Headquarters Supreme Allied Commander Transformation
Norfolk Virginia

AMENDMENT 1

REQUEST FOR INFORMATION RFI-ACT-SACT-21-124

This document contains a Request for Information (RFI) Call to Nations, Industry and Academia in support of NATO's Maritime Science and Technology Capability Programme Plan (Mar S&T CPP).

Nations and Suppliers wishing to respond to this RFI should read this document carefully and follow the guidance for responding.

This RFI is open to NATO Nations and industry or academia located in NATO Nations

General Information	
Request For Information No.	**2021-124**
Project Title	Request for Nations, Industry and Academia input to provide information related to NATO Maritime Science and Technology Programne Plan
Contracting Office Address	NATO, HQ Supreme Allied Commander Transformation (SACT) Purchasing & Contracting Suite 100 7857 Blandy Rd. Norfolk, VA, 23511-2490
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All request for clarifications and responses to this RFI have to be sent via email to all Points of Contact reported above	

1. Description

1.1. HQ Supreme Allied Commander Transformation (HQ SACT) is issuing this Request for Information (RFI).

1.2. This is a Request For Information (RFI) only. The scope of this RFI is to involve Nations, Industry and Academia through collaboration, in an examination of available capabilities related to scientific equipment, development of maritime S&T prototypes/demonstrators, science and technology naval campaign and trials at sea, Information Technology and Networks. The focus of this RFI is on technologies, products, services and all functions that could enable the planning and delivery aspects of the capability life cycle.

1.3. This RFI DOES NOT constitute a current Request for Proposal (RFP) nor a commitment to issue a future RFP. HQ SACT is not seeking proposals at this time. Therefore, HQ SACT will not accept unsolicited proposals in respect of this RFI. Responders note that HQ SACT will not pay for any information or administrative costs incurred in responding to this RFI. All costs for responding to this RFI shall be borne solely by the responding

vendor. Not responding to this RFI does not preclude participation in any future RFP if issued.

2. Program vision and desired effects

2.1 Vision

The Maritime Science and Technology Program is to provide continuous improvement of the collective maritime S&T knowledge required to inform NATO and national capability development, hence meeting NATO's collective and national targets and reaching NATO's overall level of ambition, credibility and deterrence posture.

2.2 The Maritime S&T Programme aims to

- Provide an improved, state of the art focal point for innovative NATO Maritime S&T.
- Provide NATO with cutting-edge knowledge, support and experimental infrastructure.
- Provide ACT, as NATO's warfighting development command, and acquisition professionals alike, the means (such as Infrastructure, CIS and technology) to fulfil its NATO S&T mission.
- Enhance interoperability across NATO Enterprise Maritime S&T stakeholders.
- Demonstrate and test concepts in an operational setting.
- Expose new technologies to operators and operational feedback to scientists.
- Enable cross-disciplinary research, novel application of advanced technologies, and exploration of new operational concepts through experimentation, with warfighters in the loop, at major NATO exercises.
- Enable demonstrations of transformational capabilities applied to high priority military missions such as Anti-Submarine Warfare and Naval Mine Warfare.
- Assure effective generation of NATO-owned and releasable Lessons Learned from experimentation and trials.
- Maintain and ensure access for NATO Enterprise stakeholders to maritime S&T data.
- Provide the required development and validation of tools and standards needed by NATO and Allied Nations.

3. Background

3.1 HQ SACT is seeking information to discover what is immediately available, the art-of-the-possible and state-of-the-art with respect to technologies, products or services, as well as their integration, in the following areas:

- Scientific Equipment (reference annex: ALPHA)
- Prototypes and demonstrators development (reference annex: BRAVO)
- Research and experimentation at sea (reference annex: CHARLIE)
- Information Technology and Networks (reference annex: DELTA)

3.2 The Maritime S&T Capability Programme is at Capability Programme Plan (CPP) stage. This phase of the NATO Common-Funded Capability Delivery Governance Model (CFCDGM) examines and confirms the means and methods that are best suited to update or upgrade the existing Capability within scope, cost and schedule and establish a programme to drive the transformational change.

3.3 Amongst other aims, the CPP is intended to determine the viability of a range of potential courses of action to address the requirement, including consideration of the possibility of

"Adopt"-ing (an existing solution already in-service by Nations), "Buy"-ing (acquiring a solution from industry), or "Create"-ing (developing a solution exclusive to NATO needs), or a combination thereof. In the case of Buy or Create, solutions possibly delivered either through a NATO agency or through a Nation acting as the subsequent Project Plans Host Nation. Courses of action allow validation of the requirement through any of the NATO-recognized lines of development including doctrine, organization, training, materiel (including services), leadership, personnel, facilities and interoperability. The viability of the courses of action comprises an assessment of the effectiveness, affordability, and risks (including technical maturity).

3.4 To apply due diligence in discovering courses of action in support of the CPP, a RFI is necessary to 'test the market' and determine relevant technologies and products or services that may exist or could be created within Nations and the commercial market (as part of the consideration of "Adopt, "Buy or Create"). This request intends to identify prospective (sub-) systems or products/services for which the team may need to conduct additional in-depth discussions. This is not a formal request for submissions as part of a procurement. It is intended to determine whether any possible systems or products exist, which should be identified during the development of the CPP.

3.5 **Intent/Objectives:** To support transformational change, the CPP needs a robust assessment of potential courses of action across Adopt, Buy, and Create. This RFI's intent is to offer Nations, industry and academia an opportunity to provide data that would allow NATO to determine potential benefits they might receive from a product or service.

3.6 **Expected benefits to respondents:** Nations, industry and academia participants will have the chance to reveal state-of-the-art technologies and products to NATO.

3.7 **Expected Benefits to NATO:** Exposure to, and understanding of, state of the art technological and systemic drivers to conduct future maritime Science and Technology within NATO.

3.8 **Expected input from Nations/industry/academia:** The expected input to this RFI is that Nations, industry and academia provide perspective on relevant and current emerging technologies and products, and provide a Rough Order of Magnitude (ROM) of costs for investment and for Operation and Maintenance (O&M).

4. Requested Information

4.1 This RFI consists of 22 individual RFI elements broken down in the specific categories below. Nations, industry and academia can provide information that addresses one or more of the below RFI elements:

ANNEX ALPHA Scientific Equipment

- RFI-A1: Possible provision of large/medium Autonomous Underwater Vehicles (AUV)
- RFI-A2: Possible provision of small portable Autonomous Underwater Vehicles (AUV)
- RFI-A3: Possible provision of medium Unmanned Surface Vehicles (USV)
- RFI-A4: Possible provision of small Unmanned Surface Vehicles (USV)
- RFI-A5: Possible provision of unpowered/optionally powered surface wave gliders/sailing craft
- RFI-A6: Possible provision of small Unmanned Autonomous System (UAS)

- RFI-A7: Possible provision of modern underwater gliders
- RFI-A8: Possible provision of novel sensors suitable for Anti-Submarine Warfare, Naval Mine Warfare or oceanographic underwater navigation applications

ANNEX BRAVO Prototypes and demonstrators development

- RFI-B1: Possible provision of test bed systems for underwater sensors and vehicles
- RFI-B2: Possible provision of Persistent Virtual Modelling & Simulation Laboratory
- RFI-B3: Possible provision of Prototyping Laboratory

ANNEX CHARLIE Research and experimentation at sea

- RFI-C1: Possible provision of new Global Research Vessel
- RFI-C2: Possible provision of new Ocean/Regional Research Vessel
- RFI-C3: Possible provision of new Coastal Research Vessel
- RFI-C4: Possibility to charter a Global Research Vessel for Arctic region
- RFI-C5: Possibility to charter a Regional Research Vessel in northern Europe or Mediterranean/Black Sea
- RFI-C6: Possibility to charter a Coastal Research Vessel in northern Europe or Mediterranean/Black Sea
- RFI-C7: Possible provision of a containerized Science and Technology system
- RFI-C8: Possible provision of Edge computing kits for at-sea experimentation

ANNEX DELTA Information Technology and Networks

- RFI-D1: Possible provision of a Hyperconverged Computing Infrastructure (HCI) for ML/AI and Big Data Analytics - hybrid cloud capability
- RFI-D2: Possible provision of High Performance Computing Facility (HPCF) capability for Advanced Environmental Analytics
- RFI-D3: Possible provision of a Virtual Desktop Infrastructure – Enterprise VDI and mobile workforce

4.2 White Paper. Nation, Vendor companies and organizations shall provide one white paper, of no more than five pages, for each RFI elements listed above at paragraph 4.1.

4.3 Each white paper should be clearly indicate which RFI element it refers to (e.g. “response to RFI-A1”) and it should respond only to requested information indicated in the RFI reference annex.

4.4 Any and all information provided as part of the submission in response to this RFI may be considered in developing any future HQ SACT requirements.

4.5 Any proprietary information is to be minimized and clearly marked

4.6 All submissions become HQ SACT property and are not returnable.

4.7 The white papers shall be sent in both Microsoft Word for Office and Portable Data Format (pdf) for a total size not exceeding 5MB.

4.8 The white papers shall not contain classified information.

4.9 White Paper Addendum. The white paper shall include the following information in a separate attachment, which will not be included in the 5-page limitation:

- Company or organization name
- Complete mailing address
- Overnight delivery address (if different from mailing address)
- Phone number
- Fax number
- E-mail address of designated point of contact

4.10 HQ SACT reserves the right to seek clarification on the submissions.

5. Clarifications and Questions & Answers (Q&A) sessions

5.1 Request for clarifications and questions regarding this RFI shall be submitted via email to aforementioned POCs no later than November 19th, 2021. Emailed questions shall NOT contain proprietary and/or classified information. HQ SACT, to ensure transparency, will publish, before the scheduled Q&A sessions, all responses on HQ SACT P&C website at: www.act.nato.int/contracting. HQ SACT will conduct two online collaborative question and answer (Q&A) sessions (link: sactconferenceroomgotowebinar500@act.nato.int) on November 30th and on December 2nd, 2021 (time frame: 0900-1100 EST | 1400-1600 GMT | 1500-1700 CET) to provide further clarification regarding responses published on HQ SACT P&C website (www.act.nato.int/contracting). Q&A sessions will be also recorded and made available to all on HQ SACT P&C website.

6. Response Date

6.1 **White papers are due no later than 9:00 am EST on February 21, 2022**. Responses should be submitted electronically on company letterhead to all aforementioned POCs.

7. Non-disclosure principles and/or nondisclosure agreement (NDA) with third party company

7.1 Please be informed that HQ SACT may contract a company to conduct the Analysis of Alternatives investigation in support of this project. HQ SACT will follow nondisclosure principles and possibly conclude an NDA with that company to protect submitted information from further disclosure. As the third party beneficiary of this nondisclosure, this RFI serves to inform you of how HQ SACT plans to proceed and of HQ SACT's intent to protect information from unauthorized disclosure, requiring the third party company to protect the disclosed information using the highest degree of care that the company utilizes to protect its own Proprietary Information of a similar nature, and no less than reasonable care. This includes the following responsibilities and obligations:

The third party company receiving the information shall not, without explicit, written consent of HQ SACT:

- Discuss, disclose, publish or disseminate any Proprietary Information received or accessed under nondisclosure principles and subject to an NDA, if an NDA is concluded;
- Use disclosed Proprietary Information in any way except for the purpose for which it was disclosed in furtherance of the goals of the instant project, collaboration, activity or contract; or
- Mention the other Party or disclose the relationship including, without limitation, in

marketing materials, presentations, press releases or interviews.

Exceptions to Obligations. The third party company receiving the information may disclose, publish, disseminate, and use Proprietary Information:

- To its employees, officers, directors, contractors, and affiliates of the recipient who have a need to know and who have an organizational code of conduct or written agreement with the recipient requiring them to treat the disclosed Proprietary Information in accordance with nondisclosure principles and the NDA (if executed);
- To the extent required by law; however, the company receiving the information will give HQ SACT prompt notice to allow HQ SACT a reasonable opportunity to obtain a protective order or otherwise protect the disclosed information through legal process; or
- That is demonstrated in written record to have been developed independently or already in the possession of the company receiving the information without obligation of confidentiality prior to the date of receipt from HQ SACT; that is disclosed or used with prior written approval from HQ SACT; obtained from a source other than HQ SACT without obligation of confidentiality; or publicly available when received.

7.2 Any response to this RFI is considered to establish consent to this process. A copy of the NDA, if or when concluded, can be provided on request.

8. Organizational Conflicts of Interest.

8.1 Companies responding to this RFI and companies conducting Analysis of Alternatives are hereby placed on notice responding to this RFI could conceivably create an organizational conflict of interest (OCI) on a future procurement, if a future procurement were to occur within the capability development process. Companies are cautioned to consider OCI when responding to this RFI, and to consider internal mitigation measures that would prevent OCI's from adversely affecting a company's future procurement prospects. OCI's can often be mitigated or prevented with simple, early acquisition analysis and planning and the use of barriers, teaming arrangements, internal corporate nondisclosure policies and firewalls, and similar prophylactic measures. HQ SACT is not in a position to advise responding companies on the existence of OCI or remedial measures, and encourages responding companies to consult internal or external procurement and legal consultants and in-house counsel.

9. Summary

THIS IS A REQUEST FOR INFORMATION (RFI) ONLY with the purpose of involving Nations, industry and academia in the examination of available capabilities related to NATO Maritime S&T with a focus on technologies, products, services and all functions that could enable the planning and delivery aspects of the capability life cycle. The information provided in this RFI is subject to change and is not binding on HQ SACT. HQ SACT has not made a commitment to procure any of the items described herein and release of this RFI shall not be construed as such a commitment, nor as authorization to incur cost for which reimbursement will be required or sought. To reiterate, this is a RFI and not a RFP of any kind.

REQUESTED INFORMATION

This ANNEX ALPHA contains the following requests of information (further specified in the document)

RFI-A1: Possible provision of large/medium Autonomous Underwater Vehicles (AUV)
RFI-A2: Possible provision of small (portable Autonomous Underwater Vehicles (AUV)
RFI-A3: Possible provision of medium Unmanned Surface Vehicles (USV)
RFI-A4: Possible provision of small Unmanned Surface Vehicles (USV)
RFI-A5: Possible provision of unpowered/optionally powered surface wave gliders/sailing craft
RFI-A6: Possible provision of small Unmanned Autonomous System (UAS)
RFI-A7: Possible provision of modern underwater gliders
RFI-A8: Possible provision of novel sensors suitable for Anti-Submarine Warfare, Naval Mine Warfare or oceanographic underwater navigation applications

RFI-A1: Possible provision of large/medium Autonomous Underwater Vehicles (AUV)

a. General setting

AUV is to be designed as a platform for scientific and technological experiments:

(1) Test
- New and existing sensors in different payload configurations
- Autonomy and underwater communications
- Experimental tactics applicable to Anti-submarine or Naval Mine Warfare

(2) Gather environmental data during oceanographic missions/campaigns

The reference areas of operation would be the North Atlantic Ocean, Baltic Sea, Mediterranean Sea, Black Sea and Arctic Sea.

b. Requirements

(1) Vehicle and Command and Control modules shall be stored and deployable in standard containers with a maximum dimension of 40ft ISO Standard
(2) Maximum operating depth shall not be less than 1000 meters (ideally up to 3000m)
(3) Endurance: not less than 4 days operating at least 90% underwater at optimum operating speed
(4) Range: capable of operating underwater consecutively for 72hours
(5) Capability to tow an acoustic array (reference specification: cardioid, 100 meters length, 6cm wide, neutral buoyancy)
(6) Modular design and setting for reconfiguration at least once per year
(7) Maximum speed: not less than 4kts
(8) Very precise control and navigation (with high end INS) sufficient to support high quality SAS processing
(9) Requested payload is to include the following modules:
- High resolution interferometric Synthetic Aperture Sonar (SAS)
- Sensors for gathering CTD (conductivity, temperature & depth)
- Towed array for ASW applications
- Multi beam sonar
- Acoustic and radio modems
- Underwater optical and/or acoustical camera

(10) Advanced payload configuration* modules are to be proposed taking into account the following main sensing categories:
- Acoustic (e.g. passive and active monostatic and multi-static signal detection)
- Magnetic (underwater target detection/variation), e.g. quantum effect magnetometer.
- Electric (underwater target detection/variation), e.g. quantum effect.
- Chemical (water profiling and pollution detection)
- Optics (water clarity)
- Advanced navigation in deep water and operation in anti-access area denial environment (e.g. GPS denial)

(11) Capability to integrate elements build by a 3rd party using open architecture.

c. Requested Information

i. Capability to supply the AUV wholly or in part per requested requirements specifying those of which cannot be satisfied or have operating limitations affecting desired performance

* mainly focused on AntiSubmarine Warfare and Naval Mine Counter Measure

ii. Payload configurations proposal with respect to reference requirement (9) and (10)
iii. Performance, limitations and specifications in terms of: underwater navigation denoted by accuracy as a percentage of distance covered, propulsion, on-board electric power and both underwater and surface communications
iv. Cost estimation to supply the proposed AUV and estimated time of delivery once project is commissioned
v. Estimated 10 year costs for each of the following: (1) operation, (2) yearly re-configurations and (3) standard maintenance plan.
vi. Company's references to include business relationship with NATO Countries' governmental entities (providing Point of Contact and email address), previous and/or in progress deliveries of similar design and magnitude including estimated and final completion timelines

RFI-A2: Possible provision of compact lightweight Autonomous Underwater Vehicles (AUV)

a. General setting

AUV is to be designed as a platform for scientific and technological experiments with the capability to:

(1) test
- New sensors in different payload configurations
- Autonomy and underwater communications
- Experimental tactics applicable to Anti-submarine or Naval Mine Warfare

(2) gather environmental data during oceanographic missions/campaigns

The areas of operation would be North Atlantic Ocean, Baltic Sea, Mediterranean Sea, Black Sea, and Low Latitude Arctic Sea (encompassing Marginal Ice Zone).

b. Requirements

(1) Vehicle and Command and Control modules designed to store all components in deployable transport cases for on-demand operations
(2) Maximum operating depth: not less than 100 meters
(3) Endurance: not less than 6 hours operating at least 90% underwater at optimum operating speed
(4) Range: capable to operate underwater consecutively for 4 hours at 3kts
(5) Modular design and setting to be re-configured at least once per year
(6) Maximum speed: not less than 4kts
(7) Requested payload shall include the following modules:
- High resolution interferometric Synthetic Aperture Sonar (SAS) or Side Scan Sonar
- Imaging sonar—Forward Looking Sonar (FLS)
- Optical and/or acoustic cameras
- CTD (conductivity, temperature & depth) sensors
- Acoustic and radio modems

(8) Modules for advanced payload configurations are to be proposed taking into account the following main sensing categories:
- Acoustic (e.g. active multi-static signal receiver or passive acoustic vector sensor)
- Magnetic (underwater target detection/variation), e.g. quantum effect magnetometer.
- Electric (underwater target detection/variation), e.g. quantum effect.
- Modules for advance navigation including operation in anti-access area denial environment (e.g. GPS denial)
- Optics (water clarity)
- Chemical (water profiling and pollution detection)

(9) Capable of hovering with 5 degrees of freedom (surge, sway, heave, yaw, pitch) for close target Inspection
(10) Capability to integrate elements build by a 3rd party using open architecture

c. Requested Information

i. Capability to supply the AUV wholly or in part per requested requirements specifying those of which cannot be satisfied or have operating limitations affecting desired performance
ii. Payload configurations proposal (reference requirements (7) and (8))

iii. Performances, limitations and specifications of the proposed AUV in terms of: underwater navigation, propulsion, on board electric power and both underwater and surface communications
iv. Cost estimation to supply the proposed AUV and estimated time of delivery once project is commissioned
v. Estimated 10 year costs for each of the following: (1) operation, (2) yearly re-configurations and (3) standard maintenance plan.
vi. Company's references to include business relationship with NATO Countries' governmental entities (providing Point of Contact and email address), previous and/or in progress deliveries of similar design and magnitude including estimated and final completion timelines

RFI-A3: Possible provision of medium Unmanned Surface Vehicle (USV)

a. General setting

USV is to be designed as a surface platform for scientific and technological experiments with the capability to:

(1) test
- New sensors in different payload configurations
- Autonomy and underwater communications
- Experimental tactics applicable to Anti-submarine or Naval Mine Warfare

(2) gather environmental data during oceanographic missions/campaigns

The reference areas of operation would be North Atlantic Ocean, Baltic Sea, Mediterranean Sea, Black Sea and Arctic Sea.

b. Requirements

(1) Vehicle and Command and Control modules shall be stored and deployable in standard containers with a maximum dimension of 40ft ISO Standard
(2) Maximum operating condition: not less than Sea State 4
(3) Endurance: not less 4 days at optimum operating speed
(4) Range: capable to sail without replenishment for 800 NM
(5) Capability to tow an acoustic array (reference specification: cardioid, 100 meters length, 7cm wide, neutral buoyancy)
(6) Capability to tow an acoustic source/receiver combination (SAS sled)
(7) Capability to deploy Active Dipping Sonar (during loiter mode)
(8) Modular design and setting to be changed at least once per year
(9) Maximum speed: not less than 10kts
(10) Requested payload is to include the following modules:
- High resolution Synthetic Aperture Sonar sled (SAS)
- Sensors for gathering CTD (conductivity, temperature & depth)
- Active dipping sonar
- Radio and acoustic modems
- Multi beam sonar

(11) Modules for other advanced payload configurations are to be proposed taking into account the following main sensing categories:
- Acoustic (e.g. passive and active multi-static signal detection)
- Magnetic (underwater target detection/variation), e.g. quantum effect magnetometer.
- Electric (underwater target detection/variation), e.g. quantum effect.
- Chemical (water profiling and pollution detection)
- Electromagnetic (electronic warfare support, monitor channel activity)
- Operation in anti-access area denial environment (e.g. GPS denial)

(12) Capability to integrate elements build by a 3rd party using open architecture

c. Requested Information

i. Capability to supply the USV matching all or part of the reported requirements (specifying which requirements cannot be satisfied)
ii. Payload configurations proposal (reference requirement (10) and (11))
iii. Performances, limitations and specifications of the proposed USV in terms of: underwater navigation, propulsion, on board electric power and both underwater and surface communications
iv. Cost estimation to supply the proposed USV and estimated time of delivery once project is commissioned
v. Estimated 10 year costs for each of the following: (1) operation, (2) yearly re-configurations and (3) standard maintenance plan
vi. Company's references to include business relationship with NATO Countries' governmental entities (providing Point of Contact and email address), previous and/or in progress deliveries of similar design and magnitude including estimated and final completion timelines

RFI-A4: Possible provision of small (less than 4 m) Unmanned Surface Vehicles (USV)

a. General setting

USV is to be designed as a surface platform for scientific and technological experiments:

- Test new sensors in different payload configurations
- Test autonomy
- Provide acoustic to RF gateway services
- Test experimental tactics applicable to Anti-submarine or Naval Mine Warfare
- Gather environmental data in oceanographic missions/campaigns

The areas of operation would be North Atlantic Ocean, Baltic Sea, Mediterranean Sea, Black Sea, and Arctic Sea.

b. Requirements

(1) Vehicle and Command and Control modules designed to store all components in deployable transport cases/ISO standard containers for on-demand operations
(2) Maximum operating condition: Sea State 3
(3) Endurance: not less than 36 hours at optimum operating speed
(4) Range: capable to operate up to 400 NM
(5) Modular design and setting to be reconfigured at least once per year
(6) Maximum speed: not less than 10kts
(7) Class 1 dynamic positioning
(8) requested payload is to include the following modules:
   - High resolution Synthetic Aperture Sonar (SAS) or Side Scan Sonar sled
   - Imaging sonar
   - Sensors for gathering CTD (conductivity, temperature & depth)
   - Radio and Acoustic modems
(9) Modules for advanced payload configurations are to be proposed taking into account the following main sensing categories:
   - Acoustic (e.g. active multi-static signal receiver or passive acoustic vector sensor)
   - Magnetic (underwater target detection/variation), e.g. quantum effect magnetometer.
   - Electric (underwater target detection/variation), e.g. quantum effect.
   - Anti-access area denial environment (e.g. GPS denial)
   - Chemical (water profiling and pollution detection)
   - Electromagnetic (support electronic warfare, monitoring/exploitation of coastal radar)
(10) Capability to integrate elements build by a 3rd party using open architecture

c. Requested Information

i. Capability to supply the USV matching all or part of the reported requirements (specifying which requirements cannot be satisfied)
ii. Payload configurations proposal (reference requirement (8) and (9))
iii. Performances, limitations and specifications of the proposed USV in terms of: underwater navigation, propulsion, on-board electric power and underwater and surface communications
iv. Cost estimation to supply the proposed USV and estimated time of delivery once project is commissioned
v. Estimated 10 year costs for each of the following: (1) operation, (2) yearly re-configurations and (3) standard maintenance plan
vi. Company's references to include business relationship with NATO Countries'

governmental entities (providing Point of Contact and email address), previous and/or in progress deliveries of similar design and magnitude including estimated and final completion timelines

RFI-A5: Possible provision of unpowered/optionally powered surface gliders/sailing craft

a. General setting

Naturally powered or optionally powered platform surface gliders/sail vessel designed for scientific and technological experiments:

- Test new sensors in different payload configurations
- Test autonomy
- Provide acoustic to RF gateway services
- Test experimental tactics applicable to Anti-submarine and mine countermeasures
- Gather environmental data in oceanographic missions/campaigns

Areas of operation would be North Atlantic Ocean, Baltic Sea, Mediterranean Sea, Black Sea and lower-latitude Arctic Seas (encompassing Marginal Ice Zone).

b. Requirements

(1) System designed to store all components in deployable transport cases for on-demand operations
(2) Modular design and setting to be reconfigured at least once per year
(3) 14 day continuous operation
(4) Independent scientific payload power supply (10 kWh)
(5) Solar panels for power supply re-charging (100 W)
(6) Ability to station keep or sail tight (30m) watch circle
(7) Ability to operate up to Sea State 5
(8) Payload applications:
- Oceanographic and meteorological data gathering (wind speed, humidity solar irradiance, atmospheric pressure, CTD, fluorescence, optic backscattering, RF and acoustic noise, pollution indicators parameters, turbulence)
- Relay station (throughout acoustic and RF modems) between underwater and surface assets

(9) Capability to integrate elements built/configured by the NATO Centre for Maritime Research Centre utilizing open architecture/open source formats

c. Requested Information

i. Capability to supply the glider/craft matching all or part of the reported requirements and specifying which requirements cannot be satisfied
ii. Payload configurations proposal (reference requirement (8))
iii. Reference data regarding maximum operating depth, endurance and range
iv. Performances, limitations and specifications of the proposed glider/craft
v. Cost estimation to supply the proposed USV and estimated time of delivery once project is commissioned
vi. Estimated 10 year costs for each of the following: (1) operation, (2) yearly re-configurations and (3) standard maintenance plan
vii. Company's references to include business relationship with NATO Countries' governmental entities (providing Point of Contact and email address), previous

and/or in progress deliveries of similar design and magnitude including estimated and final completion timelines

RFI-A6: Possible provision of small Unmanned Aerial System (UAS)

a. General setting

UAS is to be designed for scientific and technological experiments; in such light, it is to be an aerial platform to:

(1) Test
- New sensors in different payloads configuration
- Experimental tactics applicable to Anti-submarine or Naval Mine Warfare or ISR in conjunction with surface and underwater assets (mainly operating as a relay station)

(2) Gather
- Environmental data in oceanographic missions/campaigns

Areas of operation would be North Atlantic Ocean, Baltic Sea, Mediterranean Sea, Black Sea and Arctic Sea.

b. Requirements

(1) Vehicle and Command and Control modules designed to store all components in deployable transport cases for on-demand operations
(2) Maximum operating altitude: no less than 1500 metres (5000ft)
(3) Range: not less than 15 km (8.1NM)
(4) Capable to operate on oceans/seas
(5) Autonomy rate: remote controlled from on board station or operating in fully autonomous mode.
(6) Endurance: capable of operating up to 12h in standard conditions.
(7) Payload is to include the following modules:
- High resolution optics
- Communication module to operate as relay station
- Multispectral

(8) Modules for advanced payload configurations* are to be proposed taking into account the following main sensing categories or area of application:
- Optic
- Night vision
- Electromagnetic (radar applications)
- Magnetic (minefield and/or submarine detection/variation)
- Air profiling and pollution detection
- Sensing for weather forecast and modelling
- Extended sensor for AIS signal receiving

(9) Capability to integrate elements build by a 3rd party using open architecture

c. Requested Information

i. Capability to supply the UAS matching all or part of the reported requirements (specifying which requirements cannot be satisfied)
ii. Payload configurations proposal (reference requirement (7) and (8))

iii. Performances, limitations and specifications of the proposed UAS in terms of: wind limits, propulsion, electric power, communications sub-system, requirement for launching/landing from/to afloat platforms, emergency recovering.
iv. Required skill/certification for controlling the vehicle when flying
v. Cost estimation to supply the proposed USV and estimated time of delivery once project is commissioned
vi. Estimated 10 year costs for each of the following: (1) operation, (2) yearly re-configurations and (3) standard maintenance plan
vii. Company's references to include business relationship with NATO Countries' governmental entities providing Point of Contact and email address, previous and/or in progress deliveries of similar design and magnitude including estimated and final completion timelines

RFI-A7: Possible provision of modern underwater glider

a. General setting

Gliders are to be designed as underwater platforms for scientific and technological experiments:

(1) Test
- New sensors in different payload configurations
- Autonomy and underwater communications
- Experimental tactics applicable to Anti-submarine

(2) Gather environmental data during oceanographic missions/campaigns

Areas of operation would be North Atlantic Ocean, Baltic Sea, Mediterranean Sea, Black Sea and Arctic Sea.

b. Requirements

(1) System designed to store all components in deployable transport cases for on-demand operations
(2) Modular design and setting to be reconfigured at least once per year
(3) payload: to proposed considering the following applications:
- Oceanographic data gathering (CTD, fluorescence, optic backscattering, acoustic noise, pollution indicators parameters)
- Capability to program behaviors
- Underwater rely station (throughout acoustic modem) among underwater assets

(4) Capability to integrate elements built/configured by the NATO Centre for Maritime Research Centre utilizing open architecture/open source formats

c. Requested Information

i. Capability to supply the Underwater Glider matching all or part of the reported requirements (specifying which requirements cannot be satisfied)
ii. Payload configurations proposal (reference requirement (3))
iii. Reference data regarding maximum operating depth, endurance and range
iv. Performances, limitations and specifications of the proposed Gliders
v. Cost estimation to supply the proposed USV and estimated time of delivery once project is commissioned
vi. Estimated 10 year costs for each of the following: (1) operation, (2) yearly re-configurations and (3) standard maintenance plan
vii. Company's references to include business relationship with NATO Countries' governmental entities providing Point of Contact and email address, previous and/or in progress deliveries of similar design and magnitude including estimated and final completion timelines

RFI-A8: Possible provision of novel sensors suitable for Anti-Submarine Warfare, Naval Mine Warfare, oceanographic applications, critical infrastructure and port protection, and/or for underwater navigation applications

a. General setting

Sensors can be used as standalone applications when laid at sea or deployed from a surface platform or integrated in UxV payload. Proposed sensors are to be suitable for the following geographical areas: North Atlantic Ocean, Baltic Sea, Mediterranean Sea, Black Sea and Arctic Sea

b. Requirements

Propose innovative sensors for Anti-Submarine Warfare, Naval Mine Warfare, oceanographic or underwater navigation applications. In particular, proposed sensors should refer to but not limited to the following categories of technologies:

- Magnetic (with particular relevance to Quantum effect Magnetic sensors)
- Passive acoustic
- Active acoustic
- Extreme Low Frequency Electric (ELFE)
- Underwater Electric Potential (UEP)
- Light Detection and Ranging (LIDAR)
- Optical detection
- Quantum technology applied to underwater navigation

c. Requested Information

i. Capability to supply sensors matching all or part of the reported requirements (specifying which requirements cannot be satisfied)
ii. Reference data regarding sensors
iii. Performances, limitations and specifications
iv. Cost estimation to supply the proposed USV and estimated time of delivery once project is commissioned
v. Estimated 10 year costs for each of the following: (1) operation, (2) yearly re-configurations and (3) standard maintenance plan
vi. Company's references to include business relationship with NATO Countries' governmental entities providing Point of Contact and email address, previous and/or in progress deliveries of similar design and magnitude including estimated and final completion timelines

REQUESTED INFORMATION

This ANNEX BRAVO contains the following requests of information (further specified in the document)
RFI-B1: Possible provision of test bed systems for underwater sensors and vehicles.
RFI-B2: Possible provision of Persistent Virtual Modelling & Simulation Laboratory.
RFI-B3: Possible provision of Prototyping Laboratory

RFI-B1: Possible provision of test bed systems for underwater sensors and vehicle

a. General setting

NATO has a fleet of underwater and surface vehicles and standalone sensors used to perform scientific trials in order to test maritime prototypes. Those systems are mainly based in La Spezia Italy.

b. Requirements

(1) A System for underwater and surface sensors and vehicles (e.g. a pool no larger than 5mx10mx5mdepth and a hyperbaric chamber) in order to test statically (before their deployment at sea):

- Underwater pressure resistance up to 100 ATM
- Acoustic signals sensor gathering performances at different frequencies (from 1kHz to 1MHz) to test sensors and underwater communications
- Register acoustic signals sensor gathering performances (passive and active sensors/transducers test)
- Low intensive electric fields generation and sensor gathering performances (from +/- 0.01μV/m to +/- V/m) to test electro-magnetic sensors up to 200 Hz and to test ELFE and UEP sensors
- Sensor/vehicle magnetic own signature
- Dynamic magnetic field variations sensor gathering performances (range from +/- 100 pT to +/-400nT around local geomagnetic field) to test magnetic field sensors at up to 200 Hz

System should be capable to

- Be filled with salt or fresh water
- Change water temperature from -1.5ºC (salt water) to 30ºC

(2) A system deployable at sea (mainly in the vicinity of La Spezia - Italy) to test/measure:

- Underwater and surface vehicles speed and navigation to include navigation accuracy
- Underwater and surface vehicles station keeping
- Underwater and surface vehicles sensors performances (acoustic and magnetic) at depths of up to 20 m

The system should include suitable means for the deployment, recovery of the UMS under evaluation, including a crane (minimum capability 1.5T)

c. Requested Information

i. Capability to supply a test bed systems matching all or part of the reported requirements specifying which requirements cannot be satisfied

ii. Costs estimation to supply and estimated time of delivery for the required capabilities upon commission

iii. Estimated 10 year operating costs to include costs for yearly configuration setting and a standard maintenance plan for each facility

iv. Company's references to include business relationship with NATO countries' governmental entities providing Point of Contact and email address, previous and/or

in progress deliveries of similar design and magnitude including estimated and final completion timelines

RFI-B2: Possible provision of Persistent Virtual Modelling & Simulation Laboratory

a. General setting

NATO Maritime S&T is using Model and Simulation for testing doctrine, enhanced training, to rehearse scientific hypothesis before testing them at sea and conduct audacious war gaming to evaluate technologies impact on NATO activities. This request for information aims at evaluating the possible provision of a persistent Virtual Modelling & Simulation Laboratory supporting distributed experimentation and testing of innovative systems and prototypes able to link/work with external stakeholders. This capability shall be based on state-of-the-art technologies for supporting the execution of simulations in a distributed environment and compliant with the NATO Security procedures. This capability should allow scalable levels of classification (from public releasable up to NU/NR/NC/NS).

b. Requirements

(1) A development environment (including HW and SW) to allow collaboration between NATO's Maritime S&T activity and National partners (Industry, Nations and Academia), where project stakeholders can jointly develop applications and integrate software and hardware components, in a secured environment with access being managed in a documented, controlled and predictable way. The proposed environment should build-upon distributed, virtualised and cloud based technologies to provide scalable computational solutions. This concept is usually addressed by the use of reserved words such as "DevSecOps" and "Sandbox".

(2) The Virtual Modelling & Simulation Laboratory shall allow the distributed execution and fruition of what has been developed in the sandbox by utilizing a cloud-based service where software applications can be run and accessed by external partners. The level of classification of the applications may be Public Releasable, NATO Unclassified and above, exploiting a toolset that will allow access management and security. A common definition for this requirement is "Web Hosting Service".

(3) Support for Hardware-in-the-Loop integration of M&S capability to described systems/subsystems.

(4) A set of software and hardware components should be provided (run time infrastructure, gaming engine, virtual and augmented reality devices), with consideration towards compliance with existing, and development of future, NATO standards.

c. Requested Information

i. Capability to supply a Persistent Virtual Modelling & Simulation Laboratory matching all or part of the reported requirements specifying which requirements cannot be satisfied

ii. Costs estimation to supply and estimated time of delivery for the required capabilities upon commission

iii. Estimated 10 year operating and maintenance costs

iv. Company's references to include business relationship with NATO countries' governmental entities providing Point of Contact and email address, previous and/or

in progress deliveries of similar design and magnitude including estimated and final completion timelines

RFI-B3: Possible provision of Prototyping Laboratory

a. General setting

NATO has already an existing Science and Technology Prototyping capability that can be improved, modernized or integrated.

b. Requirements

(1) Precision NC and manual metal and plastics fabrication of mechanical parts (c.f. lathe, milling machines, bending and cutting press, TIG/MIG welding machines)
(2) Power electronics fabrication and testing up to 10 kW
(3) Electronics design, modelling and manufacturing capability (low-power, low-noise, A/D signal acquisition)
(4) Electrical/electronic design and repair capability
(5) Digital and analogue radio HF to 10 GHz and underwater acoustic 1 kHz to 50 kHz testing capability up to 10 W
(6) Sensor calibration capability (CTD, optical, acoustics)
(7) Acoustic noise measurement and characterisation
(8) Small scale underwater transducer fabrication capability (piezoelectric and other - c.f. velocity sensors), ability to pot transducers
(9) EPROM and FPGA programming capability
(10) System functionality testing capability including digital signal generators and oscilloscopes
(11) 3D printing facilities for plastic and metal parts fabrication up to 8000 cm^3
(12) indoor array fabrication/maintenance facility (including vacuum chamber for hosing/dehosing) for arrays of up to 100 m length and 70 mm diameter

c. Requested Information

i. Capability to supply all or part of the reported requirements specifying which requirements cannot be satisfied
ii. Overall dimension of the proposed Prototyping Laboratory
iii. Costs estimation to supply and estimated time of delivery for the required capabilities upon commission
iv. Estimated 10 year operating and maintenance costs
v. Company's references to include business relationship with NATO countries' governmental entities providing Point of Contact and email address, previous and/or in progress deliveries of similar design and magnitude including estimated and final completion timelines

REQUESTED INFORMATION

This ANNEX CHARLIE contains the following requests for information (further specified in the document)

RFI-C1: Possible provision of new Global Research Vessel
RFI-C2: Possible provision of new Ocean/Regional Research Vessel
RFI-C3: Possible provision of new Coastal Research Vessel
RFI-C4: Possibility to charter a Global Research Vessel for Arctic region
RFI-C5: Possibility to charter a Regional Research Vessel in northern Europe or Mediterranean/Black Sea
RFI-C6: Possibility to charter a Coastal Research Vessel in northern Europe or Mediterranean/Black Sea
RFI-C7: Possible provision of a containerized Science and Technology system
RFI-C8: Possible provision of Edge computing kits for at-sea experimentation

RFI-C1: Possible provision of new Global[1] Research Vessel

d. General setting

The Research Vessel (RV) is to conduct surveys and experimental activities mainly in the following fields of application[2]: anti-submarine warfare, naval mine warfare, military oceanography and military maritime situational awareness (MSA). 240 days of operation per year shall be considered in the following areas of operation (average in 5 years): Mediterranean Sea/Black Sea (65%), Northern Atlantic Ocean/Northern Europe Seas (20%), Arctic Sea (10%) and Red Sea/Persian-Arabic Gulf (5%). La Spezia (Italy) is to be considered the main base; therefore berthing predisposition shall be compliant in accordance with standards in use in that area.

e. Requirements

(1) At sea maximum duration (days): 40
(2) Range: 11.000 Nautical Miles (NM)
(3) Length: more than 85m
(4) Draft: less than 8m
(5) Top Cruise Speed: 16kts
(6) Sea State limit for transiting: 6
(7) Sea State limit in operation: 4 (including launch and recovering underwater/surface systems)
(8) Dynamic Positioning: Equipment Class 2 (to be used in operation) with reference to IMO Guidelines for vessels and units with dynamic positioning (DP) systems including "station keeping" and "track keeping", ideally with a precision of 1m (assuming calm weather)
(9) Polar Class: six (PC6) in accordance with IMO Guidelines for ships operating in polar waters
(10) The vessel shall have the following Classification Society Notations (DNV or IACS equivalent): SPS, CLEAN-Tier III, BWM-T, ECA-SOx-A, COMF (C-2,V-1), WINTERIZED (Basic)
(11) Communications:
- State of the art broadband satellite systems
- VHF, UHF and HF systems (data and voice capable)
- capacity to manage classified information up to NATO SECRET

(12) Navigation: Integrated navigation systems with Differential GPS positioning, W-ECDIS cartographic system, bi-band marine radar, ARPA radar, Warship AIS (W-AIS)
(13) Electrical Power generation: at least 50% redundancy of maximum estimated workload plus 1 emergency survival diesel generator
(14) HVAC: to be designed taking into account all areas of operations

[1] The classification "Global", even if similar to other sources (i.e. US FOFC or European Research Vessels Infobase) definition, refers only to the minimum requirements reported in this RFI
[2] Related operations include, but are not limited to, (1) launch, recovery, control maritime unmanned systems; (2) deploy underwater sensors, (3) lay and recover systems on sea floor, (4) support divers activities, (5) launch and recovery small Unmanned Aerial Vehicle, (7) collect info regarding maritime traffic.

(15) Crew: estimated minimum number, levels and organization to be proposed considering a high level of automation but either the need to have a security and emergency technical team on board 24/7
(16) Additional personnel to embark for scientific campaigns: up to 40
(17) Medical capability: first aid, immediate lifesaving measures and triage (ROLE 1).
(18) Dedicated scientific storage space: 1.250m^3 (or 500m^2 over decks)
(19) Dedicated scientific workshop space: 350m^2
(20) Containers: capability to move and storage on decks up to 1 (one) 40" ISO standard container (to be used for directly launching and recovering marine systems at sea), 4 (four) 20" ISO standard containers and 3 (three) 10" ISO standard containers at the same time (this containers' capacity is in addition to previous scientific storage and workshop space).
(21) Handling Gear: at least two cranes capable to handle up to 25000Kg off-board load.
(22) Security: capability to manage information up to NATO SECRET on board in restricted areas.
(23) Medical Evacuation (MEDEVAC): features to support evacuation with rotary wing assets.
(24) Embedded small crafts: two minor deployable crafts (RHIB or dinghy). Minimum length 7m, Waterjet propulsion, 3 square meters available space on deck of RHIB/dinghy.
(25) Other sub-systems
- Ultra Short Base Line (USBL) for tracking underwater vehicles
- Launch and recovery systems for medium unmanned underwater vehicles (reference dimensions: torpedo shape, length up to 7 meters, weight up to 2000kg)
- Launch and recovery systems for medium unmanned surface vehicles (reference dimensions: length up to 12 meters, weight up to 10000kg).
- Systems for launching and recovery small Unmanned Arial Vehicles (UAV)
- Winch reels for wired cable and towed array storage/deployment
- Deployment system for underwater equipment (reference dimensions/features: 3500 kg 3x1x1 meter, 5000 kg Safe Working Load line pull, max depth 200 m)
- State of the art low frequency deep water multi beam sonar.
- Light Work-ROV system (with manipulating pack, Dynamic Position capability and up to 1000m operation depth)
- Underwater pole for deployment of submerged sensors e.g. underwater telephone, acoustic modem, ADCP, etc.

f. Special requirement

Reduced radiated acoustic noise when in operation. Please provide evaluations of achievable performances in comparison to the following reference futures:

- Source level roughly equivalent to radiated noise measured at 200m being less than SS3 + distant shipping noise
- $SL_{1/3\ octave} < 139.3 - 5\log_{10}(f)$ dB re Pa@1 m (f is frequency in Hz - Requirement applies for f between 10 and 100000 Hz)

g. Requested Information

i. Capability to supply a vessel matching all or part of the reported requirements specifying which requirements cannot be satisfied
ii. Costs estimation for purchasing the new proposed vessels
iii. Estimated time of delivery since commission
iv. Capability to supply the additional special requirement and its rough impact estimation on costs
v. Estimated 20 year operating costs to be broken down in: 1. crew, 2. repairs & maintenance including dry-docks, 3. insurance and 4. others
vi. Further available/achievable features that can be part of the RV, explaining benefits in terms of scientific research values
vii. Company's references to include business relationship with NATO countries' governmental entities providing Point of Contact and email address, previous and/or in progress deliveries of similar design and magnitude including estimated and final completion timelines

RFI-C2: Possible provision of new Ocean/Regional[3] Research Vessel

a. General setting

The Research Vessel (RV) is to conduct surveys and experimental activities mainly in the following fields of application[4]: anti-submarine warfare, naval mine warfare, military oceanography, military maritime situational awareness (MSA). Industry shall consider 240 days of operation per year and in the following areas of operation (average in 5 years): Mediterranean Sea/Black Sea (70%), Northern Atlantic Ocean/Northern Europe Seas (25%), and Red Sea/Persian-Arabic Gulf (5%). La Spezia (Italy) is to be considered the main base, therefore berthing predisposition shall be compliant in accordance with standards in use in that area.

b. Requirements

(1) At sea maximum duration (days): 30
(2) Range: 9.500 Nautical Miles (NM)
(3) Length: 50-85m
(4) Draft: less than 8m
(5) Top Cruise Speed: 16kts
(6) Sea State limit for transiting: 6
(7) Sea State limit in operation: 4
(8) Dynamic Positioning: Equipment Class 2 (to be used in operation) with reference to IMO Guidelines for vessels and units with dynamic positioning (DP) systems including "station keeping" and "track keeping", ideally with a precision of 1m (assuming calm weather).
(9) The vessel shall have the following Classification Society Notations (DNV or IACS equivalent): CLEAN-Tier III, BWM-T, ECA-SOx-A, COMF (C-2,V-1)
(10) Communications:
- State of the art broadband satellite systems
- VHF, UHF and HF systems (data and voice capable)
- capacity to manage classified information up to NATO SECRET

(11) Navigation: Integrated navigation systems with Differential GPS positioning, W-ECDIS cartographic system, bi-band marine radar, ARPA radar, Warship AIS (W-AIS).
(12) Electrical Power generation: at least 50% redundancy of maximum estimated workload plus 1 emergency survival diesel generator.
(13) HVAC: to be designed taking into account all areas of operations
(14) Crew: estimated minimum number, levels and organization to be proposed considering a high level of automation but either the need to have a security and emergency technical team on board 24/7.
(15) Additional personnel to embark for scientific campaigns: up to 30.

[3] The classification "Ocean/Regional", even if similar to other sources (i.e. US FOFC or European Research Vessels Infobase) definition, refers only to the minimum requirements reported in this RFI

[4] Related operations include, but are not limited to, (1) launch, recovery, control maritime unmanned systems; (2) deploy underwater sensors, (3) lay and recover systems on sea floor, (4) support divers activities; (5) launch and recovery small Unmanned Aerial Vehicle,(7) collect info regarding maritime traffic.

(16) Medical capability: first aid, immediate lifesaving measures and triage (ROLE 1).
(17) Dedicated scientific storage space: 875m^3 (or 350m^2 over decks)
(18) Dedicated scientific workshop space: 300m^2
(19) Containers: capability to move and storage on decks up to 1 (one) 40" ISO standard container to be used for directly launching and recovering marine systems at sea, 2 (two) 20" ISO standard containers and 2 (two) 10" ISO standard containers at the same time this containers' capacity is in addition to previous scientific storage and workshop space.
(20) Handling Gear: at least two cranes capable to handle up to 25000Kg off-board load
(21) Security: capability to manage information up to NATO SECRET in restricted areas
(22) Medical Evacuation (MEDEVAC): features to support evacuation with rotary wings assets
(23) Embedded small crafts: two minor deployable crafts (rhib or dinghy). Minimum length 7m, Waterjet propulsion, 3 square meters available space on deck of RHIB/dinghy
(24) Other sub-systems
- Ultra Short Base Line (USBL) for tracking underwater vehicles
- Launch and recovery systems for medium (reference dimensions: torpedo shape, length up to 7 meters, weight up to 2000kg) underwater vehicles
- Launch and recovery systems for medium unmanned surface vehicles (reference dimensions: length up to 12 meters, weight up to 10000kg).
- Systems for launching and recovery small Unmanned Arial Vehicles (UAV)
- Winch reel(s) for wired cable and towed array storage/deployment
- Deployment system for underwater equipment (reference dimensions/features: 3500 kg 3x1x1 meter, 5000 kg Safe Working Load line pull, max depth 200 m)
- State of the art low frequency deep water multi beam sonar

c. Special requirement

(1) Reduced radiated (acoustic) noise when in operation. Please provide evaluations of achievable performances in comparison to the following reference futures:
- Source level roughly equivalent to radiated noise measured at 200m being less than SS3 + distant shipping noise
- $SL_{1/3\ octave} < 139.3 - 5\log_{10}(f)$ dB re □Pa@1 m (f is frequency in Hz - Requirement applies for f between 10 and 100000 Hz)

(2) Reduced magnetic signature (achievable standard performances to be reported)

d. Requested Information

i. Capability to supply a vessel matching all or part of the reported requirements specifying which requirements cannot be satisfied
ii. Costs estimation for purchasing the new proposed vessels
iii. Estimated time of delivery since commission
iv. Capability to supply additional special requirements and their rough impact estimation on costs
v. Estimated 20 year operating costs broken down in: 1. crew, 2. repairs & maintenance including dry-docks, 3. insurance and 4. others

vi. Further available/achievable features that can be part of the RV, explaining benefits in terms of scientific research values.

vii. Company's references to include business relationship with NATO countries' governmental entities providing Point of Contact and email address, previous and/or in progress deliveries of similar design and magnitude including estimated and final completion timelines

RFI-C3: Possible provision of new Coastal[5] Research Vessel

a. General setting

The Research Vessel (RV) is to conduct surveys and experimental activities mainly in the following fields of application[6]: anti-submarine warfare, naval mine warfare, military oceanography, military maritime situational awareness (MSA). Industry shall consider 240 days in operation per year and the following areas of operation (average in 5 years): Mediterranean Sea/Black Sea (80%), Baltic Sea (15%) and Red sea Persian/Arabic Gulf (5%). La Spezia (Italy) is to be considered the main base, therefore berthing predisposition shall be compliant in accordance with standards in use in that area.

b. Requirements

(1) At sea maximum duration (days): 20
(2) Range: 5.000 Nautical Miles (NM)
(3) Length: less than 50m
(4) Draft: less than 5m
(5) Top Cruise Speed: 12kts
(6) Sea State limit for transiting: 5
(7) Sea State limit in operation: 3
(8) Dynamic Positioning: Equipment Class 2 (to be used in operation) with reference to IMO Guidelines for vessels and units with dynamic positioning (DP) systems including "station keeping" and "track keeping" specifying standard performances
(9) The vessel shall have the following Classification Society Notations (DNV or IACS equivalent):CLEAN-Tier III, BWM-T, ECA-SOx-A, COMF (C-2,V-1)
(10) Communications:
- State of the art broadband satellite systems
- VHF, UHF and HF systems (data and voice capable)
- capacity to manage classified information up to NATO SECRET

(11) Navigation: Integrated navigation systems with Differential GPS positioning, W-ECDIS cartographic system, bi-band marine radar, ARPA radar, Warship AIS (W-AIS)
(12) Electrical Power generation: at least 50% redundancy of maximum estimated workload plus 1 emergency survival diesel generator
(13) HVAC: to be designed taking into account all areas of operations
(14) Crew: estimated minimum number, levels and organization to be proposed considering a high level of automation but to have a security and emergency technical systems remotely controlled
(15) Additional personnel to embark for scientific campaigns: up to 10
(16) Medical capability: first aid, immediate lifesaving measures and triage (ROLE 1)

[5] The classification "Ocean/Regional", even if similar to other sources (i.e. US FOFC or European Research Vessels Infobase) definition, refers only to the minimum requirements reported in this RFI

[6] Related operations include, but are not limited to, (1) launch, recovery, control maritime unmanned systems; (2) deploy underwater sensors, (3) lay and recover systems on sea floor, (4) support divers activities; (5) launch and recovery small Unmanned Aerial Vehicle,(7) collect info regarding maritime traffic.

(17) Dedicated scientific storage space: 500m^3 or 200m^2 over decks
(18) Dedicated scientific workshop space: 80m^2
(19) Containers: capability to move and storage on decks up to 2 (two) 20ft ISO standard containers (to be used for directly launching and recovering marine systems at sea) and 2 (two) 10ft ISO standard containers at the same time (this containers' capacity is in addition to previous scientific storage and workshop space)
(20) Handling Gear: at least two cranes capable to handle up to 10000Kg off-board load
(21) Security: capability to manage information up to NATO SECRET in restricted areas
(22) Medical Evacuation (MEDEVAC): features to support evacuation with rotary wings assets
(23) Embedded small crafts: one minor deployable crafts (RHIB or dinghy). Minimum length 5m, Waterjet propulsion
(24) Other sub-systems
- Ultra Short Base Line (USBL) for tracking underwater vehicles
- Launch and recovery systems for medium (torpedo shape, length up to 7 meters, weight up to 2000kg) underwater vehicles
- Launch and recovery systems for medium (length up to 8 meters, weight up to 3000kg) unmanned surface vehicles.
- Systems for launching and recovery small Unmanned Arial Vehicles (UAV)
- A frame aft (10000kg capacity) to ease launch and recovery and to relieve crane from long term deployment duties
- Winch reel for wired cable and towed array storage/deployment
- Shallow water high frequency multi beam sonar

c. Special requirement

(1) Reduced radiated (acoustic) noise when in operation. Please provide evaluations of achievable performances in comparison to the following reference futures:
- Source level roughly equivalent to radiated noise measured at 200m being less than SS3 + distant shipping noise
- $SL_{1/3\ octave} < 139.3 - 5\log_{10}(f)$ dB re □Pa@1 m
- f is frequency in Hz
- Requirement applies for f between 10 and 100000 Hz
- as an option DNV Silent Research classification[7]

(2) Reduced magnetic signature (achievable standard performances to be reported)

d. Requested Information

i. Capability to supply a vessel matching all or part of the reported requirements (specifying which requirements cannot be satisfied)
ii. Costs estimation for purchasing the new proposed vessels
iii. Estimated time of delivery once commissioned
iv. Capability to supply additional special requirements and their rough impact estimation on costs

[7] Det Norsky Veritas "Silent Research" specification is significantly less silent then the preferred specification

v. Estimated 20 year operating costs (broken down in: 1. crew, 2. repairs & maintenance including dry-docks, 3. insurance and 4. others)
vi. Further available/achievable features that can be part of the RV, explaining benefits in terms of scientific research values
vii. Company's references to include business relationship with NATO countries' governmental entities (providing Point of Contact and email address), previous and/or in progress deliveries of similar design and magnitude including estimated and final completion timelines

RFI-C4: Possibility to charter a Global Research Vessel for Arctic region

a. General setting

The Research Vessel (RV) is to conduct surveys and experimental activities mainly in the following fields of application[8]: anti-submarine warfare, naval mine warfare, military oceanography, military maritime situational awareness (MSA).

b. Requirements

(1) Top Cruise Speed: not less than 16kts
(2) Sea State limit for transiting: 6
(3) Sea State limit in operation: 4
(4) Dynamic Positioning: Equipment Class 2 (to be used in operation) with reference to IMO Guidelines for vessels and units with dynamic positioning (DP) systems including "station keeping" and "track keeping", ideally with a precision of 1m (assuming calm weather)
(5) Polar Class: six (PC6) in accordance with IMO Guidelines for ships operating in polar waters
(6) The vessel shall have the following Classification Society Notations (DNV or IACS equivalent): SPS, CLEAN-Tier III, BWM-T, ECA-SOx-A, COMF (C-2,V-1), WINTERIZED (Basic)
(7) Communications:
- State of the art broadband satellite systems
- VHF, UHF and HF systems (data and voice capable)

(8) Navigation: positioning system for oceanographic campaigns (performances to be reported in the response).
(9) Personnel to embark (in addition to the crew): up to 40
(10) Safety
- Medical capability: first aid, immediate lifesaving measures and triage (NATO ROLE 1).
- Medical Evacuation (MEDEVAC): features to support evacuation with rotary wings assets
- IMO regulations compliant

(11) Dedicated scientific storage space: 1.250m^3 (or 500m^2 over decks)
(12) Dedicated scientific workshop space: 350m^2
(13) Containers: capability to move and storage on decks up to 1 (one) 40ft ISO standard container (to be used for directly launching and recovering marine systems at sea), 4 (four) 20ft ISO standard containers and 3 (three) 10ft ISO standard containers at the same time (this containers' capacity is in addition to previous scientific storage and workshop space).
(14) Handling Gear: to handle up to 25000Kg off-board load
(15) Winch reels for wired cable and towed array storage/deployment

[8] Related operations include, but are not limited to, (1) launch, recovery, control maritime unmanned systems; (2) deploy underwater sensors, (3) lay and recover systems on sea floor, (4) support divers activities; (5) launch and recovery small Unmanned Aerial Vehicle,(7) collect info regarding maritime traffic.

(16) Small crafts: two minor deployable crafts (RHIB or dinghy) available for scientific campaign needs. 3 square meters available space on deck of RHIB/dinghy
(17) Possibility to provide Ultra Short Base Line (USBL) or to install a portable USBL for tracking underwater vehicles
(18) State of the art low frequency deep water multi beam sonar.

c. Special requirement

Reduced radiated (acoustic) noise when in operation. Please provide evaluations of achievable performances in comparison to the following reference futures:

- Source level roughly equivalent to radiated noise measured at 200m being less than SS3 + distant shipping noise
- $SL_{1/3\ octave} < 139.3 - 5\log_{10}(f)$ dB re Pa@1 m (f is frequency in Hz - Requirement applies for f between 10 and 100000 Hz)
- as an option DNV Silent Research classification[9]

d. Requested Information

i. Capability to charter a RV matching the reported requirements
ii. Radiated (acoustic) noise of the proposed RV when in operation.
iii. Other available scientific research features on board the proposed RV.
iv. Costs estimation for 30 days chartering 5 days for loading/unloading and 20 consecutive days at sea in operation on location including costs for proposed SPODs[10] .Sea Ports of Disembarkation is to be considered close to Svalbard Island. Costs for additional each day of transit should from/to SPODs should also be included.
v. Estimated availability per year
vi. Minimum/maximum booking times and terms/conditions
vii. Company's references to include business relationship with NATO countries' governmental entities providing Point of Contact – email address to include previous, or in progress, scientific campaigns the proposed vessel took part in

[9] Det Norsky Veritas "Silent Research" specification will not meet ASW requirements
[10] Baseline SPOD of Tromso unless compelling alternative is available.

RFI-C5: Possibility to charter a Regional Research Vessel in northern Europe or Mediterranean/Black Sea

a. General setting

The Research Vessel (RV) is to conduct surveys and experimental activities mainly in the following fields of application[11]: anti-submarine warfare, naval mine warfare, military oceanography, military maritime situational awareness (MSA). The referenced area of operation considered is the North Atlantic.

b. Requirements

(1) Top Cruise Speed: not less than 16kts
(2) Sea State limit for transiting: 6
(3) Sea State limit in operation: 4
(4) Dynamic Positioning: Equipment Class 2 (to be used in operation) with reference to IMO Guidelines for vessels and units with dynamic positioning (DP) systems including "station keeping" and "track keeping", ideally with a precision of 1m (assuming calm weather).
(5) The vessel shall have the following Classification Society Notations (DNV or IACS equivalent): CLEAN-Tier III, BWM-T, ECA-SOx-A, COMF (C-2,V-1)
(6) Communications:
- State of the art broadband satellite systems
- VHF, UHF and HF systems (data and voice capable)

(7) Navigation: positioning system for oceanographic campaigns (performances to be reported).
(8) Personnel to embark (in addition to the crew): up to 20
(9) Safety
- Medical capability: first aid, immediate lifesaving measures and triage (NATO ROLE 1)
- Medical Evacuation (MEDEVAC): features to support evacuation with rotary wings assets
- Compliancy with IMO regulations

(10) Dedicated scientific storage space: 875m^3 (or 350m^2 over decks)
(11) Dedicated scientific workshop space: 200m^2
(12) Containers: capability to move and storage on decks up to 1 (one) 40ft ISO standard container (to be used for directly launching and recovering marine systems at sea), 2 (two) 20ft ISO standard containers and 2 (two) 10ft ISO standard containers at the same time (this containers' capacity is in addition to previous scientific storage and workshop space)
(13) Handling Gear: to handle up to 20000Kg off-board load
(14) Winch reel(s) for wired cable and towed array storage/deployment

[11] Related operations include, but are not limited to, (1) launch, recovery, control maritime unmanned systems; (2) deploy underwater sensors, (3) lay and recover systems on sea floor, (4) support divers activities; (5) launch and recovery small Unmanned Aerial Vehicle,(7) collect info regarding maritime traffic.

(15) Small crafts: two minor deployable crafts (RHIB or dinghy) available for scientific campaign needs. 3 square meters available space on deck of RHIB/dinghy
(16) Possibility to provide Ultra Short Base Line (USBL) or to install a portable USBL for tracking underwater vehicles
(17) Possibility to host light work-ROV system to light deployment of scientific packages, and salvage operations
(18) Auxiliary pole for deployment of submerged assets (e.g. underwater telephone, acoustic modem, ADCP, etc.)

c. Special requirement

Reduced radiated (acoustic) noise when in operation:

- DNV Silent Research classification[12]

d. Requested Information

i. Capability to charter a RV matching the reported requirements in northern Europe, Baltic Sea, or Mediterranean/Black sea
ii. Radiated (acoustic) noise of the proposed RV when in operation.
iii. Other available scientific research features on board the proposed RV.
iv. Costs estimation for 30 days chartering 5 days for loading/unloading and 20 consecutive days at sea in operation including costs for a proposed SPODs (Sea Ports of Disembarkation) in one of the areas of operation (Northern Europe, Baltic Sea, and Mediterranean/Black Sea).
v. Estimated availability per year
vi. Minimum/maximum booking times and terms/conditions
vii. Company's references. Business relationship with NATO Countries governmental entities providing Point of Contact – email address to include previous, or in progress, scientific campaigns the proposed vessel took part in

[12] Det Norsky Veritas "Silent Research" specification will not meet ASW requirements

RFI-C6 Possibility to charter a Coastal Research Vessel in northern Europe or Mediterranean/Black Sea

a. General setting

The Research Vessel (RV) is to conduct surveys and experimental activities mainly in the following fields of application[13]: anti-submarine warfare, naval mine warfare, military oceanography, military maritime situational awareness (MSA). The reference area of operation to be considered is Mediterranean Sea.

b. Requirements

(1) Top Cruise Speed: not less than 12kts
(2) Sea State limit for transiting: 5
(3) Sea State limit in operation: 3
(4) Dynamic Positioning: Equipment Class 2 (to be used in operation) with reference to IMO Guidelines for vessels and units with dynamic positioning (DP) systems including "station keeping" and "track keeping", ideally with a precision of 1m (assuming calm weather).
(5) The vessel shall have the following Classification Society Notations (DNV or IACS equivalent): CLEAN-Tier III, BWM-T, ECA-SOx-A, COMF (C-2,V-1)
(6) Communications:
- State of the art broadband satellite systems
- VHF systems (data and voice capable)

(7) Navigation: positioning system for oceanographic campaigns (performances to be reported)
(8) Personnel to embark (in addition to the crew): up to 10
(9) Safety
- Medical capability: first aid, immediate lifesaving measures and triage (NATO ROLE 1)
- Medical Evacuation (MEDEVAC): features to support evacuation with rotary wings assets
- Compliancy with IMO regulations

(10) Medical capability: first aid, immediate lifesaving measures and triage (ROLE 1)
(11) Dedicated scientific storage space: 500m^3 (or 200m^2 over decks)
(12) Dedicated scientific workshop space: 80m^2
(13) Containers: capability to move and storage on decks up to 2 (two) 20ft ISO standard containers (to be used for directly launching and recovering marine systems at sea) and 2 (two) 10ft ISO standard containers at the same time (this containers' capacity is in addition to previous scientific storage and workshop space)
(14) Handling Gear: to handle up to 10000Kg off-board load.
(15) Winch reel for wired cable and towed array storage/deployment.

[13] Related operations include, but are not limited to, (1) launch, recovery, control maritime unmanned systems; (2) deploy underwater sensors, (3) lay and recover systems on sea floor, (4) support divers activities; (5) launch and recovery small Unmanned Aerial Vehicle,(7) collect info regarding maritime traffic.

(16) Small crafts: one minor deployable crafts (RHIB or dinghy) available for scientific campaign needs.
(17) Possibility to provide Ultra Short Base Line (USBL) or to install a portable USBL for tracking underwater vehicles

c. Special requirement

(1) Reduced radiated (acoustic) noise when in operation:
- DNV Silent Research classification[14]

(2) Reduced magnetic signature achievable standard performances to be reported

d. Requested Information

i. Capability to charter a RV matching the reported requirements in northern Europe, Baltic Sea, or Mediterranean/Black sea
ii. Standard performances, if available, afferent to the special requirements
iii. Other available scientific research features on board the proposed RV
iv. Costs estimation for 30 days chartering 5 days for loading/unloading and 20 consecutive days at sea in operation) including costs for a proposed SPODs (Sea Ports of Disembarkation) in one of the areas of operation (Northern Europe, Baltic Sea and Mediterranean/Black Sea)
v. Estimated availability per year
vi. Minimum/maximum booking times and terms/conditions
vii. Company's references. Business relationship with NATO Countries governmental entities providing Point of Contact – email addresses as well as previous, or in progress, scientific campaigns the proposed vessel took part in

[14] Det Norsky Veritas "Silent Research" specification will not meet ASW requirements

RFI-C7: Possible provision of a containerized Science and Technology system

a. General setting

The required systems is to be shipped and embarked on a chartered vessel or a NATO warship operating in North Atlantic Ocean, Baltic Sea, Arctic Ocean, Mediterranean Sea, Black sea, Red Sea, Arabic/Persian Gulf.

b. Requirements

(1) Maximum number of ISO standard containers for the system:
- 1 (one) 40ft
- 4 (four) 2ft
- 3 (three) 10ft

(2) Specific container requirements
- Suitable to be stored on outdoor decks
- Suitable to be shipped with TIR,
- Configurable to receive power supply at different voltage (at least 220V and 110V) and frequencies (at least 50Hz, 60Hz or 400Hz)
- Fitted with a conditioning system suitable for all area of operation reported in the general setting
- Fitted with fire-fighting system designed to protect electronic equipment
- Presence of other safety features (c.f. emergency doors)
- 20 year warranty

(3) Functionalities to be satisfied
- Workshop for maintenance and small repairs of Unmanned Underwater Vehicles
- Chemical laboratory to analyze marine environmental data (CTD, seafloor sediment, bio-chemical composition of the water)
- Launch and recovering systems for one medium Unmanned Underwater Vehicles (reference dimensions: torpedo shape, length up to 7 meters, weight up to 2000kg)
- Launch and recovering systems for one medium Unmanned Surface Vehicle (reference dimensions/features: rigid hull or RHIB, length up to 8 meters, weight up to 3000kg)
- Every container linkable with private IT LAN
- Minimum 10 workstations
- Embedded data server and data storage capacity
- Independent high performance positioning system (DGPS)
- Acoustic Transmission capability (amplifiers, programmable signal generators)
- General purpose winches depending on function/sensor supported (e.g. CTD, acoustic source, towed array)
- Retractable antenna mast (for RF data links to other ships/UxV/remote equipment/buoys)
- W-ECDIS cartographic system (linked to the positioning system)
- Portable USBL (Ultra Short Base Line for tracking and communicating with unmanned underwater systems) linked to W-ECDIS cartographic system
- State of the art satellite communication (data-voice) capacity

- VHF communication (voice) capacity
- Minimum hosting (2 persons) to be used in shipping when requested
- Video surveillance systems
- General storage capacity

c. Requested Information

i. Capability to supply a containers' system matching the reported requirements or a different configuration that provide same functionalities
ii. Other available scientific research features that the system can be fitted with
iii. Costs estimation for purchasing the proposed system
iv. Estimated time of delivery since commission
v. Company's references. Business relationship with NATO countries' governmental entities providing Point of Contact – email address
vi. Description of supplied similar system

RFI-C8: Possible provision of Edge computing kits for at-sea experimentation

a. General Setting

Edge computing kits for at-sea experimentation, to provide improved capability to conduct scientific research and development on emerging concepts and technologies.

b. Requirements

(1) Edge computing enclosures, 2 units

- Chiller units (2 units required), with enclosures designed to meet TEMPEST level C requirements, with total cooling power; realized with materials, components and treatments specific to the marine environment and resistant to shock and vibration during transportation or when installed on board a vessel (MIL STD 810)
- Equipment cases (6 units, with 6 rack units each) designed to meet TEMPEST level C requirements, and to be resistant to salted water, shock and vibration, external handles, panel for fibre optic connections and power supply, complete with internal shielded elements, in compliance with TEMPEST requirements

(2) Edge computing equipment

- Hyper convergent computing nodes (8 nodes overall, 4 nodes per edge computing enclosure)
  a. 128 GB RAM (per node)
  b. Storage 6 SSD * 3.8 TB (per node)
  c. CPU 2x Intel Processor 2.40 GHz 12-core (per node)
  d. C-NIC 1x 10 GbE Dual SFP+ (per node)
- GPU computing solution (e.g. NVIDIA DGX station A100 or equivalent) (2 units)

c. Requested Information

i. Capability to supply all or part of the reported requirements specifying which requirements cannot be satisfied
ii. Configuration proposal
iii. Costs estimation for the provision of the system and its installation
iv. Estimated 5 year operating costs including cost for standard maintenance plan
v. Assurance of the availability of software updates and spare parts for 5 years
vi. Company's references to include business relationship with NATO countries' governmental entities providing Point of Contact and email address, previous and/or in progress deliveries of similar design and magnitude

REQUESTED INFORMATION

This ANNEX DELTA contains the following requests of information further specified in the document.

RFI-D1: Possible provision of a Hyperconverged Computing Infrastructure (HCI) for AI/ML and Big data Analytics –hybrid cloud capability

RFI-D2: Possible provision of High Performance Computing Facility (HPCF) capability for Advanced Environmental Analytics

RFI-D3: Possible provision of a Virtual Desktop Infrastructure –Enterprise VDI and mobile workforce

RFI-D1 Possible provision of a Hyperconverged Computing Infrastructure (HCI) for ML/AI and Big Data Analytics - hybrid cloud capability

a. General Setting

The required Hyperconverged infrastructure is to support unclassified/classified computing, deployed across a mix of data center, public cloud and edge environments

b. Requirements

(1) Virtualization-extended platform with GPU hardware for graphics-intensive desktops and graphics-compute workloads based on Intel® Xeon® Scalable or AMD EPYC™ processors

(2) The solution must provide an initial configuration of min. 512 CPU cores (e.g. CPU equivalent of 3rd Generation AMD EPYCTM processors), 14 TB RAM and 440 TB available storage

(3) The solution must provide a flexible set of GPU virtualization options: e.g. NVIDIA's vGPU software and Multi-Instance GPU (MIG) capability

(4) The solution must provide native support for virtualization e.g. vSphere

(5) The solution must provide support for a DevSecOps architecture (e.g. Kubernetes, CI/CD, Code Repository, Artefact Repository and Data Pipeline)

(6) The solution must provide support for a scientific computing environment, e.g. MATLAB client software and/or MATLAB hosted solution

(7) The solution must include support for hosting distributed services for calculous, data storage and message streaming, such as Apache Spark and Apache Kafka

(8) The solution must improve automation and support hybrid cloud services (on-premises and integration with cloud service providers like AWS and Azure).

(9) The solution must provide N+1 resilience such that in the event of a component failure there will be no loss of performance and no data loss.

(10) The solution must be able to demonstrate non-disruptive scaling up of the cluster to allow addition of new nodes.

(11) The solution must be able to scale without major limitations.

c. Requested Information

i. Capability to supply the reference requirements or proposed alternative solutions for ML/AI and Big Data Analytics that can assure the same level of performances

ii. Support/maintenance strategy and training availability

iii. Proposed mid-term upgrade strategy

iv. Costs estimation for the provision of the system and its installation

v. Company's references to include business relationship with NATO countries' governmental entities providing Point of Contact and email address, previous and/or in progress deliveries of similar design and magnitude.

RFI-D2 Possible provision of High Performance Computing Facility (HPCF) capability for Advanced Environmental Analytics

a. General Setting

NATO Maritime S&T Programme is looking for High Performance Computing Facility (HPCF) to deliver computational resources for Environmental Analytics.

b. Minimum Requirements

(1) The solution must provide computing nodes with min. 2 CPU per node, min 24 cores/socket – (e.g. CPU-equivalent of AMD EPYC™ 7002 Series Processors), 512 GB RAM, 1 TB SSD

(2) The solution must provide high performance networking between nodes (e.g. Mellanox InfiniBand HDR 200 Gb/s)

(3) The solution must provide an initial configuration of min. 8 nodes

(4) The solution must be able to demonstrate non-disruptive scaling up of the cluster to allow addition of new nodes.

(5) The solution must be able to scale without major limitations.

c. Requested Information

i. Capability to supply a High Performance Computing Facility (HPCF) matching the minimum requirements or proposed alternative/advanced solutions for Advanced Environmental Analytics that can assure similar or higher performances.

ii. Support/maintenance strategy and training availability

iii. Proposed mid-term upgrade strategy

iv. Costs estimation for the provision of the system and its installation

v. Company's references to include business relationship with NATO countries' governmental entities providing Point of Contact and email address, previous and/or in progress deliveries of similar design and magnitude.

RFI-D3 Possible provision of a Virtual Desktop Infrastructure – Enterprise VDI and mobile workforce

a. General Setting

NATO maritime S&T Capability Programme is looking for a new generation of mobility to enable users without compromising security or high-quality end user experience, at the same time streamlining IT resources and management.

b. Reference Requirements

(1) The solution must provide a mobile IT environment for 150 users with the ability to work offline
(2) The solution must provide a facility for the remote workers in a fixed environment with various degrees of performance and expandability
(3) The solution must provide an hyper-converged virtual desktop infrastructure able to interface with the current Scientific Network computing capabilities
(4) The solution must provide high performance networking
(5) The solution must be able to demonstrate non-disruptive scaling up of the number of users or computing/storage capacity

c. Requested Information

i. Capability to supply the reference requirements or proposed alternative solutions that can assure the same or higher level of performances
ii. Support/maintenance strategy and training availability
iii. Proposed mid-term upgrade strategy
iv. Costs estimation for the provision of the system and its installation
v. Company's references to include business relationship with NATO countries' governmental entities providing Point of Contact and email address, previous and/or in progress deliveries of similar design and magnitude.