

# **Headquarters Supreme Allied Commander Transformation**

## **STATEMENT OF WORK for Deliverables in Support of Analyses of Alternatives for Maritime Science and Technology**

**4 April 2022**

### **1. INTRODUCTION**

The purpose of this Statement of Work (SoW) is to describe the scope of the contracted services required in support of Maritime Science and Technology (Mar S&T) Capability Programme Plan (CPP).

The NATO recently adopted a new Common Funded Capability Delivery (CFCD) model intended to enhance the speed of capability delivery for NATO's common funded capabilities. The model includes six stages focused on through lifecycle capability delivery and includes persistent collaboration between Allied Command Transformation (ACT) and Allied Command Operations (ACO), NATO's two strategic commands. The model is focused on satisfying operational requirements with capability solutions across the spectrum of Doctrine, Organisation, Training, Materiel, Leadership, Personnel, Facilities, and Interoperability (DOTMLPFI).

NATO's Governance bodies have approved the Mar S&T Capability Requirement Brief which sets out the requirements to reach the desired end state, and a consolidated, comprehensive programme plan (the CPP) is currently being developed to deliver these requirements. The NATO CFCD Governance Model includes decision points on the:

- a. Requirement (via the Operational Requirements Statement) – the programme mandate;
- b. Viability of a capability-based programme to satisfy the requirement (via the Capability Requirements Brief) – the programme brief and vision; and
- c. Establishment of a programme to deliver capabilities and to drive the transformational change (via the Capability Programme Plan) – the programme creation.

The CFCD model considers a range of potential courses of actions to address a requirement, including the possibility of "Adopt"-ing a solution (from Nations), "Buy"-ing (acquiring a solution from Industry), or "Create"-ing (developing a solution bespoke to NATO). The varied options are analysed across DOTMLPFI lines of development. To support both the CPP, Analysis of Alternatives (AoA) are conducted to provide a comparative analysis of the Operational Effectiveness, Rough Order of Magnitude (ROM) Life Cycle Costs (LCC), and Risk and Opportunities of identified alternatives (considering all DOTMLPFI aspects). The AoA in NATO's Capability Delivery Lifecycle Standard

Operating Procedure [Ref A] provides guidance to conducting AoA in support of NATO CFCD programmes.

## **2. BACKGROUND**

The main aim of the Mar S&T programme is to provide a modernized research and development capability in the maritime domain. This is required due to the increasing obsolescence of current research vessels, the need to evaluate evolving maritime concepts and technology, and an increasing need to collaborate across research communities.

NATO must be able to design, develop, test and evaluate software and hardware prototypes to support NATO concept development, military exercises and maritime force interoperability. The Mar S&T programme will provide investments in test equipment, IT networking, hardware and software prototyping and assured access to S&T vessels which can operate in all NATO relevant maritime environments.

This will be pursued through a cost-effectiveness assessment for each project areas listed below:

1. Scientific equipment project, including unmanned platforms and sensor systems to conduct experiments relating to Anti-Submarine Warfare, Naval Mine Warfare, oceanographic or underwater navigation applications.
2. Hardware and software prototyping project, including a physical and virtual test environment with representative characteristics to operational maritime environments.
3. Experimentation at sea project, including research vessels to conduct surveys and experimental activities in coastal to open ocean environments, covering Mediterranean, Black Sea, Northern Europe and Arctic. This may include containerized deployable systems and edge computational capabilities.
4. Upgraded network infrastructure project, including hyperconverged infrastructure, high-performance computing infrastructure and virtual desktop infrastructure.

## **3. SCOPE OF WORK**

The chosen supplier will perform cost analysis of the alternatives identified by the programme team. Although alternatives are still being drafted based on the information taken from industry and Nations, it is expected to have between 3 to 6 alternatives in each project areas (which are namely Scientific Equipment, Prototyping, Seagoing, and Networking),

Cost Analysis: Costs will be identified for each alternatives across an agreed duration life cycle which will be different for each of the four project areas. The Lifecycle Cost Analysis will include Work Breakdown Structure activities across all DOTMLPFI aspects to produce two products:

- a. An un-inflated<sup>1</sup> comparative cost of each alternative to support analysis of alternatives.
- b. A mature, inflated<sup>2</sup> absolute programmatic cost estimate over a specified time scale, including the costs for all selected alternatives.

Cost data will be provided, but may need to be supported by open-source research, reference to prior analysis, and/or use of commercial or bespoke parametric tools.

#### 4. COST DATA

Cost data will be provided by NATO where available from Nations and industry. The supplier will further require to liaise with programme staff and stakeholders to identify and solicit additional information and data as needed. The majority of data will be passed to the supplier by 13 May 2022, but may continue to be matured throughout the duration of the task in line with advice from the supplier. The following data will be provided:

- a. Approved Capability Requirements Brief [Ref B] document and other contextual documentation as needed.
- b. Descriptions of alternatives and options for the delivery of services.
- c. Qualitative risks and issues for all DOTMLPFI lines of development for each of the alternatives.
- d. Data collected from current service providers (where available): lists of services, associated costs, and overall lifecycle plan for the services.
- e. Information from previous NATO programmes and projects (where available); and current in-service costs.
- f. Expected procurement and transition schedules, once alternatives are sufficiently mature to allow selection.
- g. NATO agreed inflation indices (National GDP deflator forecasts).
- h. NATO agreed foreign exchange rates.

Across the four projects there are 17 alternatives in total, which broadly provide incremental increases in scope for each project:

- *Scientific equipment*: 4 incremental alternatives,
- *Hardware and software prototyping*: 5 incremental alternatives,
- *Experimentation at sea*: 5 different alternatives,
- *Network infrastructure*: 3 incremental alternatives.

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<sup>1</sup> Also known as “constant cost”, “constant economic condition”, “Base Year”, etc.

<sup>2</sup> Also known as “outturn cost”, “Then Year”, etc.

For each project the first alternative assesses the cost of doing nothing (accepting capability reduction), the second assesses the cost of maintaining current capability, and the remaining alternatives assess capability acquisition. So these 17 alternatives are:

- 4 x “do nothing”,
- 4 x “do minimum”,
- 9 x “acquire new capability”.

## 5. REQUIREMENT DESCRIPTION

The supplier shall provide deliverables to identified NATO ACT Technical Authorities for the following analysis tasks:

a. **Project management:**

- i. Liaise with HQ SACT action officers to understand the requirement, be presented with the cost data or initial estimates and define other data required to undertake assessment of cost estimates.
- ii. Undertake regular interactions to brief progress and process clarifications; provide progress reports to the technical authorities.

b. **Data collection:**

- i. Continuously consult as appropriate with programme subject matter experts and stakeholders within NATO commands and agencies to obtain the information necessary for analysis;
- ii. Facilitate workshops as necessary to solicit or consolidate information required for analyses;
- iii. Use open-source information and/or parametric cost models as appropriate to support, sense-check, or challenge NATO-provided information.

c. **Comparative Rough Order of Magnitude Life Cycle Cost (ROM LCC) estimates** of alternatives as per Ref A:

- i. Develop a cost breakdown structure (CBS) in consultation with NATO suitable for comparative analysis. Map the available data (including supplier data sources) to the identified alternatives indicating (a) direct applicability, (b) indirect applicability (e.g. use as an analogous cost), (c) no applicability / missing data.
- ii. Develop a cost analysis plan for the programme detailing the types of analyses (methods, models, etc.), required data gathering to fill data gaps, presentation of results, etc.
- iii. Develop the ROM LCC model and perform analysis: develop estimates with risk and uncertainty for each of the alternatives. The required form for presentation of total estimated costs is as a three-point estimate reflecting the cost range between most likely, optimistic (realistic minimum) and pessimistic (realistic maximum) estimates. This should include analysis of sensitivity to key assumptions and cost drivers.

d. **Documentation:**

- i. Detailed accompanying analytical report in an agreed format that provides all supporting evidence for the analysis.

## **6. DELIVERABLES**

The following formal deliverable items are expected:

- a. A short progress report highlighting key activities undertaken, forward plans, and key risks, every 2 weeks.
- b. A short start-up review summary, demonstrating understanding after initial engagement with programme SMEs.
- c. Cost Data and Assumptions List (CDAL), including proposed CBS and summary of proposed approach (cost analysis plan).
- d. Briefing/presentation of preliminary findings for comparative costing of alternatives.
- e. Alternatives Comparison Cost Estimation Report (no more than 50 pages), to include:
  - i. Basic definitions, ground rules, boundaries and assumptions used in cost estimation process.
  - ii. Description of models and methods adopted for costs estimation.
  - iii. Cost Breakdown Structure of assessed alternatives.
  - iv. Identification of cost drivers, and the output cost sensitivity to these drivers; in particular those that differentiate alternatives.
  - v. Risk and uncertainty assessment.

- vi. Comparative assessment of alternative cost distributions.
- f. Briefing/presentation of final findings.
- g. Life Cycle Cost Estimation Report (no more than 30 pages), to include:
  - i. Basic definitions, ground rules, boundaries and assumptions used in cost estimation process.
  - ii. Description of models and methods adopted for costs estimation.
  - iii. Cost Breakdown Structure of selected alternatives.
  - iv. Identification of cost drivers, and the output cost sensitivity to these drivers; in particular those that differentiate alternatives.
  - v. Risk and uncertainty assessment, including indicative risk scenarios.
  - vi. Estimated uninflated Life Cycle Cost for each alternative, in a format consistent with the results of the estimation method used and with the risk and uncertainty assessment.
  - vii. Estimated inflated Life Cycle Cost for the overall programme, including the costs of all selected alternatives.
- h. Updated CDAL aligned to deliverable item (g): cost estimation report.
- i. Any cost model files produced to support this estimation, including evidence of validation and verification activities undertaken.

It is also expected that the contractor will:

- Interact directly with external stakeholders within the scope of this contract.
- Provide weekly verbal progress reports to the assigned Project Lead and COTR.

## 7. TIMELINES. Target timelines for outputs are:

- a. Deliverable item (b) by 09 May 2022
- b. Deliverable item (c) by 23 May 2022
- c. Deliverable item (d) by 08 July 2022
- d. Deliverable item (e) by 22 July 2022
- e. Deliverable item (f) by 19 August 2022
- f. Deliverable items (g) and (h) by 31 August 2022
- g. Deliverable item (h) by 31 August 2022

These timelines are indicative and subject to contract award date and data availability.

## 8. TYPE OF CONTRACT AND PERIOD OF PERFORMANCE

- a. **Type of Contract.** This is a Firm Fixed Price Deliverables in accordance with the General Terms and Conditions. All employer responsibilities for the Contractor Personnel performing under this contract shall lie with the Supplier.
- b. **Period of Performance.** The Period of Performance is for one base period of 6 months: 2 May 2022 through 31 October 2022.

## 9. PLACE OF PERFORMANCE

The supplier will support NATO staff based in HQ SACT, Norfolk VA for the performance of this contract, however will not be required to be co-located: remote support is viable. No travel to other locations is expected.

## **10. CONTRACTOR SUPERVISION AND REPORTING**

The Contracting Officer will assign a Contracting Officer's Technical Representative (COTR) to administer all technical contract details. The Contracting Officer has final authority (in consultation with the COTR) to determine if the contract/SOW should be amended, extended, modified or cancelled for evolving requirements, new tasking, and/or technical non-performance.

The technical authorities for this contract will be Mr. Nick ROSE and Maj. Nahit YILMAZ as AOA Branch Operations Research Analysts, and CDR Fabrizio ROSSI as Mar S&T Programme Coordinator. For administrative purposes, Maj. Nahit YILMAZ, will be the COTR.

- a. The COTR shall:
  - i. Resolve outstanding disputes, problems, deficiencies, and/or questions on the technical aspects of the SOW;
  - ii. Review (and approve) all Contractor duties for completeness and accuracy;
  - iii. Review the Contractor's work at a minimum of monthly, or more often if needed.
- b. The COTR's written approval of work reported and products submitted is mandatory for contractor invoices to be successfully processed.
- c. The contractor shall submit a report every two weeks to the COTR and the Contracting Officer, detailing progress on the SOW for the reporting period. The report shall include, but not be limited to, the following information:
  - i. Summary of work and status of tasks undertaken during the reporting period;
  - ii. Current or anticipated problems/deficiencies and recommended solutions.
- d. The COTR reserves the right to amend the reporting requirements to receive alternate/additional data and information on a more frequent or less frequent basis, and to request other reports that detail designated aspects of the work or methods to remedy problems and deficiencies.

**11. QUALITY OF DELIVERABLE.** It is expected that all deliverables are developed/delivered in high quality. Reporting deliverables should be produced at the graduate level, in English using the appropriate Microsoft Office Software program. Analyses (and their documentation) must meet the following:

- a. **Replication:** The contractor must provide a sufficiently detailed audit trail, including documentation of data and assumptions list to enable a third party to independently replicate the analyses.
- b. **Rationale:** The contractor must provide justifiable rationale for the selection of the inputs to the proposed methods and models.

## **12. SECURITY AND INSTALLATION ACCESS**

Personnel details are to be supplied as requested to allow access to HQ SACT, if required. All contractor personnel shall abide by the security restrictions regarding carrying and using electronic devices (e.g. laptops, cell phones) in all NATO facilities. The Supplier(s) shall be responsible for satisfying the necessary clearance requirements before bringing any such device into a NATO facility.

**13. CONTRACTOR ESSENTIAL TECHNICAL COMPETENCIES.** Contractor companies shall submit papers of no more than 15 pages (single-spaced) text, describing in detail:

- a. Their expertise and past experience in developing and delivering products similar to those outlined in this SOW.
  - i. Contractor companies shall cite at least two past performances based on contracts held within the last ten years that are of similar scope, magnitude, and complexity to the tasks, activities, and deliverables detailed in this SOW, or succinctly state that they have no relevant, directly related or similar past performance experience.
  - ii. Contractor companies shall show this relevant past and present experience in a manner that is directly traceable to the requirements of the SOW.
  - iii. In particular, contractor companies shall show relevant experience in cost estimating and modelling for similarly sized/complexity programmes, to include analogous estimating, parametric estimating, and the use of workshops or surveys to elicit cost data.
  - iv. Contractor companies shall show relevant experience in estimating ROM costs of hardware and software.
- b. Contractor companies shall identify the individual or set of individuals that will deliver on the task and provide evidence to assure appropriate levels of experience and expertise in cost estimating and modelling for similarly sized/complexity programmes.
- c. Contractor companies shall list any assumptions of NATO-provided data and shall state the impact of these data being provided late, or being unavailable. In each case a fallback position (“what can still be done”) should be stated if feasible.

**14. NON-NEGOTIABLE.** The supplier will sign a Non-Disclosure Agreement to maintain the confidentiality of cost information provided by NATO, Nations, and industry.

**15. BIDDER EVALUATION.** HQ SACT intends to award a firm-fixed price deliverables contract to the lowest-cost-compliant bid. Technical clarification of essential competencies may be conducted.

## **16. APPLICABLE STANDARDS AND GUIDES**

Analysis of Alternatives in NATO's Capability Delivery Lifecycle Standard Operating Procedure [Ref A] provides indicative guidance to conducting analysis in support of NATO CFCD programmes. NATO standardization recommendation (STANREC) 4755 lists recommended practices regarding LCC estimation. NATO STANREC 4755 recommends the following standard: NATO Guidance on Life Cycle Costs ALCCP-01 (Edition B). NATO STANREC 4739 lists recommended practices regarding risk management, to include schedule.

## **17. REFERENCES:**

- a) Analysis of Alternatives in NATO's Capability Delivery Lifecycle Standard Operating Procedure. [Ref A]
- b) Capability Requirements Brief for Maritime Science and Technology (Mar S&T).
- c) NATO - ALCCP-1 NATO Guidance on Life Cycle Costs, EDITION B, Dec 17.
- d) NATO - SRD ALCCP-1.1 NATO LCC Common Methodology, EDITON A, Oct 21.
- e) NATO STANDARD ARAMP-1 NATO RISK MANAGEMENT GUIDE FOR ACQUISITION PROGRAMMES Edition 1 Version 1 FEBRUARY 2012.

## Annex A: Example CBS

To provide an indicative scale of work for this task, this annex gives an example of a Cost Breakdown Structure (CBS) used on a previous IT-focused Capability Programme Plan. Final cost analyses at the end of this task should provide a similar level of detail.

CBSs presented for comparison of alternatives may be at a higher summary level or lower detailed level if supported by associated evidence. Output cost uncertainty bounds will reflect the quality and resolution of evidence, which is associated with the level of CBS detail.

Note that this example is not applicable to all projects within the Maritime S&T programme, and is only provided to understand the scope of costing requirement.

|    |   |
|----|---|
| 1  | IT Hardware                                   |
| 2  | Supplier Project Management                   |
| 3  | Software Development                          |
| 4  | Software Licences                             |
| 5  | Design, Development, Integration              |
| 6  | Product & Integration Testing                 |
| 7  | Security Testing                              |
| 8  | Service Transition                            |
| 9  | NATO Engineering Services                     |
| 10 | NATO Project Management                       |
|    | <b>Investment Sub-Total</b>                   |
| 11 | Service Support & Helpdesks                   |
| 12 | Spares & Hardware Maintenance                 |
| 13 | Software Maintenance                          |
| 14 | Software Licences                             |
|    | <b>Operations &amp; Maintenance Sub-Total</b> |
|    | <b>Project Total</b>                          |