during the evaluation process.

Tenderers who wish to use an ESPD form for qualification instead of the requirements stated by the SMA in the Section Qualification shall use the ESPD form, with requirements relevant to the procurement. Please note that tenderers using an ESPD form also must fill in ESPD forms for every stated subcontractor, and on request from the university also submit the specified verifications for each subcontractor.

#### 2.1.14.1 ESPD or requirements for tenderer

The tenderer shall state whether the tenderer uses the specifications of the tenderer for the tenderer or the ESPD documents.
a. If the tenderer make use of the tender documents, the tenderer writes ‘tender documents’ below.
If the tenderer make use of the ESPD file, attach it in the Tendsign’s system and the tenderer writes ‘ESPD’ below.

Text field

ESPD
3. Drafted Agreement

3.1 Agreement (Draft)

3.1.1 Introduction
The following Agreement has been entered into by and between The Swedish Maritime Administration (SMA) with organization number 202100-0654, and ______, hereinafter referred to as the Contractor/Supplier, with organization number______. The Contractor commits itself to performing the assignment according to the tender (hereinafter “the Assignment”) in accordance with the provisions in this agreement.

3.1.2 Agreement

3.1.3 Subcontractors
Approved subcontractors are:

The engagement by the Supplier of any subcontractor shall not relieve the Supplier from any liabilities or obligations under this Contract and the Supplier shall be responsible for any acts or omissions of any subcontractor as if they were acts or omissions of the Supplier.

The Supplier shall ensure that the terms and conditions of this Contract are reflected in all subcontracts, if any, to the extent necessary to enable the Supplier to fully meet his obligations to SMA. Such terms and conditions include, but are not limited to, technical, functional and operational requirements and technical specifications; time of delivery; warranty terms; and quality Control.

Only subcontractors approved by SMA can be used.

3.1.4 Period of contract
The contract is valid from the time of both parties have signed and will ends when the project ends, but no longer than until June 21, 2021.

3.1.5 Contact
Each Party shall appoint a primary contact person whose responsibilities and obligations during the Term of the Contract are defined in this contract.

For SMA: Cajsa Jersler Fransson

For the Supplier: XXXXX
3.1.6 Agreed Specifications
This agreement covers all software and support services for a STM compatible system in the STM Balt Safe Project.

3.1.7 Scope
A STM compatible system shall in the STM Balt Safe project be a system that fulfill the requirements in the attached list. A system might be a software upgrade to an ECDIS or a stand alone unit compatible to an ECDIS with the capability to retrieve and send RTZ.

3.1.8 Security agreement

3.1.9 Agreement documents
In the event of the documents relating to the Agreement refers to or contains conflicting general terms and conditions, these documents shall prevail as follows:

1. Written changes and additions to this Framework
2. This Framework with accompanying appendices
3. The request for a tender with accompanying appendices
4. The tender, including any clarifications
5. IT & Telekomföretagens - IT Project, version 2014, General terms and conditions, applies unless otherwise stipulated in this agreement

No other documents besides the above apply.

If the Supplier has and/or applies any "General terms and conditions of contract" or equivalent, these have been rejected by the SMA, meaning that through this Contract the Parties have expressly agreed to exclude all such terms and conditions.

3.1.10 Changes and additions
All changes and additions must be in writing and agreed by all parts.

Notices required to be given by one party to another shall be in the English language unless expressly agreed otherwise and shall be deemed properly given if reduced to writing and personally delivered or sent by registered or certified post to the address below, postage prepaid, or by fax or e-mail with confirmation of receipt in the same manner and shall be effective upon receipt.

Unless specified elsewhere in the Contract, all notices and requests shall be addressed as follows:

<table>
<thead>
<tr>
<th>SMA</th>
<th>Supplier</th>
</tr>
</thead>
</table>

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3.1.11 Suppliers undertakings and system responsibility

3.1.11.1 "System" responsibility

The Supplier shall have responsibility for the fully satisfactory function of the complete "system" throughout the test period. The Supplier shall have full responsibility for design even if design proposals are put forward by SMA. SMA’s approval of drawings, designs or products and services does not constitute a discharge of the Supplier from his design and System responsibility.

3.1.11.2 Suppliers undertakings

The Supplier undertakes to design, develop, install and supply the "system", fully compliant with the tendering documentation, educate vessels command and to maintain those systems operational throughout the project time.

The undertaking includes all undertaking described in the tender documents.

The Supplier is also responsible for managing any required implementation activities, training and giving advice in how the System should be used to reach the best quality and efficiency. The scope of delivery (as set forth in Supplier’s Draft Project Management Plan) should include support and maintenance.

The Supplier is fully responsible for a fully setup System ready for deployment, and fully responsible for deploying the System. The delivery includes all components, software, for the System.

The Supplier is fully responsible for support during project time.

3.1.11.3 Specifications

The Supplier shall deliver the "system" in accordance with this Contract.

3.1.12 Delivery requirements

The Supplier will cooperate with all parties involved in the Implementation Project as well as SMA.

The Implementation Project will be executed in close cooperation with SMA to assure that the high
quality in the System and deployment is achieved.

In no event shall Supplier be liable for any acts or commissions of any third party under the present Contract other than Supplier’s subcontractors.

3.1.13 SMA:s undertaking and responsibilities

The Swedish Maritime Administration will provide VIS (Voyage Information Service) instance, expertise and documentation on how to use the private side for integration.

SMA is responsible for the following undertakings:

SeaSWIM central services
- Service Registry including examples, templates and descriptions for use
- Identity Registry including examples, templates and descriptions for use

SeaSWIM connector (SSC) (three alternatives depending on tenders preference)
- SSC implementation run by SMA (to facilitate the test bed), requires SMA VIS or SPIS (Ship and Port Information Service)

Voyage Information Service (three alternatives depending on tenders preference)
- VIS implementation run by SMA (to facilitate the test bed)

During the project we will keep up support for the ships through the Gothenburg Shore Center. There will be a special instance called Baltic Shore center during the STM Balt Safe project period.

Baltic shore center
-Are a possible test partner.

Will encourage the connected ships to use the services available for each ship.

-Can be a support in usage if an ECDIS is placed in Gothenburg.

Gothenburg shore center
- Are a possible test partner.

-Will encourage the connected ships entering to the Baltic, to use the services available in The Baltic

-Support how to use the different STM services available in the Baltic.
Technical support.
- Host developers forum
- Maintain and update Developers Forum online with all technical specifications.
- Analyse log files and put together statistics.

3.1.14 Project overview
The Implementation Project includes all activities to reach final acceptance. It includes Project management, product training and solving problems identified during acceptance tests.

3.1.15 Milestone 1

3.1.16 Milestone 2

3.1.17 Milestone 3

3.1.18 Milestone 4: Final acceptance

3.1.19 Milestone 5

3.1.20 Delivery and Payment

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Activity</th>
<th>Date</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milestone 1</td>
<td>Installation of STM 1.0</td>
<td>2020-07-01</td>
<td>if approved installation, 30% of the purchase price can be invoiced</td>
</tr>
<tr>
<td>Milestone 2</td>
<td>System Design Review</td>
<td>2020-09-01</td>
<td></td>
</tr>
<tr>
<td>Milestone 3</td>
<td>FAT</td>
<td>2020-10-31</td>
<td></td>
</tr>
<tr>
<td>Milestone 4</td>
<td>SAT</td>
<td>2020-11-30</td>
<td></td>
</tr>
<tr>
<td>Milestone 5</td>
<td>Final acceptance, all ships updated to 2.0</td>
<td>2021-01-31</td>
<td>if approved final acceptance, 70% of the purchase</td>
</tr>
</tbody>
</table>
3.1.21 Actual acceptance date
Provided that SMA does not reject the system or part thereof, the actual acceptance date shall be deemed to be the day the system or part thereof (as the case may be) is accepted by SMA. SMA’s issuance of a written acceptance will serve as evidence of SMA’s acceptance.

3.1.22 Ownership after acceptance
Ownership after acceptance shall be the property of the supplier.

3.1.23 Delay
If deliveries are delayed according to the stated times in the timetable, and these delays are caused by the supplier, a discussion will be held between the parties. If the supplier cannot perform the deliveries within a reasonable time after that, SMA has the right to terminate the contract.

3.1.24 Release notes, test reports and installation guide
Release notes shall include, but not limited to; platform releases feature releases, bug fix releases and upgrade notes, test reports and installation guide shall always be attached to deliveries of software, new releases and patches.

3.1.25 Price
Prices are given in the Tender from the supplier.
All local taxes and duties, if any, are included in the prices as listed in the Contract. VAT is excluded.
Total price for the system: XXXEUR
Price per hour for consulting: XXX EUR

3.1.26 Invoicing
Payment shall be made in Euro (EUR)
Invoices from the Supplier shall be accompanied by relevant and detailed specifications clearly identifying on an item-by-item basis the purpose and scope of the delivery including the description, delivered quantity, agreed price and delivery time of each product and service.

Invoices shall always specify SMA’s Contract reference number as well as a reference number

3.1.27 Invoice address

Payment must be made 30 days after the invoice approved by SMA.

The supplier is not entitled to charge invoicing fees, handling fees or other fees which are not subject to law.

Invoice address is:

GSF
Sjöfartsverket
601 78 Norrköping

The invoice must state:

- which agreement / order the invoice refers to and reference number,
- the contractor's organizational and VAT registration number, the company's registered office and information on the F-tax identification, and
- the contractor's plusgiro, bankgiro or payment address.

Invoices that do not contain the above information will not be approved by SMA and will be returned.

3.1.28 Title, right of use, personal data, etc.

3.1.28.1 Title

All technical data of whatever kind, including all software and source codes with documentation necessary for operation, correction, modification and expansion produced by the Supplier or its subcontractor during the performance of this Contract shall be the property of the supplier.

3.1.28.2 Non-disclosure

If not stipulated otherwise in the agreement all Data and information relating to a Party's business and activities that is disclosed by one Party to the other Party under this Contract shall be treated as confidential and proprietary by the other Party. Neither Party shall disclose such Data or information to any subcontractor, consultant or other third party unless such subcontractor, consultant or other third party has executed a confidentiality agreement with the Party for the direct benefit of the other Party.
protecting such Data and information.

The foregoing shall not apply to any information

- in the public domain; or
- which has been legally acquired from sources other than the other Party without confidentiality restrictions; or
- which is required to be disclosed under applicable mandatory law, final and legally enforceable order of any competent court or regulatory body or similar provisions.

3.1.28.3 Infringement of intellectual property rights

If not stipulated otherwise in the agreement the supplier shall indemnify and hold SMA harmless in respect of any damages, costs and other expenses, which may arise for SMA as a result of any claim due to any alleged infringement of intellectual property rights as a consequence of manufacture or use of the system.

The supplier shall not be liable for infringement pursuant to the preceding paragraph to the extent that such infringement is directly attributable to materiel supplied by SMA or to solutions or procedures prescribed by SMA contrary to the Supplier’s written objection.

The Supplier and SMA shall keep each other informed of claims arising from intellectual property rights. If infringement occurs, the Supplier shall, in addition to what is stated in the first paragraph, at its own expense either modify the System so that infringement no longer occurs, or reach an agreement with the holder of the infringed upon intellectual property rights.

If a claim is made against SMA in respect of an alleged infringement of any third party’s intellectual property rights, the Supplier shall at its own expense participate in any court proceedings where an action is brought against SMA and for such purpose, as well as otherwise, assist SMA to the best of its ability in the case of alleged infringement of any intellectual property rights.

Supplier will have no obligation to indemnify SMA with respect to any infringement claim based upon any use of the system in combination with other products, equipment, software, or data not supplied by the supplier, unless the infringement is attributable to the System itself and not the act of combination stated above.

3.1.29 Use of software Products

3.1.30 Liability

Unless otherwise provided by other paragraphs in this contract, each Party shall be liable for loss or damage to its property, injury to or death of any of its employees or other person for whom the Party is responsible.
Each Party shall be liable for direct damage to property of third parties or personal injury, including death, in accordance with the applicable law, if caused by the Party, its personnel and/or its subcontractor(s) engaged in carrying out this Contract and shall indemnify and hold harmless the other Party accordingly.

If claim for damages pursuant to this Clause is made by a third party against either of the parties, said party shall immediately so notify the other party in writing. Neither Party shall be liable to pay any compensation to the other Party either for loss of profit, production drop-out or any other consequential or indirect loss.

The Supplier’s maximum liability under this Contract shall be limited to the Contract Price.

No party shall be responsible for any indirect or consequential loss or similar damages such as, but not limited to, loss of profit, loss of revenue or loss of contracts, provided such damages was not caused by a wilful act or gross negligence.

3.1.31 Insurance

The supplier shall hold adequate liability insurance for its operations throughout the agreement. The insurance amount should be at least the total value of this agreement.

3.1.32 Force Majeure

The following circumstances shall be deemed to constitute grounds for discharge from performing the Supplier’s obligations under this Contract if they occur after the Contract has been entered into and the due performance of the Contract is thereby prevented and it may not be considered that the Supplier ought to have taken such circumstances into account at the time of entering into the Contract whose consequences could not reasonably have been avoided or circumvented by the Supplier: general labour conflict and any other circumstances, such as fire, war, mobilization or unforeseen military callup of corresponding extent, requisition, seizure, insurrection and riot, general shortage of qualified labour, general scarcity of means of transport, general shortage of goods, general and enduring restrictions on the supply of motive power, as well as delay in deliveries from Subcontractors as a consequence of circumstances falling within the scope of this Clause, where the Supplier or subcontractor has not caused or contributed to such obstacle.

The aforesaid shall also apply in respect of undertakings, which it is SMA’s duty to perform.

In the event that a Force Majeure event described above prevents a Party from performing its obligations under this Contract for a period exceeding three (3) months, each Party shall be entitled to terminate the Contract and the following shall apply: SMA shall pay to the Supplier the Contract price for work completed as well as the costs of material and labour used for work uncompleted at the time of such termination, less any payments received for such work; and the Contract or shall deliver to SMA upon request any work so paid for.
3.1.33 Disputes

3.1.33.1 Applicable law

This Contract shall be governed by and interpreted in accordance with the laws of Sweden.

Any dispute, controversy or claim arising out of or in connection with this Contract shall be settled by a Swedish court of law in accordance with the laws of Sweden.

3.1.34 Amendments

Amendments or alterations have to be made in writing and signed by both Parties in order to be valid.

3.1.35 Transfer of agreement

The Supplier does not have the right to fully or partly transfer the agreement to a third party without the SMA's written consent.

The Supplier does not have the right, without the SMA's written permission, to transfer debts or other claims (including, inter alia, claims for damages) related to this agreement to any third party.

3.1.36 Subcontractors

The supplier may obtain written consent from the customer to engage subcontractors to carry out part of the work if necessary. Consent requires that the subcontracting company satisfies all the subcontractor requirements made by the customer. The supplier is responsible for the subcontractor's work as well as for their own.

3.1.37 Termination

SMA shall be entitled to terminate all or part of this Contract with immediate effect if:

a) The acceptance of the Milestones occurs later than the agreed dates and the delay for an individual Contractual Milestone has lasted more than three (3) months or the aggregate delay has lasted more than six (6) months and this is not due to Force Majeure, SMA or circumstances for which SMA is responsible and if such delay is attributable to the Supplier, or.

b) enforcement by a legal authority of a judgement or an enforceable decision of any other kind has shown the Supplier to be lacking the means of making full payment of a claim which is the subject of the judgement or decision, has suspended payments, a system has been made to a court or a public authority for corporation restructuring regarding the Supplier pursuant to a legislation act or the Supplier has been declared bankrupt, or

c) the Supplier fails to comply with any other obligation of this Contract and this may be regarded as constituting a substantial breach of Contract. In case of termination for default, SMA shall be entitled to claim damage compensation in accordance with this contract and to a refund of payments made prior to the termination for default.
The Supplier may terminate this Contract in whole or in part if SMA substantially fails to perform its obligations under the Contract. Any Supplier termination for default shall become effective 90 (ninety) days following written notice of the event, unless the event has been cured within such notice period.

In case of termination for default, the Supplier shall be entitled to claim damage compensation in accordance with this Contract.

Any Party claiming breach of Contract shall take all measures necessary to limit the loss or damage arising insofar as this is possible without incurring unreasonable expense and inconvenience.

SMA also have the right to terminate this Contract with immediate effect if:

- the Contract has been changed in way that is prohibited according to the Swedish Public Procurement Act (2016:1145) chapter 17 §§ 9-14,

- at the time of Contract assignment the Contractor meet any of the obligatory grounds for exclusion according to the Swedish Public Procurement Act (2016:1145) chapter 13 §1 and thus should have been excluded from the procurement, or

- The Court of Justice of the European Union in a procedure according to article 258 of the Treaty on the Functioning of the European Union declares that Sweden, by way of allowing SMA to enter into the Contract, has violated its obligations regarding the European Union, the Treaty on the Functioning of the European Union or 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.

3.2 Assignment

Neither Party shall be entitled without the other Party’s written consent to put another party in its place, with the proviso, however, that SMA shall be entitled to assign all or part of the Contract to its legal successor(s) or an authority, agency, state enterprise or company wholly or partly owned by the Swedish State.

3.3 Signing

This Contract is executed in two (2) originals, whereof each Party shall keep one.
4. European Single Procurement Document (ESPD)

Part I: Information concerning the procurement procedure and the contracting authority or contracting entity

Part II: Information concerning the economic operator

Part III: Exclusion grounds

A: Grounds relating to criminal convictions

Article 57(1) of Directive 2014/24/EU sets out the following reasons for exclusion

Participation in a criminal organisation

Has the economic operator itself or any person who is a member of its administrative, management or supervisory body or has powers of representation, decision or control therein been the subject of a conviction by final judgment for participation in a criminal organisation, by a conviction rendered at the most five years ago or in which an exclusion period set out directly in the conviction continues to be applicable? As defined in Article 2 of Council Framework Decision 2008/841/JHA of 24 October 2008 on the fight against organised crime (OJ L 300, 11.11.2008, p. 42).

a. Your answer?

Yes/No. No is required

Answer

No

b. Is this information available at no cost to the authorities from an EU Member State database?

Yes/No. No is desired

Answer

No

Corruption

Has the economic operator itself or any person who is a member of its administrative, management or supervisory body or has powers of representation, decision or control therein been the subject of a conviction by final judgment for corruption, by a conviction rendered at the most five years ago or in which an exclusion period set out directly in the conviction continues to be applicable? As defined in...
Article 3 of the Convention on the fight against corruption involving officials of the European Communities or officials of Member States of the European Union, OJ C 195, 25.6.1997, p. 1, and in Article 2(1) of Council Framework Decision 2003/568/JHA of 22 July 2003 on combating corruption in the private sector (OJ L 192, 31.7.2003, p. 54). This exclusion ground also includes corruption as defined in the national law of the contracting authority (contracting entity) or the economic operator.

**Fraud**

Has the economic operator itself or any person who is a member of its administrative, management or supervisory body or has powers of representation, decision or control therein been the subject of a conviction by final judgment for fraud, by a conviction rendered at the most five years ago or in which an exclusion period set out directly in the conviction continues to be applicable? Within the meaning of Article 1 of the Convention on the protection of the European Communities' financial interests (OJ C 316, 27.11.1995, p. 48).

**a. Your answer?**

Yes/No. No is required

**Answer**

No

**b. Is this information available at no cost to the authorities from an EU Member State database?**

Yes/No. No is desired

**Answer**

No
Terrorist offences or offences linked to terrorist activities

Has the economic operator itself or any person who is a member of its administrative, management or supervisory body or has powers of representation, decision or control therein been the subject of a conviction by final judgment for terrorist offences or offences linked to terrorist activities, by a conviction rendered at the most five years ago or in which an exclusion period set out directly in the conviction continues to be applicable? As defined in Articles 1 and 3 of Council Framework Decision of 13 June 2002 on combating terrorism (OJ L 164, 22.6.2002, p. 3). This exclusion ground also includes inciting or aiding or abetting or attempting to commit an offence, as referred to in Article 4 of that Framework Decision.

a. Your answer?
Yes/No. No is required

Answer
No

b. Is this information available at no cost to the authorities from an EU Member State database?
Yes/No. No is desired

Answer
No

Money laundering or terrorist financing

Has the economic operator itself or any person who is a member of its administrative, management or supervisory body or has powers of representation, decision or control therein been the subject of a conviction by final judgment for money laundering or terrorist financing, by a conviction rendered at the most five years ago or in which an exclusion period set out directly in the conviction continues to be applicable? As defined in Article 1 of Directive 2005/60/EC of the European Parliament and of the Council of 26 October 2005 on the prevention of the use of the financial system for the purpose of money laundering and terrorist financing (OJ L 309, 25.11.2005, p. 15).

a. Your answer?
Yes/No. No is required

Answer
No
Child labour and other forms of trafficking in human beings

Has the economic operator itself or any person who is a member of its administrative, management or supervisory body or has powers of representation, decision or control therein been the subject of a conviction by final judgment for child labour and other forms of trafficking in human beings, by a conviction rendered at the most five years ago or in which an exclusion period set out directly in the conviction continues to be applicable? As defined in Article 2 of Directive 2011/36/EU of the European Parliament and of the Council of 5 April 2011 on preventing and combating trafficking in human beings and protecting its victims, and replacing Council Framework Decision 2002/629/JHA (OJ L 101, 15.4.2011, p. 1).

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B: Grounds relating to the payment of taxes or social security contributions

Article 57(2) of Directive 2014/24/EU sets out the following reasons for exclusion

Payment of taxes

Has the economic operator breached its obligations relating to the payment of taxes, both in the country in which it is established and in Member State of the contracting authority or contracting entity if other than the country of establishment?
### Payment of social security

Has the economic operator breached its obligations relating to the payment social security contributions, both in the country in which it is established and in Member State of the contracting authority or contracting entity if other than the country of establishment?

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**Answer**

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**Answer**

No

### C: Grounds relating to insolvency, conflicts of interests or professional misconduct

Article 57(4) of Directive 2014/24/EU sets out the following reasons for exclusion

**Breaching of obligations in the field of environmental law**

Has the economic operator, to its knowledge, breached its obligations in the field of environmental law?

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</table>

**Answer**

No
procurement documents or in Article 18(2) of Directive 2014/24/EU.

**Breaching of obligations in the field of social law**

Has the economic operator, to its knowledge, breached its obligations in the field of social law? As referred to for the purposes of this procurement in national law, in the relevant notice or the procurement documents or in Article 18(2) of Directive 2014/24/EU.

**Answer**

No

**Breaching of obligations in the fields of labour law**

Has the economic operator, to its knowledge, breached its obligations in the field of labour law? As referred to for the purposes of this procurement in national law, in the relevant notice or the procurement documents or in Article 18(2) of Directive 2014/24/EU.

**Answer**

No

**Bankruptcy**

Is the economic operator bankrupt? This information needs not be given if exclusion of economic operators in this case has been made mandatory under the applicable national law without any possibility of derogation where the economic operator is nevertheless able to perform the contract.

**a. Your answer?**

Yes/No. No is required
b. Is this information available at no cost to the authorities from an EU Member State database?
Yes/No. No is desired

Answer
No

Insolvency
Is the economic operator the subject of insolvency or winding-up? This information needs not be given if exclusion of economic operators in this case has been made mandatory under the applicable national law without any possibility of derogation where the economic operator is nevertheless able to perform the contract.

a. Your answer?
Yes/No. No is required

Answer
No

b. Is this information available at no cost to the authorities from an EU Member State database?
Yes/No. No is desired

Answer
No

Arrangement with creditors
Is the economic operator in arrangement with creditors? This information needs not be given if exclusion of economic operators in this case has been made mandatory under the applicable national law without any possibility of derogation where the economic operator is nevertheless able to perform the contract.

a. Your answer?
Yes/No. No is required
**b. Is this information available at no cost to the authorities from an EU Member State database?**

Yes/No. No is desired

**Answer**

No

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**Analogous situation like bankruptcy under national law**

Is the economic operator in any analogous situation like bankruptcy arising from a similar procedure under national laws and regulations? This information needs not be given if exclusion of economic operators in this case has been made mandatory under the applicable national law without any possibility of derogation where the economic operator is nevertheless able to perform the contract.

**a. Your answer?**

Yes/No. No is required

**Answer**

No

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**b. Is this information available at no cost to the authorities from an EU Member State database?**

Yes/No. No is desired

**Answer**

No

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**Assets being administered by liquidator**

Are the assets of the economic operator being administered by a liquidator or by the court? This information needs not be given if exclusion of economic operators in this case has been made mandatory under the applicable national law without any possibility of derogation where the economic operator is nevertheless able to perform the contract.

**a. Your answer?**

Yes/No. No is required

**Answer**

No
b. Is this information available at no cost to the authorities from an EU Member State database?

Yes/No. No is desired

Answer
No

Business activities are suspended

Are the business activities of the economic operator suspended? This information needs not be given if exclusion of economic operators in this case has been made mandatory under the applicable national law without any possibility of derogation where the economic operator is nevertheless able to perform the contract.

a. Your answer?

Yes/No. No is required

Answer
No

b. Is this information available at no cost to the authorities from an EU Member State database?

Yes/No. No is desired

Answer
No

Agreements with other economic operators aimed at distorting competition

Has the economic operator entered into agreements with other economic operators aimed at distorting competition?

Your answer?

Yes/No. No is required

Answer
Guilty of grave professional misconduct

Is the economic operator guilty of grave professional misconduct? Where applicable, see definitions in national law, the relevant notice or the procurement documents.

Your answer?
Yes/No. No is required

Answer
No

Conflict of interest due to its participation in the procurement procedure

Is the economic operator aware of any conflict of interest, as indicated in national law, the relevant notice or the procurement documents due to its participation in the procurement procedure?

Your answer?
Yes/No. No is required

Answer
No

Early termination, damages or other comparable sanctions

Has the economic operator experienced that a prior public contract, a prior contract with a contracting entity or a prior concession contract was terminated early, or that damages or other comparable sanctions were imposed in connection with that prior contract?

Your answer?
Yes/No. No is required

Answer
No

Guilty of misinterpretation, withheld information, unable to provide required documents and obtained confidential information of this procedure

Can the economic operator confirm that:
a) It has been guilty of serious misrepresentation in supplying the information required for the verification of the absence of grounds for exclusion or the fulfilment of the selection criteria,

b) It has withheld such information,

c) It has not been able, without delay, to submit the supporting documents required by a contracting authority or contracting entity, and

d) It has undertaken to unduly influence the decision making process of the contracting authority or contracting entity, to obtain confidential information that may confer upon it undue advantages in the procurement procedure or to negligently provide misleading information that may have a material influence on decisions concerning exclusion, selection or award?

**Your answer?**
Yes/No. No is required

**Answer**
No

**Direct or indirect involvement in the preparation of this procurement procedure**

Has the economic operator or an undertaking related to it advised the contracting authority or contracting entity or otherwise been involved in the preparation of the procurement procedure?

**Your answer?**
Yes/No. No is required

**Answer**
No

**D: Purely national exclusion grounds**

Do the purely national grounds of exclusion, which are specified in the relevant notice or in the procurement documents, apply?

**Purely national exclusion grounds**

Other exclusion grounds that may be foreseen in the national legislation of the contracting authority's or contracting entity's Member State. Has the economic operator breached its obligations relating to the purely national grounds of exclusion, which are specified in the relevant notice or in the procurement documents?
Part IV: Selection criteria

ɑ: Global indication for all selection criteria
Concerning the selection criteria the economic operator declares that

It satisfies all the required selection criteria
It satisfies all the required selection criteria indicated in the relevant notice or in the procurement documents referred to in the notice.

Your answer?
Yes is desired

A: Suitability
Article 58(2) of Directive 2014/24/EU sets out the following selection criteria

Enrolment in a relevant professional register
It is enrolled in relevant professional registers kept in the Member State of its establishment as described in Annex XI of Directive 2014/24/EU; economic operators from certain Member States may have to comply with other requirements set out in that Annex.
Enrolment in a trade register

It is enrolled in trade registers kept in the Member State of its establishment as described in Annex XI of Directive 2014/24/EU; economic operators from certain Member States may have to comply with other requirements set out in that Annex.

a. Your answer?
Yes/No. Yes is desired

Answer
Yes

b. Is this information available at no cost to the authorities from an EU Member State database?
Yes/No. No is desired

Answer
No

For service contracts: authorisation of particular organisation needed

Is a particular authorisation of a particular organisation needed in order to be able to perform the service in question in the country of establishment of the economic operator?

a. Your answer?
Yes/No. Yes is desired
b. Is this information available at no cost to the authorities from an EU Member State database?

Yes/No. No is desired

For service contracts: membership of particular organisation needed

Is a particular membership of a particular organisation needed in order to be able to perform the service in question in the country of establishment of the economic operator?

a. Your answer?

Yes/No. Yes is desired

b. Is this information available at no cost to the authorities from an EU Member State database?

Yes/No. No is desired

B: Economic and financial standing

Article 58(3) of Directive 2014/24/EU sets out the following selection criteria

General yearly turnover

Its general yearly turnover for the number of financial years required in the relevant notice, the procurement documents or the ESPD is as follows:

Average yearly turnover

Its average yearly turnover for the number of years required in the relevant notice, the procurement documents or the ESPD is as follows:
Specific yearly turnover
Its specific yearly turnover in the business area covered by the contract for the number of financial years required in the relevant notice, the procurement documents or the ESPD is as follows:

Specific average turnover
Its specific average yearly turnover in the business area covered by the contract for the number of years required in the relevant notice, the procurement documents or the ESPD is as follows:

Set up of economic operator
In case the information concerning turnover (general or specific) is not available for the entire period required, please state the date on which the economic operator was set up or started trading:

Financial ratio
Concerning the financial ratios specified in the relevant notice, the procurement documents or the ESPD, the economic operator declares that the actual values for the required ratios are as follows:

Professional risk indemnity insurance
The insured amount in its professional risk indemnity insurance is the following:

Other economic or financial requirements
Concerning the other economic or financial requirements, if any, that may have been specified in the relevant notice or the procurement documents, the economic operator declares that:

C: Technical and professional ability
Article 58(4) of Directive 2014/24/EU sets out the following selection criteria

For works contracts: performance of works of the specified type
For public works contracts only: During the reference period, the economic operator has performed the following works of the specified type. Contracting authorities may require up to five years and allow experience dating from more than five years.

For supply contracts: performance of deliveries of the specified type
For public supply contracts only: During the reference period, the economic operator has delivered the following principal deliveries of the type specified. Contracting authorities may require up to three years and allow experience dating from more than three years.

For service contracts: performance of services of the specified type
For public service contracts only: During the reference period, the economic operator has provided the following main services of the type specified. Contracting authorities may require up to three years and allow experience dating from more than three years.

Technicians or technical bodies for quality control
It can call upon the following technicians or technical bodies, especially those responsible for quality control. For technicians or technical bodies not belonging directly to the economic operator’s undertaking but on whose capacities the economic operator relies as set out under Part II, Section C, separate ESPD forms must be filled in.

For works contracts: technicians or technical bodies to carry out the work

In the case of public works contracts, the economic operator will be able to call on the following technicians or technical bodies to carry out the work:

Technical facilities and measures for ensuring quality

It uses the following technical facilities and measures for ensuring quality and its study and research facilities are as follows:

Study and research facilities

It uses the following study and research facilities:

Supply chain management

It will be able to apply the following supply chain management and tracking systems when performing the contract:

Allowance of checks

For complex products or services to be supplied or, exceptionally, for products or services which are required for a special purpose: The economic operator will allow checks to be conducted on the production capacities or the technical capacity of the economic operator and, where necessary, on the means of study and research which are available to it and on the quality control measures? The check is to be performed by the contracting authority or, in case the latter consents to this, on its behalf by a competent official body of the country in which the supplier or service provider is established.

Do you allow checks?

Yes/No. Yes is desired

Answer

Yes

Educational and professional qualifications

The following educational and professional qualifications are held by the service provider or the contractor itself, and/or (depending on the requirements set out in the relevant notice or the procurement documents) by its managerial staff.

Environmental management measures

The economic operator will be able to apply the following environmental management measures when performing the contract:
**Number of managerial staff**
The economic operator's number of managerial staff for the last three years were as follows:

**Average annual manpower**
The economic operator's average annual manpower and the number of managerial staff for the last three years were as follows:

**Tools, plant or technical equipment**
The following tools, plant or technical equipment will be available to it for performing the contract:

**Subcontracting proportion**
The economic operator intends possibly to subcontract the following proportion (i.e. percentage) of the contract. Please note that if the economic operator has decided to subcontract a part of the contract and relies on the subcontractor's capacities to perform that part, then please fill in a separate ESPD for such subcontractors, see Part II, Section C above.

**For supply contracts: samples, descriptions or photographs without certification of authenticity**
For public supply contracts: The economic operator will supply the required samples, descriptions or photographs of the products to be supplied, which do not need to be accompanied by certifications of authenticity.

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**For supply contracts: samples, descriptions or photographs with certification of authenticity**
For public supply contracts: The economic operator will supply the required samples, descriptions or photographs of the products to be supplied and will provide certifications of authenticity where
applicable.

a. Your answer? Yes/No. Yes is desired
Answer Yes

b. Is this information available at no cost to the authorities from an EU Member State database? Yes/No. No is desired
Answer No

For supply contracts: certificates by quality control institutes
Can the economic operator provide the required certificates drawn up by official quality control institutes or agencies of recognised competence attesting the conformity of products clearly identified by references to the technical specifications or standards, which are set out in the relevant notice or the procurement documents?

a. Your answer? Yes/No. Yes is desired
Answer Yes

b. Is this information available at no cost to the authorities from an EU Member State database? Yes/No. No is desired
Answer No

D: Quality assurance schemes and environmental management standards
Article 62(2) of Directive 2014/24/EU sets out the following selection criteria

Certificates by independent bodies about quality assurance standards
Will the economic operator be able to produce certificates drawn up by independent bodies attesting that the economic operator complies with the required quality assurance standards, including accessibility for disabled persons?

<table>
<thead>
<tr>
<th>a. Your answer?</th>
<th>[Yes/No. Yes is desired]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Answer</td>
<td>Yes</td>
</tr>
</tbody>
</table>

b. Is this information available at no cost to the authorities from an EU Member State database?

<table>
<thead>
<tr>
<th>Yes/No. No is desired</th>
</tr>
</thead>
<tbody>
<tr>
<td>Answer</td>
</tr>
</tbody>
</table>

**Certificates by independent bodies about environmental management systems or standards**

Will the economic operator be able to produce certificates drawn up by independent bodies attesting that the economic operator complies with the required environmental management systems or standards?

<table>
<thead>
<tr>
<th>a. Your answer?</th>
<th>[Yes/No. Yes is desired]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Answer</td>
<td>Yes</td>
</tr>
</tbody>
</table>

b. Is this information available at no cost to the authorities from an EU Member State database?

<table>
<thead>
<tr>
<th>Yes/No. No is desired</th>
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</thead>
<tbody>
<tr>
<td>Answer</td>
</tr>
</tbody>
</table>
Part V: Reduction of the number of qualified candidates

The economic operator declares that:

It meets the objective and non discriminatory criteria or rules to be applied in order to limit the number of candidates in the following way: In case certain certificates or other forms of documentary evidence are required, please indicate for each whether the economic operator has the required documents:

If some of these certificates or forms of documentary evidence are available electronically, please indicate for each:

<table>
<thead>
<tr>
<th>a. Your answer?</th>
<th>ESPD template project …</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes/No. Yes is desired</td>
<td>ESPD</td>
</tr>
</tbody>
</table>

Answer
No

<table>
<thead>
<tr>
<th>b. Is this information available at no cost to the authorities from an EU Member State database?</th>
<th>ESPD template project …</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes/No. No is desired</td>
<td>ESPD</td>
</tr>
</tbody>
</table>

Answer
No

Part VI: Concluding statements

Concluding statements

The undersigned formally declare that the information stated under Parts II - V above is accurate and correct and that it has been set out in full awareness of the consequences of serious misrepresentation.

The undersigned formally declare to be able, upon request and without delay, to provide the certificates and other forms of documentary evidence referred to, except where:

a) The contracting authority or contracting entity has the possibility of obtaining the supporting documentation concerned directly by accessing a national database in any Member State that is available free of charge (on condition that the economic operator has provided the necessary information (web address, issuing authority or body, precise reference of the documentation) allowing the contracting authority or contracting entity to do so. Where required, this must be accompanied by the relevant consent to such access), or

b) As of 18 October 2018 at the latest (depending on the national implementation of the second subparagraph of Article 59(5) of Directive 2014/24/EU), the contracting authority or contracting entity
already possesses the documentation concerned.

The undersigned formally consent to [identify the contracting authority or contracting entity as set out in Part I, Section A], gaining access to documents supporting the information, which has been provided in [identify the Part/Section/Point(s) concerned] of this European Single Procurement Document for the purposes of [identify the procurement procedure: (summary description, reference of publication in the Official Journal of the European Union, reference number)].

Date, place and, where required or necessary, signature(s):
1. Preparation work for the project.

2. Milestone 1 – Presentation of preparation work.

3. Software are already finished for Adveto ECDIS-4000.

4. Operators Documentation based on the documentation made for STM will we start to update to get a product useful for the Operators.

5. Installations can take place when an acceptable list of vessels are made. Our product is ready, and we arrange installation according to project requirement and agreement between SNMA and Adveto.

6. We will follow the time plan made for the project after final agreement.

Peter Nilsson
Managing Director
Adveto Advanced Technology AB
Zeatec Group AB – Company presentation

Business concept

*World wide system supplier of marine communication, navigation, IT and security solutions for professional users in the marine market.*

Objectives

By 2019 we will achieve:

- Profit, 5% of the total Group Turnover
- Revenue of about 16M SEK
- Customer satisfaction to be higher than average in the business

Zeatec Group AB, background

Zeatec Group AB was established in 2006. The company Zeatec Marine AB was started and a short time after the establishment did Zeatec Group acquire Satpool (2006), Boatnav (2007) and Navitron (2010). 2015 did the group consolidate and concentrated all marine business in the company Zeatec Marine AB. 2017-09-01 did Zeatec Group AB acquire the Swedish ECDIS manufacturer Adveto Advanced Technology AB. Adveto have since before been working as a supplier to Zeatec Marine and we can see large benefits in the co-operation between the manufacturer Adveto and the service/installation company Zeatec Marine. In the production of ECDIS systems in the facility in Landskrona will it be possible for the two companies to assist each other. This will also make the focus on sales to Marine customers more important for the future. The longterm goal for the Zeatec Group is to grow, either by organic growth or by extending the Group with new companies in the Maritime area. Zeatec Group AB aim to have a total Group turnover about 30 M SEK by the year 2025 with a healthy revenue.

Zeatec Marine AB

Zeatec Marine AB is a system supplier of marine communication, navigation, IT and security solutions for professional users in the marine market. An important part for the business is to carry out Radio Surveys and VDR Surveys.
Main customers include shipyards, system houses, ship owners and fishing/workboats. Zeatec Marine AB can offer World Wide installation and service on all their products. The headquarters is located in Landskrona, Sweden since 2016-08-15.

Service engineers operate from the office inside the repair shipyard Oresund Dry Docks in the port of Landskrona. One goal for coming growth is to become the number one partner for Oresund Drydocks when they need service work on navigation- and radio equipment. In the office have Zeatec Marine AB a facility to carry out repair of navigation equipment for the Swedish Army, used for navigation of tanks in the battle field. This is performed with a contract the Swedish Defence Administration.

Another business for Zeatec Marine AB is Airtime contracts with vessels for modern communication onboard either with Inmarsat or with the modern V-sat traffic system. The company covers both the heavy marine area, such as passenger and cargo ships under IMO-regulations as well as smaller workboats/fishing vessels. The main business is service on electronic navigation and communication equipment as well as carrying out surveys for GMDSS and VDR equipment onboard as representative for many marine Class Societies.

2015 was Zeatec Marine AB elected by one of the worlds large manufacturer, JRC, to represent them in Sweden. It was a good step forward to Zeatec Marine. The new more tight co-operation with Adveto will also make it possible for Zeatec Marine AB to develop further and to extend sales and installation work with new and extended products from Adveto.

Adveto, Advanced Technology AB
2017-09-01 did Zeatec Group AB purchase the Swedish ECDIS manufacturer Adveto Advanced Technology AB. This will give Zeatec Marine AB possibility to provide assistance with manufacturing when Adveto are producing ECDIS systems in the facility in Landskrona. Adveto did start its business in Spånga 1985 and have since the start been concentrated on development and manufacturing of ECS and ECDIS systems for vessel working in areas where advanced navigation is needed.

The customers are spread and sailing in the whole world. Main focus has been in Sweden, Finland and Norway. A small step has also been taken to German market where a certificate has been awarded by the German authorities.

One important customer for Adveto is the Swedish National Maritime Administration where many of their Pilot vessels are equipped with Adveto ECS. The vessels in the Administration that handles all location and service of buoys and lighthouses are also using a special version of Adveto ECS software.

The important ferry traffic in the Stockholm archipelago is also an important customer of Adveto. Together with these vessels and as a close partner in the development of AIS, have
Adveto been able to become an important supplier of High Precision navigation systems for customers with high demands.

For the future are Adveto in the process to develop a new generation of ECDIS and ECS software G8 and the goal is to have this new generation of systems brought to the market wit a start in the end of year 2019.

**Other companies in the Zeatec Group**
Zeatec Group AB also includes Zeatec Engineering doo in Serbia (technical drawings), Zeatec Marine China Ltd (support). The two external companies do work together with Zeatec Marine AB in order to support customers in all the business areas and to be able to handle work all over the world.

**Organisation scheme, Zeatec Group AB**
The companies Zeatec Marine AB and Adveto are working is sister companies and uses the same organization for the work. Zeatec Marine offer service and sales to the market and Adveto offers development and production of ECS and ECDIS. Sales from Adveto is made to a few agents, where Zeatec Marine AB is one.
Zeatec Group AB
Kvalitetsmanual
Ver. 3.5

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1 Zeatec Group AB

Zeatec Group AB är ett svenskt företag verksamt inom den marina branschen. Ägare till Zeatec Marine AB och Adveto Advanced Technology AB. Huvudkontor för företagen finns i Landskrona.

Denna kvalitetsmanual för Zeatec Group AB tillämpas och gäller för ägarbolaget och ägarbolagets samtliga dotterbolag.

<table>
<thead>
<tr>
<th>Ägarbolag</th>
<th>Organisationsnummer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zeatec Group AB</td>
<td>556304 - 4956</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Dotterbolag</th>
<th></th>
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<tbody>
<tr>
<td>Zeatec Marine AB</td>
<td>556385-3919</td>
</tr>
<tr>
<td>Zeatec Equipment AB</td>
<td>556044-5511</td>
</tr>
<tr>
<td>Adveto Advanced Technology AB</td>
<td>556267-7319</td>
</tr>
<tr>
<td>Zeatec Marine China Ltd</td>
<td>Hong Kong, Kina</td>
</tr>
<tr>
<td>Zeatec Engineering doo</td>
<td>Belgrad, Serbien</td>
</tr>
</tbody>
</table>

Postadress och besöksadress för alla svenska bolag är:

Dockgatan 58
261 35 Landskrona
Sverige

Kontoret befinner sig inne på bevakat området för Oresund Dry Docks
2 Omfattning

Zeatec Group AB kvalitetssystem och dess dokumentation indelas i följande avsnitt:

2.1 Kvalitetsmanual


2.2 Styrande dokument

Till styrande dokument räknas alla typer av dokumentation som anger villkor, bestämmer nivåer och sätter ramar. Exempel på styrande dokument inkluderar: arbetsbeskrivningar, ritningar, kvalitetsmanual, beslut, interna samt externa rutiner, instruktioner, specifikationer och processbeskrivningar.

2.3 Kvalitets- och miljöplaner


2.4 Kvalitetsdokumentation

Kvalitets- och miljöplan skall dokumenteras. Kvalitetsdokumentationen upprättas i 2 exemplar och delges kunden i ett exemplar och arkiveras i ett exemplar, arkivering sker digitalt.
3 Referenser

Zeatec Group AB kvalitetssystem är uppbyggt med hjälp av följande standarder: SS-EN ISO 9001 kvalitets system. Lagar, förordningar, författning och allmänna bestämmelser som är gällande för svenska företag och vår verksamhet.
4 Definitioner

4.1 *Kvalitet*

Kvalitet är ett begrepp för att beskriva egenskaper hos en tjänst eller produkt som ger dess förmåga att uppfylla såväl underförstådda som uttalade behov.

4.2 *Kvalitetspolicy*

Med kvalitetspolicy avses inriktning och övergripande avsikter vad gäller kvalitet för en organisation. Detta är formellt uttalat av högsta ledningen.

4.3 *Kvalitetssäkring*

Innebär aktiviteter och åtgärder för att säkerställa att en tjänst eller produkt uppfyller dess krav på kvalitet.

4.4 *Kvalitetsstyrning*

Metoder och aktiviteter som praktiseras för att uppfylla kvalitetskrav.

4.5 *Kvalitetssystem*

Innefattar den organisatoriska struktur, rutiner, processer och resurser som behövs för att leda och styra en verksamhet med avseende på kvalitet. Ett av dess syften är således att skapa en grundläggande ordning och reda.

4.6 *Kvalitets- och miljöplan*

Dokument som fastställer de specifika kvalitets- och miljöpåverkande aktiviteterna, deras ordningsföljd och de resurser som används för en viss produkt, tjänst eller projekt.

4.7 *Kontroll*

Mätning, undersökning, provning eller annan bestämning av en eller flera egenskaper hos en tjänst eller produkt för jämförelse av uppfyllande av ställda krav.

4.8 *Avvikelse*

Icke-överensstämmelse med specificerade krav.
4.9 **Reklamation**
Avvikelse eller fel som resulterat i åtgärd utförd av leverantör/kund eller dess ombud.

4.10 **Specifikation**
Dokument som föreskriver de krav som en tjänst eller produkt skall uppfylla.

4.11 **Process**
En serie aktiviteter som förädlar en produkt eller en tjänst.

4.12 **Rutin**
En rutin är en övergripande beskrivning av vem som gör vad, samt vilka instruktioner som innefattas av rutinen.

4.13 **Instruktioner**
Avser lokala och generella instruktioner i form av enhetsspecifika instruktioner, ordersystem, materialspecificationer, kontrollinstruktioner etc.

4.14 **Produkt**
Med produkt avses i hela detta dokument om inget annat anges både produkter och tjänster.
5 Ledningens ansvar

Företagets kvalitetssystem inkluderar policy, kvalitetsmål, ansvar och befogenheter samt rutiner för verksamheten. Kvalitetssystemet skall användas som styrmedel för att garantera att hela verksamhetens aktiviteter uppfyller på förhand specificerade krav.

Förslag till överbripande mål och policies arbetas fram av gruppens ledningsgrupp. Styrelsen beslutar och fastställer sedan dessa förslag för respektive bolag. Ledningen ansvarar även för att resurser finns tillgängliga för kvalitetsarbetet.

5.1 Kvalitetspolicy

5.1.1 Kundtillfredställelse

Vi strävar efter att våra produkter och tjänster skall uppfylla, och helst överträffa, våra kunders krav och förväntningar. För samtliga våra avdelningar gäller att vi skall ställa kundens önskemål och krav i centrum och utföra våra uppdrag med den kvalitet som kunden kräver.

5.1.2 Ständig förbättring

Tillsammans med våra samarbetspartners strävar vi efter att kontinuerligt förbättra våra arbetssätt för att förbättra kvalitén.

5.1.3 Service


5.1.4 Försäljning

Kontakta kunden senast inom 2 arbetsdagar efter förfrågan eller beställning. Kunden skall efter detta få besked om priser, leveranstider och övriga villkor etc. i enlighet med kundens önskemål.

5.2 Kvalitetsmål

5.2.1 Reducerings av kundreklamationer

Mäts i antal samt procent av antal order under en bestämd period.

5.2.2 Reducerings av leverantörsreklamationer

Mäts i antal samt procent av antal order under en bestämd period.

5.2.3 Ökad kundnöjdhet

Mäts genom kundundersökningar
5.2.4 Ökad leveranshastighet
Mäts genom att titta på genomsnittlig tid mellan order och leverans,

5.3 Ansvar och befogenheter
Samtliga medarbetare har inom sitt arbetsområde ansvar och skyldighet att arbeta för att uppfylla våra kvalitetskrav. Utöver detta finns funktioner med särskilt ansvar, dessa specificeras nedan.

<table>
<thead>
<tr>
<th>Ansvarsområde</th>
<th>Ansvarig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kvalitet</td>
<td>Teknisk Chef</td>
</tr>
<tr>
<td>Inköp/Logistik</td>
<td>VD</td>
</tr>
<tr>
<td>Försäljning</td>
<td>Försäljnings Chef</td>
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<td>Ekonomi</td>
<td>VD</td>
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<td>Miljö</td>
<td>Teknisk chef</td>
</tr>
<tr>
<td>Kunder</td>
<td>Försäljnings Chef / Service Chef</td>
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<tr>
<td>Personal</td>
<td>VD</td>
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<tr>
<td>Trivsel</td>
<td>Samtliga</td>
</tr>
<tr>
<td>Anskaffning material och tjänster</td>
<td>Samtliga</td>
</tr>
<tr>
<td>Service</td>
<td>Service Chef</td>
</tr>
</tbody>
</table>
6 Hantering av resurser

6.1 Kompetens, utbildning och medvetenhet

Verkställande direktör är ansvarig för att personalen har rätt kompetens för att utföra sina arbetsuppgifter. Varje år genomförs medarbetarsamtal så att den anställda bland annat är medveten om sin roll i kvalitetsprocessen.

Verkställande direktör tillsammans med Service Chef är även ansvariga för utbildning och fortbildning av personalen. Utbildningsbehovet skall identifieras, planeras, genomföras samt följas upp på regelbunden basis. Ledningen beslutar om prioriteringsordning samt budget för utbildningarna.
7 Produkt- och tjänsteframtagning

7.1 Processtyrning

Innan ett arbete startar utförs berednings och planeringsarbete anpassat efter projektets omfattning. Som lägsta nivå skall framgå: vad som skall göras, särskilda krav från kund, ekonomiska ramar och överenskommen leveranstid.

Muntliga samt skriftliga förfrågningar för våra tjänster och produkter registreras och kontrolleras av ansvarig säljare. Ansvarig person tar sedan fram samt bevakar anbud.


7.2 Kontraktsgenomgång


7.3 Styrning av dokument och data

Under arbetet skall dokumentation förvaras hos den enligt kvalitetsplanen ansvariga personen. Dokumentation sparas digitalt på server med extern back-up server. Efter avslutat uppdrag skall dokumentationen sparas i minst 5 år eller om så föreskrivs enligt lagar, förordningar eller liknande under så lång tid som föreskrivs.

7.4 Hantering av elektroniska dokument

På samtliga datorer och servrar där dokumentation sparas elektroniskt finns det uppdaterade virusprogram. All elektronisk dokumentation sparas dessutom på en extern server med fastställda backup-rutiner.

7.5 Inköp

Vid inköp från underleverantörer bedöms deras förmåga och kapacitet att utföra ett åtagande enligt: Produkt och tjänste- kvalitet, pris, leveransförmåga samt leveranstid. Samtliga produkter kontrolleras vid ankomst, innan avsändning och innan installation av berörd personal.
7.6 **Lagerhantering**

Samtliga produkter som inte omedelbart efter ankomst till godsmottagning skall sändas vidare till kund märks tydligt upp med ett internt artikelnummer och placeras på angiven lagerhylla.

7.7 **Produktidentifikation och spårbarhet**

Samtliga artiklar och produkter skall vara märkta med ett internt artikelnummer. Märkningen skall vara utförd så att artikeln i samtliga led lätt kan identifieras.

7.8 **Behandling av produkter tillhandahållna av kund**

Samtliga produkter som ankommer godsmottagning skall genomgå mottagningskontroll. Om gods ej redan är märkt skall detta omgående göras så att det tydligt framgår att godset tillhör kunden. Godset märks även med en beskrivning av ärendet och lämnas sedan vidare till ansvarig avdelning.

7.9 **Hantering, förvaring, packning, skydd och leverans**

Om något material kräver särskild hantering så skall det märkas, hanteras och förpackas så att dessa krav uppfylls. I övrigt skall allt material hanteras, förvaras och packas enligt sunt förnuft. Vid sändning skall allt material förses med följesedel som minst specificerar: kund, eventuellt ordernummer, datum samt kontaktperson.

7.10 **Behandling av kontroll-, mät-, och provningsinstrument**

Instrument för kontroll, mätning och provning kontrolleras och kalibreras regelbundet enligt tillverkarens instruktioner. Detta gäller såväl inhyrd som ordinarie utrustning.
8 Mätning, analys och förbättring

8.1 Kundtillfredsställelse

För att ta reda på om vi har uppfyllt våra kunders krav på kvalitet används årligen en kundenkät på ett urval av våra kunder.

8.2 Interna kvalitetsrevisioner

På uppdrag av verkställande direktör så skall det årligen genomföras en intern kvalitetsrevision (QMS annual examination). Revisionen utgör en ögonblicksbild av kvalitetssystemet och hur det efterlevs. Resultatet skall rapporteras till ledningsgruppen.

8.3 Kontroll och provning

Våra tjänster och produkter kontrolleras konstant för att säkerställa kvaliteten. Vid ankomst kontrolleras gods mot följesedel för att kontrollera att rätt saker i rätt antal anlänt. Det kontrolleras även att godset är helt och redo att sändas vidare till kund.

När det gäller service kontrolleras alltid utrustning efter utförd serviceåtgärd. Resultatet dokumenteras i en servicerapport som kunden sedan tar del av.

All dokumentation över kontroller och provningar som görs under ett visst projekt samlas i en pärm. Vid slutleverans och eventuell besiktning lämnas detta över till kunden.

8.4 Behandling av avvikande produkter

Vid kundklagomål eller vid förbättringsförslag skall detta rapporteras via avsedd blankett (Return Declaration Form). Detta gäller även andra störningar och avvikelser och både intern och externt. Störningar och avvikelser skall rapporteras tillsammans med vidtagna åtgärder.

8.5 Ständig förbättring

Med hjälp av kvalitetspolicy, kvalitetsmål samt resultat av interna revisioner, analys av information, korrigerande och förebyggande åtgärder och ledningens genomgång skall aktivt arbetas med att förbättra kvalitetssystemet.

8.6 Korrigerande och förebyggande åtgärder

För att förhindra upprepade avvikelser skall en avvikelse granskas och beroende på proportionen av avvikelsen så skall: orsak fastställas, eventuella åtgärder utvärderas, åtgärder vidtas. Detta skall sedan dokumenteras och åtgärderna skall sedan analyseras.
Förbättringsprogram som bygger på sammanställningar av erfarenheter, upprättas efter varje projekt och skall innehålla förslag till beslut för förbättringsaktiviteter med avseende på korrigerande och förebyggande åtgärder. Förbättringsprogram beslutas och följs upp på ledningsgruppssmöten.

8.7 **Statistiska metoder**

För att få ett underlag för styrning av vår kvalitetsprocess så tillämpar vi statistiska metoder på följande:

<table>
<thead>
<tr>
<th>Område</th>
<th>Tillvägagångssätt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nöjda kunder</td>
<td>Kundenkät</td>
</tr>
<tr>
<td>Reklamationer</td>
<td>Blanketter (RDF)</td>
</tr>
<tr>
<td>Kvalitetssystem</td>
<td>QMS annual examination, intern kvalitetsrevision</td>
</tr>
<tr>
<td>Nöjda medarbetare</td>
<td>Medarbetarsamtal</td>
</tr>
<tr>
<td>Projektlönsamhet</td>
<td>Enligt projektavslut</td>
</tr>
</tbody>
</table>
# Technical Requirements

## General

This document contains the technical requirement for the procurement of STM ship system within the scope of the STM Validation Project. The document describes the scope of the required functional and technical characteristics of the systems. The technical specifications, APIs and xml-codes are anticipated to be accurate but some are yet to be prototyped. This means that minor updates might be necessary. Latest updates to the specifications will be presented at the latest before the negotiation phase of the tender is commenced in order to tenderers to take updates into consideration in their final bid.

### Info

Our system have been approved for STM.

## Definitions

### 1.2.1 Terminology for denoting a requirement

- **shall**: A mandatory requirement is denoted with the word "shall" and must be fulfilled.
- **should**: A criteria is denoted with the word "should" and gives added value in the evaluation if fulfilled.
- **NB.** Other requirement specifications referring to this specification might stipulate that a should requirement is changed to a shall requirement.

All requirements are labeled with R-X.Y:Z, where X.Y is the current chapter number and Z is a consecutive numbering to separate each requirement within the chapter. There can be several "shall" or "should" in one numbered requirement, which means that all must be fulfilled in order for the requirement to be fulfilled. Descriptive text occurs throughout the document but is not labeled.

### 1.2.2 Select, turn-on, set etc.

All functions that are said to be selectable, turned-on, set, etc. will implicitly also be said to be the reverse, i.e. de-selected, turned-off, de-set, etc. unless specified explicitly to something else.

## General requirements on the STM ship system

All requirements that cannot be categorized into one or more of the 5 different components of the STM ship system as depicted in Figure 1 below, is stated.

### 2.1.1 The Tenderer of STM ship system

- **shall**: At milestone 2 prove that the STM ship system can exchange relevant payload formats defined in reference SeaSWIM specification.

### 2.1.2 The tenderer

- **should**: Be able to adopt to external standards and requirements i.e. RTZ that is being updated to S-421. See reference Standard forecast.

### 2.1.3 The tenderer

- **shall**: Assure that the delivered system adheres to all relevant requirements regarding normal functionality in all navigational equipment. The Supplier is fully responsible that all installations of software and/or hardware, fulfilling the tender specifications, does not interfere with existing navigational systems and that the System is compliant with existing rules and regulations including but not limited to SOLAS Ch V reg 17 on electromagnetic compatibility.

### 2.1.4 The Tenderer

- **shall**: Conduct appropriate training and provide documentation (manual) for onboard equipment users. The tenderer shall deliver all educational material to the ship in hard copy, CBT etc. The training material shall be held updated during the project period. Planned training shall be presented at SAT.

### 2.1.5 The Tenderer

- **shall**: Provide shipping companies included in the testbed sufficient information including a meeting presenting the STM-concept and demo the equipment updates introduced.
### 3 Functional/Technical Requirements

#### 3.1 STM Ship system overall description

<table>
<thead>
<tr>
<th>Requirement fulfills</th>
<th>Comment/describe</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3.1.1</strong></td>
<td>At least one navigation system workstation on the ship’s bridge shall be able to interact with the STM Module. The main functions are: to receive voyage plan (VP) for further processing until used for navigation, to send the VP used for navigation to the STM Module, to send ETA to the STM Module. Communication between the navigation system and the STM Module will ensure that the maximum possible degree of consistency is upheld between information held in the navigation system and the STM Module. If information consistency decreases due to the status of communication link between the navigation system and the STM Module, the communication status shall be known by both ends. The STM Module is a set of software functions on some hardware that presumably is located on the ship. The STM Module may be integrated in the navigation system, if certification allows, it may be integrated into an existing planning station or it may be running on a dedicated device which is supplied by the supplier. If information consistency can be assured, the STM module can be placed ashore.</td>
</tr>
<tr>
<td><strong>3.1.2</strong></td>
<td>Communication between the STM Module and Online access point will ensure that the maximum possible degree of consistency is upheld between information held in the STM Module and at the Online access point, depending on the online status of the ship. If information consistency decreases due to the status of communication links with the ship, the communication status and the age of information shall be known by both ends. The online access point is constantly and stably connected to the internet and represents the ship towards other actors and services. The main functions in the online access point are the VIS, Port Information Service (optional) and the SeaWiSM Connector (SSC). The Online access point may be implemented onboard the ship or at another location. Each VIS is attached to a SSC and each ship has one (1) VIS instance.</td>
</tr>
</tbody>
</table>

![Figure 1](image-url)
### 3.2 Navigation system functionality

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Requirement fulfills</th>
<th>Comment/Describe</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2.1 The STM ship system shall be able to send and receive route segment via Ais, ASM message (8), according to Appendix 2; Route Message system requirements, F1.</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>3.2.2 The STM ship system shall be able to present route segment accordingly in navigation system.</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>3.2.3 STM ship systems shall be able to include legspeed in route message format.</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>3.2.4 Not applicable</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>3.2.5 In the STM ship system it shall be possible to make a default choice that the route message (and/or RTZs) will be shared or not, with other STM ships.</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>3.2.6 The STM ship system shall be able to present, via ASM message (8), according to appendix 3; Route message format (version 1.0), info/flag on AIs targets that participates in STM test beds.</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>3.2.7 STM ship systems shall be able to calculate CPA and intersection points between own/other-ships route segments (including legspeed), even if the routes are not crossing each other. The operator should have the option to chose between legspeed or actual speed.</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>3.2.8 If a ship is deviating from its intended route (exceeding pre-set limits, geographically and in time, set by own ship), that shall be presented on own ships STM ship system.</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>3.2.9 It shall be possible to do &quot;Route Trial Manoeuvre&quot; including own and other ships routes. The operator should have the option to chose between legspeed or actual speed.</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>3.2.10 It shall be possible for the operator to activate other ships routes on a case by case basis. Eg. Acquire them manually in the navigation system. Manual activation of routes should be the default setting.</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>3.2.11 Alerts for low route CPA/TCPA shall be easy to set and optional for the operator. If limits are exceeded other ships route might be triggered to show in the display.</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>3.2.12 The navigation system shall be able to upload, download and display VP and S-124 to and from the STM Module. Communication between the navigation system and the STM Module will ensure that the maximum possible degree of consistency is upheld between information held in the navigation system and the STM Module.</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>3.2.13 If information consistency decreases due to the status of communication link between the navigation system and the STM Module, the communication status shall be known by both ends. The communication status shall be displayed to the operator.</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>3.2.14 When difference between real time ETA and PTA (to a predefined waypoint) is more than a preset value the operator shall get a question if the operator wants to update the PTA. (New PTA must be easy to set.) If yes, schedule in RTZ shall automatically be updated and sent to relevant STM actors.</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>3.2.15 It shall be possible to define which waypoint that is used for ETA calculations by setting a PTA at that waypoint. (ETA in manual schedule in RTZ) to mark it as &quot;synchronization&quot; WP.</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>3.2.16 When RTA is received from STM actors, the PTA shall be possible to be updated, using the received RTA. The route shall not have to be safety checked due to only updated schedule. When new PTA is set, the VP shall be shared.</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>3.2.17 It should be clearly visible that only the schedule has been changed and which waypoint are affected by the change.</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>3.2.18 Area received in STM text message format shall be possible to display in navigation system.</td>
<td>shall</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### 3.3 Communication between STM Module and navigation system

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Requirement fulfills</th>
<th>Comment/Describe</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.3.1 The communication between the STM Module and navigation system shall have Information consistency (e.g. ship receives a VP in the STM module, accepts it, then the operator shall be able to choose it for monitoring in navigation system, it shall then be identical to the one in the STM module).</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>3.4 STM Module</td>
<td>requirement fulfills</td>
<td>comment/describe</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------------</td>
<td>---------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>3.4.1 STM module <em>shall</em> be able to send, receive and show text messages to/from other STM actor according to “STM text format”, in SeaSWIM specification, appendix 4 (e.g. Text body, Message subject, receiver id (actor id), sender id (actor id), reference to information object ID (e.g. SVID)).</td>
<td>shall</td>
<td>Yes</td>
</tr>
</tbody>
</table>
| 3.4.2 The STM module *shall* include the functionality to communicate the following (but not limited to) to and from VIS/Online access point.  
- Publish VP to VIS / Online access point.  
- Retrieve VP proposals from VIS / Online access point.  
- Ref:06218Send and receive VP, Area- and text messages to other STM services through VIS / Online access point. | shall               | Yes              |
| 3.4.3 The STM module *shall* include the functionality to show, create, edit and save VP. It *shall* be possible to graphically clearly distinguish received VP updates, e.g. route suggestions. | shall               | Yes              |
| 3.4.4 Not applicable                                                            | shall               | Yes              |
| 3.4.5 If an appropriate schedule is not attached to the monitored VP, operator *shall* get notified. | shall               | Yes              |
| 3.4.6 The STM module *shall* be able to set route status according to RTZ format in SeaSWIM specification. | shall               | Yes              |
| 3.4.7 The route status “inactive” *shall* only be shared with other STM actors when the voyage is completed or cancelled. | shall               | Yes              |
| 3.4.8 OOW *shall* be made aware of relevant events such as incoming messages (VP updates, text messages new RTA etc.) The event shall be detectable from ships conning position. Above events shall not interfere with navigational information. | shall               | Yes              |
| 3.4.9 The STM Module *shall* be able to upload/download VP and S-124 to/from the ships navigation system. | shall               | Yes              |
| 3.4.10 Operator *shall* be able to search for service instances in STM module according to SeaSWIM specification, based on attributes available in service registry. | shall               | Yes              |
| 3.4.11 Operator *shall* be able to search for services by means of Geometry (e.g. area search and/or Voyageplan search). | shall               | Yes              |
| 3.4.12 STM module *shall* be able to present the service descriptions included in service registration. | shall               | Yes              |
| 3.4.13 STM module *should* be able to present all relevant information available in instance descriptions as document (PDF, HTML). | should              | Yes              |
| 3.4.14 STM module *shall* be able to store lists of services (for offline purposes). | shall               | Yes              |
| 3.4.15 The STM module *should* be able to support offline work when connectivity goes down, e.g. search for services and call them and when connectivity returns the “call” should be processed. | should              | Yes              |
| 3.4.16 If stored service list is used, the list *shall* be updated minimum once per day and/or when service is called to prevent old entries to be used. | shall               | Yes              |
| 3.4.17 If search fails, the operator *shall* get an error message within 30 seconds. | shall               | Yes              |
| 3.4.18 | Operator should be made aware if "messages" has been sent or not, due to connectivity or other issues. | should | Yes |
| 3.4.19 | Operator shall in the STM module be able to assign/remove access rights on information objects (VP) to services. | shall | Yes |
| 3.4.20 | STM module shall be able to present for the operator which actors that have been given access rights to VP. | shall | Yes |
| 3.4.21 | Operator shall in the STM module be able to share VP to selected services. It shall be possible to share a VP once or to set a service as a subscriber (i.e. automatically send future updates of VP). | shall | Yes |
| 3.4.22 | Operator should in the STM module be able to subscribe on a service. | should | Yes |
| 3.4.23 | There should be a functionality in the STM Module to present relationship between different payload formats, e.g. a text message can be correlated to a VP. | should | Yes |
| 3.4.24 | The STM Module shall be able to show navigational warning according to S-124 [See SeaSWIM specification]. | shall | Yes |
| 3.4.25 | The STM Module shall be able to show area in STM text format. | shall | Yes |
| 3.4.26 | The STM Module should handle real time calculation (including preplanned speeds) of ETA and or STG (Speed To Go to reach a WP at a given time) to one or more selected WPs (e.g. arrival traffic area or Pilot Boarding Position) along the route, not necessarily the last waypoint in the route. | shall | Yes |
| 3.4.27 | The STM ship system shall automatically give the VP an Unique Voyage ID (UVID) using the maritime resource name (mrn) structure (see SeadSWIM specification). | shall | Yes |
| 3.4.28 | When a STM actor has sent e.g. a VP to another STM actor (e.g Ship-Shore, Shore-Ship) the sender shall get information regarding that that message is "read" by the receiver. (Requires update of VIS technical design as an intermediary before the standardized service interface). | shall | Yes |

### 3.5 Communications between the STM Module and Online access point

<table>
<thead>
<tr>
<th>Requirement fulfills</th>
<th>yes/no</th>
<th>comment/describe</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5.1 Each ship shall have data link connectivity between the STM Module and the Online access point. The connectivity has the ability to be continuous with adequate capacity according the following: Communication between the STM Module and Online access point ensures that the maximum possible degree of consistency is upheld between information held in the STM Module and at the Online access point, depending on the online connectivity status of the ship. (Quantifying of above will be done in separate projects).</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>3.6 Online access point (Service Instance)</td>
<td>requirement fulfills yes/no</td>
<td>comment/describe</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>----------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>3.6.1 The online access point shall hold a service instance that is the internet connected representation of the ship, the service instance shall represent the ship towards other actors via a SSC (service instance shall be based on latest service design VIS).</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>3.6.2 The online access point should hold a service instance that is the internet connected representation of the ship, the service instance should represent the ship in receiving port call messages (PCMF) in port-call synchronization interactions towards other actors via a SSC.</td>
<td>should</td>
<td>Yes</td>
</tr>
<tr>
<td>3.6.3 Online access point shall be able to expose and consume (to other STM actors) RTZ-format, S124-format and text format using VIS (See SeaSWIM specification).</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>3.6.4 Online access point should be able to exchange PCMF-format with other STM actors (See SeaSWIM specification).</td>
<td>should</td>
<td>Yes</td>
</tr>
<tr>
<td>3.6.5 Online access point shall be permanently and stably internet connected.</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>3.6.6 External events (according to service log specification) in and out to/from the system should be stored and logged for traceability. Events could include, but are not limited to: Exchange of VP and received S-124.</td>
<td>should</td>
<td>Yes</td>
</tr>
<tr>
<td>3.6.7 Service shall be registered in service registry according to guideline (See SeaSWIM specification).</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>3.6.8 All messages, sent and received, shall be validated against payload schema.</td>
<td>shall</td>
<td>Yes</td>
</tr>
</tbody>
</table>

4 STM Cyber security requirements

<table>
<thead>
<tr>
<th>4.1 STM Cyber security requirements</th>
<th>requirement fulfills yes/no</th>
<th>comment/describe</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1.1 Service instance in online access point shall adhere to requirements stated in SeaSWIM Connector Specification and SeaSWIM Connector Design.</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>4.1.2 Each ship shall be individually identifiable for the receiver of information, hence a unique certificate for the ship shall be used as client certificate.</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>4.1.3 The information owner shall implement authorization mechanism for external actors, that ensures only authorized external actors have access to its information (See also requirement R-3.4.19).</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>4.1.4 Security events should be logged for traceability (time, denied access etc.) in Online access point.</td>
<td>should</td>
<td>Yes</td>
</tr>
<tr>
<td>4.1.5 The communication between STM Module and Online Access Point shall be secured to hinder unauthenticated requests and unauthorized access to information (e.g. VPN).</td>
<td>shall</td>
<td>Yes</td>
</tr>
</tbody>
</table>

5 Non-Functional/Technical Requirements

<table>
<thead>
<tr>
<th>5.1 STM identified non-functional requirements</th>
<th>requirement fulfills yes/no</th>
<th>comment/describe</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1.1 Information shall not be lost due to restart or due to no connection tointernet.</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>5.1.2 Information shared shall not exceed 400kb</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>5.1.3 The online access point shall be available at least 99% of the time.</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>5.1.4 The status of service call shall be clearly indicated (e.g. by symbols for OK, Error) to the operator. Reason for the error shall be presented in text. See VIS Technical Design for details.</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>5.1.5 The response message from service call shall be possible for an operator to read. The response message may contain information regarding the service call even if call was technically a success, such as missing information in the voyage plan.</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>5.1.6 The Online access point VIS-based instance shall return HTTP response (code and message/information) according to VIS Technical Design.</td>
<td>shall</td>
<td>Yes</td>
</tr>
</tbody>
</table>

6 GDPR

<table>
<thead>
<tr>
<th>6.1 GDPR requirements</th>
<th>requirement fulfills yes/no</th>
<th>comment/describe</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1.1 General Data Protection Regulation (GDPR) shall be applied.</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>6.1.2 Personal information shall be avoided in the system.</td>
<td>shall</td>
<td>Yes</td>
</tr>
<tr>
<td>6.1.3 GDPR handling required in MCP shall be followed (See SeaSWIM specification).</td>
<td>shall</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Application of: Directive 2014/90/EU of 23 July 2014 on marine equipment (MED), issued as "Forskrift om Skipsutstyr" by the Norwegian Maritime Authority. This Certificate is issued by DNV GL AS under the authority of the Government of Norway.

This is to certify:
That the Electronic chart display and information system (ECDIS) with backup, and raster chart display system (RCDS)

with type designation(s)
ECDIS-4000

Issued to
Adveto Advanced Technology AB
Landskrona, Skåne Län, Sweden

is found to comply with the requirements in the following Regulations/Standards:
Regulation (EU) 2019/1397,
item No. MED/4.30. SOLAS 74 as amended, Regulations V/18, V/19, V27 & X/3, IMO Res. A.694(17), IMO Res. MSC.36(63), IMO Res. MSC.97(73), IMO Res. MSC.191(79), IMO Res. MSC.232(82), IMO Res. MSC.302(87), IMO MSC.1/Circ.1503 Rev.1

Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until 2021-08-31.
Issued at Hovik on 2019-12-10

DNV GL local station: VERIT\ULBR
Approval Engineer: Frederik Tore Elter
Notified Body No.: 0575

for DNV GL AS

Roald Vårheim
Head of Notified Body

A U.S. Coast Guard approval number will be assigned to the equipment when the production module has been completed and will appear on the production module certificate (module D, E or F), as allowed by the "Agreement between the United States of America and the EEA EFTA states on the mutual recognition of Certificates of Conformity for Marine Equipment" signed 17 October 2005, and amended by Decision No 1/2019 dated February 22nd, 2019.

The mark of conformity may only be affixed to the above type approved equipment and a Manufacturer's Declaration of Conformity issued when the production-surveillance module (D, E or F) of Annex B of the MED is fully complied with and controlled by a written inspection agreement with a Notified Body. The product liability rests with the manufacturer or his representative in accordance with Directive 2014/90/EU.

This certificate is valid for equipment, which is conform to the approved type. The manufacturer shall inform DNV GL AS of any changes to the approved equipment. This certificate remains valid unless suspended, withdrawn, recalled or cancelled. Should the specified regulations or standards be amended during the validity of this certificate, the product is to be re-approved before being placed on board a vessel to which the amended regulations or standards apply.
**Product description**

ECDIS-4000 consisting of the following components:

- Computer
- Monitor
- Keyboard/Trackball
- Sensor connection unit
- Control unit (optional)

### Hardware modules:

<table>
<thead>
<tr>
<th>Type</th>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer and monitor</td>
<td>Computer: Hatteland HTC01, with on board graphics Q35 chipset</td>
</tr>
<tr>
<td>solutions:</td>
<td>Monitor: Hatteland JH 19T14 MMD or</td>
</tr>
<tr>
<td></td>
<td>Monitor: Hatteland JH 23T14 MMD</td>
</tr>
<tr>
<td></td>
<td>Computer: Hatteland HTC02, with on board Intel HD Graphics 4600 integrated</td>
</tr>
<tr>
<td></td>
<td>Monitor: Hatteland JH 19T14 MMD or</td>
</tr>
<tr>
<td></td>
<td>Monitor: Hatteland JH 23T14 MMD</td>
</tr>
<tr>
<td></td>
<td>Hatteland HD 24T21MMC (Panel PC solution - Integrated computer and monitor)</td>
</tr>
<tr>
<td>Keyboard/Trackball:</td>
<td>Cherry G84-5400, or KSML92Y or</td>
</tr>
<tr>
<td></td>
<td>CKS 96T-OEM-Black-3 MOUSE-TRAK, TSX50YZ (Optional - trackball only) or</td>
</tr>
<tr>
<td></td>
<td>MOUSE-TRAK, B-9PIND (Optional - trackball only)</td>
</tr>
<tr>
<td>Sensor connection unit</td>
<td>Adveto SCU Qwerty N8E, or</td>
</tr>
<tr>
<td></td>
<td>Adveto SCU-2 Qwerty CN8E</td>
</tr>
<tr>
<td>Control unit (optional)</td>
<td>Adveto 20S, or</td>
</tr>
<tr>
<td></td>
<td>Adveto 16USB</td>
</tr>
<tr>
<td></td>
<td>Sensor Interface Unit (SIU-1)</td>
</tr>
</tbody>
</table>

### Software modules:

<table>
<thead>
<tr>
<th>Type</th>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECDIS-4000 software ver.</td>
<td>4000.10.xx</td>
</tr>
<tr>
<td>Seven Cs EC2007 kernel ver.</td>
<td>5.12 or 5.2x</td>
</tr>
<tr>
<td>IHO presentation library</td>
<td>ver. 4.0.x (kernel ver. 5.2x)</td>
</tr>
<tr>
<td>Operating system:</td>
<td>Windows 7 Pro (or Microsoft Windows XP, or Windows Embedded SP3)</td>
</tr>
</tbody>
</table>

### Application/Limitation

- ECDIS-4000 is to be installed onboard according to Installation, setup and maintenance manual.
- A dual installation of ECDIS-4000 is found to comply with the requirements for ECDIS with Back-up arrangements.
- ECDIS-4000 can be delivered in 3 different versions: Base, Standard and Extended.
- The ECDIS-4000 shall be supplied by an Uninterruptible Power Supply (UPS) in accordance with Installation, setup and maintenance manual.
- ECDIS-4000 may be optionally provided with conning display functionality.
- ECDIS-4000 may be optionally provided with the additional non-standard night colour mode "Norwegian Night Presentation", specifically developed for High Speed Craft navigation.
- ECDIS-4000 may be optionally provided with seismic operation functionality.
- ECDIS-4000 may be optionally provided with CCTV control and display functionality.
- ECDIS-4000 may import/export RTZ route files via USB as optional feature.
- ECDIS-4000 may present STM data in a dedicated window on the ECDIS as an optional feature.
- ECDIS-4000 cannot be connected to an INS for reception of sensor data.
- The ECDIS-4000 may be installed with the optional Primar ECDIS online functionality for downloading chart updates via the Internet. External network connection is to be through Gateway.*

Note:
*A For ship external data exchange, a Gateway in accordance to IEC61162-460 is to be provided. Gateway is not part of this certification.

Tests carried out
- Performance testing, IEC 61174 Ed. 4.0 (2015)
- Serial interface testing, IEC 61162-1 (2016)
- Presentation of navigation information, IEC 62288 (2014)

Type Examination documentation

<table>
<thead>
<tr>
<th>DNV GL No</th>
<th>Title</th>
<th>Document No.</th>
<th>Rev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>112</td>
<td>Report: BSH IEC61162-1 Conformance test report 1N4B (SIU-1)</td>
<td>BSH/46162/0041158/09</td>
<td>2010-03-18</td>
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<tr>
<td>104</td>
<td>Report: IEC60945 Climatic (SIU-1) - Intertek Semko AB Environmental</td>
<td>913128</td>
<td></td>
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<tr>
<td>102</td>
<td>Report: Conformance test report 23T14+HTC01</td>
<td>DOC100904</td>
<td>6</td>
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<tr>
<td>101</td>
<td>Report: Appendix IEC62288 JH 23T14_SIGNED</td>
<td>DOC101901</td>
<td>1R2</td>
</tr>
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<td>91</td>
<td>MRA0000008 Marine computer HT CO2Hx</td>
<td></td>
<td></td>
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<tr>
<td>89</td>
<td>Wittnessed test report S-64 testing</td>
<td></td>
<td></td>
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<tr>
<td>78</td>
<td>2015-10-14 STATEMENT DNVGL(1)</td>
<td></td>
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<tr>
<td>77</td>
<td>Certificate HTC02 Computer</td>
<td>MRA0000008</td>
<td>1</td>
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<tr>
<td>75</td>
<td>ECDIS-4000 Users Manual</td>
<td></td>
<td>12th Edition</td>
</tr>
<tr>
<td>70</td>
<td>GPU Similarity Report HTC01 - HTC02</td>
<td>DOC101950-1</td>
<td>1</td>
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<tr>
<td>67</td>
<td>Certificate: DNV, Type Approval certificate for EDS SERIES</td>
<td>A-13543</td>
<td></td>
</tr>
<tr>
<td>64</td>
<td>Certificate: Type Approval Moxa EDS Switch</td>
<td>A-13543</td>
<td></td>
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<tr>
<td>DNV GL No</td>
<td>Title</td>
<td>Document No.</td>
<td>Rev.</td>
</tr>
<tr>
<td>-----------</td>
<td>-------</td>
<td>--------------</td>
<td>------</td>
</tr>
<tr>
<td>61</td>
<td>Report: Test Report IEC60945 ECDIS Keyboard KSM92F1RLED</td>
<td>20094390200</td>
<td>Mar. 2010</td>
</tr>
<tr>
<td>60</td>
<td>Certificate: TFT Displays</td>
<td>A-13515</td>
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<tr>
<td>54</td>
<td>EMC and environmental testing of JH 19T12 MMD-AA1-AAAC</td>
<td>2008-3143</td>
<td>01</td>
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<tr>
<td>53</td>
<td>EMC and environmental testing of JH 19T14 MMD-AA1-A0AA</td>
<td>2008-3528</td>
<td>01</td>
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<tr>
<td>52</td>
<td>Conformance test report of LCD for use in RADAR and ECDIS, JH19T14-ADD-AAE-AABA</td>
<td>DOC100675-1</td>
<td></td>
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<tr>
<td>51</td>
<td>Type approval testing of MOUSE-TRAK trackball</td>
<td>E501359-2</td>
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<td>48</td>
<td>Mechanical test of Adveto</td>
<td>279693</td>
<td>2</td>
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<td>47</td>
<td>Adveto Test Report No 2009-3115, EMC &amp; Environmental Testing of ECDIS-4000 Control Unit</td>
<td>2009-3115</td>
<td>01</td>
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<tr>
<td>46</td>
<td>EMC test on XS Keyboard</td>
<td>F917800-C</td>
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<td>45</td>
<td>EMC test on ESIG</td>
<td>F917800-B</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>EMC test on CN8E, N1E and 1N4B</td>
<td>F917800-A</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>EMC test report</td>
<td>916478-1</td>
<td></td>
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<tr>
<td>42</td>
<td>Compass safe testing of G84-5400 and SCU-2</td>
<td>2010-3007</td>
<td>01</td>
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<td>38</td>
<td>ECDIS-4000 Instruction for Norwegian Night Presentation</td>
<td>2009-12-14</td>
<td></td>
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<tr>
<td>37</td>
<td>Survey report Waxø - Alternative night colour presentation on ECDIS</td>
<td>913128</td>
<td>October 19, 2009</td>
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<tr>
<td>34</td>
<td>Environmental Tests Acc to IEC 60945</td>
<td>913128</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Compass safe distance certificate</td>
<td>453</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Compass safe distance certificate</td>
<td>470</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>ECDIS-4000 Technical Description</td>
<td>2009-12-14</td>
<td></td>
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<tr>
<td>19</td>
<td>Performance test report</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Survey report - Alternative night colour presentation on ECDIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Test report 44341008.pdf</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Marking of product**

The name and contact address of the manufacturer and type designation of the product is to be affixed to the equipment in a clearly visible location. In addition the equipment shall be marked with serial number, safe distance to magnetic compass, power consumption and/or supply voltage.
1. Call for tender

1.1 Procurement

1.1.1 Invitation to tender

The Swedish Maritime Administration (hereinafter SMA) hereby grants you the opportunity to submit a tender regarding STM update on ECDIS or stand alone units connected to ECDIS.

1.1.2 About the Authority

SMA is a central administrative authority with a sector responsibility for shipping. This means a collective responsibility for achieving the government’s transport and economic policy goals in the field of shipping.

The goals of transport policy guiding our operations are to attain an accessible transport system, a high level of transport quality, secure shipping, a favourable environment, positive regional development and an equitable transport system. Regarding economic policy, SMA shall work to take advantage of the potential of shipping as a competitive export industry, and to look after the competitive conditions of the
merchant fleet.

Of 1160 SMA’s employees, 240 are located in the head office located in Norrköping.

1.1.3 Purpose/Aim of the Tender

The higher purpose of the STM Balt Safe is to increase the safety in the Baltic Sea with the focus on tankers.

The aim of this tender is to expand the STM compliant fleet to be able to have a concentrated test bed in the Baltic Sea Region with special focus on Gulf of Finland and Bay of Riga.

1.1.4 Documents in the tender invitation

This invitation consists of the following documents:

- Call for tender (this document)
- Tender requirements
- Drafted agreement
- ESPD (European Single Procurement Document)

Attachments:

- Appendix_1_Technical requirements
- Appendix_2_Route-Message-system-requirements
- Appendix_3_textMessageSchema_Description_1_3
- Appendix_4_SeaSWIM-Specification-v3.0

Any complementary information, including question and answers, that might be published during the procurement process.

Please note that it is the responsibility of the tenderer to make sure that all procurement documents, questions and answers and other information have been obtained.

Documentation regarding usecases, FAT and SAT protokoll will be published at https://www.stmvalidation.eu/projects/stm-balt-safe/

1.1.5 Background

STM BALT SAFE

The sensitive Baltic Sea region has one of the highest shipping intensities in the world. There are many tanker ships and crossing traffic of passenger ships and narrow passages. Shipping accidents happen and may in the worst-case scenario have an extreme impact on the environment. Measures in the field of safety of navigation are needed to reduce accident risks. There is a need to improve the exchange of information between ships and between ships and shore for increased situational awareness and as a catalyst for improved safety of navigation, optimized capacity utilization and just-in-time operations.
Increased safety in the Baltic Sea

STM BALT SAFE (2019-2021) will contribute to increased safety of navigation in the Baltic Sea by providing Sea Traffic Management (STM) enabled maritime services to the tanker traffic in the Baltic. The project will address the recently amended HELCOM recommendations 34 E/2 "Further testing and development of the concept of exchange of voyage plans as well as other e-navigation solutions to enhance safety of navigation and protection of the marine environment in the Baltic Sea region". Tanker ships will be made safer by making them STM compatible hence given the ability to send and receive voyage plans with other ships and with public authorities in Baltic Sea countries. By the STM BALT SAFE project, the institutional capacity of the public sector on supporting and developing safety of navigation services and efficiency of sustainable transport will be enhanced.

Enhanced monitoring and automated reporting

The project will build on the methods, results and the maritime service infrastructure developed in previous projects like EfficienSea II, MONALISA 2.0 and Sea Traffic Management Validation project and will encompass exchange of voyage plans and integration of STM functionalities in VTS shore centres. Services for enhanced monitoring of maritime traffic, different automatic reporting services to Ship Reporting Systems e.g. GOFREP and SOUNDREP as well as automated reporting to Maritime Single Windows, will be developed and tested in the project. Different services that optimize the ship´s voyage and decrease the administrative burden will also be developed and tested within the STM BALT SAFE.

New STM-clause enable just-in time for charter parties

The standard clauses for shipping are currently being developed to be efficient when using Sea Traffic Management to optimize the sea traffic. These new clauses for Charter Party contracts to enable just-in-time shipping will also be tested and validated in practice within the STM BALT SAFE.

A wide partnership around the Baltic Sea
The STM BALT SAFE project will be implemented by a Baltic Sea wide partnership of public administrations from Norway, Sweden, Finland and Estonia. The total budget amounts to appr. 4 million euro.

STM capability on board ships

STM Balt Safe will provide the ships in the testbed with STM capable onboard system in order to facilitate ship-to-ship and ship-to-shore exchange of voyage plans. This is fully in line with the amended HELCOM Recommendation 34E/2 on further testing and development of the concept of exchange of voyage plans to enhance safety of navigation and protection of marine environment in the Baltic Sea region. The recommendation also mentions a number of different suitable services such as ice routing and winter navigation services as well as SAR information.

These STM enabled maritime services are also included in in other HELCOM recommendations. The aim is to involve tanker ships and regular ferries in crossing traffic in the Gulf of Finland in the testbed of the STM BALT SAFE project. The increase of the number of STM compatible tanker ships in the Baltic will contribute to increase navigational safety while at the same time increase efficiency and reducing environmental impact.

The STM concept supports ships in both the voyage planning phase and during the voyage e.g. route optimization services, providing pilot routes and Navigational Warnings directly to the navigational system of the ships, ship-to-ship route exchange etc. All services are supported and delivered via the Maritime Digital Infrastructure where the exchange of voyage plans is executed in a standardized way. This caters for that end-to-end interoperability in communication between systems from different manufactures regardless if they are shore based systems or ship based systems and with an ability to interact with maritime services enabled by STM.

By involving a large number of tanker ships in the STM BALT SAFE testbed, a good quantity of data can be collected for analyses and evaluations. The functional requirements for ship systems will also take into account the needs of other maritime services than exchange of voyage plans, i.a. automated ship reporting services etc.

1.1.6 Procurement procedure

The procurement is carried out according to the Swedish Public Procurement Act as an Negotiated procedure without publication

1.1.7 Overall timetable

<table>
<thead>
<tr>
<th>Action</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>This procurement is published</td>
<td>12/20/2019</td>
</tr>
</tbody>
</table>
### 1.1.8 Contract period

The contract is valid from the time of both parties have signed. Contract time starts when both parts signing the contract and ends when the Project ends.

### 1.1.9 Close of the tender period

The tender must be received by SMA by 1/31/2020 11:59 PM at the latest. Tenders received after this date will not be considered.

### 1.1.10 Validity of the tender

The tender should be valid until: 5/31/2020.

### 1.1.11 Extended validity of the tender

If the procurement is subject to a legal review, the validity of the tender may be extended until the contract can be signed, up until a maximum of six (6) months from the end of the validity period.

### 1.2 Administrative regulations

#### 1.2.1 Submission of tenders in TendSign

Tenderers who want to participate in this procurement shall submit bids electronically via TendSign, tenders received by mail, email or fax will not be considered. If signed documents are requested they shall be scanned and uploaded and all required documents shall be in a legible format.

#### 1.2.2 Instructions for structure

- All shall- and should requirements shall be answered. Answers left out are normally regarded as unmet requirements.
- All 'shall' requirements must be met for the tender to be considered.
- Should requirements are evaluated and used to obtain the tender that has the most advantageous relationship for the SMA between price and quality, see the section on evaluation.
- If proof in the form of appendices are required, these should generally be attached to the tender.
An exception apply for proof of compliance for grounds of exclusion and selection according to the European Single Procurement Document (ESPD) Regulation.

Please submit a complete and final tender.

1.2.3 Costs associated with tendering
No compensation will be provided for any costs associated with the invitation to tender.

1.2.4 Language
Submitted tender and attached document shall be written in English. Questions and answers shall be in English.

1.2.5 Pricing
Tendered prices must be given as follows:

State the price in the comment field below. The price shall be for a fully developed solution, installed in assigned vessels, technical support during the project period and training of bridge officers in the usage of the STM functionalities. The price shall refer to installation in one (1) vessel.

Prices must be stated in EUR and are assumed to be exclusive of VAT, including customs, shipping and handling fees unless otherwise stated in the terms of the agreement.

Budget price for each installation in vessels is max 4200eur/vessel, tenderer with prices above that will be rejected.

<table>
<thead>
<tr>
<th>a. Total price for the system, installed in one (1) vessel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Text field</td>
</tr>
<tr>
<td>EUR 4200</td>
</tr>
</tbody>
</table>

1.2.6 Acceptance of drafted agreements
The tenderer shall accept the drafted agreements.

<table>
<thead>
<tr>
<th>a. accept of drafted agreements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Text field</td>
</tr>
<tr>
<td>Yes/No. Yes is required</td>
</tr>
<tr>
<td>Answer</td>
</tr>
<tr>
<td>Yes</td>
</tr>
</tbody>
</table>
1.2.7 Standard agreements

Standard agreement IT & Telekomföretagens - IT Project, version 2014, General terms and conditions will form the basis of this agreement and must be accepted.

a. accept of standard agreements

Yes/No. Yes is required

Answer

Yes

1.2.8 Evaluation of tenders

Qualification and evaluation is conducted as follows:

1. **Qualification of tenderers.** In this step, checks are performed to verify that the tenderers fulfil 'shall' requirements to qualify as a supplier, i.e., that tenderers have fulfilled their social obligations, have adequate finances and have the necessary expertise.

2. **Fulfilment of 'shall' requirements.** In this step, checks are performed to verify that 'shall requirements are fulfilled. Tenders that do not fulfil the 'must requirements are rejected.

3. Those tenders that fulfil all 'shall' requirements are *evaluated* according to the principle of the Most economically advantageous tender.

1.2.8.1 Price for evaluation

Tenderers stated prices, according to 1.2.5 will be used for evaluation.

1.2.8.2 Most economically advantageous tender

SMA will adopt the tenderers which is the most economically advantageous in consideration of the tenderers price. The tender with the lowest comparative price according to provided prices will get contracts. Maximum 5 tenderers will get contracts. The distribution will be made according to the matrix below based on the number of tenders accepted. If several tenderers end up at the same comparative value, lottery will be applied.

<table>
<thead>
<tr>
<th>Number of accepted bids</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of vessel amount depending on rankings according to tenderers comparative value</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>
1.3 Questions

1.3.1 Information management

The TendSign system is used for distribution of specifications and other information relevant to the procurement. Documents and information are distributed electronically via the internet address (URL link) provided in the Call for Tender.

In order to access the system, a username and password must be obtained by following the simple registration process on www.TendSign.com. Tenderers can use this system free of charge and gain immediate access to the system and specifications once registration has been carried out. TendSign’s support is open on working days between 07.00 – 17.00.

Questions concerning TendSign (how to post questions, tender etc.) shall be addressed to tendsignsupport@visma.com. TendSign answers the questions by telephone or e-mail.

1.3.2 Questions concerning the tender specification

If a tenderer finds the specifications unclear in any aspect then it is important to clarify the issue quickly to avoid any misunderstandings. Questions regarding this tender should be sent in writing via TendSign.

Questions and answers together with any other information about the tender specifications (such as clarifications and corrections) will be distributed via TendSign to all tenderers. Supplementary information is only binding if it is in writing from SMA.

Last date for questions 1/23/2020

1.4 Conflicts of interest

In order to avoid a possible situation of equality, the Swedish Maritime Administration wants information about the tenderer, its owner (with actual influence) or its employees are employed by the Swedish Maritime Administration, or if there is Another link that may affect the procurement process or contractual relationship.

a. Enter if any connection to the Swedish Maritime Administration as described above. If no connection exist, then enter that in the text box.

Yes/No. Yes is required

General part (1)

Answer

Yes
1.5 Commercial Secrecy

In accordance with the Official Information and Secrecy Act (Offentlighets- och sekretesslag (2009:400)) all information pertaining to a procurement matter is subject to secrecy until an agreement has been entered into or procurement has otherwise been concluded.

Any information mentioned may be subject to secrecy even after the aforementioned time. Note however that only in exceptional cases, information and prices according to the evaluation of the tender are considered to be of such nature that they may be held secret for commercial reasons. With respect to commercial secrecy for the protection of a tenderer’s information, the requirement is that the information in question refers to the tenderer’s business or service conditions and that there is a specific reason to presume that the tenderer will suffer damages if the information is disclosed.

If a tenderer considers the information submitted in connection with this procurement matter fulfills the aforementioned requirements for commercial secrecy, the tenderer must submit a request for commercial secrecy, in writing, with clarification concerning the information referred to and what damage the tenderer would suffer if the information were disclosed. The decision whether or not the information submitted by the tenderer fulfills the requirements for commercial secrecy will be made by the Contracting Entity.

a. If the tenderer is to make the tender, or part of the tender confidential, please specify which information needs to be protected and the damage that could occur if the information is made public.


1.6 Discontinuance of procurement

SMA reserves the right not to make an award and/or to cancel the invitation to tender, to issue a new invitation for tendering, to adapt the procedure for the invitation to tender and/or to introduce alterations to the nature of those according to unexpected economic, political or organizational changes. If offered price is over budget according to the goal of the project, SMA has the right to cancel the procurement.
2. Tenderer requirements

2.1 Tenderer requirements

2.1.1 Requirements for tenderers

Tenderers must meet all requirements in chapter 2.1 in order to qualify for their tender to be examined and evaluated.

2.1.2 Subcontractors

A tenderer may engage subcontractors for part of the work. This should be clearly shown in the tender, and the subcontractor must also meet all the requirements. Upon request by SMA, tenderer shall be able to present a cooperative agreement or similar, showing that each subcontractor agrees to make the necessary resources available.

a. If a subcontractor will be used, the name of the organization number and the part they intend to perform shall be stated. If no subcontractor is to be used write "not relevant"

not relevant

2.1.3 Grounds for exclusion

Circumstances that will lead to exclusion of a tender: Examination according to the Swedish Public Procurement Act (2016:1145) 13 CH. § 1, 2 and 3.

Requirements for evidence

The tender shall include a statement certifying that situations described in the Swedish Public Procurement Act CH 1-3 § do not apply.

a. The tenderer certifies that there are no grounds for exclusion

Yes/No. Yes is required

Answer

Yes

2.1.4 Registration obligations, payment of taxes and fees

Tenderers shall satisfy the legal requirements of Sweden or their homeland concerning registration, tax
and obligatory fees. Tenderers may not have incurred any debts for social security fees or taxes, in Sweden or in their homeland, if the debt has led to registration with the Swedish Enforcement Authority or similar authority in the homeland.

Requirements for evidence
If the tenderer is registered in Sweden no evidence needs to be included. SMA will verify that the requirements are satisfied and will contact the tenderer if any clarification is needed when the tenders are being processed. If the tenderer is a foreign company, certified copies of official documents issued by a competent judicial or administrative authority shall be provided to SMA.

2.1.5 Company registration
The tenderer must meet the requirements on company registration (limited liability companies’ register, partnerships register or a similar register) in the country where the tenderer’s business is registered.

To confirm requirement fulfillment, tenderers may already attach the following documentation in the tender, but must upon request attach the documents as soon as possible.

- Document from a relevant official authority/equivalent that confirms that the company is registered.

2.1.6 Financial Position
Tenderers shall have a stable financial position, to ensure that all commitments can be fulfilled during the contract period.

Requirements for evidence
If the tenderer is registered in Sweden no evidence needs to be included in the tender. SMA will carry out a credit check with help of the Swedish CreditSafe (www.creditsafe.se), where tenderers will need a rating of "Kreditvärdig" or higher to satisfy the requirements. If the tenderer is aware of, or suspects that up-to-date information is missing or incorrect (for example for a newly created business that has not yet submitted an annual report), or that requirements are not satisfied, then an explanation should be provided so that SMA can make an overall assessment of the tenderer, to determine whether or not the requirements for a stable financial position have been fulfilled.

If the Tenderer is a foreign Company, the tenderer shall provide a certificate of financial status, not older than 2 months, from CreditSafe (www.creditsafe.se) or other finance Company. The credit rating, to be approved, shall be at the minimum creditworthy.

a. Tenderer approves with the requirement
Yes/No. Yes is required

Answer
Yes

b. If the tenderer is a foreign company, the requested certificate shall be attached

Attachment

Credit ranking report WVLtd.pdf

2.1.7 Pension Insurances, collective agreement and occupational healthcare
The contracting partner shall before contract signing supply information and certificates described below that are no older than three (3) months:

- Certificates of pension insurances arranged for employees and of pension insurance premiums paid, or an account that a payment agreement on outstanding pension insurance premiums has been made
- An account of the collective agreement or the principal terms of employment applicable to the work
- An account of provided occupational healthcare

These requirements are included as this is a procurement funded by funds from the EU via Central Baltic.
2.1.8 Technical and professional capacity

The tenderer shall have the technical and professional capacity required to fulfill their contractual obligations.

The tender shall include:

- A brief description of tenderer’s organisation, number of employees, operations, history and ownership, as well as geographical location and resources within the relevant field.

- A brief description of the staffing plans for the contract, in particular with regard to replacements if key staff are absent.

- The tenderer’s historic and current work on development and research and cooperation with industry organizations and authorities.

2.1.9 Experience of ECDIS

To be qualified for this procurement you need to be:

1. A manufacturer of type approved ECDIS equipment or have a planning station that is connected with ECDIS.*
2. Ships equipped shall be either/or
   1. Tanker DW, minimum 3000 GT.
   2. Ferries 500 GT, trading Gulf of Finland.
   3. Ships assisting in Winter navigation along the Estonian coast.
3. The ships equipped shall be planned to trade the Baltic Sea, preferably Gulf of Finland.

*Route in ECDIS shall be possible to be exchanged with planning station without the need for USB-drives.
2.1.10 Quality
Tenderers shall apply quality control procedures to ensure that work is carried out in such a way that the agreed scope and quality is achieved and maintained. The quality assurance work shall be conducted with the support of tools and/or written procedures so that the work is monitored and the result is measured against set targets.

Requirements for evidence
The tender shall include:
- A summary describing how the tenderer will work with quality assurance and other controls, including the procedures to document them and/or a copy of quality certification.

2.1.11 Liability Insurance
In case of a contractual signing, the tenderer shall have a liability insurance for the commitment. The tenderer shall hold liability insurance for his business which includes the commitment under this contract.

Liability Insurance shall be valid throughout the contract period. Insurance certificates shall be submitted to SMA on request.

Answer
Yes
2.1.12 Technical requirement

Technical Requirements, requested functionality and prerequisites for the system is described in appendix 1.

All requirements in the Appendix 1 shall be answered and be attached with the tender.

a. All shall requirements in Appendix 1 are met

Yes/No. Yes is required

b. Answered Appendix 1, technical requirements of the system shall be attached

Attachment

1 attached document

Appendix_1_Technical_Requirements_BALT_SAFE_Solutions_complete_11122019.xlsx

2.1.13 Project and timeplan

The tenderer must attach a preliminary project and timetable, linked to the mentioned milestones in 1.1.7, that clearly describes the implementation Project scope and length, area of responsibility for each party and measurable milestones.

Explanation and definition of Some of the milestones that shall be included in the timeplan.

System design review. A technical description of the planned system shall be presented for and reviewed by SMA.

FAT  The STM compatible system shall be fully developed and presented for SMA. SMA will follow a preset test procedure.

SAT  The STM compatible system shall be installed onboard a ship and presented to SMA. SMA will follow a preset test procedure.

All ships systems installed. When the contractor have installed systems in all ships that was agreed upon in the contract.

Final acceptance The project have come to an end and all agreed ships have been installed. The bridge officers have gotten due training and the technical support have been up and running.

Documentation regarding usecases, FAT and SAT protokoll will be published at https://www.stmvalidation.eu/projects/stm-balt-safe/
The project must be done according to an iterative implementation, where SMA and the supplier have frequent reconciliations during the process.

The project plan must very clearly emphasize the requirements that the tenderer places on SMA and the dates which the client is expected to satisfy these.

The preliminary timetable will be fundamental to the detailed project and timetable to be produced and approved by both the client and tenderer after the agreement has been signed. A detailed project and time schedule must be produced as soon as possible after signing of agreement.

a. Project and timeplan
Attachment

2.1.13 Project_time_plan.docx

2.1.14 Qualification requirements - espd
The European Single Procurement Document (ESPD) is a standardised selfdeclaration that tenderers may use as a preliminary evidence of their possibility to participation in a procurement. In an ESPD, tenderers and applicants certify that they should not be excluded from the procurement according to Chapter 13, Sections 1-3 of the Public Procurement Act (2016: 1145) and that they can provide evidence for this. If a tenderer has not attached the specified verifications together with the tender, or if the contracting authority itself can retrieve the verifications from a third party, the authority can request that the verifications are submitted during the evaluation process.

Tenderers who wishes to use an ESPD form for qualification instead of the requirements stated by the SMA in the Section Qualification shall use the ESPD form, with requirements relevant to the procurement. Please note that tenderers using an ESPD form also must fill in ESPD forms for every stated subcontractor, and on request from the university also submit the specified verifications for each subcontractor.

2.1.14.1 ESPD or requirements for tenderer
The tenderer shall state whether the tenderer uses the specifications of the tenderer for the tenderer or the ESPD documents.

a. If the tenderer make use of the tender documents, the tenderer writes 'tender documents' below.
If the tenderer make use of the ESPD file, attach it in the Tendsign’s system and the tenderer writes ‘ESPD’ below.

Text field
3. Drafted Agreement

3.1 Agreement (Draft)

3.1.1 Introduction
The following Agreement has been entered into by and between The Swedish Maritime Administration (SMA) with organization number 202100-0654, and ______, hereinafter referred to as the Contractor/Supplier, with organization number______. The Contractor commits itself to performing the assignment according to the tender (hereinafter “the Assignment”) in accordance with the provisions in this agreement.

3.1.2 Agreement

3.1.3 Subcontractors
Approved subcontractors are:

The engagement by the Supplier of any subcontractor shall not relieve the Supplier from any liabilities or obligations under this Contract and the Supplier shall be responsible for any acts or omissions of any subcontractor as if they were acts or omissions of the Supplier.

The Supplier shall ensure that the terms and conditions of this Contract are reflected in all subcontracts, if any, to the extent necessary to enable the Supplier to fully meet his obligations to SMA. Such terms and conditions include, but are not limited to, technical, functional and operational requirements and technical specifications; time of delivery; warranty terms; and quality Control.

Only subcontractors approved by SMA can be used.

3.1.4 Period of contract
The contract is valid from the time of both parties have signed and will ends when the project ends, but no longer than until June 21, 2021.

3.1.5 Contact
Each Party shall appoint a primary contact person whose responsibilities and obligations during the Term of the Contract are defined in this contract.

For SMA: Cajsa Jersler Fransson

For the Supplier: XXXXX
3.1.6 Agreed Specifications
This agreement covers all software and support services for a STM compatible system in the STM Balt Safe Project.

3.1.7 Scope
A STM compatible system shall in the STM Balt Safe project be a system that fulfill the requirements in the attached list. A system might be a software upgrade to an ECDIS or a stand alone unit compatible to an ECDIS with the capability to retrieve and send RTZ.

3.1.8 Security agreement

3.1.9 Agreement documents
In the event of the documents relating to the Agreement refers to or contains conflicting general terms and conditions, these documents shall prevail as follows:

1. Written changes and additions to this Framework
2. This Framework with accompanying appendices
3. The request for a tender with accompanying appendices
4. The tender, including any clarifications
5. IT & Telekomföretagens - IT Project, version 2014, General terms and conditions, applies unless otherwise stipulated in this agreement

No other documents besides the above apply.

If the Supplier has and/or applies any “General terms and conditions of contract” or equivalent, these have been rejected by the SMA, meaning that through this Contract the Parties have expressly agreed to exclude all such terms and conditions.

3.1.10 Changes and additions
All changes and additions must be in writing and agreed by all parts.

Notices required to be given by one party to another shall be in the English language unless expressly agreed otherwise and shall be deemed properly given if reduced to writing and personally delivered or sent by registered or certified post to the address below, postage prepaid, or by fax or e-mail with confirmation of receipt in the same manner and shall be effective upon receipt.

Unless specified elsewhere in the Contract, all notices and requests shall be addressed as follows:

<table>
<thead>
<tr>
<th>SMA</th>
<th>Supplier</th>
</tr>
</thead>
</table>
3.1.11 Suppliers undertakings and system responsibility

3.1.11.1 “System” responsibility

The Supplier shall have responsibility for the fully satisfactory function of the complete "system" throughout the test period. The Supplier shall have full responsibility for design even if design proposals are put forward by SMA. SMA’s approval of drawings, designs or products and services does not constitute a discharge of the Supplier from his design and System responsibility.

3.1.11.2 Suppliers undertakings

The Supplier undertakes to design, develop, install and supply the "system", fully compliant with the tendering documentation, educate vessels command and to maintain those systems operational throughout the project time.

The undertaking includes all undertaking described in the tender documents.

The Supplier is also responsible for managing any required implementation activities, training and giving advice in how the System should be used to reach the best quality and efficiency. The scope of delivery (as set forth in Supplier’s Draft Project Management Plan) should include support and maintenance.

The Supplier is fully responsible for a fully setup System ready for deployment, and fully responsible for deploying the System. The delivery includes all components, software, for the System.

The Supplier is fully responsible for support during project time.

3.1.11.3 Specifications

The Supplier shall deliver the "system" in accordance with this Contract.

3.1.12 Delivery requirements

The Supplier will cooperate with all parties involved in the Implementation Project as well as SMA.

The Implementation Project will be executed in close cooperation with SMA to assure that the high
quality in the System and deployment is achieved.

In no event shall Supplier be liable for any acts or commissions of any third party under the present Contract other than Supplier’s subcontractors.

3.1.13 SMA:s undertaking and responsibilities

The Swedish Maritime Administration will provide VIS (Voyage Information Service) instance, expertise and documentation on how to use the private side for integration.

SMA is responsible for the following undertakings:

SeaSWIM central services
- Service Registry including examples, templates and descriptions for use
- Identity Registry including examples, templates and descriptions for use

SeaSWIM connector (SSC) (three alternatives depending on tenders preference)
- SSC implementation run by SMA (to facilitate the test bed), requires SMA VIS or SPIS (Ship and Port Information Service)

Voyage Information Service (three alternatives depending on tenders preference)
- VIS implementation run by SMA (to facilitate the test bed)

During the project we will keep up support for the ships through the Gothenburg Shore Center. There will be a special instance called Baltic Shore center during the STM Balt Safe project period.

Baltic shore center
- Are a possible test partner.
Will encourage the connected ships to use the services available for each ship.
- Can be a support in usage if an ECDIS is placed in Gothenburg.

Gothenburg shore center
- Baltic shore center
- Are a possible test partner.
- Will encourage the connected ships entering to the Baltic, to use the services available in The Baltic
- Support how to use the different STM services available in the Baltic.
Technical support.
- Host developers forum
- Maintain and update Developers Forum online with all technical specifications.
- Analyse log files and put together statistics.

3.1.14 Project overview
The Implementation Project includes all activities to reach final acceptance. It includes Project management, product training and solving problems identified during acceptance tests.

3.1.15 Milestone 1

3.1.16 Milestone 2

3.1.17 Milestone 3

3.1.18 Milestone 4: Final acceptance

3.1.19 Milestone 5

3.1.20 Delivery and Payment

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Description</th>
<th>Date</th>
<th>Payment Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milestone 1</td>
<td>Installation of STM 1.0</td>
<td>2020-07-01</td>
<td>if approved installation, 30% of the purchase price can be invoiced</td>
</tr>
<tr>
<td>Milestone 2</td>
<td>System Design Review</td>
<td>2020-09-01</td>
<td></td>
</tr>
<tr>
<td>Milestone 3</td>
<td>FAT</td>
<td>2020-10-31</td>
<td></td>
</tr>
<tr>
<td>Milestone 4</td>
<td>SAT</td>
<td>2020-11-30</td>
<td></td>
</tr>
<tr>
<td>Milestone 5</td>
<td>Final acceptance, all ships updated to 2.0</td>
<td>2021-01-31</td>
<td>if approved final acceptance, 70% of the purchase</td>
</tr>
</tbody>
</table>
3.1.21 Actual acceptance date
Provided that SMA does not reject the system or part thereof, the actual acceptance date shall be deemed to be the day the system or part thereof (as the case may be) is accepted by SMA. SMA’s issuance of a written acceptance will serve as evidence of SMA’s acceptance.

3.1.22 Ownership after acceptance
Ownership after acceptance shall be the property of the supplier.

3.1.23 Delay
If deliveries are delayed according to the stated times in the timetable, and these delays are caused by the supplier, a discussion will be held between the parties. If the supplier cannot perform the deliveries within a reasonable time after that, SMA has the right to terminate the contract.

3.1.24 Release notes, test reports and installation guide
Release notes shall include, but not limited to; platform releases feature releases, bug fix releases and upgrade notes, test reports and installation guide shall always be attached to deliveries of software, new releases and patches.

3.1.25 Price
Prices are given in the Tender from the supplier.

All local taxes and duties, if any, are included in the prices as listed in the Contract. VAT is excluded.

Total price for the system: XXXEUR
Price per hour for consulting: XXX EUR

3.1.26 Invoicing
Payment shall be made in Euro (EUR)
Invoices from the Supplier shall be accompanied by relevant and detailed specifications clearly identifying on an item-by-item basis the purpose and scope of the delivery including the description, delivered quantity, agreed price and delivery time of each product and service.

Invoices shall always specify SMA’s Contract reference number as well as a reference number

3.1.27 Invoice address

Payment must be made 30 days after the invoice approved by SMA

The supplier is not entitled to charge invoicing fees, handling fees or other fees which are not subject to law.

Invoice address is:

GSF
Sjöfartsverket
601 78 Norrköping

The invoice must state

- which agreement / order the invoice refers to and reference number,
- the contractor's organizational and VAT registration number, the company's registered office and information on the F-tax identification, and
- the contractor's plusgiro, bankgiro or payment address.

Invoices that do not contain the above information will not be approved by SMA and will be returned

3.1.28 Title, right of use, personal data, etc.

3.1.28.1 Title

All technical data of whatever kind, including all software and source codes with documentation necessary for operation, correction, modification and expansion produced by the Supplier or its subcontractor during the performance of this Contract shall be the property of the supplier.

3.1.28.2 Non-disclosure

If not stipulated otherwise in the agreement all Data and information relating to a Party's business and activities that is disclosed by one Party to the other Party under this Contract shall be treated as confidential and proprietary by the other Party. Neither Party shall disclose such Data or information to any subcontractor, consultant or other third party unless such subcontractor, consultant or other third party has executed a confidentiality agreement with the Party for the direct benefit of the other Party.
protecting such Data and information.

The foregoing shall not apply to any information

- in the public domain; or
- which has been legally acquired from sources other than the other Party without confidentiality restrictions; or
- which is required to be disclosed under applicable mandatory law, final and legally enforceable order of any competent court or regulatory body or similar provisions.

### 3.1.28.3 Infringement of intellectual property rights

If not stipulated otherwise in the agreement the supplier shall indemnify and hold SMA harmless in respect of any damages, costs and other expenses, which may arise for SMA as a result of any claim due to any alleged infringement of intellectual property rights as a consequence of manufacture or use of the system.

The supplier shall not be liable for infringement pursuant to the preceding paragraph to the extent that such infringement is directly attributable to materiel supplied by SMA or to solutions or procedures prescribed by SMA contrary to the Supplier’s written objection.

The Supplier and SMA shall keep each other informed of claims arising from intellectual property rights. If infringement occurs, the Supplier shall, in addition to what is stated in the first paragraph, at its own expense either modify the System so that infringement no longer occurs, or reach an agreement with the holder of the infringed upon intellectual property rights.

If the system is modified, the Supplier shall be responsible for ensuring that its agreed function, performance and utility remains unaffected and that there will be no cost increase for its future use.

If a claim is made against SMA in respect of an alleged infringement of any third party’s intellectual property rights, the Supplier shall at its own expense participate in any court proceedings where an action is brought against SMA and for such purpose, as well as otherwise, assist SMA to the best of its ability in the case of alleged infringement of any intellectual property rights.

Supplier will have no obligation to indemnify SMA with respect to any infringement claim based upon any use of the system in combination with other products, equipment, software, or data not supplied by the supplier, unless the infringement is attributable to the System itself and not the act of combination stated above.

### 3.1.29 Use of software Products

### 3.1.30 Liability

Unless otherwise provided by other paragraphs in this contract, each Party shall be liable for loss or damage to its property, injury to or death of any of its employees or other person for whom the Party is responsible.
Each Party shall be liable for direct damage to property of third parties or personal injury, including death, in accordance with the applicable law, if caused by the Party, its personnel and/or its subcontractor(s) engaged in carrying out this Contract and shall indemnify and hold harmless the other Party accordingly.

If claim for damages pursuant to this Clause is made by a third party against either of the parties, said party shall immediately so notify the other party in writing. Neither Party shall be liable to pay any compensation to the other Party either for loss of profit, production drop-out or any other consequential or indirect loss.

The Supplier's maximum liability under this Contract shall be limited to the Contract Price.

No party shall be responsible for any indirect or consequential loss or similar damages such as, but not limited to, loss of profit, loss of revenue or loss of contracts, provided such damages was not caused by a wilful act or gross negligence.

### 3.1.31 Insurance

The supplier shall hold adequate liability insurance for its operations throughout the agreement. The insurance amount should be at least the total value of this agreement.

### 3.1.32 Force Majeure

The following circumstances shall be deemed to constitute grounds for discharge from performing the Supplier's obligations under this Contract if they occur after the Contract has been entered into and the due performance of the Contract is thereby prevented and it may not be considered that the Supplier ought to have taken such circumstances into account at the time of entering into the Contract whose consequences could not reasonably have been avoided or circumvented by the Supplier: general labour conflict and any other circumstances, such as fire, war, mobilization or unforeseen military callup of corresponding extent, requisition, seizure, insurrection and riot, general shortage of qualified labour, general scarcity of means of transport, general shortage of goods, general and enduring restrictions on the supply of motive power, as well as delay in deliveries from Subcontractors as a consequence of circumstances falling within the scope of this Clause, where the Supplier or subcontractor has not caused or contributed to such obstacle.

The aforesaid shall also apply in respect of undertakings, which it is SMA’s duty to perform.

In the event that a Force Majeure event described above prevents a Party from performing its obligations under this Contract for a period exceeding three (3) months, each Party shall be entitled to terminate the Contract and the following shall apply: SMA shall pay to the Supplier the Contract price for work completed as well as the costs of material and labour used for work uncompleted at the time of such termination, less any payments received for such work; and the Contract or shall deliver to SMA upon request any work so paid for.
3.1.33 Disputes

3.1.33.1 Applicable law
This Contract shall be governed by and interpreted in accordance with the laws of Sweden.

Any dispute, controversy or claim arising out of or in connection with this Contract shall be settled by a Swedish court of law in accordance with the laws of Sweden.

3.1.34 Amendments
Amendments or alterations have to be made in writing and signed by both Parties in order to be valid.

3.1.35 Transfer of agreement
The Supplier does not have the right to fully or partly transfer the agreement to a third party without the SMA's written consent.

The Supplier does not have the right, without the SMA's written permission, to transfer debts or other claims (including, inter alia, claims for damages) related to this agreement to any third party.

3.1.36 Subcontractors
The supplier may obtain written consent from the customer to engage subcontractors to carry out part of the work if necessary. Consent requires that the subcontracting company satisfies all the subcontractor requirements made by the customer. The supplier is responsible for the subcontractor's work as well as for their own.

3.1.37 Termination
SMA shall be entitled to terminate all or part of this Contract with immediate effect if:

a) The acceptance of the Milestones occurs later than the agreed dates and the delay for an individual Contractual Milestone has lasted more than three (3) months or the aggregate delay has lasted more than six (6) months and this is not due to Force Majeure, SMA or circumstances for which SMA is responsible and if such delay is attributable to the Supplier, or.

b) enforcement by a legal authority of a judgement or an enforceable decision of any other kind has shown the Supplier to be lacking the means of making full payment of a claim which is the subject of the judgement or decision, has suspended payments, a system has been made to a court or a public authority for corporation restructuring regarding the Supplier pursuant to a legislation act or the Supplier has been declared bankrupt, or

c) the Supplier fails to comply with any other obligation of this Contract and this may be regarded as constituting a substantial breach of Contract. In case of termination for default, SMA shall be entitled to claim damage compensation in accordance with this contract and to a refund of payments made prior to the termination for default.
The Supplier may terminate this Contract in whole or in part if SMA substantially fails to perform its obligations under the Contract. Any Supplier termination for default shall become effective 90 (ninety) days following written notice of the event, unless the event has been cured within such notice period.

In case of termination for default, the Supplier shall be entitled to claim damage compensation in accordance with this Contract.

Any Party claiming breach of Contract shall take all measures necessary to limit the loss or damage arising insofar as this is possible without incurring unreasonable expense and inconvenience.

SMA also have the right to terminate this Contract with immediate effect if:

- the Contract has been changed in way that is prohibited according to the Swedish Public Procurement Act (2016:1145) chapter 17 §§ 9-14,

- at the time of Contract assignment the Contractor meet any of the obligatory grounds for exclusion according to the Swedish Public Procurement Act (2016:1145) chapter 13 §1 and thus should have been excluded from the procurement, or

- The Court of Justice of the European Union in a procedure according to article 258 of the Treaty on the Functioning of the European Union declares that Sweden, by way of allowing SMA to enter into the Contract, has violated its obligations regarding the European Union, the Treaty on the Functioning of the European Union or 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.

3.2 Assignment

Neither Party shall be entitled without the other Party's written consent to put another party in its place, with the proviso, however, that SMA shall be entitled to assign all or part of the Contract to its legal successor(s) or an authority, agency, state enterprise or company wholly or partly owned by the Swedish State.

3.3 Signing

This Contract is executed in two (2) originals, whereof each Party shall keep one.
4. European Single Procurement Document (ESPD)

Part I: Information concerning the procurement procedure and the contracting authority or contracting entity

Part II: Information concerning the economic operator

Part III: Exclusion grounds

A: Grounds relating to criminal convictions

Article 57(1) of Directive 2014/24/EU sets out the following reasons for exclusion

Participation in a criminal organisation

Has the economic operator itself or any person who is a member of its administrative, management or supervisory body or has powers of representation, decision or control therein been the subject of a conviction by final judgment for participation in a criminal organisation, by a conviction rendered at the most five years ago or in which an exclusion period set out directly in the conviction continues to be applicable? As defined in Article 2 of Council Framework Decision 2008/841/JHA of 24 October 2008 on the fight against organised crime (OJ L 300, 11.11.2008, p. 42).

Corruption

Has the economic operator itself or any person who is a member of its administrative, management or supervisory body or has powers of representation, decision or control therein been the subject of a conviction by final judgment for corruption, by a conviction rendered at the most five years ago or in which an exclusion period set out directly in the conviction continues to be applicable? As defined in Article 3 of the Convention on the fight against corruption involving officials of the European Communities or officials of Member States of the European Union, OJ C 195, 25.6.1997, p. 1, and in Article 2(1) of Council Framework Decision 2003/568/JHA of 22 July 2003 on combating corruption in the private sector (OJ L 192, 31.7.2003, p. 54). This exclusion ground also includes corruption as defined in the national law of the contracting authority (contracting entity) or the economic operator.

Fraud

Has the economic operator itself or any person who is a member of its administrative, management or supervisory body or has powers of representation, decision or control therein been the subject of a conviction by final judgment for fraud, by a conviction rendered at the most five years ago or in which an exclusion period set out directly in the conviction continues to be applicable? Within the meaning of Article 1 of the Convention on the protection of the European Communities’ financial interests (OJ C 316, 27.11.1995, p. 48).

Terrorist offences or offences linked to terrorist activities
Has the economic operator itself or any person who is a member of its administrative, management or supervisory body or has powers of representation, decision or control therein been the subject of a conviction by final judgment for terrorist offences or offences linked to terrorist activities, by a conviction rendered at the most five years ago or in which an exclusion period set out directly in the conviction continues to be applicable? As defined in Articles 1 and 3 of Council Framework Decision of 13 June 2002 on combating terrorism (OJ L 164, 22.6.2002, p. 3). This exclusion ground also includes inciting or aiding or abetting or attempting to commit an offence, as referred to in Article 4 of that Framework Decision.

**Money laundering or terrorist financing**

Has the economic operator itself or any person who is a member of its administrative, management or supervisory body or has powers of representation, decision or control therein been the subject of a conviction by final judgment for money laundering or terrorist financing, by a conviction rendered at the most five years ago or in which an exclusion period set out directly in the conviction continues to be applicable? As defined in Article 1 of Directive 2005/60/EC of the European Parliament and of the Council of 26 October 2005 on the prevention of the use of the financial system for the purpose of money laundering and terrorist financing (OJ L 309, 25.11.2005, p. 15).

**Child labour and other forms of trafficking in human beings**

Has the economic operator itself or any person who is a member of its administrative, management or supervisory body or has powers of representation, decision or control therein been the subject of a conviction by final judgment for child labour and other forms of trafficking in human beings, by a conviction rendered at the most five years ago or in which an exclusion period set out directly in the conviction continues to be applicable? As defined in Article 2 of Directive 2011/36/EU of the European Parliament and of the Council of 5 April 2011 on preventing and combating trafficking in human beings and protecting its victims, and replacing Council Framework Decision 2002/629/JHA (OJ L 101, 15.4.2011, p. 1).

**B: Grounds relating to the payment of taxes or social security contributions**

Article 57(2) of Directive 2014/24/EU sets out the following reasons for exclusion

**Payment of taxes**

Has the economic operator breached its obligations relating to the payment of taxes, both in the country in which it is established and in Member State of the contracting authority or contracting entity if other than the country of establishment?

**Payment of social security**

Has the economic operator breached its obligations relating to the payment social security contributions, both in the country in which it is established and in Member State of the contracting authority or contracting entity if other than the country of establishment?

**C: Grounds relating to insolvency, conflicts of interests or professional misconduct**

Article 57(4) of Directive 2014/24/EU sets out the following reasons for exclusion
Breaching of obligations in the field of environmental law
Has the economic operator, to its knowledge, breached its obligations in the field of environmental law? As referred to for the purposes of this procurement in national law, in the relevant notice or the procurement documents or in Article 18(2) of Directive 2014/24/EU.

Breaching of obligations in the field of social law
Has the economic operator, to its knowledge, breached its obligations in the field of social law? As referred to for the purposes of this procurement in national law, in the relevant notice or the procurement documents or in Article 18(2) of Directive 2014/24/EU.

Breaching of obligations in the fields of labour law
Has the economic operator, to its knowledge, breached its obligations in the field of labour law? As referred to for the purposes of this procurement in national law, in the relevant notice or the procurement documents or in Article 18(2) of Directive 2014/24/EU.

Bankruptcy
Is the economic operator bankrupt? This information needs not be given if exclusion of economic operators in this case has been made mandatory under the applicable national law without any possibility of derogation where the economic operator is nevertheless able to perform the contract.

Insolvency
Is the economic operator the subject of insolvency or winding-up? This information needs not be given if exclusion of economic operators in this case has been made mandatory under the applicable national law without any possibility of derogation where the economic operator is nevertheless able to perform the contract.

Arrangement with creditors
Is the economic operator in arrangement with creditors? This information needs not be given if exclusion of economic operators in this case has been made mandatory under the applicable national law without any possibility of derogation where the economic operator is nevertheless able to perform the contract.

Analogous situation like bankruptcy under national law
Is the economic operator in in any analogous situation like bankruptcy arising from a similar procedure under national laws and regulations? This information needs not be given if exclusion of economic operators in this case has been made mandatory under the applicable national law without any possibility of derogation where the economic operator is nevertheless able to perform the contract.

Assets being administered by liquidator
Are the assets of the economic operator being administered by a liquidator or by the court? This information needs not be given if exclusion of economic operators in this case has been made
mandatory under the applicable national law without any possibility of derogation where the economic operator is nevertheless able to perform the contract.

**Business activities are suspended**

Are the business activities of the economic operator suspended? This information needs not be given if exclusion of economic operators in this case has been made mandatory under the applicable national law without any possibility of derogation where the economic operator is nevertheless able to perform the contract.

**Agreements with other economic operators aimed at distorting competition**

Has the economic operator entered into agreements with other economic operators aimed at distorting competition?

**Guilty of grave professional misconduct**

Is the economic operator guilty of grave professional misconduct? Where applicable, see definitions in national law, the relevant notice or the procurement documents.

**Conflict of interest due to its participation in the procurement procedure**

Is the economic operator aware of any conflict of interest, as indicated in national law, the relevant notice or the procurement documents due to its participation in the procurement procedure?

**Early termination, damages or other comparable sanctions**

Has the economic operator experienced that a prior public contract, a prior contract with a contracting entity or a prior concession contract was terminated early, or that damages or other comparable sanctions were imposed in connection with that prior contract?

**Guilty of misinterpretation, withheld information, unable to provide required documents and obtained confidential information of this procedure**

Can the economic operator confirm that:

a) It has been guilty of serious misrepresentation in supplying the information required for the verification of the absence of grounds for exclusion or the fulfilment of the selection criteria,

b) It has withheld such information,

c) It has not been able, without delay, to submit the supporting documents required by a contracting authority or contracting entity, and

d) It has undertaken to unduly influence the decision making process of the contracting authority or contracting entity, to obtain confidential information that may confer upon it undue advantages in the procurement procedure or to negligently provide misleading information that may have a material influence on decisions concerning exclusion, selection or award?
Direct or indirect involvement in the preparation of this procurement procedure

Has the economic operator or an undertaking related to it advised the contracting authority or contracting entity or otherwise been involved in the preparation of the procurement procedure?

D: Purely national exclusion grounds

Do the purely national grounds of exclusion, which are specified in the relevant notice or in the procurement documents, apply?

Purely national exclusion grounds

Other exclusion grounds that may be foreseen in the national legislation of the contracting authority's or contracting entity's Member State. Has the economic operator breached its obligations relating to the purely national grounds of exclusion, which are specified in the relevant notice or in the procurement documents?

Part IV: Selection criteria

α: Global indication for all selection criteria

Concerning the selection criteria the economic operator declares that

It satisfies all the required selection criteria

It satisfies all the required selection criteria indicated in the relevant notice or in the procurement documents referred to in the notice.

A: Suitability

Article 58(2) of Directive 2014/24/EU sets out the following selection criteria

Enrolment in a relevant professional register

It is enrolled in relevant professional registers kept in the Member State of its establishment as described in Annex XI of Directive 2014/24/EU; economic operators from certain Member States may have to comply with other requirements set out in that Annex.

Enrolment in a trade register

It is enrolled in trade registers kept in the Member State of its establishment as described in Annex XI of Directive 2014/24/EU; economic operators from certain Member States may have to comply with other requirements set out in that Annex.

For service contracts: authorisation of particular organisation needed

Is a particular authorisation of a particular organisation needed in order to be able to perform the service in question in the country of establishment of the economic operator?
For service contracts: membership of particular organisation needed

Is a particular membership of a particular organisation needed in order to be able to perform the service in question in the country of establishment of the economic operator?

B: Economic and financial standing

Article 58(3) of Directive 2014/24/EU sets out the following selection criteria

General yearly turnover

Its general yearly turnover for the number of financial years required in the relevant notice, the procurement documents or the ESPD is as follows:

Average yearly turnover

Its average yearly turnover for the number of years required in the relevant notice, the procurement documents or the ESPD is as follows:

Specific yearly turnover

Its specific yearly turnover in the business area covered by the contract for the number of financial years required in the relevant notice, the procurement documents or the ESPD is as follows:

Specific average turnover

Its specific average yearly turnover in the business area covered by the contract for the number of years required in the relevant notice, the procurement documents or the ESPD is as follows:

Set up of economic operator

In case the information concerning turnover (general or specific) is not available for the entire period required, please state the date on which the economic operator was set up or started trading:

Financial ratio

Concerning the financial ratios specified in the relevant notice, the procurement documents or the ESPD, the economic operator declares that the actual values for the required ratios are as follows:

Professional risk indemnity insurance

The insured amount in its professional risk indemnity insurance is the following:

Other economic or financial requirements

Concerning the other economic or financial requirements, if any, that may have been specified in the relevant notice or the procurement documents, the economic operator declares that:

C: Technical and professional ability

Article 58(4) of Directive 2014/24/EU sets out the following selection criteria
For works contracts: performance of works of the specified type

For public works contracts only: During the reference period, the economic operator has performed the following works of the specified type. Contracting authorities may require up to five years and allow experience dating from more than five years.

For supply contracts: performance of deliveries of the specified type

For public supply contracts only: During the reference period, the economic operator has delivered the following principal deliveries of the type specified. Contracting authorities may require up to three years and allow experience dating from more than three years.

For service contracts: performance of services of the specified type

For public service contracts only: During the reference period, the economic operator has provided the following main services of the type specified. Contracting authorities may require up to three years and allow experience dating from more than three years.

Technicians or technical bodies for quality control

It can call upon the following technicians or technical bodies, especially those responsible for quality control. For technicians or technical bodies not belonging directly to the economic operator's undertaking but on whose capacities the economic operator relies as set out under Part II, Section C, separate ESPD forms must be filled in.

For works contracts: technicians or technical bodies to carry out the work

In the case of public works contracts, the economic operator will be able to call on the following technicians or technical bodies to carry out the work:

Technical facilities and measures for ensuring quality

It uses the following technical facilities and measures for ensuring quality and its study and research facilities are as follows:

Study and research facilities

It uses the following study and research facilities:

Supply chain management

It will be able to apply the following supply chain management and tracking systems when performing the contract:

Allowance of checks

For complex products or services to be supplied or, exceptionally, for products or services which are required for a special purpose: The economic operator will allow checks to be conducted on the production capacities or the technical capacity of the economic operator and, where necessary, on the means of study and research which are available to it and on the quality control measures? The check is to be performed by the contracting authority or, in case the latter consents to this, on its behalf by a competent official body of the country in which the supplier or service provider is established.
Educational and professional qualifications

The following educational and professional qualifications are held by the service provider or the contractor itself, and/or (depending on the requirements set out in the relevant notice or the procurement documents) by its managerial staff.

Environmental management measures

The economic operator will be able to apply the following environmental management measures when performing the contract:

Number of managerial staff

The economic operator's number of managerial staff for the last three years were as follows:

Average annual manpower

The economic operator's average annual manpower and the number of managerial staff for the last three years were as follows:

Tools, plant or technical equipment

The following tools, plant or technical equipment will be available to it for performing the contract:

Subcontracting proportion

The economic operator intends possibly to subcontract the following proportion (i.e. percentage) of the contract. Please note that if the economic operator has decided to subcontract a part of the contract and relies on the subcontractor's capacities to perform that part, then please fill in a separate ESPD for such subcontractors, see Part II, Section C above.

For supply contracts: samples, descriptions or photographs without certification of authenticity

For public supply contracts: The economic operator will supply the required samples, descriptions or photographs of the products to be supplied, which do not need to be accompanied by certifications of authenticity.

For supply contracts: samples, descriptions or photographs with certification of authenticity

For public supply contracts: The economic operator will supply the required samples, descriptions or photographs of the products to be supplied and will provide certifications of authenticity where applicable.

For supply contracts: certificates by quality control institutes

Can the economic operator provide the required certificates drawn up by official quality control institutes or agencies of recognised competence attesting the conformity of products clearly identified by references to the technical specifications or standards, which are set out in the relevant notice or the procurement documents?
D: Quality assurance schemes and environmental management standards

Article 62(2) of Directive 2014/24/EU sets out the following selection criteria

Certificates by independent bodies about quality assurance standards
Will the economic operator be able to produce certificates drawn up by independent bodies attesting that the economic operator complies with the required quality assurance standards, including accessibility for disabled persons?

Certificates by independent bodies about environmental management systems or standards
Will the economic operator be able to produce certificates drawn up by independent bodies attesting that the economic operator complies with the required environmental management systems or standards?

Finish

Part V: Reduction of the number of qualified candidates

The economic operator declares that:

It meets the objective and non discriminatory criteria or rules to be applied in order to limit the number of candidates in the following way: In case certain certificates or other forms of documentary evidence are required, please indicate for each whether the economic operator has the required documents:

If some of these certificates or forms of documentary evidence are available electronically, please indicate for each:

Part VI: Concluding statements

Concluding statements

The undersigned formally declare that the information stated under Parts II - V above is accurate and correct and that it has been set out in full awareness of the consequences of serious misrepresentation.

The undersigned formally declare to be able, upon request and without delay, to provide the certificates and other forms of documentary evidence referred to, except where:

a) The contracting authority or contracting entity has the possibility of obtaining the supporting documentation concerned directly by accessing a national database in any Member State that is available free of charge (on condition that the economic operator has provided the necessary information (web address, issuing authority or body, precise reference of the documentation) allowing the contracting authority or contracting entity to do so. Where required, this must be accompanied by the relevant consent to such access), or

b) As of 18 October 2018 at the latest (depending on the national implementation of the second
subparagraph of Article 59(5) of Directive 2014/24/EU), the contracting authority or contracting entity already possesses the documentation concerned.

The undersigned formally consent to [identify the contracting authority or contracting entity as set out in Part I, Section A], gaining access to documents supporting the information, which has been provided in [identify the Part/Section/Point(s) concerned] of this European Single Procurement Document for the purposes of [identify the procurement procedure: (summary description, reference of publication in the Official Journal of the European Union, reference number)].

Date, place and, where required or necessary, signature(s):
Technical and Professional capacity

2.1.5

Prepared for: Swedish Maritime Administration
Prepared by: Wärtsilä Voyage Limited

Our reference: STC-TMI-C-00019-00-N
Date: 2019-05-21
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   1.2. Project Organisation – Functional Structure .................................................................................. 5
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Steffen.faeldt@wartsila.com
INTRODUCTION

This document describes Wärtsilä’s Technical and Professional capacity.

As the largest ECDIS supplier in the world for retro-fit, we have the knowledge and resources to install and support.

Partnership is one of our key words. Working close is a huge benefit for both you as end users and for us assystem suppliers.

PARTNERSHIP FOR THE FUTURE

Welcome to the world of Wärtsilä...
1. ORGANISATION OVERVIEW

Please refer to separate company presentation for a general overview of Wärtsilä and Wärtsilä Voyage.

1.1. WÄRTSILÄ VOYAGE – FUNCTIONAL STRUCTURE
2.1.5 - TECHNICAL AND PROFESSIONAL CAPACITY

Project: STM and Flow management functionality
Customer: Swedish Maritime Administration
Project ID: STC-TMI-C-00019-00-N

1.2. PROJECT ORGANISATION – FUNCTIONAL STRUCTURE
1.3. PROJECT ORGANISATION – GEOGRAPHICAL GLOBAL
1.4. PROJECT ORGANISATION – GEOGRAPHICAL EUROPE
1.5. SUPPORT ORGANISATION – GEOGRAPHICAL GLOBAL
1.6. SUPPORT ORGANISATION – GEOGRAPHICAL EUROPE

Customer Support Europe Region Functional Structure

Tiers: 1, 2 & 4

*Country code after the name indicates a place of work.

Co-Directors of Customer Support

Coordination Team Leader (T1) (UK)
Support Coordinator (UK) 5 employees
Support Coordinator (GR) 2 employees

Head of Customer Support (T2) (DE)
Technical Support Specialists (T2) 1 employee (DE) 3 employees (GR) 2 employees (PL) 3 employees (SE)
Planning Team (T2) 2 employees (DE)

Regional Customer Support Manager Europe

Field Support Engineers (T4)
1 employee (PL) 2 employees (SE) 3 employees (DE) 3 employees (UK) 1 employee (PL) 2 employees (GR) 2 employees (IT) 2 employees (SE) 1 employee (C7)

Legend:

Global resources
Regional resources

T1 – coordination and on-call solution tier.
T2 – technical support, remote troubleshooting.
T3 – expert support group.
T4 – field support.
Green – exclusive contractors, self-employed engineers.
2. PROJECT KEY ROLES – STAFFING PLANS

This section describes the key roles of the proposed project team together with an overview of the main functions necessary to implement the project.

2.1. PROJECT MANAGER

Responsible for:

- Point of Contact: Single point of contact for the Administration of the Contract. Project Steering: overseeing project Activities and ensuring customer expectations are understood and met. Checking documents completed by project team members before approval and issue.
- Project Management (PM): Overall responsibility for Project activities.
- Compilation and submission applications, cash flow forecasting, pricing and budgeting requirements to aid efficient administration of the Contract.
2.2. PROJECT PLANNER

Responsible for:

- Managing project logistics. Liaise with the Employer to ensure that any onsite works external to the project are understood and scheduling conflicts avoided.
- Produce, monitor progress and revise the project plan
2.3. LEAD PROJECT ENGINEER

Responsible for:

- Main Point of Contact on Site for the Employer for the technical questions, Supervisor for the duration of the works. Overall responsibility for the technical part of system design.
- Co-ordination of all design responsibility of the Contractor.
- Ensuring that supplied hardware meets requirements and managing configuration of hardware items. Responsible for system design including specification of hardware items, traceability between them, conceptual drawings and hardware list.
- Responsibility for successful implementation of test procedures including FAT, SAT and informal testing. Preparation of test reports.

2.4. INSTALLATION ENGINEER

Responsible for:

- Equipment and software installation on a FAT bench. Equipment packing and preparing for transportation upon FAT completion.
- System installation and commissioning including works: operator workstation installation and configuration, software installation and configuration, equipment installation into racks, rack cabling, network equipment configuration and setting to work, integration of existing equipment to the system
- Providing on-site hand-on technical training
## 2.5. STAFFING PLAN

The following resource pool utilisation is expected.

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Resource</th>
<th>Project role</th>
<th>Project usage (Person)</th>
<th>Available Resources (Person)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wartsila Voyage Limited</td>
<td>Project Manager</td>
<td>Project Manager</td>
<td>1</td>
<td>17 (Europe)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Site Manager</td>
<td></td>
<td>Incl. 1 (Sweden)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Project Planner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design and Installation Engineer</td>
<td>Lead Project Engineer</td>
<td></td>
<td>2</td>
<td>27 (Europe)</td>
</tr>
<tr>
<td></td>
<td>Design Engineer</td>
<td></td>
<td></td>
<td>Incl. 2 (Sweden)</td>
</tr>
<tr>
<td></td>
<td>Installation Engineer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service and support engineers</td>
<td>Service and support Engineer</td>
<td></td>
<td>1</td>
<td>21 (Europe)</td>
</tr>
</tbody>
</table>

The number of available resources for each project role within Europe region ensures that replacement of the key persons (if needed during the project implementation) can be performed avoiding critical impact on the project results.
Quality Management

2.1.6

Prepared for: Swedish Maritime Administration
Prepared by: Wärtsilä Voyage Limited

Our reference: STC-TMI-C-00019-00-N
Date: 2019-05-21
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1. Quality Management ................................................................. 3
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1. **QUALITY MANAGEMENT**

Wartsila Voyage (Transas) operates a quality management system conforming to the ISO 9001:2015 and ISO 12207:2008 standards holding a valid certification from DNV GL.

Wartsila Voyage (Transas) Quality Management System is aligned with the business core values of Wartsila Voyage (Transas), and based on the quality management principles and requirements described in ISO 9001 standard “Quality management system – Requirements”. Wartsila Voyage (Transas) software development process conforms to ISO 12207 standard ‘Systems and Software engineering – Software life cycle process’.

Wartsila Voyage (Transas) has organized itself according to matrix principle, with two dimensions:

- **FUNCTIONS** operating globally
- Geography (REGIONS – Europe, APAC, MEAI, Americas, Russia)

Quality Management System processes include:

**CORE processes** are key activities or cluster of activities essential in adding value and creating a competitive advantage. Wartsila Voyage (Transas) processes which add primary value to an output are Solutions Management, Research & Development, Sales, Operations including Project Management, Supply Chain Management, Project Procurement and Customer Support.

**ENABLERS** are activities providing resources and facilitating achievement of planned results. Wartsila Voyage (Transas) enabling processes are Finance Management, IT & Back Office Systems Support, Legal Support, Corporate Resources including HR Management and office administration, Marketing Communications, Quality Management processes & activities including management of documented information, internal audits, analysis and improvement, customer experience.

Each process or cluster is described through the management system documents and incorporates business practices that are deployed appropriately by Wartsila Voyage (Transas) functional and regional teams.
2. QUALITY CONTROL

The table below provides an overview of quality assurance and quality control activities performed at the different stages of the project to ensure proper execution with focus on quality.

<table>
<thead>
<tr>
<th>Project Milestone / Phase</th>
<th>QA/QC activities</th>
<th>Responsibility</th>
</tr>
</thead>
</table>
| Project Feasibility Study        | • Customer requirement analysis  
                                  • System requirements specification development  
                                  • Technical risks assessment  
                                  • System requirements specification review by engineering experts | Project Management Office          |
| Proposal/Contract approval       | • Verify system design compliance with project requirements.                     | Project Management Office          |
| Project Initiation               | • Verify system design compliance with project requirements.  
                                  • Manage changes if any                                                        | Project Management Office          |
| Project Planning                 | • Develop schedule  
                                  • Define required HR & competence  
                                  • Plan necessary quality assurance activities (audits, tests)                   | Project Manager  
                                  Quality Management Team          |
| Product development & release    | • Testing of software  
                                  • Testing of hardware  
                                  • Testing of final product                                                      | R&D Testing team  
                                  Project Technical Team           |
| 3rd Services supplying          | • Pre-qualification of suppliers  
                                  • Selection and approval of suppliers  
                                  • Verification of compliance of sub-contract agreement with the main contract requirements  
                                  • Enforce Quality Assurance requirements as per Purchasing process  
                                  • Review and mark up Inspection and Test Plan.                                    | Chief Project  
                                  Engineer or Project Manager  
                                  Project Procurement              |
<table>
<thead>
<tr>
<th>2.1.6 – QUALITY MANAGEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project:</strong> STM and Flow management functionality</td>
</tr>
<tr>
<td><strong>Customer:</strong> Swedish Maritime Administration</td>
</tr>
<tr>
<td><strong>Project ID:</strong> STC-TMI-C-00019-00-N</td>
</tr>
</tbody>
</table>

### Procurement
- Perform technical assessment visit prior to award of sub-contract to ensure that the following requirements are met:
  - Review of manufacturer's Quality Assurance/Quality Control procedure to ensure that specifications and the quality of the Products and the manufacturing process will comply with Customer requirements
  - Review source material certification and material traceability
  - Examine material tests and test procedures
  - Inspect and monitor manufacturers' equipment fabrication activities in accordance with the agreed Inspection and Test Plan, approved procedures, specifications and codes

### Vendor assessment and selection
- Ensure traceability of project purchase orders
- Ensure purchase order / agreements clearly address the material specification.
- Ensure purchased material are identified and traceable
- Settle RMA cases

### Manufacturing
During manufacturing on agreed random basis:
- Witness major test stages
- Inspect sub-supplier key components as agreed in Inspection and Test Plan
- Check of testing and measuring device calibration records

### Delivery
Ensure preserved and timely delivery

### FAT
- Witness FAT and sign acceptance
2.1.6 – QUALITY MANAGEMENT

| Project: STM and Flow management functionality |
| Customer: Swedish Maritime Administration |
| Project ID: STC-TMI-C-00019-00-N |

| Delivery of materials to site | • Final visual and dimensional inspection. |
| | Project Technical Team |
| • Incoming material inspection |
| • Control of storage and preservation |
| • Review material certification, results, records, and material traceability |
| | In accordance with Split of responsibility: |
| | Project Team or Site representative |
| Installation | • Supervision of installation activities |
| | • Checking of marking of equipment |
| | • Installed system testing |
| | • Maintenance of project on site documentation |
| | • Control of corrective and preventive actions |
| | Chief Project Engineer or Project Manager |
| Testing and commissioning (SAT) | • Supervision of testing and commissioning |
| | • Control of corrective and preventive actions |
| | Chief Project Engineer or Project Manager |

- The Project Specifications and project drawings are the main applicable documents for the project.
- Contract
- Wartsila Voyage (Transas) Quality Management System documents (policies, procedures, instructions and ect.)
Apart from the specific areas, I have also been working on developing and implementing the STM Baltsafe solution. Our plan is to have everything ready by December 31st 2020. Before this date, the ECDIS can be installed in vessels and then remotely updated as soon as new parts are developed.

Steffen Fäldt
Managing Director
Wärtsilä Voyage Solution Sweden
### 1.1 General

This document contains the technical requirements for the procurement of STM ship system within the scope of the STM Validation Project. The document describes the scope of the required functional and technical characteristics of the systems. The technical specifications, APIs and xml-codes are anticipated to be accurate but some are yet to be prototyped. This means that minor updates might be necessary. Latest updates to the specifications will be presented at the latest before the negotiation phase of the tender is commenced in order to tenderers to take updates into consideration in their final bid.

<table>
<thead>
<tr>
<th>Requirement fulfillment</th>
<th>Tenderers' name: Wartsila</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra comments from SMA</td>
<td>Info yes</td>
</tr>
</tbody>
</table>

#### 1.2 Definitions

1.2.1 Terminology for denoting a requirement

The following requirement is valid throughout this document:

- A mandatory requirement is denoted with the word "shall" and must be fulfilled.
- A criteria is denoted with the word "should" and gives added value in the evaluation if fulfilled.

All requirements are labeled with R-X.Y:Z, where X.Y is the current chapter number and Z is a consecutive numbering to separate each requirement within the chapter. There can be several "shall" or "should" in one numbered requirement, which means that all must be fulfilled in order for the requirement to be fulfilled.

#### 2. General requirements on the STM ship system

In this chapter the requirements that cannot be categorized into one or more of the 5 different components of the STM ship system as depicted in Figure 1 below, is stated.

<table>
<thead>
<tr>
<th>Requirement fulfillment</th>
<th>Tenderers' name: Wartsila</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra comments from SMA</td>
<td>Info yes</td>
</tr>
</tbody>
</table>

#### 2.1.1 The Tenderer of STM ship system shall at milestone 2 prove that the STM ship system can exchange relevant payload formats defined in reference SeaSWIM specification.

Agreed that VIS/PortCDM services use the same specification as it used in STM Validation project.

#### 2.1.2 The Tenderer should be able to adopt to external standards and requirements i.e. RTZ that is being updated to S-421. See reference Standard forecast.

Agreed that all S-421 requirements are optional. Implementation of this standard is too complex and usefulness is vague.

#### 2.1.3 The Tenderer shall assure that the delivered system adheres to all relevant requirements regarding normal functionality in all navigational equipment, The Supplier is fully responsible that all installations of software and/or hardware, fulfilling the tender specifications, does not interfere with existing navigational systems and that the System is compliant with existing rules and regulations including but not limited to SOLAS Ch V reg 17 on electromagnetic compatibility.

It is necessary to investigate if recertification is necessary.

#### 2.1.4 The Tenderer shall conduct appropriate training and provide documentation (manuals) for onboard equipment users. The tenderer shall deliver all educational material to the ship in hard copy, CBT etc. The training material shall be held updated during the project period. Planned training shall be presented at SAT.

Require development for training material updates introduced.

#### 2.1.5 The Tenderer shall provide shipping companies included in the testbed sufficient information including a meeting presenting the STM concept and demo the equipment updates introduced.

Require development for meeting and demo.
### 3 Functional/Technical Requirements

#### 2.1 STM Ship system overall description

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Requirement fulfilled</th>
<th>Comment/describe</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1.1 At least one navigation system workstation on the ship's bridge shall be able to interact with the STM Module. The main functions are: to receive voyage plan (VP) for further processing until used for navigation, to send the VP used for navigation to the STM Module, to send ETA to the STM Module. Communication between the navigation system and the STM Module will ensure that the maximum possible degree of consistency is upheld between information held in the navigation system and the STM Module. If information consistency decreases due to the status of communication link between the navigation system and the STM Module, the communication status shall be known by both ends. The STM Module is a set of software functions on some hardware that presumably is located on the ship. The STM Module may be integrated in the navigation system, if certification allows, it may be integrated into an existing planning station or it may be running on a dedicated device which is supplied by the supplier. If information consistency can be assured, the STM module can be placed ashore. Implemented in STM Validation</td>
<td>yes</td>
<td>Implemented in STM Validation</td>
</tr>
</tbody>
</table>

#### 2.1.2 Communication between the STM Module and Online access point will ensure that the maximum possible degree of consistency is upheld between information held in the STM Module and at the Online access point, depending on the online status of the ship. If information consistency decreases due to the status of communication links with the ship, the communication status and the age of information shall be known by both ends. The online access point is constantly and stably connected to the internet and represents the ship towards other actors and services. The main functions in the online access point are the VIS, Port Information Service (optional) and the SeaSWIM Connector (SSC). The Online access point may be implemented onboard the ship or at another location. Each VIS is attached to a SSC and each ship has one (1) VIS instance. Implemented in STM Validation | yes                   | Implemented in STM Validation                           |

![Figure 1](image-url)
<table>
<thead>
<tr>
<th>3.2 Navigation system functionality</th>
<th>requirement fulfills</th>
<th>comment/describe</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2.1 The STM ship system <em>shall</em> be able to send and receive route segment via AIS, ASM message (B), according to Appendix 2 - Route Message system requirements, F1.</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>3.2.2 The STM ship system <em>shall</em> be able to prevent route segment accordingly in navigation system.</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>3.2.3 STM ship systems <em>shall</em> add to include legspeed in route message format.</td>
<td>n/a</td>
<td>We assume that this topic is about field &quot;speed&quot; in section schedule/implementation</td>
</tr>
<tr>
<td>3.2.4 Not applicable. (As the list of specifications are used in several projects, there might be specifications that does not apply to a project.)</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>3.2.5 In the STM ship system <em>it shall</em> be possible to make a default choice that the route message (and/or RTZ) will be shared or not, with other STM-ships.</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>3.2.6 The STM ship system <em>shall</em> be able to prevent, via ASM message (B), according to appendix 8 - Route message format (version 1.0), info/flag an AIS targets that participates in STM test beds.</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>3.2.7 STM ship systems <em>shall</em> be able to calculate CPA/SA and intersection points between own/other ships route segments (including leg speed), even if the routes are not crossing each other. The operator should have the option to choose between legspeed or actual speed.</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>3.2.8 If a ship is deviating from its intended route (exceeding pre-set limits, geographically and in time, set by own/other ships routes including legs or route segments), that <em>shall</em> be presented on own ships STM ship system.</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>3.2.9 <em>It shall</em> be possible to do &quot;Route Trial Maneuver&quot; including own and other ships routes. The operator should have the option to choose between legspeed or actual speed.</td>
<td>n/a</td>
<td>ref. 2.7</td>
</tr>
<tr>
<td>3.2.10 <em>It shall</em> be possible for the operator to activate other ships routes on a case by case basis. E.g. Acquire them manually in the navigation system. Manual activation of routes should be the default setting.</td>
<td>n/a</td>
<td>Require development R5.1 (april)</td>
</tr>
<tr>
<td>3.2.11 Alerts for low route CPA/SA <em>shall</em> be easy to set and optional for the operator. If limits are exceeded other ship route might be triggered to show in the display.</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>

### STM Ship System functionality in Navigation System

<table>
<thead>
<tr>
<th>requirement fulfills</th>
<th>comment/describe</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2.12 The navigation system <em>shall</em> be able to upload, download and display VP and S-124 to and from the STM Module. Communication between the navigation system and the STM Module will ensure that the maximum possible degree of consistency is upheld between information held in the navigation system and the STM Module.</td>
<td>n/a</td>
</tr>
<tr>
<td>3.2.13 If information consistency decreases due to the status of communication link between the navigation system and the STM Module, the communication status shall be known by both ends. The communication status <em>shall</em> be displayed to the operator.</td>
<td>n/a</td>
</tr>
<tr>
<td>3.2.14 When difference between real time ETA and PTA (to a predefined waypoint) is more than a preset value the operator <em>shall</em> get a question if the operator wants to update the PTA. (New PTA must be easy to set.) If yes, schedule in RTZ shall automatically be updated and sent to relevant STM actors.</td>
<td>n/a</td>
</tr>
<tr>
<td>3.2.15 <em>It shall</em> be possible to define which waypoint that is used for ETA calculations by setting a PTA at that waypoint (ETA in manual schedule in RTZ) to mark it as &quot;synchronization&quot; WP.</td>
<td>n/a</td>
</tr>
<tr>
<td>3.2.16 When a PTA is received from STM actors, the PTA <em>shall</em> be possible to be updated, using the received RTA. The route shall not have to be safety checked due to only updated schedule. When new PTA is set, the VP shall be shared.</td>
<td>n/a</td>
</tr>
<tr>
<td>3.2.17 <em>It shall</em> be clearly visible that only the schedule has been changed and which waypoint is affected by the change.</td>
<td>n/a</td>
</tr>
<tr>
<td>3.2.18 Area received in STM text message format <em>shall</em> be possible to display in navigation system.</td>
<td>n/a</td>
</tr>
</tbody>
</table>

### Communication between STM Module and navigation system

<table>
<thead>
<tr>
<th>requirement fulfills</th>
<th>comment/describe</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.3.1 The communication between the STM Module and navigation system <em>shall</em> have information consistency (e.g. ship receives a VP in the STM module, accepts it, then the operator shall be able to choose it for monitoring in navigation system, it shall then be identical to the one in the STM module).</td>
<td>n/a</td>
</tr>
</tbody>
</table>
### 3.4 STM Module

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Requirement Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.4.1 STM module shall be able to send, receive and show text messages to/from other STM actor according to &quot;STM text format&quot;, in SeaSWIM specification, appendix A (e.g. Text body, Message subject, receiver id (actor id), sender id (actor id), reference to information object ID [e.g. UVID]).</td>
<td>yes</td>
<td>Implemented in STM Validation</td>
</tr>
<tr>
<td>3.4.2 The STM module shall include the functionality to communicate the following (but not limited to) to and from VIS/Online access point.</td>
<td>yes</td>
<td>Implemented in STM Validation</td>
</tr>
</tbody>
</table>
| - Publish VP to VIS / Online access point.  
- Retrieve VP proposals from VIS / Online access point.  
- Send and receive VP.  
- Area- and text messages to other STM services through VIS / Online access point. | yes | Implemented in STM Validation |
<p>| 3.4.3 The STM module shall include the functionality to show, create, edit and save VP. It shall be possible to graphically clearly distinguish received VP updates, e.g. route suggestions. | yes | Implemented in STM Validation |
| 3.4.4 Not applicable | n/a | Why Not Applicable is under &quot;shall&quot; |
| 3.4.5 If an appropriate schedule is not attached to the monitored VP, operator shall get notified. | yes | Implemented in STM Validation |
| 3.4.6 The STM module shall be able to set route status according to RTZ format in SeaSWIM specification. | yes | Implemented in STM Validation |
| 3.4.7 The route status &quot;inactive&quot; shall only be shared with other STM actors when the voyage is completed or cancelled. | yes | Implemented in STM Validation |
| 3.4.8 OCC shall be made aware of relevant events such as incoming messages (VP updates, text messages new RTA, etc.) The event shall be detectable from ships coming position. Above events shall not interfere with navigational information. | yes | Agreed that S-124 uploading from ship to shore/or to another ship/service is not required. Implemented in STM Validation |
| 3.4.9 The STM Module shall be able to upload/download VP and S-124 to/from the ships navigation system. | yes | Implemented in STM Validation |
| 3.4.10 Operator shall be able to search for service instances in STM module according to SeaSWIM specification, based on attributes available in service registry. | yes | Implemented in STM Validation |
| 3.4.11 Operator shall be able to search for services by means of Geometry (e.g. area search and/or Voyageplan search). | yes | Implemented in STM Validation |
| 3.4.12 STM module shall be able to present the service descriptions included in service registration. | yes | Implemented in STM Validation |
| 3.4.13 STM module should be able to present all relevant information available in instance descriptions as document (PDF, HTML). | NO | NO in a nearest feature. Require development. Can be developed by December |
| 3.4.14 STM module shall be able to store lists of services (for offline purposes). | yes | Implemented in STM Validation. Services can be stored in onboard Service book manually. |
| 3.4.15 The STM module should be able to support offline work when connectivity goes down, e.g. search for services and call them and when connectivity returns the &quot;call&quot; should be processed. | NO | A lot of development needed and usecases are not clear. |
| 3.4.16 If stored service list is used, the list shall be updated minimum once per day and/or when service is called to prevent old entries to be used. | NO | It is &quot;should&quot; requirement because has a reference to a previous item |
| 3.4.17 If search fails, the operator shall get an error message within 30 seconds. | yes | Timegap depends on Internet connectivity and external service load. Error visible as hint in Service window. |</p>
<table>
<thead>
<tr>
<th>Requirement</th>
<th>Action</th>
<th>Status</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.4.18</td>
<td>Operator should be made aware if “messages” has been sent or not, due to connectivity or other issues.</td>
<td>should</td>
<td>NO</td>
</tr>
<tr>
<td>3.4.19</td>
<td>Operator shall in the STM module be able to assign/remove access rights on information objects (VP) to services.</td>
<td>shall</td>
<td>YES</td>
</tr>
<tr>
<td>3.4.20</td>
<td>STM module shall be able to present for the operator which actors that have been given access rights to VP.</td>
<td>shall</td>
<td>YES</td>
</tr>
<tr>
<td>3.4.21</td>
<td>Operator shall in the STM module be able to share VP to selected services. It shall be possible to share a VP once or to set a service as a subscriber (i.e. automatically send future updates of VP).</td>
<td>shall</td>
<td>YES</td>
</tr>
<tr>
<td>3.4.22</td>
<td>Operator should in the STM module be able to subscribe on a service.</td>
<td>should</td>
<td>YES</td>
</tr>
<tr>
<td>3.4.23</td>
<td>There should be a functionality in the STM Module to present relationship between different payload formats, e.g. a text message can be correlated to a VP.</td>
<td>should</td>
<td>partly YES</td>
</tr>
<tr>
<td>3.4.24</td>
<td>The STM Module shall be able to show navigational warning according to S-124 (See SeaSWIM specification).</td>
<td>shall</td>
<td>YES</td>
</tr>
<tr>
<td>3.4.25</td>
<td>The STM Module shall be able to show area in STM text format.</td>
<td>shall</td>
<td>YES</td>
</tr>
<tr>
<td>3.4.26</td>
<td>The STM Module should handle real time calculation (including preplanned speeds) of ETA and or STG (Speed To Go to reach a WP at a given time) to one or more selected WP(s) (e.g. arrival traffic area or Pilot Boarding Position) along the route, not necessarily the last waypoint in the route.</td>
<td>should</td>
<td>YES</td>
</tr>
<tr>
<td>3.4.27</td>
<td>The STM ship system shall automatically give the VP an Unique Voyage ID (UVID) using the maritime resource name (mrn) structure (see SeaSWIM specification).</td>
<td>shall</td>
<td>YES</td>
</tr>
<tr>
<td>3.4.28</td>
<td>When a STM actor has sent e.g. a VP to another STM actor (e.g. Ship-Shore, Shore-Ship) the sender shall get information regarding that message is “read” by the receiver. (Requires update of VIS technical design as an intermediary before the standardized service interface).</td>
<td>shall</td>
<td>NO</td>
</tr>
<tr>
<td>3.5</td>
<td>Communications between the STM Module and Online access point</td>
<td>requirement</td>
<td>YES/NO</td>
</tr>
<tr>
<td>3.5.1</td>
<td>Each ship shall have data link connectivity between the STM Module and the Online access point. The connectivity has the ability to be continuous with adequate capacity according the following: Communication between the STM Module and Online access point ensures that the maximum possible degree of consistency is upheld between information held in the STM Module and at the Online access point, depending on the online connectivity status of the ship. (Quantifying of above will be done in separate projects).</td>
<td>shall</td>
<td>YES</td>
</tr>
</tbody>
</table>
### 3.6 Online access point (Service Instance)

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Fulfillment</th>
<th>Comment/Describe</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.6.1 The online access point <strong>shall</strong> hold a service instance that is the internet connected representation of the ship, the service instance shall represent the ship towards other actors via a SSC (service instance shall be based on latest service design VIS).</td>
<td><strong>shall</strong></td>
<td>Agreed that VIS specification shouldn’t be changed.</td>
</tr>
<tr>
<td>3.6.2 The online access point <strong>should</strong> hold a service instance that is the internet connected representation of the ship, the service instance should represent the ship in receiving port call messages (PCMF) in port-call synchronization interactions towards other actors via a SSC.</td>
<td><strong>should</strong></td>
<td>Implemented in STM Validation</td>
</tr>
<tr>
<td>3.6.3 Online access point <strong>shall</strong> be able to exchange PCM-format with other STM actors (See SeaSWIM specification).</td>
<td><strong>shall</strong></td>
<td>Implemented in STM Validation</td>
</tr>
<tr>
<td>3.6.4 Online access point <strong>should</strong> be able to exchange PCM-format with other STM actors (See SeaSWIM specification).</td>
<td><strong>should</strong></td>
<td>Implemented in STM Validation</td>
</tr>
<tr>
<td>3.6.5 Online access point <strong>shall</strong> be able to expose and consume (to other STM actors) RTZ-format, S124-format and text format using VIS (See SeaSWIM specification).</td>
<td><strong>shall</strong></td>
<td>Implemented in STM Validation</td>
</tr>
<tr>
<td>3.6.6 Online access point <strong>shall</strong> be able to exchange PCM-format with other STM actors (See SeaSWIM specification).</td>
<td><strong>shall</strong></td>
<td>Implemented in STM Validation</td>
</tr>
<tr>
<td>3.6.7 External events (according to service log specification) in and out to/from the system <strong>should</strong> be stored and logged for traceability. Events could include, but are not limited to: Exchange of VP and received S-124.</td>
<td><strong>should</strong></td>
<td>Require development R5.1 (April)</td>
</tr>
<tr>
<td>3.6.8 Service <strong>shall</strong> be registered in service registry according to guideline (See SeaSWIM specification).</td>
<td><strong>shall</strong></td>
<td>Implemented in STM Validation</td>
</tr>
<tr>
<td>3.6.9 All messages, sent and received, <strong>shall</strong> be validated against payload schema.</td>
<td><strong>shall</strong></td>
<td>Implemented in STM Validation</td>
</tr>
</tbody>
</table>

### 4.1 STM Cyber security requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Fulfillment</th>
<th>Comment/Describe</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1.1 Service instance in online access point <strong>shall</strong> adhere to requirements stated in SeaSWIM Connector Specification and SeaSWIM Connector Design.</td>
<td><strong>shall</strong></td>
<td>Implemented in STM Validation</td>
</tr>
<tr>
<td>4.1.2 Each ship <strong>shall</strong> individually identifiable for the receiver of information, hence a unique certificate for the ship <strong>shall</strong> be used as client certificate.</td>
<td><strong>shall</strong></td>
<td>Standard MCP and Service ID requirements</td>
</tr>
<tr>
<td>4.1.3 The information owner <strong>shall</strong> implement authorization mechanism for external actors, that ensures only authorized external actors have access to its information (See also requirement R-3.4.19).</td>
<td><strong>shall</strong></td>
<td>Implemented in STM Validation</td>
</tr>
<tr>
<td>4.1.4 Security events <strong>should</strong> be logged for traceability (time, denied access etc.) in Online access point.</td>
<td><strong>should</strong></td>
<td>Implemented in STM Validation</td>
</tr>
<tr>
<td>4.1.5 The communication between STM Module and Online Access Point <strong>shall</strong> be secured to hinder unauthenticated requests and unauthorized access to information. (e.g. VPN).</td>
<td><strong>shall</strong></td>
<td>Implemented in STM Validation</td>
</tr>
</tbody>
</table>

### 5.1 STM identified non-functional requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Fulfillment</th>
<th>Comment/Describe</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1.1 Information <strong>shall</strong> not be lost due to restart or due to no connection to internet.</td>
<td><strong>shall</strong></td>
<td>Implemented in STM Validation</td>
</tr>
</tbody>
</table>
| 5.1.2 Information shared **shall** not exceed 400kb. | **shall** | |}

### 6.1 GDPR requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Fulfillment</th>
<th>Comment/Describe</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1.1 General Data Protection Regulation (GDPR) <strong>shall</strong> be applied.</td>
<td><strong>shall</strong></td>
<td>Wartsila GDPR assessment</td>
</tr>
<tr>
<td>6.1.2 Personal information <strong>shall</strong> be avoided in the system.</td>
<td><strong>shall</strong></td>
<td>Wartsila GDPR assessment</td>
</tr>
<tr>
<td>6.1.3 GDPR handling required in NOC <strong>shall</strong> be followed (See SeaSWIM specification).</td>
<td><strong>shall</strong></td>
<td>Wartsila GDPR assessment</td>
</tr>
</tbody>
</table>
Summary

Order Reference: clare.wITHERS@transas.com | Report as of: 08-10-2019 10:48 AM | using Currency as EUR

<table>
<thead>
<tr>
<th>WÄRTSILÄ VOYAGE LIMITED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tradestyle(s): TRANSAS +1</td>
</tr>
<tr>
<td>Address: 10 Eastgate Avenue, Eastgate Business Park, Little Island, CORK, Ireland</td>
</tr>
<tr>
<td>Phone: (021) 471 0400</td>
</tr>
<tr>
<td>D-U-N-S: 98-563-1196</td>
</tr>
<tr>
<td>CRO Number: 360963</td>
</tr>
<tr>
<td>In Portfolio: No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Failure Score</th>
<th>PAYDEX ®</th>
<th>Age of Business</th>
<th>Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>54 (No change since last month)</td>
<td>75 (No change since last month)</td>
<td>17 years 2002 Year Started</td>
<td>628 628 (here)</td>
</tr>
</tbody>
</table>

Company Profile

<table>
<thead>
<tr>
<th>D-U-N-S</th>
<th>98-563-1196</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legal Form</td>
<td>Private Company Limited By Shares</td>
</tr>
<tr>
<td>Date of Registration</td>
<td>04-09-2002</td>
</tr>
<tr>
<td>Telephone</td>
<td>(021) 471 0400</td>
</tr>
<tr>
<td>Website</td>
<td><a href="http://www.transas.com">www.transas.com</a></td>
</tr>
<tr>
<td>Email</td>
<td><a href="mailto:info@transas.com">info@transas.com</a></td>
</tr>
<tr>
<td>Annual Sales</td>
<td>€ 139,568 (In Thousand)</td>
</tr>
<tr>
<td>Employees</td>
<td>628</td>
</tr>
<tr>
<td>Age (Year Started)</td>
<td>17 years (2002)</td>
</tr>
<tr>
<td>Line of Business</td>
<td>Computer programming and software services</td>
</tr>
</tbody>
</table>

Risk Assessment

<table>
<thead>
<tr>
<th>Overall Business Risk</th>
<th>Maximum Credit Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Dun & Bradstreet Thinks...

- Overall assessment of this organisation over the next 12 months: **STABLE CONDITION**
- Based on the predicted risk of failure: **HIGH LIKELIHOOD OF CONTINUED OPERATIONS**
- Based on the trade data received by D&B for this company: **EXHIBITS ON TIME OR SLIGHTLY LATE PAYMENT BEHAVIOUR**

**Failure Score** Formerly Financial Stress Score

- Low Risk (100) 54 High Risk (1)

Company's risk level is: **LOW-MODERATE**

Probability of failure over the next 12 months: **1.94 %**

**PAYDEX ®**

- Low Risk (100) 75 High Risk (0)

Days Beyond Terms: **8**

**D&B Rating**

**Current Rating as of 02-10-2019**

- Financial Strength based on Net Worth: **3A**: € 7,000,000 to € 14,999,999 in Tangible Net Worth or Equity
- Risk Indicator: **2**: Lower than Average Risk

This Company's Current Tangible Net Worth: **€ 14,984,000**

**Previous Rating**

- Financial Strength based on Net Worth: **4A**: € 15,000,000 to € 34,999,999 in Tangible Net Worth or Equity
- Risk Indicator: **2**: Lower than Average Risk

The scores and ratings included in this report are designed as a tool to assist the user in making their own credit related decisions, and should be used as part of a balanced and complete assessment relying on the knowledge and expertise of the reader, and where appropriate on other information sources. The score and rating models are developed using statistical analysis in order to generate a prediction of future events. Dun & Bradstreet monitors the performance of thousands of businesses in order to identify characteristics common to specific business events. These characteristics are weighted by significance to form rules within its models that identify other businesses with similar characteristics in order to provide a score or rating.
Dun & Bradstreet's scores and ratings are not a statement of what will happen, but an indication of what is more likely to happen based on previous experience. Though Dun & Bradstreet uses extensive procedures to maintain the quality of its information, Dun & Bradstreet cannot guarantee that it is accurate, complete or timely, and this may affect the included scores and ratings. Your use of this report is subject to applicable law, and to the terms of your agreement with Dun & Bradstreet.

### Legal Events

<table>
<thead>
<tr>
<th>Events</th>
<th>Occurrences</th>
<th>Last Filed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insolvency</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>Court Judgements</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Mortgages and Charges</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Public Filings</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>

### Trade Payments

**Highest Past Due**

€ 2,000

**Highest Now Owing**

€ 200,000

**Total Trade Experiences**

16

**Largest High Credit**

€ 200,000

### Ownership

This company is a **Domestic Ultimate, Headquarters, Parent, Subsidiary**

**Global Ultimate, Immediate Parent**

WÄRTSILÄ VOYAGE HOLDING LIMITED

D-U-N-S Number 22-206-9043

100% shareholding

**Domestic Ultimate**

WÄRTSILÄ VOYAGE LIMITED

IRELAND

D-U-N-S Number 98-563-1196

Total Members in **Family Tree** - 16

**Subsidiaries**

8

**Branches**

2

### People

**Current Principals**

3

**New Appointments**

2

**Resignations**

3

**Closures**

10

### Executive Leadership

TORSTEN BUSSOW, **Director**

THOMAS BARR, **Company Secretary**

ANDREI SITKOV, **Director**

### Financial Overview

**Source**: D&B

**Balance Sheet** Fiscal (Consolidated) 31-12-2017

<table>
<thead>
<tr>
<th>Amount (In Thousands)</th>
<th>Last 4 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Balance Sheet  Fiscal (Consolidated) 31-12-2017

<table>
<thead>
<tr>
<th></th>
<th>Amount (In Thousands)</th>
<th>Last 4 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tangible Net Worth:</td>
<td>€ 14,984</td>
<td></td>
</tr>
<tr>
<td>Current Assets:</td>
<td>€ 84,514</td>
<td></td>
</tr>
<tr>
<td>Total Fixed Assets:</td>
<td>€ 19,229</td>
<td></td>
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<tr>
<td>Total Current Liabilities:</td>
<td>€ 69,201</td>
<td></td>
</tr>
<tr>
<td>Long Term Liabilities:</td>
<td>€ 8,224</td>
<td></td>
</tr>
<tr>
<td>Net Current Assets (Liabilities):</td>
<td>€ 15,313</td>
<td></td>
</tr>
</tbody>
</table>

### Profit & Loss  Fiscal (Consolidated) 31-12-2017

<table>
<thead>
<tr>
<th></th>
<th>Amount (In Thousands)</th>
<th>Last 4 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales / Turnover:</td>
<td>€ 139,568</td>
<td></td>
</tr>
<tr>
<td>Gross Profit / (Loss):</td>
<td>€ 39,451</td>
<td></td>
</tr>
<tr>
<td>Profit / (Loss) Before Taxes:</td>
<td>€ 4,640</td>
<td></td>
</tr>
<tr>
<td>Net Profit / (Loss):</td>
<td>€ 2,034</td>
<td></td>
</tr>
</tbody>
</table>

### Key Business Ratios

<table>
<thead>
<tr>
<th></th>
<th>Ratio for the Business</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Ratio:</td>
<td>1.20</td>
</tr>
<tr>
<td>Acid Test:</td>
<td>1.40</td>
</tr>
<tr>
<td>Current Liabilities / Net Worth (%):</td>
<td>461.80</td>
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<tr>
<td>Sales / Net Working Capital:</td>
<td>9.10</td>
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<tr>
<td>Return on Capital (%):</td>
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</tr>
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</table>

### Country/Regional Insight

**Ireland**

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>Low Risk</th>
<th>Moderate</th>
<th>High Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resistance to the ‘irish backstop’ could backfire.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Risk Assessment

**D&B Risk Assessment**

<table>
<thead>
<tr>
<th>Overall Business Risk</th>
<th>Maximum Credit Recommendation</th>
</tr>
</thead>
</table>
Dun & Bradstreet Thinks...

- Overall assessment of this organisation over the next 12 months: **STABLE CONDITION**
- Based on the predicted risk of failure: **HIGH LIKELIHOOD OF CONTINUED OPERATIONS**
- Based on the trade data received by D&B for this company: **EXHIBITS ON TIME OR SLIGHTLY LATE PAYMENT BEHAVIOUR**

**Failure Score** Formerly Financial Stress Score

| Low Risk (100) | 54 | High Risk (1) |

- There have been no Judgments or Scottish Decrees associated to this business in the past 4 years.
- The pre-tax profit over total assets ratio (calculated from the accounts made up to 31-12-2017) is strong.
- There are few or no insolvency events associated with the Principals of this business.
- This business is well established and has been trading since 04-09-2002.
- Values, ratios and trends taken from the Balance Sheet (made up to 31-12-2017) are generally satisfactory.

<table>
<thead>
<tr>
<th>Level of Risk</th>
<th>Raw Score</th>
<th>Probability of Failure</th>
<th>Industry Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-Moderate</td>
<td>1356</td>
<td>1.94%</td>
<td>2.83%</td>
</tr>
</tbody>
</table>

**Business and Industry Trends**

- **PAYDEX ®** Based on 24 months of data

<table>
<thead>
<tr>
<th>Risk of Slow Pay</th>
<th>Payment behaviour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>8 Days Beyond Terms</td>
</tr>
</tbody>
</table>
**D&B Rating**

**Current Rating as of 02-10-2019**

**Financial Strength based on Net Worth**

3A: € 7,000,000 to € 14,999,999 in Tangible Net Worth or Equity

Risk Indicator: 2: Lower than Average Risk

This Company’s Current Tangible Net Worth: € 14,984,000

**Previous Rating**

**Financial Strength based on Net Worth**

4A: € 15,000,000 to € 34,999,999 in Tangible Net Worth or Equity

Risk Indicator: 2: Lower than Average Risk

---

**Trade Payments**

**Trade Payments Summary (Based on 24 months of data)**

<table>
<thead>
<tr>
<th>Overall Payment behaviour</th>
<th>% of Trade Within Terms</th>
<th>Highest Past Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 Days Beyond Terms</td>
<td>86%</td>
<td>€ 2,000</td>
</tr>
</tbody>
</table>

**Highest Now Owing:** € 200,000
Total Trade Experiences: 16
Largest High Credit: € 200,000
Average High Credit: € 23,542

Total Placed in Collections:
Largest High Credit: -

Trade Credit Analysis

€377.0K in 16 Experiences

14% of the Total Value reported as Overdue
This company has an average days beyond terms of 8 and payment score of 75

Trade Payments By Credit Extended (Based on 12 months of data)

<table>
<thead>
<tr>
<th>Range of Credit Extended (€)</th>
<th>Number of Payment Experiences</th>
<th>Total Value</th>
<th>% Within Terms</th>
<th>1 - 30 Days</th>
<th>31 - 60 Days</th>
<th>61 - 90 Days</th>
<th>91+ Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>100,000 &amp; over</td>
<td>1</td>
<td>€ 200,000</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>75,000 - 99,999</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50,000 - 74,999</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25,000 - 49,999</td>
<td>3</td>
<td>€ 70,000</td>
<td>71</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10,000 - 24,999</td>
<td>2</td>
<td>€ 18,000</td>
<td></td>
<td>100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 10,000</td>
<td>9</td>
<td>€ 39,040</td>
<td>66</td>
<td>15</td>
<td></td>
<td></td>
<td>19</td>
</tr>
</tbody>
</table>

Legal Events

All public notice information has been obtained in good faith from the appropriate public sources.
### Satisfied Charge - General Charge

<table>
<thead>
<tr>
<th><strong>Filing Date</strong></th>
<th>06-07-2007</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description of amount</strong></td>
<td>All monies, liabilities, and obligations now or for the time being due, owing, or incurred to the Chargee by the Company whether solely or jointly with any other person and whether as principal or surety, including interest, discount, commission and other expenses computed and compounded as agreed from (contd. in the attached Schedule)</td>
</tr>
<tr>
<td><strong>Charge Type Description</strong></td>
<td>A floating charge on the undertakings or property of the company.</td>
</tr>
<tr>
<td><strong>Date Registered</strong></td>
<td>2007-07-27</td>
</tr>
<tr>
<td><strong>Property Description</strong></td>
<td>XXX THE COMPANY AS BENEFICIAL OWNER CHARGED BY WAY OF FIRST FLOATING CHARGE THE UNDERTAKING AND ALL THE ASSETS AND PROPERTY OF THE COMPANY WHATSOEVER AND WHERESOEVER, BOTH PRESENT AND FUTURE AS CONTINUING SECURITY FOR THE PAYMENT AND DISCHARGE OF THE SECURED OBLIGATIONS (THE &quot;SECURITY&quot;). NEGATIVE PLEDGE: THE COMPANY HAS AGREED NOT TO CREATE OR PERMIT TO SUBSIST ANY MORTGAGE, CHARGE, PLEDGE, DEBENTURE, LIEN (OTHER THAN A LIEN ARISING IN THE ORDINARY AND USUAL COURSE OF BUSINESS BY OPERATION OF LAW) OR OTHER ENCUMBRANCE SECURING ANY OBLIGATION OF ANY PERSON (OTHER THAN THE SECURITY) OR ANY OTHER TYPE OF PREFERENTIAL ARRANGEMENT (INCLUDING ANY TITLE TRANSFER AND RETENTION ARRANGEMENT) HAVING A SIMILAR EFFECT. XXX</td>
</tr>
<tr>
<td><strong>Persons Entitled</strong></td>
<td>SWEDBANK AB (PUBL) (THE &quot;CHARGEE&quot;)</td>
</tr>
</tbody>
</table>

### Satisfied Charge - General Charge

<table>
<thead>
<tr>
<th><strong>Filing Date</strong></th>
<th>16-05-2006</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description of amount</strong></td>
<td>All monies and/or obligations which now are, or at any time may become, due or owing to the security holder by the company on any account and all the other liabilities whatsoever of the company to the security holder whether actual or contingent and whether as principal debtor, guarantor, surety or otherwise.</td>
</tr>
<tr>
<td><strong>Charge Type Description</strong></td>
<td>A floating charge on the undertakings or property of the company.</td>
</tr>
<tr>
<td><strong>Date Registered</strong></td>
<td>2006-05-30</td>
</tr>
<tr>
<td><strong>Property Description</strong></td>
<td>FLOATING CHARGE OVER THE COMPANY'S UNDERTAKING OVER ALL ITS PROPERTY BOTH PRESENT AND FUTURE INCLUDING THE BOOKDEBTS GOODWILL AND UNCALLED CAPITAL FOR THE TIME BEING BUT SO THAT THE COMPANY IS NOT TO BE AT LIBERTY TO CREATE ANY MORTGAGE OR CHARGE ON THE PROPERTY HEREBY CHARGED OR ANY PART OR PARTS THEREOF IN PRIORITY TO OR PARI PASSU WITH THIS DEBENTURE.</td>
</tr>
<tr>
<td><strong>Persons Entitled</strong></td>
<td>ULSTER BANK IRELAND LIMITED</td>
</tr>
</tbody>
</table>

### Other Legal Event - Unknown

| **Details** | Latest Account Filed on 181215, accounting reference date 300614. |

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**Special Events**

**Events**

---

06-12-2016
On 2016-12-06 legal form changed from, Single Member Private Company Limited By Shares (IE) to Private Company Limited By Shares (IE)

Corporate Linkage

Members in the Tree | Subsidiaries of this Company | Branches of this Company
--- | --- | ---
16 | 8 | 2

Ownership

This company is a Domestic Ultimate, Headquarters, Parent, Subsidiary

Global Ultimate, Immediate Parent
WÄRTSILÄ VOYAGE HOLDING LIMITED
D-U-N-S Number 22-206-9043
100% shareholding

Domestic Ultimate
WÄRTSILÄ VOYAGE LIMITED
IRELAND
D-U-N-S Number 98-563-1196

Total Members in Family Tree - 16
Subsidiaries | Branches
--- | ---
8 | 2

Subsidiaries

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Operates as</th>
<th>Year Started</th>
<th>% Shares Owned</th>
</tr>
</thead>
<tbody>
<tr>
<td>WÄRTSILÄ VOYAGE UK LIMITED</td>
<td>-</td>
<td>-</td>
<td>100%</td>
</tr>
<tr>
<td>WÄRTSILÄ VOYAGE MIP LIMITED</td>
<td>-</td>
<td>-</td>
<td>100%</td>
</tr>
<tr>
<td>TRANSAS NEW BUILDING LIMITED</td>
<td>-</td>
<td>-</td>
<td>100%</td>
</tr>
<tr>
<td>Waersilae Voyage Ltd</td>
<td>-</td>
<td>2017</td>
<td>-</td>
</tr>
<tr>
<td>Transas Benelux B.V.</td>
<td>Ship building and repairing</td>
<td>2009</td>
<td>-</td>
</tr>
<tr>
<td>Waersilae Voyage Sweden AB</td>
<td>Wholesale-industrial machinery and equipment</td>
<td>1994</td>
<td>-</td>
</tr>
<tr>
<td>WARTSILA VOYAGE PACIFIC PTE. LTD.</td>
<td>Wholesale-transportation equipment and supplies</td>
<td>2001</td>
<td>-</td>
</tr>
<tr>
<td>TRANSAS BALTIC SIA</td>
<td>Wholesale-electronic parts and equipment</td>
<td>2007</td>
<td>-</td>
</tr>
<tr>
<td>Wartsila Voyage Americas, Inc.</td>
<td>Wholesale-transportation equipment and supplies</td>
<td>1993</td>
<td>-</td>
</tr>
</tbody>
</table>
Minority Interests

<table>
<thead>
<tr>
<th>Name</th>
<th>Country / Region</th>
<th>% Owned</th>
</tr>
</thead>
<tbody>
<tr>
<td>WÄRTSILÄ VOYAGE INVESTMENTS UNLIMITED COMPANY</td>
<td>-</td>
<td>50%</td>
</tr>
</tbody>
</table>

Company Profile

Company Overview

- **D-U-N-S:** 98-563-1196
- **Date of Registration:** 04-09-2002
- **Telephone:** (021) 471 0400
- **Website:** www.transas.com
- **Email:** info@transas.com
- **Annual Sales:** € 139,568 (In Thousand)
- **Age (Year Started):** 17 years (2002)
- **Line of Business:** Computer programming and software services

Business Registration

- **Registered Name:** WÄRTSILÄ VOYAGE LIMITED
- **Registered Address:** 13-18 CITY QUAY, DUBLIN 2, D02 ED70, Ireland
- **Legal Form:** Private Company Limited By Shares
- **Registration Date:** 04-09-2002
- **CRO Number:** 360963
- **Date Started:** 04-09-2002
- **Latest Annual Return Date:** 21-06-2018
- **Date of the Latest Financial Statement at the Registry:** 2018-06-21
- **Date of Latest Financial Statement included in the report:** 31-12-2017
- **Issued Share Capital:** € 1,000,000 made up of 1,000,000 Ordinary shares of € 1.00 each

Business Activities And Employees

- **Employees:** 628
- **Trade Style(s):** TRANSAS, WARTSILA VOYAGE
### SIC Information

<table>
<thead>
<tr>
<th>SIC Codes</th>
<th>Type</th>
<th>Source</th>
<th>SIC Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7372</td>
<td>US SIC (1972)</td>
<td>-</td>
<td>Computer programming and software services</td>
</tr>
</tbody>
</table>

### NACE Information

<table>
<thead>
<tr>
<th>NACE Codes</th>
<th>Type</th>
<th>Source</th>
<th>NACE Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3320</td>
<td>NACE Rev 1</td>
<td>Companies House</td>
<td>Manufacture Of Instruments And Appliances For Measuring, Checking, Testing, Navigating And Other Purposes, Except Industrial Process Control Equipment</td>
</tr>
</tbody>
</table>

### History

<table>
<thead>
<tr>
<th>Change Type</th>
<th>Date Changed</th>
<th>Changed To</th>
<th>Changed From</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registere d Address</td>
<td>-</td>
<td>13-18 CITY QUAY, DUBLIN 2, D02 ED70, Ireland</td>
<td>10 EASTGATE AVENUE, EASTGATE BUSINESS PARK, LITTLE ISLAND, CORK, Ireland</td>
</tr>
<tr>
<td>Registere d Address</td>
<td>-</td>
<td>10 EASTGATE AVENUE, EASTGATE BUSINESS PARK, LITTLE ISLAND, CORK, Ireland</td>
<td>30 HERBERT STREET, DUBLIN 2, Ireland</td>
</tr>
<tr>
<td>Legal Form</td>
<td>06-12-2016</td>
<td>Private Company Limited By Shares</td>
<td>Single Member Private Company Limited By Shares</td>
</tr>
<tr>
<td>Registere d Name</td>
<td>-</td>
<td>WÄRTSILÄ VOYAGE LIMITED</td>
<td>TRANSAS LIMITED</td>
</tr>
</tbody>
</table>

### Principals

<table>
<thead>
<tr>
<th>Current Principals</th>
<th>New Appointments</th>
<th>Resignations</th>
<th>Linked to Closures</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>2</td>
<td>3</td>
<td>10</td>
</tr>
</tbody>
</table>

#### TOP-FIVE-PRINCIPALS

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>TORSTEN BUSSOW</td>
<td>12 Feb 2019 - Current</td>
</tr>
<tr>
<td>THOMAS BARR</td>
<td>19 Oct 2018 - Current</td>
</tr>
<tr>
<td>ANDREI SITKOV</td>
<td>20 Sep 2018 - Current</td>
</tr>
<tr>
<td>WUBBO VELVIS</td>
<td>28 Sep 2018 - 22 Aug 2019</td>
</tr>
</tbody>
</table>
## CURRENT PRINCIPALS

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>LinkedIn Profile</th>
<th>Date Appointed</th>
<th>Address</th>
<th>Date of Birth</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>TORSTEN BUSSOW</td>
<td>Director</td>
<td><a href="#">LinkedIn Profile</a></td>
<td>12-02-2019</td>
<td>SULLDORFER KIRCHENWEG 57, 22587 HAMBURG</td>
<td>01-01-1975</td>
<td>44</td>
</tr>
<tr>
<td>THOMAS BARR</td>
<td>Company Secretary</td>
<td><a href="#">LinkedIn Profile</a></td>
<td>19-10-2018</td>
<td>WILLOW BARN, TUFTON</td>
<td>01-08-1977</td>
<td>42</td>
</tr>
<tr>
<td>ANDREI SITKOV</td>
<td>Director</td>
<td><a href="#">LinkedIn Profile</a></td>
<td>20-09-2018</td>
<td>MALY PR. V.O., 52, APP.115, 199178</td>
<td>01-05-1974</td>
<td>45</td>
</tr>
</tbody>
</table>

## PREVIOUS PRINCIPALS

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>LinkedIn Profile</th>
<th>Date Appointed</th>
<th>Date Resigned</th>
<th>Address</th>
<th>Date of Birth</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>WUBBO VELVIS</td>
<td>Director</td>
<td><a href="#">LinkedIn Profile</a></td>
<td>28-09-2018</td>
<td>22-08-2019</td>
<td>PARKMOS 3, 2914LR NIEUWERKERK AAN DEN USSEL</td>
<td>27-07-1962</td>
<td>57</td>
</tr>
<tr>
<td>EVGENII DOROSHENKO</td>
<td>Director</td>
<td><a href="#">LinkedIn Profile</a></td>
<td>19-10-2016</td>
<td>20-11-2018</td>
<td>1 TINTAGEL WAY, PORT SOLENT</td>
<td>23-09-1978</td>
<td>41</td>
</tr>
<tr>
<td>Name</td>
<td>Position</td>
<td>LinkedIn Profile</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------</td>
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<td>------------------</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>NIKOLAI LEBEDEV</td>
<td>Director</td>
<td><a href="#">LinkedIn Profile</a></td>
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<tr>
<td>EVGENII DOROSHENKO</td>
<td>Company Secretary</td>
<td><a href="#">LinkedIn Profile</a></td>
<td></td>
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</tr>
<tr>
<td>FRANK JOHN COLES</td>
<td>Director</td>
<td><a href="#">LinkedIn Profile</a></td>
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</tr>
<tr>
<td>JOEL MCDONALD</td>
<td>Company Secretary</td>
<td><a href="#">LinkedIn Profile</a></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>SERGEY GENERALOV</td>
<td>Director</td>
<td><a href="#">LinkedIn Profile</a></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Address        | 63 NEVSKY PROSPECT, APT 52 SAINT PETERSBURG 191025 | 1 TINTAGEL WAY, PORT SOLENT | 3 TANZA ROAD, LONDON | 63 NEVSKY PROSPECT, APT 52 SAINT PETERSBURG 191025 | 3 TANZA ROAD, LONDON |
| Date of Birth  | 08-06-1952 (Age - 67 Years) | 23-09-1978 (Age - 41 Years) | 06-04-1959 (Age - 60 Years) | 13-11-1962 (Age - 56 Years) | 13-11-1962 (Age - 56 Years) |

**Associations**

1. WÄRTSILÄ VOYAGE INVESTMENTS UNLIMITED COMPANY
   - 12 Nov 2015 - 05 Nov 2018
2. TRANSAS NEW BUILDING LIMITED
   - 12 Nov 2015 - 05 Nov 2018
<table>
<thead>
<tr>
<th>Address</th>
<th>Date of Birth</th>
</tr>
</thead>
<tbody>
<tr>
<td>MINSKAYA STREET 1A, APARTMENT 47</td>
<td>07-09-1963 (Age - 56 Years)</td>
</tr>
<tr>
<td>DAVYDKOVSKAYA STREET 3, APARTMENT 303</td>
<td>18-01-1972 (Age - 47 Years)</td>
</tr>
<tr>
<td>RUSSIAN FEDERATION, 127006, MOSCOW, KRASNOPROLETARSKAYA ST B 7 AP</td>
<td>03-02-1987 (Age - 32 Years)</td>
</tr>
<tr>
<td>VYPOLZOV SIDE STREET, 6 BLD, APP 70, MOSCOW, 129090, RUSS, 6 BLD APP 70 MOSCOW 129090 RUS</td>
<td>23-03-1979 (Age - 40 Years)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address</th>
<th>Date of Birth</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANDREY BURLINOV</td>
<td>13-10-2015</td>
</tr>
<tr>
<td>PHILIPP OTDELNOV</td>
<td>10-07-2015</td>
</tr>
<tr>
<td>ARMEN ISAAKYAN</td>
<td>28-04-2015</td>
</tr>
<tr>
<td>ANDREY BELENTIEV</td>
<td>04-06-2014</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date Appointed</th>
<th>Date Resigned</th>
</tr>
</thead>
<tbody>
<tr>
<td>13-10-2015</td>
<td>13-10-2015</td>
</tr>
<tr>
<td>10-07-2015</td>
<td>10-07-2015</td>
</tr>
<tr>
<td>04-06-2014</td>
<td>04-06-2014</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address</th>
<th>Date of Birth</th>
</tr>
</thead>
<tbody>
<tr>
<td>RUSSIAN FEDERATION, 127006, MOSCOW, KRASNOPROLETARSKAYA ST B 7 AP</td>
<td>03-02-1987 (Age - 32 Years)</td>
</tr>
<tr>
<td>VYPOLZOV SIDE STREET, 6 BLD, APP 70, MOSCOW, 129090, RUSS, 6 BLD APP 70 MOSCOW 129090 RUS</td>
<td>23-03-1979 (Age - 40 Years)</td>
</tr>
</tbody>
</table>

**Associations**

- **TAERO LEASING LIMITED**
  - Out of Business Favourable

- **TAERO AVIATION LIMITED**
  - Out of Business Favourable
  - 13 Sep 2013 - 17 Sep 2015

- **TRANSAS NEW BUILDING LIMITED**
  - 10 Nov 2009 - 16 Aug 2016
### Pavel Pavlovskiy
**Director**

| Date Appointed | 01-06-2012 |
| Date Resigned | 13-09-2013 |
| Address | DUNAJSKIJ PROSPEKT 40-1-20, ST. PETERSBURG, RUSSIA, 192281, ST PETERSBURG RUSSIA |
| Date of Birth | 11-12-1969 (Age - 49 Years) |

**Associations**

- **TAERO AVIATION LIMITED**
  - 25 Jun 2012 - 13 Sep 2013
  - Out of Business Favourable

### Sharon Deeny
**Director**

| Date Appointed | 24-10-2007 |
| Date Resigned | 13-10-2015 |
| Address | 17, MANOR GROVE, THORNBURY VIEW, ROCHESTOWN, |
| Date of Birth | 03-02-1956 (Age - 63 Years) |

**Associations**

- **WÄRTSILÄ VOYAGE INVESTMENTS UNLIMITED COMPANY**
  - 01 Jun 2012 - 06 Apr 2016
- **WÄRTSILÄ VOYAGE MIP LIMITED**
  - 30 Jun 2009 - 06 Apr 2016
- **TAERO OPERATIONS UNLIMITED COMPANY**
  - 30 Jun 2009 - 06 Apr 2016
  - Out of Business Favourable

### Victor Godunov
**Director**

| Date Appointed | 24-10-2007 |
| Date Resigned | 27-04-2010 |
| Address | 1ST LANE 20 FLAT 3, ST. PETERSBURG, RUSSIA 199053 |
| Date of Birth | 23-02-1954 (Age - 65 Years) |

**Associations**
<table>
<thead>
<tr>
<th><strong>Date Appointed</strong></th>
<th><strong>Date Resigned</strong></th>
<th><strong>Address</strong></th>
<th><strong>Date of Birth</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>30-11-2005</td>
<td>13-10-2015</td>
<td>JOIEVILLA, BEAUMONT DRIVE,, BALLINTEMPLE,, CORK</td>
<td>27-11-1950 (Age - 68 Years)</td>
</tr>
</tbody>
</table>

**Associations**

<table>
<thead>
<tr>
<th><strong>Company</strong></th>
<th><strong>Dates</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>TAERO AVIATION LIMITED</td>
<td>29 Jan 2009 - 25 Jun 2012</td>
</tr>
<tr>
<td>NOEL GLEESON</td>
<td>LinkedIn Profile</td>
</tr>
<tr>
<td>Date Appointed</td>
<td>30-11-2005</td>
</tr>
<tr>
<td>Date Resigned</td>
<td>13-10-2015</td>
</tr>
<tr>
<td>Address</td>
<td>JOIEVILLA, BEAUMONT DRIVE,, BALLINTEMPLE,, CORK</td>
</tr>
<tr>
<td>Date of Birth</td>
<td>27-11-1950 (Age - 68 Years)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Company</strong></th>
<th><strong>Dates</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>TRANSAS NEW BUILDING LIMITED</td>
<td>10 Nov 2009 - 12 Nov 2015</td>
</tr>
<tr>
<td>NIKOLAY LEBEDEV</td>
<td>LinkedIn Profile</td>
</tr>
<tr>
<td>Date Appointed</td>
<td>30-11-2005</td>
</tr>
<tr>
<td>Date Resigned</td>
<td>01-06-2012</td>
</tr>
<tr>
<td>Address</td>
<td>PIONERSKAYA D. 53, PESOCHNIY, DIBUNI, ST. PETERSBURG,, PESOCHNIY DIBUNI ST PETERSBURG</td>
</tr>
<tr>
<td>Date of Birth</td>
<td>08-06-1957 (Age - 62 Years)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Company</strong></th>
<th><strong>Dates</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>TAERO OPERATIONS UNLIMITED COMPANY</td>
<td>30 Jun 2009 - 26 Feb 2016</td>
</tr>
<tr>
<td>WÄRTSILÄ VOYAGE MIP LIMITED</td>
<td>30 Jun 2009 - 12 Nov 2015</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Company</strong></th>
<th><strong>Dates</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>TAERO AVIATION LIMITED</td>
<td>29 Jan 2009 - 01 Jun 2012</td>
</tr>
<tr>
<td>RED SUNSET LIMITED</td>
<td>24 Oct 2006 - 01 Jun 2012</td>
</tr>
<tr>
<td>PETER MANTEL</td>
<td>LinkedIn Profile</td>
</tr>
<tr>
<td>Date Appointed</td>
<td>13-12-2004</td>
</tr>
<tr>
<td>Date Resigned</td>
<td>27-04-2010</td>
</tr>
<tr>
<td>Address</td>
<td>32, THE MEADOW, DENMEAD,, HAMPSHIRE, PO7 6YJ</td>
</tr>
<tr>
<td>Date of Birth</td>
<td>31-07-1961 (Age - 58 Years)</td>
</tr>
</tbody>
</table>
CARL-LOF CARLSSON
Director
LinkedIn Profile

Date Appointed: 20-01-2004
Date Resigned: 13-10-2015
Address: GRINDVAGEN 12, 429 35 KULLAVIK, SWEDEN
Date of Birth: 23-05-1949 (Age - 70 Years)

Associations

TAERO OPERATIONS UNLIMITED COMPANY
Out of Business Favourable

SHARON DEENY
Company Secretary
LinkedIn Profile

Date Appointed: 01-09-2003
Date Resigned: 06-10-2003
Address: 17 MANOR GROVE, THORNBURY VIEW, ROCHESTOWN
Date of Birth: 03-02-1956 (Age - 63 Years)

Associations

RED SUNSET LIMITED
Out of Business Favourable

Financials

Overview

Source: D&B | Currency: All figures shown in EUR unless otherwise stated

Financial Statement Comparison
### Sales / Turnover

<table>
<thead>
<tr>
<th>Year</th>
<th>Consolidated 31-12-2017 In Thousands</th>
<th>Consolidated 31-12-2016 In Single Units</th>
<th>Consolidated 30-06-2015 In Single Units</th>
<th>Consolidated 30-06-2014 In Single Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>139,568</td>
<td>223,143,935</td>
<td>159,114,512</td>
<td>93,630,709</td>
</tr>
<tr>
<td>2016</td>
<td>4,640</td>
<td>23,726,813</td>
<td>10,539,460</td>
<td>(6,908,577)</td>
</tr>
<tr>
<td>2015</td>
<td>26,318</td>
<td>27,272,640</td>
<td>40,951,593</td>
<td>31,055,102</td>
</tr>
<tr>
<td>2014</td>
<td>14,984</td>
<td>23,709,666</td>
<td>40,742,060</td>
<td>29,391,663</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>
### Employees *

<table>
<thead>
<tr>
<th>Year</th>
<th>Employees *</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>962</td>
</tr>
<tr>
<td>2016</td>
<td>923</td>
</tr>
<tr>
<td>2015</td>
<td>778</td>
</tr>
<tr>
<td>2014</td>
<td>758</td>
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</table>

* = In Single Units

### Financial Notes / Opinions

<table>
<thead>
<tr>
<th>Year</th>
<th>Unfavourable</th>
<th>Financial Notes / Opinions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

### Audit Information
Balance Sheet

Source: D&B  |  Currency: All figures shown in EUR unless otherwise stated

Financial Statement Comparison

Annual

![Graph showing financial statement comparison from 2014 to 2017](image-url)

<table>
<thead>
<tr>
<th>Assets</th>
<th>Consolidated 31-12-2017 In Thousands</th>
<th>Consolidated 31-12-2016 In Single Units</th>
<th>Consolidated 30-06-2015 In Single Units</th>
<th>Consolidated 30-06-2014 In Single Units</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FIXED ASSETS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Intangible Assets</td>
<td>11,334</td>
<td>3,562,974</td>
<td>209,533</td>
<td>1,663,439</td>
</tr>
<tr>
<td>Total Tangible Fixed Assets</td>
<td>3,513</td>
<td>2,503,298</td>
<td>877,938</td>
<td>3,388,904</td>
</tr>
<tr>
<td>Land &amp; Buildings</td>
<td>656</td>
<td>976,792</td>
<td>122,073</td>
<td>2,106,608</td>
</tr>
<tr>
<td>Fixtures And Equipment</td>
<td>2,857</td>
<td>1,526,506</td>
<td>755,865</td>
<td>1,282,296</td>
</tr>
<tr>
<td>Other Long Term Assets</td>
<td>4,382</td>
<td>717,467</td>
<td>13,466,949</td>
<td>29,762,172</td>
</tr>
<tr>
<td><strong>Total Fixed Assets</strong></td>
<td>19,229</td>
<td>6,783,739</td>
<td>14,554,420</td>
<td>34,814,515</td>
</tr>
<tr>
<td>Stock &amp; Work In Progress</td>
<td>10,275</td>
<td>11,581,086</td>
<td>11,894,889</td>
<td>17,317,466</td>
</tr>
<tr>
<td><strong>TOTAL CURRENT ASSETS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Debtors &amp; Prepayments</td>
<td>42,544</td>
<td>57,657,464</td>
<td>48,332,605</td>
<td>53,867,731</td>
</tr>
<tr>
<td>Trade Debtors</td>
<td>32,305</td>
<td>46,566,345</td>
<td>29,554,930</td>
<td>34,619,523</td>
</tr>
<tr>
<td>Amounts Owed by Group Companies</td>
<td>128</td>
<td>-</td>
<td>8,359,608</td>
<td>11,685,573</td>
</tr>
<tr>
<td>Assets</td>
<td>Consolidated 31-12-2017</td>
<td>Consolidated 31-12-2016</td>
<td>Consolidated 30-06-2015</td>
<td>Consolidated 30-06-2014</td>
</tr>
<tr>
<td>--------</td>
<td>------------------------</td>
<td>-------------------------</td>
<td>--------------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td></td>
<td>In Thousands</td>
<td>In Single Units</td>
<td>In Single Units</td>
<td>In Single Units</td>
</tr>
<tr>
<td>Tax Recoverable</td>
<td>2,164</td>
<td>2,588,889</td>
<td>3,478,149</td>
<td>1,844,590</td>
</tr>
<tr>
<td>Other Receivables</td>
<td>2,164</td>
<td>2,588,889</td>
<td>3,478,149</td>
<td>1,844,590</td>
</tr>
<tr>
<td>Prepayments</td>
<td>876</td>
<td>1,270,120</td>
<td>1,113,961</td>
<td>2,296,523</td>
</tr>
<tr>
<td>Cash at Bank / In Hand</td>
<td>876</td>
<td>1,270,120</td>
<td>1,113,961</td>
<td>2,296,523</td>
</tr>
<tr>
<td>Other Current Assets</td>
<td>7,071</td>
<td>7,232,110</td>
<td>5,825,957</td>
<td>3,421,522</td>
</tr>
<tr>
<td>Total Current Assets</td>
<td>84,514</td>
<td>80,247,519</td>
<td>97,655,320</td>
<td>77,430,541</td>
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</table>

<table>
<thead>
<tr>
<th>Liabilities</th>
<th>Consolidated 31-12-2017</th>
<th>Consolidated 31-12-2016</th>
<th>Consolidated 30-06-2015</th>
<th>Consolidated 30-06-2014</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In Thousands</td>
<td>In Single Units</td>
<td>In Single Units</td>
<td>In Single Units</td>
</tr>
<tr>
<td>Trade Creditors</td>
<td>15,815</td>
<td>9,985,879</td>
<td>10,285,519</td>
<td>18,326,399</td>
</tr>
<tr>
<td>Bank Loans &amp; Overdrafts</td>
<td>24,279</td>
<td>14,799,336</td>
<td>7,433,225</td>
<td>1,894,410</td>
</tr>
<tr>
<td>Other Loans Payable</td>
<td>-</td>
<td>3,483,312</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>HP / Lease Payments</td>
<td>146</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Amounts Due to Group Companies</td>
<td>472</td>
<td>1,003,040</td>
<td>11,000,479</td>
<td>30,091,146</td>
</tr>
<tr>
<td>Tax &amp; Social Security</td>
<td>419</td>
<td>2,498,265</td>
<td>3,677,816</td>
<td>3,136,841</td>
</tr>
<tr>
<td>Accruals / Deferred Income</td>
<td>6,297</td>
<td>8,394,852</td>
<td>9,219,842</td>
<td>7,395,108</td>
</tr>
<tr>
<td>Other Current Liabilities</td>
<td>21,773</td>
<td>17,740,313</td>
<td>28,445,995</td>
<td>7,391,761</td>
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<tr>
<td>Total Current Liabilities</td>
<td>69,201</td>
<td>57,904,997</td>
<td>70,062,877</td>
<td>68,235,664</td>
</tr>
<tr>
<td>Net Current Assets (Liabilities)</td>
<td>15,313</td>
<td>22,342,522</td>
<td>27,592,443</td>
<td>9,194,877</td>
</tr>
<tr>
<td>Total Assets less Current Liabilities</td>
<td>34,542</td>
<td>29,126,260</td>
<td>42,146,863</td>
<td>44,009,392</td>
</tr>
<tr>
<td>Bank &amp; Other Loans</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>8,612,374</td>
</tr>
<tr>
<td>HP / Lease Payments</td>
<td>555</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Liabilities</th>
<th>Consolidated 31-12-2017</th>
<th>Consolidated 31-12-2016</th>
<th>Consolidated 30-06-2015</th>
<th>Consolidated 30-06-2014</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In Thousands</td>
<td>In Single Units</td>
<td>In Single Units</td>
<td>In Single Units</td>
</tr>
<tr>
<td>Deferred Taxation</td>
<td>627</td>
<td>604,565</td>
<td>771,977</td>
<td>2,182,893</td>
</tr>
<tr>
<td>Other Long Term Liabilities</td>
<td>7,042</td>
<td>1,249,054</td>
<td>173,844</td>
<td>1,879,276</td>
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<tr>
<td>Minority Interest Liability</td>
<td>-</td>
<td>-</td>
<td>249,450</td>
<td>279,747</td>
</tr>
<tr>
<td>Total Long Term Liabilities</td>
<td>8,224</td>
<td>1,853,619</td>
<td>1,195,271</td>
<td>12,954,290</td>
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</tbody>
</table>

| Net Assets | 26,318 | 27,272,641 | 40,951,592 | 31,055,102 |

<table>
<thead>
<tr>
<th>Net Worth / Shareholders’ Funds</th>
<th>Consolidated 31-12-2017</th>
<th>Consolidated 31-12-2016</th>
<th>Consolidated 30-06-2015</th>
<th>Consolidated 30-06-2014</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In Thousands</td>
<td>In Single Units</td>
<td>In Single Units</td>
<td>In Single Units</td>
</tr>
<tr>
<td>Issued Share Capital</td>
<td>1,001</td>
<td>1,000,000</td>
<td>1,000,001</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Retained Profit / (Loss) Reserve</td>
<td>20,442</td>
<td>21,397,102</td>
<td>35,076,053</td>
<td>25,179,564</td>
</tr>
<tr>
<td>Other Reserves</td>
<td>4,876</td>
<td>4,875,539</td>
<td>4,875,539</td>
<td>4,875,539</td>
</tr>
<tr>
<td>Total Equity Shareholders’ Funds</td>
<td>26,319</td>
<td>27,272,641</td>
<td>40,951,592</td>
<td>31,055,103</td>
</tr>
</tbody>
</table>
**Net Worth / Shareholders' Funds**

<table>
<thead>
<tr>
<th>Tangible Net Worth</th>
<th>Consolidated 31-12-2017 In Thousands</th>
<th>Consolidated 31-12-2016 In Single Units</th>
<th>Consolidated 30-06-2015 In Single Units</th>
<th>Consolidated 30-06-2014 In Single Units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>14,984</td>
<td>23,709,666</td>
<td>40,742,060</td>
<td>29,391,663</td>
</tr>
</tbody>
</table>

**Balance Sheet Notes**

<table>
<thead>
<tr>
<th>Total Operating Lease Commitments</th>
<th>Consolidated 31-12-2017 In Thousands</th>
<th>Consolidated 31-12-2016 In Single Units</th>
<th>Consolidated 30-06-2015 In Single Units</th>
<th>Consolidated 30-06-2014 In Single Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Lease Commitments - Plant &amp; Machinery (or other)</td>
<td>-</td>
<td>16,408,456</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Operating Lease Commitments - Land &amp; Buildings</td>
<td>-</td>
<td>482,855</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operating Lease Commitments - Land &amp; Buildings</th>
<th>Consolidated 31-12-2017 In Thousands</th>
<th>Consolidated 31-12-2016 In Single Units</th>
<th>Consolidated 30-06-2015 In Single Units</th>
<th>Consolidated 30-06-2014 In Single Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Lease Commitments - Land &amp; Buildings</td>
<td>-</td>
<td>15,925,601</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Profit And Loss Accounts**

Source: D&B  | Currency: All figures shown in EUR unless otherwise stated

**Financial Statement Comparison**

<table>
<thead>
<tr>
<th>Sales / Turnover</th>
<th>Consolidated 31-12-2017 In Thousands</th>
<th>Consolidated 31-12-2016 In Single Units</th>
<th>Consolidated 30-06-2015 In Single Units</th>
<th>Consolidated 30-06-2014 In Single Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales / Turnover</td>
<td>139,568</td>
<td>223,143,935</td>
<td>159,114,512</td>
<td>93,630,709</td>
</tr>
<tr>
<td>Cost Of Sales</td>
<td>100,117</td>
<td>151,072,848</td>
<td>107,469,990</td>
<td>59,001,956</td>
</tr>
<tr>
<td>Gross Profit / (Loss)</td>
<td>39,451</td>
<td>72,071,087</td>
<td>51,644,522</td>
<td>34,628,753</td>
</tr>
<tr>
<td>Operating Expenses</td>
<td>32,780</td>
<td>58,299,415</td>
<td>38,978,918</td>
<td>42,875,343</td>
</tr>
<tr>
<td>Other Operating Income</td>
<td>568</td>
<td>13,372,190</td>
<td>201,303</td>
<td>1,684,726</td>
</tr>
<tr>
<td>Other Operating Charges</td>
<td>-</td>
<td>-</td>
<td>4,510,417</td>
<td>-</td>
</tr>
</tbody>
</table>
### Net Operating Profit / (Loss)

<table>
<thead>
<tr>
<th></th>
<th>Consolidated 31-12-2017 In Thousands</th>
<th>Consolidated 31-12-2016 In Single Units</th>
<th>Consolidated 30-06-2015 In Single Units</th>
<th>Consolidated 30-06-2014 In Single Units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7,239</td>
<td>27,143,862</td>
<td>8,356,490</td>
<td>(6,561,864)</td>
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</tbody>
</table>

### Total Financial Income and Gains

<table>
<thead>
<tr>
<th></th>
<th>248</th>
<th>147,142</th>
<th>1,174,219</th>
<th>1,311,493</th>
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</thead>
<tbody>
<tr>
<td>External Interest receivable</td>
<td>248</td>
<td>147,142</td>
<td>1,174,219</td>
<td>1,311,493</td>
</tr>
<tr>
<td>Other financial income and gains</td>
<td>-</td>
<td>-</td>
<td>3,096,266</td>
<td>-</td>
</tr>
</tbody>
</table>

### Total Financial Expenses and Losses

<table>
<thead>
<tr>
<th></th>
<th>2,847</th>
<th>3,564,191</th>
<th>2,087,515</th>
<th>1,658,207</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Interest Payable</td>
<td>660</td>
<td>1,835,640</td>
<td>1,472,052</td>
<td>1,072,725</td>
</tr>
<tr>
<td>Group Interest Payable and Other Financial Expenses and Losses</td>
<td>2,186</td>
<td>1,728,551</td>
<td>615,464</td>
<td>585,481</td>
</tr>
</tbody>
</table>

### Profit / (Loss) Before Taxes

<table>
<thead>
<tr>
<th></th>
<th>4,640</th>
<th>23,726,813</th>
<th>10,539,460</th>
<th>(6,908,577)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Taxes</td>
<td>2,606</td>
<td>2,477,431</td>
<td>1,539,313</td>
<td>1,000,776</td>
</tr>
<tr>
<td>Current Taxes</td>
<td>2,606</td>
<td>2,658,998</td>
<td>1,300,713</td>
<td>1,676,186</td>
</tr>
<tr>
<td>Deferred and Other Taxation</td>
<td>0</td>
<td>(181,567)</td>
<td>238,600</td>
<td>(675,410)</td>
</tr>
</tbody>
</table>

### Profit / (Loss) after Taxes

<table>
<thead>
<tr>
<th></th>
<th>2,034</th>
<th>21,249,383</th>
<th>9,000,147</th>
<th>(7,909,353)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exceptional / Extraordinary Items</td>
<td>-</td>
<td>-</td>
<td>(884,293)</td>
<td>-</td>
</tr>
<tr>
<td>Minority Interests Profit/(Loss) Appropriation</td>
<td>-</td>
<td>-</td>
<td>(30,262)</td>
<td>(349,527)</td>
</tr>
</tbody>
</table>

### Net Profit / (Loss)

<table>
<thead>
<tr>
<th></th>
<th>2,034</th>
<th>21,249,383</th>
<th>9,914,701</th>
<th>(7,559,826)</th>
</tr>
</thead>
</table>

### STATEMENT OF RECONCILIATION

<table>
<thead>
<tr>
<th>Retained Profit / (Loss) at start of year</th>
<th>21,396</th>
<th>35,076,053</th>
<th>25,179,564</th>
<th>26,905,324</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Profit / (Loss) for the year</td>
<td>2,034</td>
<td>21,249,383</td>
<td>9,914,701</td>
<td>(7,559,826)</td>
</tr>
<tr>
<td>Dividends</td>
<td>1,960</td>
<td>35,597,260</td>
<td>18,212</td>
<td>978</td>
</tr>
<tr>
<td>Other Additions</td>
<td>-</td>
<td>668,926</td>
<td>-</td>
<td>5,835,043</td>
</tr>
<tr>
<td>Other Deductions</td>
<td>1,028</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Retained Profit / (Loss) at end of year</td>
<td>20,442</td>
<td>21,397,102</td>
<td>35,076,053</td>
<td>25,179,564</td>
</tr>
</tbody>
</table>

### Profit and Loss Notes

<table>
<thead>
<tr>
<th></th>
<th>Consolidated 31-12-2017 In Thousands</th>
<th>Consolidated 31-12-2016 In Single Units</th>
<th>Consolidated 30-06-2015 In Single Units</th>
<th>Consolidated 30-06-2014 In Single Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Payroll</td>
<td>36,403</td>
<td>60,167,264</td>
<td>40,258,587</td>
<td>34,004,992</td>
</tr>
<tr>
<td>Total Depreciation and Amortisation</td>
<td>2,470</td>
<td>2,468,821</td>
<td>1,221,866</td>
<td>1,652,153</td>
</tr>
<tr>
<td>Total Directors' Remuneration *</td>
<td>503,000</td>
<td>1,296,284</td>
<td>326,987</td>
<td>368,580</td>
</tr>
<tr>
<td>Total Auditors' Remuneration *</td>
<td>95,001</td>
<td>110,000</td>
<td>645,589</td>
<td>154,999</td>
</tr>
<tr>
<td>Auditors' Remuneration - Audit Fees *</td>
<td>95,001</td>
<td>110,000</td>
<td>456,500</td>
<td>154,999</td>
</tr>
<tr>
<td>Auditors' Remuneration - Non Audit Fees *</td>
<td>-</td>
<td>-</td>
<td>189,089</td>
<td>-</td>
</tr>
</tbody>
</table>

* = Full Value
## Financial Statement Comparison

### Annual

<table>
<thead>
<tr>
<th></th>
<th>Consolidated 31-12-2017 in Thousands</th>
<th>Consolidated 31-12-2016 in In Single Units</th>
<th>Consolidated 30-06-2015 in Single Units</th>
<th>Consolidated 30-06-2014 in Single Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash inflow from Operating Activities</td>
<td>19,177</td>
<td>6,858,085</td>
<td>12,116,988</td>
<td>(11,585,392)</td>
</tr>
<tr>
<td>Return on Investment &amp; Servicing of Finance</td>
<td>(2,599)</td>
<td>(1,934,368)</td>
<td>739,815</td>
<td>(1,095,665)</td>
</tr>
<tr>
<td>Taxation</td>
<td>(2,465)</td>
<td>(3,463,648)</td>
<td>(1,067,219)</td>
<td>-</td>
</tr>
<tr>
<td>Capital Expenditure &amp; Financial Investment</td>
<td>(15,831)</td>
<td>(7,314,088)</td>
<td>(12,398,249)</td>
<td>2,305,428</td>
</tr>
<tr>
<td>Dividends Paid</td>
<td>(1,960)</td>
<td>-</td>
<td>(18,212)</td>
<td>(978)</td>
</tr>
<tr>
<td>Cash inflow (Outflow) Before Use of Liquid Assets &amp; Financing</td>
<td>(3,678)</td>
<td>(5,854,020)</td>
<td>(626,876)</td>
<td>(10,376,606)</td>
</tr>
<tr>
<td>Financing</td>
<td>9,693</td>
<td>8,975,863</td>
<td>(1,226,043)</td>
<td>9,369,336</td>
</tr>
<tr>
<td>Increase (Decrease) in Cash in the Year</td>
<td>6,015</td>
<td>3,121,843</td>
<td>(1,852,919)</td>
<td>(1,007,270)</td>
</tr>
</tbody>
</table>

### Quarterly

## Financial Ratios

Source: D&B  |  Currency: All figures shown in EUR unless otherwise stated
<table>
<thead>
<tr>
<th><strong>Profitability</strong></th>
<th>31-12-2017</th>
<th>31-12-2016</th>
<th>30-06-2015</th>
<th>30-06-2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profit Margin (%)</td>
<td>3.3</td>
<td>10.6</td>
<td>6.6</td>
<td>(7.4)</td>
</tr>
<tr>
<td>Shareholder's Return (%)</td>
<td>31.0</td>
<td>100.1</td>
<td>25.9</td>
<td>(23.5)</td>
</tr>
<tr>
<td>Return on Capital (%)</td>
<td>13.4</td>
<td>81.5</td>
<td>25.0</td>
<td>(15.7)</td>
</tr>
<tr>
<td>Return on Assets (%)</td>
<td>4.5</td>
<td>27.3</td>
<td>9.4</td>
<td>(6.2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Financial Status</strong></th>
<th>31-12-2017</th>
<th>31-12-2016</th>
<th>30-06-2015</th>
<th>30-06-2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acid Test (x)</td>
<td>1.4</td>
<td>1.5</td>
<td>1.5</td>
<td>1.1</td>
</tr>
<tr>
<td>Current Ratio (x)</td>
<td>1.2</td>
<td>1.4</td>
<td>1.4</td>
<td>1.1</td>
</tr>
<tr>
<td>Solvency Ratio (x)</td>
<td>516.7</td>
<td>252.0</td>
<td>174.9</td>
<td>276.2</td>
</tr>
<tr>
<td>Fixed Assets / Networth (%)</td>
<td>23.4</td>
<td>10.6</td>
<td>2.2</td>
<td>11.5</td>
</tr>
<tr>
<td>Current Liabilities / Networth (%)</td>
<td>461.8</td>
<td>244.2</td>
<td>172.0</td>
<td>232.2</td>
</tr>
<tr>
<td>Current Liabilities / Stocks (%)</td>
<td>673.5</td>
<td>500.0</td>
<td>589.0</td>
<td>394.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Asset Utility</strong></th>
<th>31-12-2017</th>
<th>31-12-2016</th>
<th>30-06-2015</th>
<th>30-06-2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stock Turnover Rate</td>
<td>13.6</td>
<td>19.3</td>
<td>13.4</td>
<td>5.4</td>
</tr>
<tr>
<td>Sales / Net Working Capital (x)</td>
<td>9.1</td>
<td>10.0</td>
<td>5.8</td>
<td>10.2</td>
</tr>
<tr>
<td>Assets/Sales (%)</td>
<td>74.3</td>
<td>39.0</td>
<td>70.5</td>
<td>119.9</td>
</tr>
<tr>
<td>Asset Turnover (%)</td>
<td>134.5</td>
<td>256.4</td>
<td>141.8</td>
<td>83.4</td>
</tr>
<tr>
<td>Collection Period (days)</td>
<td>84.5</td>
<td>76.2</td>
<td>67.8</td>
<td>135.0</td>
</tr>
<tr>
<td>Capital / Employee *</td>
<td>35.9</td>
<td>31.6</td>
<td>54.2</td>
<td>58.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>*<em>Employee <em>(In Thousand)</em></em></th>
<th>31-12-2017</th>
<th>31-12-2016</th>
<th>30-06-2015</th>
<th>30-06-2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales / Employee *</td>
<td>145.1</td>
<td>241.8</td>
<td>204.6</td>
<td>123.5</td>
</tr>
<tr>
<td>Profit / Employee *</td>
<td>4.8</td>
<td>25.6</td>
<td>13.6</td>
<td>(9.1)</td>
</tr>
<tr>
<td>Employee Average Wage *</td>
<td>37.8</td>
<td>65.1</td>
<td>51.8</td>
<td>44.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Turnover</td>
<td></td>
<td></td>
<td></td>
<td>(37.45)</td>
<td>40.24</td>
<td>69.94</td>
<td></td>
</tr>
<tr>
<td>Gross Profit</td>
<td></td>
<td></td>
<td></td>
<td>(45.26)</td>
<td>39.55</td>
<td>49.14</td>
<td></td>
</tr>
<tr>
<td>Net Operating Profit / (Loss)</td>
<td>(73.33)</td>
<td>224.82</td>
<td>227.35</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profit / (Loss) Before Tax</td>
<td>(80.44)</td>
<td>125.12</td>
<td>252.56</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profit / (Loss) After Tax</td>
<td>(90.43)</td>
<td>136.10</td>
<td>213.79</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Profit / (Loss) for the Year</td>
<td>(90.43)</td>
<td>114.32</td>
<td>231.15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Employees</td>
<td>4.23</td>
<td>18.64</td>
<td>2.64</td>
<td>2.64</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profit / Employee</td>
<td>(81.25)</td>
<td>88.24</td>
<td>249.45</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Intangible Assets</td>
<td>218.11</td>
<td>1,600.44</td>
<td>(87.40)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current Assets</td>
<td>5.32</td>
<td>(17.83)</td>
<td>26.12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Registry Info

#### General Info

<table>
<thead>
<tr>
<th>CRO Number</th>
<th>Registered Address</th>
<th>Registration Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>360963</td>
<td>13-18 CITY QUAY DUBLIN 2 D02 ED70</td>
<td>04-09-2002</td>
</tr>
<tr>
<td></td>
<td>Ireland</td>
<td></td>
</tr>
</tbody>
</table>
Tax Clearance Application Result

We confirm that your tax affairs are in order, and you have been issued with a tax clearance certificate. Confirmation of this has also been sent to your Revenue Record.

In order to confirm to a third party that you have a tax clearance certificate, you will need to provide them with your PPSN/tax reference number and the tax clearance access number below.

Applicant Name: Transas Marine Limited
Applicant PPSN/Tax Reference Number: 6380963P
Access Number: 541942

Please note that in order to retain your tax clearance certificate you need to continue to keep your tax affairs in order. Revenue will review your tax affairs periodically and will rescind your tax clearance certificate if your tax affairs are not in order at any stage.

PDF/Print date: 22/02/2019
THIS IS WÄRTSILÄ
OUR PERSONNEL

- Approximately 19,000 professionals
- In over 200 locations
- In more than 80 countries
A UNIQUE PLATFORM

The world’s widest product portfolio
Integrated systems through smart on-site solutions

Unrivalled install base
Access to big data for analytics and machine learning

Marine ecosystem know-how
Experience and expertise to understand big data and transform it into business opportunities
MARINE SOLUTIONS BUSINESSES

Marine Power Solutions
- Power Supply
- Propulsion
- Exhaust Treatment
- Power Conversion

Processing Solutions
- Water & Waste
- Flow Solutions
- Gas Solutions

Voyage Solutions
- Automation, Navigation & Communication
- Voyage Optimisation
- TRANSAS
- Entertainment Systems
- Special Products
WÄRTSILÄ VOYAGE SOLUTIONS

Wärtsilä Voyage Solutions vision is to lead the way in creating an ecosystem of harmonized integrated solutions in safety, navigation and ship operations.

In creating these solutions Wärtsilä Voyage Solutions unites global maritime stakeholders in the future of e-Navigation and operations.
Voyage Solutions personnel: over 2000
WÄRTSILÄ AROUND THE GLOBE

80 countries

> 200 locations
Transas was acquired by Wärtsilä in 2018, and is a global market leader in ship & fleet operation solutions, including bridge infrastructure, digital data and electronic charts services, and applications requiring access to real-time information. The company is also a leader in professional training and simulation solutions, ship traffic control, and AI-based decision-support tools.

Transas leverages the latest advances in machine learning to create a unified cloud-based platform for managing operations across the entire marine ecosystem. The company has regional offices worldwide and a distribution network that spans 120 countries. Its workforce of approximately 1000 employees includes a large and competent team of engineers who, together with Wärtsilä’s team, work to accelerate the development of smart digital solutions.

PRODUCT PORTFOLIO
SHIP & FLEET OPERATIONS SOLUTIONS

UNIQUE INTEGRATED INFRASTRUCTURE

- Bridge infrastructure
- Fleet operations
- Mobile applications
- AI-powered decision support tools
- Charts and data services
Fleet Operations Solutions (FOS) are designed to achieve the highest level of safety at sea, increase fleet efficiency and simplify everyday tasks both ashore and on board.

With FOS, the operations are processed seamlessly, the compliance is guaranteed and the workload and costs are optimized.
All tools and data are connected in one operating system with the ECDIS kernel at its core, building the basis for improved operational efficiency and safe processes, with all stakeholders having access to and relying on the same information.
Marine onboard equipment is used on more than 13,000 commercial vessels and patrol boats of naval and coast guard fleets from over 100 nations.

OVER 35% OF THE ECDIS MARKET SHARE

Transas ECDIS installed on 100+ Maersk line vessels and 70+ Maersk tankers ships

Transas equips the world's first ice breaking LNG carrier

Transas ECDIS for 54 vessels of NYK line (Tokyo, Japan)
NAVIGATION AND INTEGRATED ONBOARD SOLUTIONS

BROAD RANGE OF NAVIGATION SOLUTIONS FROM COMPLETE BRIDGE SYSTEMS TO DIGITAL PRODUCTS AND CHARTS
SHIP TRAFFIC CONTROL

FACILITATION AND COORDINATION OF VESSEL TRAFFIC AND PORT CALLS

- Vessel traffic services
- Coastal surveillance systems
- Search and rescue solutions
- River information systems
- Pilot management solutions
25% OF VTMS INSTALLATIONS WORLDWIDE

300 VTMS are installed in more than 100 ports in 55 countries
SIMULATION & TRAINING
BRINGING TECHNOLOGY, EXPERTISE AND CONTENT TOGETHER

- Port study, incident investigation, R&D
- Navigational simulators
- DP & offshore simulators
- Technological simulators
- Tug handling simulators
- Naval applications
- Web-based training
More than 5500 marine simulation systems in 91 countries
This is to certify that the management system of

Wärtsilä Voyage Limited
10 Eastgate Avenue, Eastgate Business Park, Little Island, Cork, Ireland, 111
and the sites as mentioned in the appendix accompanying this certificate

has been found to conform to the Quality Management System standard:
**ISO 9001:2015**

This certificate is valid for the following scope:
**Design and development, sales, assembling, engineering, installation, training in use and after-sales service of integrated solutions for fleet operations (FOS), ship traffic control, simulation systems.**

Place and date:
London, 02 April 2019

For the issuing office:
DNV GL – Business Assurance
4th Floor, Vivo Building, 30 Stamford Street, London, SE1 9LQ, United Kingdom

Erie Koek
Management Representative

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.

ACCREDITED UNIT: DNV GL Business Assurance UK Limited, 4th Floor, Vivo Building, 30 Stamford Street, London, SE1 9LQ, United Kingdom.
TEL: +44(0) 203 816 4000. www.dnvgl.co.uk
## Appendix to Certificate

**Wärtsilä Voyage Limited**

Locations included in the certification are as follows:

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Site Address</th>
<th>Site Scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transas Navigator, Ltd.</td>
<td>54, 4B Maly pr. V.O., Saint-Petersburg, Russian Federation, 199178</td>
<td>Sales, assembling, installation, training in use and after-sales service of integrated solutions for fleet operations (FOS), ship traffic control, simulation systems.</td>
</tr>
<tr>
<td>Transas New Building Ltd.</td>
<td>10 Eastgate Avenue, Eastgate Business Park, Little Island, Cork, 111, Ireland</td>
<td>Sales, installation, training in use and after-sales service of integrated solutions for fleet operations (FOS), ship traffic control, simulation systems.</td>
</tr>
<tr>
<td>Wärtsilä Digital Technologies JSC</td>
<td>54-4/B Maly pr., V.O., Saint-Petersburg, Russian Federation, 199178</td>
<td>Design and development, engineering, installation, training in use and after-sales service of integrated solutions for fleet operations (FOS), ship traffic control, simulation systems; navigation data processing; development and manufacturing of dedicated hardware.</td>
</tr>
<tr>
<td>Wärtsilä Voyage Americas Inc.</td>
<td>751 North Drive Suite 9-12, Melbourne, FL, 32934, USA</td>
<td>Sales, assembling, installation, training in use and after-sales service of integrated solutions for fleet operations (FOS), ship traffic control, simulation systems.</td>
</tr>
<tr>
<td>Wärtsilä Voyage Germany GmbH</td>
<td>Luruper Chaussee, 125, 22761 Hamburg, Germany</td>
<td>Sales, installation, training in use and after-sales service of integrated solutions for fleet operations (FOS), ship traffic control, simulation systems.</td>
</tr>
<tr>
<td>Wärtsilä Voyage Greece Branch</td>
<td>1, Posidonos Ave. &amp; Goumi - 17456 Athens - Greece</td>
<td>Sales, installation, training in use and after-sales service of integrated solutions for fleet operations (FOS), ship traffic control, simulation systems.</td>
</tr>
<tr>
<td>Wärtsilä Voyage Limited</td>
<td>10 Eastgate Avenue, Eastgate Business Park, Little Island, Cork, Ireland, 111</td>
<td>Corporate representative and registration functions.</td>
</tr>
<tr>
<td>Wärtsilä Voyage Mediterranean Branch</td>
<td>Via de Marini, 16 - 16167 Genova (GE) - Italy</td>
<td>Sales, installation, training in use and after-sales service of integrated solutions for fleet operations (FOS), ship traffic control, simulation systems.</td>
</tr>
<tr>
<td>Wärtsilä Voyage Mediterranean SAS</td>
<td>Les 2 Arcs, 1800, Route des Cretes, 06560, Valbonne, France</td>
<td>Sales, installation, training in use and after-sales service of integrated solutions for fleet operations (FOS), ship traffic control, simulation systems.</td>
</tr>
<tr>
<td>Wärtsilä Voyage Middle East DMCEST</td>
<td>P.O. Box 117148, DY 151, DY 151, Dubai, United Arab Emirates</td>
<td>Sales, installation, training in use and after-sales service of integrated solutions for fleet operations (FOS), ship traffic control, simulation systems.</td>
</tr>
<tr>
<td>Wärtsilä Voyage Pacific Pte Ltd</td>
<td>Cyber Centre, 16/18 Jalan Kilang Barat, Singapore, Singapore, 159358</td>
<td>Sales, assembling, installation, training in use and after-sales service of integrated solutions for fleet operations (FOS), ship traffic control, simulation systems.</td>
</tr>
</tbody>
</table>

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.

ACCREDITED UNIT: DNV GL Business Assurance UK Limited, 4th Floor, Vivo Building, 30 Stamford Street, London, SE1 9LQ, United Kingdom.

TEL: +44(0) 203 816 4000. www.dnvgl.co.uk
<table>
<thead>
<tr>
<th>Company</th>
<th>Address</th>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wärtsilä Voyage Shanghai Co. Ltd</td>
<td>1702, West Tower, Lilacs International Commercial Center, No. 1299 Minsheng Road, Pudong, Shanghai, China, 200135</td>
<td>Sales, installation, training in use and after-sales service of integrated solutions for fleet operations (FOS), ship traffic control, simulation systems.</td>
</tr>
<tr>
<td>Wärtsilä Voyage Sweden AB</td>
<td>Datavägen 37, 43632, Askim, Sweden</td>
<td>Sales, assembling, installation, training in use, after-sales service of integrated solutions for fleet operations (FOS), ship traffic control, simulation systems.</td>
</tr>
<tr>
<td>Wärtsilä Voyage UK Limited</td>
<td>2000 Lakeside North Harbour, Western Road, Portsmouth, PO6 3EN, United Kingdom</td>
<td>Sales, installation, training in use and after-sales service of integrated solutions for fleet operations (FOS), ship traffic control, simulation systems.</td>
</tr>
</tbody>
</table>
This procurement report concerns the procurement of Ship and Port ICT application

Name of the procurement: Balt Safe II

Procurement reference number: 19-03921

Date of advertisement of procurement: 12/20/2019

Final tender date: 1/31/2020 11:59 PM

Number of tenders: 2

Tenderer:
Adveto Advanced Technology Aktiebolag, 5562677319
Wärtsilä Voyage Limited - 360963

Qualifying of tenderers
Listed below are the tenderers who are qualified to proceed to evaluation.

Number of qualified tenderers: 1

Following tender are qualified:
Wärtsilä Voyage Limited - 360963

Evaluation
Tenders that are qualified are evaluated according to the principle the most economically advantageous tender, as a basis for evaluation quality and price will be used.

The tender with the best relation between price and quality, is the tender that obtains the lowest comparative price according to the formula below. Comparative price is a comparison number or fictitious price, calculated by a weighing up of price and obtained 'should'-requirement points.

Comparative price = tendered price for the application system x markup.

Since only one tenderer has proceeded to this stage, this tender has not been evaluated in
detail, but all requirements has been met and the proposed design and references was judged to be more than sufficient.

**Decision**
Based on the information given above, it is the intention of the Maritime Administration to comply with the award decision accept bids from Wärtsilä Voyage Limited - 360963

Sjöfartsverket
Inköpsavdelningen
Michael Roxin
Inköpare
Contract award decision
2/26/2020

Procuring organization
Sjöfartsverket
Michael Roxin

Procurement
Balt Safe II
19-03921

Contract award decision
The Swedish Maritime Administration thanks you for the interest you have shown in connection with the procurement of Ship and port ICT application.

The procurement has been conducted through an open procedure in accordance with The Swedish Public Procurement Act (2016:1145).

With reference to the completed procurement has Swedish Maritime Administration decided to award contracts to Wärtsilä Voyage Limited - 360963

The decision has been made after evaluation of received tenders. The evaluation has been carried out in accordance with the conditions in the procurement document and is reported in the evaluation report.

A binding agreement does not exist until it is signed by both parties.

Standstill period is valid for ten (10) days after the contract award decision has been published.

Agreements can be signed at the earliest 2020-03-09

Swedish Maritime Administration
Purchasing department

Anders Holmgren
Deputy purchasing Director
Contract
3/10/2020

Contract name Balt Safe II
Ref No. 19-03921

Start date 3/10/2020
End date 6/21/2021
Prolongation no extension

Contracting parties

Buyer
Sjöfartsverket
2021000654

Address
60178
NORRKÖPING
Sweden

Contact person
Michael Roxin
+4610 47 86 461 (tel)
+46721440971. (mob)
michael.roxin@sjofartsverket.se

Seller
Wärtsilä Voyage Solutions Limited
360963

Address
10 Eastgate Business Avenue, Eastgate Business Park
Little Island
Cork
Ireland

Contact person
Steffen Fältd
0046736565046 (tel)
0046736565046 (mob)
steffen.faeldt@wartsila.com

1. Agreement

1.1 Introduction
The following Agreement has been entered into by and between The Swedish Maritime Administration (SMA) with organization number 202100-0654, and Wärtsilä Voyage Limited hereinafter referred to as the Contractor/Supplier, with organization number 360963. The Contractor commits itself to performing the assignment according to the tender (hereinafter “the Assignment”) in accordance with the provisions in this agreement.

1.2 Subcontractors
Approved subcontractors are:
The engagement by the Supplier of any subcontractor shall not relieve the Supplier from any liabilities
or obligations under this Contract and the Supplier shall be responsible for any acts or omissions of
any subcontractor as if they were acts or omissions of the Supplier.

The Supplier shall ensure that the terms and conditions of this Contract are reflected in all
subcontracts, if any, to the extent necessary to enable the Supplier to fully meet his obligations to
SMA. Such terms and conditions include, but are not limited to, technical, functional and operational
requirements and technical specifications; time of delivery; warranty terms; and quality Control.

Only subcontractors approved by SMA can be used.

1.3 Period of contract
The contract is valid from the time of both parties have signed and will ends when the project ends, but
no longer than until June 21, 2021.

1.4 Contact
Each Party shall appoint a primary contact person whose responsibilities and obligations during the
Term of the Contract are defined in this contract.

For SMA: Caisa Jersler Fransson, Phone: +46 10 478 54 63 e-mail:
caisa.jerslerfransson@sjofartsverket.se

For the Supplier: Steffen Feldt, Phone: +46 (0) 736 56 50 46, e-mail: steffen.faeldt@wartsila.com

1.5 Agreed Specifications
This agreement covers all software and support services for a STM compatible system in the STM Balt
Safe Project,

1.6 Scope
A STM compatible system shall in the STM Balt Safe project be a system that fulfill the requirements
in the attached list. A system might be a software upgrade to an ECDIS or a stand alone unit
compatible to an ECDIS with the capability to retrieve and send RTZ.

1.7 Agreement documents
In the event of the documents relating to the Agreement refers to or contains conflicting general terms
and conditions, these documents shall prevail as follows:

1. Written changes and additions to this Framework
2. This Framework with accompanying appendices
3. The request for a tender with accompanying appendices
4. The tender, including any clarifications
5. IT & Telekomföretagens - IT Project, version 2014, General terms and conditions, applies unless
   otherwise stipulated in this agreement

No other documents besides the above apply.

If the Supplier has and/or applies any "General terms and conditions of contract" or equivalent, these
have been rejected by the SMA, meaning that through this Contract the Parties have expressly agreed to exclude all such terms and conditions.

1.8 Changes and additions
All changes and additions must be in writing and agreed by all parts.

Notices required to be given by one party to another shall be in the English language unless expressly agreed otherwise and shall be deemed properly given if reduced to writing and personally delivered or sent by registered or certified post to the address below, postage prepaid, or by fax or e-mail with confirmation of receipt in the same manner and shall be effective upon receipt.

Unless specified elsewhere in the Contract, all notices and requests shall be addressed as follows:

<table>
<thead>
<tr>
<th>SMA</th>
<th>Supplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name: Michael Roxin</td>
<td>Name: Steffen Fälldt</td>
</tr>
<tr>
<td>Phone: +46 010-47 86461</td>
<td>Phone: +46 (0) 736 56 50 46</td>
</tr>
<tr>
<td>e-mail: <a href="mailto:michael.roxin@sjofartsverket.se">michael.roxin@sjofartsverket.se</a></td>
<td>e-mail: <a href="mailto:steffen.faeldt@wartsila.com">steffen.faeldt@wartsila.com</a></td>
</tr>
</tbody>
</table>

1.9 "System" responsibility
The Supplier shall have responsibility for the fully satisfactory function of the complete "system" throughout the test period. The Supplier shall have full responsibility for design even if design proposals are put forward by SMA. SMA's approval of drawings, designs or products and services does not constitute a discharge of the Supplier from his design and System responsibility.

1.10 Suppliers undertakings
The Supplier undertakes to design, develop, install and supply the "system" in 50 vessels as minimum, fully compliant with the tendering documentation, educate vessels command and to maintain those systems operational throughout the project time.

The undertaking includes all undertaking described in the tender documents.

The Supplier is also responsible for managing any required implementation activities, training and giving advice in how the System should be used to reach the best quality and efficiency. The scope of delivery (as set forth in Supplier's Draft Project Management Plan) should include support and maintenance.

The Supplier is fully responsible for a fully setup System ready for deployment, and fully responsible for deploying the System. The delivery includes all components, software, for the System.

The Supplier is fully responsible for support during project time.

1.11 Specifications
The Supplier shall deliver the "system" in accordance with this Contract.
1.12 Delivery requirements
The Supplier will cooperate with all parties involved in the Implementation Project as well as SMA.

The Implementation Project will be executed in close cooperation with SMA to assure that the high quality in the System and deployment is achieved.

In no event shall Supplier be liable for any acts or omissions of any third party under the present Contract other than Supplier’s subcontractors.

1.13 SMA:s undertaking and responsibilities
The Swedish Maritime Administration will provide VIS (Voyage Information Service) instance, expertise and documentation on how to use the private side for integration.

SMA is responsible for the following undertakings:

SeaSWIM central services
- Service Registry including examples, templates and descriptions for use
- Identity Registry including examples, templates and descriptions for use

SeaSWIM connector (SSC) (three alternatives depending on tenders preference)
- SSC implementation run by SMA (to facilitate the test bed), requires SMA VIS or SPIS (Ship and Port Information Service)

Voyage Information Service (three alternatives depending on tenders preference)
- VIS implementation run by SMA (to facilitate the test bed)

During the project we will keep up support for the ships through the Gothenburg Shore Center. There will be a special instance called Baltic Shore center during the STM Balt Safe project period.

Baltic shore center
- Are a possible test partner.

Will encourage the connected ships to use the services available for each ship.
- Can be a support in usage if an ECDIS is placed in Gothenburg.

Gothenburg shore center Baltic shore center
- Are a possible test partner.
- Will encourage the connected ships entering to the Baltic, to use the services available in The Baltic
- Support how to use the different STM services available in the Baltic.
Technical support.

- Host developers forum
- Maintain and update Developers Forum online with all technical specifications.
- Analyse log files and put together statistics.

1.14 Project overview
The Implementation Project includes all activities to reach final acceptance. It includes Project management, product training and solving problems identified during acceptance tests.

1.15 Final acceptance
The Supplier shall carry out the system installation of update to 2.0. After completion of each tested and verified installation, the Installation Test Protocol shall be sent to SMA for approval.

1.16 Delivery and Payment

<table>
<thead>
<tr>
<th>Milestone 1</th>
<th>Installation of STM 1.0</th>
<th>2020-07-01</th>
<th>if approved installation, 30% of the purchase price can be invoiced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milestone 2</td>
<td>System Design Review</td>
<td>2020-09-01</td>
<td></td>
</tr>
<tr>
<td>Milestone 3</td>
<td>FAT</td>
<td>2020-10-31</td>
<td></td>
</tr>
<tr>
<td>Milestone 4</td>
<td>SAT</td>
<td>2020-11-30</td>
<td></td>
</tr>
<tr>
<td>Milestone 5</td>
<td>Final acceptance, all ships updated to 2.0</td>
<td>2021-01-31</td>
<td>if approved final acceptance, 70% of the purchase price can be invoiced</td>
</tr>
</tbody>
</table>

1.17 Actual acceptance date
Provided that SMA does not reject the system or part thereof, the actual acceptance date shall be deemed to be the day the system or part thereof (as the case may be) is accepted by SMA. SMA’s issuance of a written acceptance will serve as evidence of SMA’s acceptance.

1.18 Ownership after acceptance
Ownership after acceptance shall be the property of the supplier
1.19 Delay
If deliveries are delayed according to the stated times in the timetable, and these delays are caused by the supplier, a discussion will be held between the parties. If the supplier cannot perform the deliveries within a reasonable time after that, SMA has the right to terminate the contract.

1.20 Release notes, test reports and installation guide
Release notes shall include, but not limited to; platform releases feature releases, bug fix releases and upgrade notes, test reports and installation guide shall always be attached to deliveries of software, new releases and patches.

1.21 Price
All local taxes and duties, if any, are included in the prices as listed in the Contract. VAT is excluded.
Total cost per installation: 4 200 EUR per vessel.

1.22 Invoicing
Payment shall be made in Euro (EUR)

Invoices from the Supplier shall be accompanied by relevant and detailed specifications clearly identifying on an item-by-item basis the purpose and scope of the delivery including the description, delivered quantity, agreed price and delivery time of each product and service.

Invoices shall always specify SMA’s Contract reference number as well as a reference number

1.23 Invoice adress
Payment must be made 30 days after the invoice approved by SMA
The supplier is not entitled to charge invoicing fees, handling fees or other fees which are not subject to law.

Invoice address is:

GSF
Sjöfartsverket
601 78 Norrköping

The invoice must state
- which agreement / order the invoice refers to and reference number,
- the contractor’s organizational and VAT registration number, the company’s registered office and information on the F-tax identification, and
- the contractor’s plusgiro, bankgiro or payment address.

Invoices that do not contain the above information will not be approved by SMA and will be returned
1.24 Title
All technical data of whatever kind, including all software and source codes with documentation necessary for operation, correction, modification and expansion produced by the Supplier or its subcontractor during the performance of this Contract shall be the property of the supplier.

1.25 Non-disclosure
If not stipulated otherwise in the agreement all Data and information relating to a Party’s business and activities that is disclosed by one Party to the other Party under this Contract shall be treated as confidential and proprietary by the other Party. Neither Party shall disclose such Data or information to any subcontractor, consultant or other third party unless such subcontractor, consultant or other third party has executed a confidentiality agreement with the Party for the direct benefit of the other Party protecting such Data and information.

The foregoing shall not apply to any information
- in the public domain; or
- which has been legally acquired from sources other than the other Party without confidentiality restrictions; or
- which is required to be disclosed under applicable mandatory law, final and legally enforceable order of any competent court or regulatory body or similar provisions.

1.26 Infringement of intellectual property rights
If not stipulated otherwise in the agreement the supplier shall indemnify and hold SMA harmless in respect of any damages, costs and other expenses, which may arise for SMA as a result of any claim due to any alleged infringement of intellectual property rights as a consequence of manufacture or use of the system.

The supplier shall not be liable for infringement pursuant to the preceding paragraph to the extent that such infringement is directly attributable to materiel supplied by SMA or to solutions or procedures prescribed by SMA contrary to the Supplier’s written objection.

The Supplier and SMA shall keep each other informed of claims arising from intellectual property rights. If infringement occurs, the Supplier shall, in addition to what is stated in the first paragraph, at its own expense either modify the System so that infringement no longer occurs, or reach an agreement with the holder of the infringed intellectual property rights.

If the system is modified, the Supplier shall be responsible for ensuring that its agreed function, performance and utility remains unaffected and that there will be no cost increase for its future use.

If a claim is made against SMA in respect of an alleged infringement of any third party’s intellectual property rights, the Supplier shall at its own expense participate in any court proceedings where an action is brought against SMA and for such purpose, as well as otherwise, assist SMA to the best of its ability in the case of alleged infringement of any intellectual property rights.

Supplier will have no obligation to indemnify SMA with respect to any infringement claim based upon any use of the system in combination with other products, equipment, software, or data not supplied by the supplier, unless the infringement is attributable to the System itself and not the act of combination stated above.
1.27 Liability

Unless otherwise provided by other paragraphs in this contract, each Party shall be liable for loss or damage to its property, injury to or death of any of its employees or other person for whom the Party is responsible.

Each Party shall be liable for direct damage to property of third parties or personal injury, including death, in accordance with the applicable law, if caused by the Party, its personnel and/or its subcontractor(s) engaged in carrying out this Contract and shall indemnify and hold harmless the other Party accordingly.

If claim for damages pursuant to this Clause is made by a third party against either of the parties, said party shall immediately so notify the other party in writing. Neither Party shall be liable to pay any compensation to the other Party either for loss of profit, production drop-out or any other consequential or indirect loss.

The Supplier's maximum liability under this Contract shall be limited to the Contract Price.

No party shall be responsible for any indirect or consequential loss or similar damages such as, but not limited to, loss of profit, loss of revenue or loss of contracts, provided such damages was not caused by a wilful act or gross negligence.

1.28 Insurance

The supplier shall hold adequate liability insurance for its operations throughout the agreement. The insurance amount should be at least the total value of this agreement.

1.29 Force Majeure

The following circumstances shall be deemed to constitute grounds for discharge from performing the Supplier’s obligations under this Contract if they occur after the Contract has been entered into and the due performance of the Contract is thereby prevented and it may not be considered that the Supplier ought to have taken such circumstances into account at the time of entering into the Contract whose consequences could not reasonably have been avoided or circumvented by the Supplier: general labour conflict and any other circumstances, such as fire, war, mobilization or unforeseen military callup of corresponding extent, requisition, seizure, insurrection and riot, general shortage of qualified labour, general scarcity of means of transport, general shortage of goods, general and enduring restrictions on the supply of motive power, as well as delay in deliveries from Subcontractors as a consequence of circumstances falling within the scope of this Clause, where the Supplier or subcontractor has not caused or contributed to such obstacle.

The aforesaid shall also apply in respect of undertakings, which it is SMA’s duty to perform.

In the event that a Force Majeure event described above prevents a Party from performing its obligations under this Contract for a period exceeding three (3) months, each Party shall be entitled to terminate the Contract and the following shall apply: SMA shall pay to the Supplier the Contract price for work completed as well as the costs of material and labour used for work uncompleted at the time of such termination, less any payments received for such work; and the Contract or shall deliver to SMA upon request any work so paid for.
1.30 Disputes

1.30.1 Applicable law
This Contract shall be governed by and interpreted in accordance with the laws of Sweden.

Any dispute, controversy or claim arising out of or in connection with this Contract shall be settled by a Swedish court of law in accordance with the laws of Sweden.

1.31 Amendments
Amendments or alterations have to be made in writing and signed by both Parties in order to be valid.

1.32 Transfer of agreement
The Supplier does not have the right to fully or partly transfer the agreement to a third party without the SMA’s written consent.

The Supplier does not have the right, without the SMA’s written permission, to transfer debts or other claims (including, inter alia, claims for damages) related to this agreement to any third party.

1.33 Subcontractors
The supplier may obtain written consent from the customer to engage subcontractors to carry out part of the work if necessary. Consent requires that the subcontracting company satisfies all the subcontractor requirements made by the customer. The supplier is responsible for the subcontractor’s work as well as for their own.

1.34 Termination
SMA shall be entitled to terminate all or part of this Contract with immediate effect if:

a) The acceptance of the Milestones occurs later than the agreed dates and the delay for an individual Contractual Milestone has lasted more than three (3) months or the aggregate delay has lasted more than six (6) months and this is not due to Force Majeure, SMA or circumstances for which SMA is responsible and if such delay is attributable to the Supplier, or

b) enforcement by a legal authority of a judgement or an enforceable decision of any other kind has shown the Supplier to be lacking the means of making full payment of a claim which is the subject of the judgement or decision, has suspended payments, a system has been made to a court or a public authority for corporation restructuring regarding the Supplier pursuant to a legislation act or the Supplier has been declared bankrupt, or

c) the Supplier fails to comply with any other obligation of this Contract and this may be regarded as constituting a substantial breach of Contract. In case of termination for default, SMA shall be entitled to claim damage compensation in accordance with this contract and to a refund of payments made prior to the termination for default.

The Supplier may terminate this Contract in whole or in part if SMA substantially fails to perform its obligations under the Contract. Any Supplier termination for default shall become effective 90 (ninety) days following written notice of the event, unless the event has been cured within such notice period.
In case of termination for default, the Supplier shall be entitled to claim damage compensation in accordance with this Contract.

Any Party claiming breach of Contract shall take all measures necessary to limit the loss or damage arising insofar as this is possible without incurring unreasonable expense and inconvenience.

SMA also have the right to terminate this Contract with immediate effect if:

- the Contract has been changed in way that is prohibited according to the Swedish Public Procurement Act (2016:1145) chapter 17 §§ 9-14,

- at the time of Contract assignment the Contractor meet any of the obligatory grounds for exclusion according to the Swedish Public Procurement Act (2016:1145) chapter 13 §1 and thus should have been excluded from the procurement, or

- The Court of Justice of the European Union in a procedure according to article 258 of the Treaty on the Functioning of the European Union declares that Sweden, by way of allowing SMA to enter into the Contract, has violated its obligations regarding the European Union, the Treaty on the Functioning of the European Union or 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.

1.35 Assignment
Neither Party shall be entitled without the other Party’s written consent to put another party in its place, with the proviso, however, that SMA shall be entitled to assign all or part of the Contract to its legal successor(s) or an authority, agency, state enterprise or company wholly or partly owned by the Swedish State.

1.36 Signing
This agreement has been created in two identical copies, one for each party involved. The contract is valid when signed by both parties.

Signatures of authorized parties:

<table>
<thead>
<tr>
<th>Buyer</th>
<th>Contractor/Supplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Swedish Maritime Administration</td>
<td>Wärtsilä Voyage Limited</td>
</tr>
<tr>
<td>Location/Date: Malmö 2020-01-02</td>
<td>Location/Date: Göteborg 2003-11</td>
</tr>
<tr>
<td>Signature: Anders Holmberg</td>
<td>Signature: Jörn</td>
</tr>
<tr>
<td>Print name: Leif Puchner Direc.</td>
<td>Print name: Steffen Fälldt</td>
</tr>
<tr>
<td>Role: Managing Director/Area sales manager</td>
<td>Role: Managing Director/Area sales manager</td>
</tr>
</tbody>
</table>