CTBTO PREPARATORY COMMISSION | COMPREHENSIVE NUCLEAR-TEST-BAN TREATY ORGANIZATION

REQUEST FOR PROPOSAL

To: ALL BIDDERS

Vienna, 1400
Austria

Attn:

Phone:
Fax:
Email:

CTBTO Ref. No.: **2026-0108/MOGAPI**
(PLEASE QUOTE ON ALL COMMUNICATIONS)

Tel. No.: +43 (1) 26030-6350
E-mail: procurement@ctbto.org

Date: 28 Oct 26

Subject: Provision of Software Development and Maintenance of NET-VISA on a Call-Off Basis.

Deadline for Submission: 11 Nov 26 ***Vienna Local Time:*** 17:00

The Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization (hereinafter referred to as the 'Commission') hereby invites you to submit a proposal that meets the requirements of the attached documents.

You are kindly requested to complete and return the acknowledgement form by email as soon as possible.

If you have any questions you should contact the email address indicated above.

Yours Sincerely,

Ms Selma Bukvic
OiC, Procurement Services Section

CTBTO PREPARATORY COMMISSION | COMPREHENSIVE NUCLEAR-TEST-BAN TREATY ORGANIZATION

ACKNOWLEDGEMENT FORM

Solicitation No: 2026-0108	***Closing Date:*** 11 Nov 26
Title: Provision of Software Development and Maintenance of NET-VISA on a Call-Off Basis.	***Vienna Local Time:*** 17:00

Procurement Staff: Gookeditswe Mogapi ***CTBTO Req. No.:*** 0010030239

Please complete 'A' or 'B' or 'C'
and Return

WITHIN FIVE (5) DAYS

THE PREPARATORY COMMISSION FOR THE
COMPREHENSIVE NUCLEAR-TEST-BAN TREATY ORGANIZATION (CTBTO)

by email to
procurement@ctbto.org

A: We shall submit our proposal

Company Name: _____

By: _____ Contact Name: _____
(date)

Email/Tel: _____

B: We may submit and will advise

Company Name: _____

By: _____ Contact Name: _____
(date)

Email/Tel: _____

C: We will not submit a proposal for the following reason(s)

___ our current workload does not permit us to take on additional work at this time;
___ we do not have the required expertise for this specific project;
___ insufficient time to prepare a proper submission;
___ other (please specify) _____

Company Name: _____

Contact Name: _____

Email/Tel: _____

INSTRUCTIONS FOR PREPARATION AND SUBMISSION OF PROPOSALS

1. General

The Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization (the Commission) with its headquarters in Vienna is the International Organization mandated to establish the global verification system foreseen under the Comprehensive Nuclear-Test-Ban Treaty (CTBT), which is the Treaty banning any nuclear weapon test explosion or any other nuclear explosions. The Treaty provides for a global verification regime, including a network of 337 stations worldwide, a communication system, an International Data Centre and on-site inspections to monitor compliance with the Treaty.

This Request for Proposal (RFP) is for the ***Provision of Services Pertaining to Software Development and Maintenance of NET-VISA on a Call-off Basis*** as described in the attached Terms of Reference.

The Proposal shall meet all requirements stated in the Terms of Reference and be submitted in accordance with these Instructions for Preparation and Submission of Proposals. For this project, the Commission is seeking capabilities, which will ensure that the services are delivered, and the tasks are accomplished expeditiously and at a reasonable cost.

2. Documents included in this RFP

This RFP consists of the following documents:

(a) Letter of Invitation
(b) These Instructions for Preparation and Submission of Proposals, including Bidder's Statement, and the following attachments:
- Attachment 1: Minimum Content of the Technical proposal and Technical Compliance Matrix
- Attachment 2: Technical Evaluation Criteria
- Attachment 3: Price Schedule Form
- Attachment 4: Procedure for submission of electronic bids

(c) Statement of Confirmation
(d) Vendor Profile Form
(e) The Commission's Model Contract and its Annexes A – C:
  - The Commission General Conditions of Contract (Annex A of the Model Contract) - incorporated herein by reference available at this link: Microsoft Word - 2026-01 General Conditions of Contract
  - Terms of Reference (Annex B)

Note: In the event of award, the Proposal will be incorporated as Annex C to the Contract.

3. Amendment of RFP Documents

At any time prior to the closing date for submission of Proposal, the Commission may, for any reason, modify the RFP documents by amendment. The Commission may consider extending

the deadline in order to allow adequate time for considering the modifications in the preparation of the Proposal.

4. Language of the Proposal

The Proposal and all correspondence and documents relating to it shall be in English.

5. Format and Submission of the Proposal

The Proposal shall be typed, dated and signed by an official legally authorized to enter into contracts on behalf of your organization. The Proposal shall not contain any interlineation, erasures or overwriting except as necessary to correct errors, in which case such corrections shall be initialled by the authorized person(s) signing the Proposal.

The Proposal shall be submitted electronically according to the attached "PROCEDURE FOR SUBMISSION OF ELECTRONIC OFFERS IN 2 SEALED FILES".

Proposals sent by regular e-mail unless clearly submitted as electronically sealed bids as indicated above and following the instructions outlined in Attachment 4 will not be considered and may lead to the rejection of the Proposal.

The Proposal shall be received not later than the closing date and time indicated in the Letter of Invitation.

6. Request for Clarifications and Contacting the Commission

The Commission will issue clarifications, if required. Bidders are requested to e-mail any questions pertaining to this RFP as soon as possible after receipt of the solicitation documents, but in any case no later than 7 business days prior to the Closing Date. No requests for clarifications will be entertained after this time. Questions will only be accepted via e-mail sent to:

E-mail: procurement@ctbto.org
Subject: Request for Clarifications re RFP No. 2026-0108/MOGAPI

The Commission will make all reasonable efforts to issue the clarifications not later than 5 business days prior to the Closing Date.

Except in the case of responding to a RFP clarification, no bidder shall contact the Commission on any matter relating to the Proposal after its submission and until the award of the Contract. Any attempt to influence the Commission in its evaluation of the Proposal or the contract award decision may result in the rejection of the Proposal.

7. Eligible Goods and Services

The goods and services (if any) to be rendered under the Contract shall have their origin in the States Signatories of the Comprehensive Nuclear-Test-Ban Treaty (CTBT) which is available

in the CTBTO website at www.ctbto.org under Status of Signatures and Ratifications | CTBTO. For purposes of this paragraph, "the origin" means the place from where the materials, goods and/or from which the services are supplied.

8. Type of Contract and Payment

The Commission intends to conclude firm fixed unit prices Contract based on the attached Model Contract. The terms and conditions of payment for services are described in the attached Model Contract.

9. Preparation of the Proposal

The Proposal shall contain, but not necessarily be limited to, the information described below.

The Proposal shall be composed of the following separate parts:

I. **Technical Proposal**; and
II. **Financial Proposal**;

providing, but not limited to, the following information:

PART I: TECHNICAL PROPOSAL

Please state the reference number and the date of this RFP in the Proposal and any correspondence relating to it.

Point of Contact
The Proposal shall state the contact details and address (name, telephone and fax numbers, and e-mail address) of the person/point of contact in your company dealing with this RFP.

Statement of Confirmation, Bidder's Statement and Vendor Profile Form
The attached Statement of Confirmation, Bidder's Statement and Vendor Profile Form shall be duly signed and submitted together with the Proposal.

Description of Services and Technical Compliance Matrix
The Proposal shall include the duly filled-in Technical Compliance Matrix available as Part II in **Attachment 1** and an explanation of the bidder's understanding of the services to be provided and an overall preliminary operational plan for the execution of the services following the minimum content of the technical proposal as per **Attachment 1** hereto.

Specifications
The Proposal shall include a detailed description of the items proposed and include relevant technical literature.

The Proposal shall also provide any other relevant issue which the bidder would like to bring to the attention of the Commission whether or not having cost implications. This shall include details of warranties/manufacturer's guaranties in respect to any Equipment item.

Commission's Inputs

A description of the expected inputs/resources to be made available by the Commission and at what stage of the services.

Time Schedule
A bar chart indicating the estimation of the duration of the services or delivery of Goods, including the duration of each task required by the Terms of Reference and key staff to be involved in each task.

Qualifications
Documentary evidence of your qualifications to provide the Services, which shall establish to the Commission's satisfaction that the bidder has technical capability necessary to perform the Contract and other necessary ongoing services as required.

Personnel
Curriculum vitae of key personnel proposed for this contract, including technical experience to perform the Work.

Please note that it is the bidder's responsibility alone to obtain **work permits or visa or similar** for the personnel proposed to implement this project. The Commission will make no effort nor accept any responsibility for obtaining work permits or visa or similar for the Contractor's personnel.

Use of former Preparatory Commission for the CTBTO ("Commission") employees in the preparation of Quotations:

A bidder must not, in the absence of prior written approval from the Commission, permit a person to contribute to, or participate in, any process relating to the preparation of a Quotation or the procurement process if the person, at any time:

a. During the 12 months immediately preceding the date of issue of the Solicitation was an official, agent, servant or employee of, or otherwise engaged by the Commission;
b. During the 24 months immediately preceding the date of issue of the Solicitation was an employee of the Commission personally engaged, directly or indirectly, in the definition of the requirements, project or activity to which the Solicitation relates.

Sub-Contractors
Names, legal status, address and qualifications of subcontractor(s), if any, and the scope of the subcontracted services. The Proposal shall provide a statement that your organization shall be fully responsible for the performance of sub-contractors. All sub-contractors shall be legally established in one of the CTBTO States Signatories the list of which is available at www.ctbto.org under Status of Signatures and Ratifications | CTBTO.

Delivery Schedule
Delivery time shall be indicated in weeks after receipt of an order and shall be firm during the validity of the Proposal.

PART II: FINANCIAL PROPOSAL

(i) The Proposal shall include the Price Schedule Form provided in Attachment 3 hereto. In presenting the cost for each item, adequate justification and calculation must be included in the Financial Proposal. Note that clear and detailed explanations would enable us to evaluate the Proposal promptly and proceed with fewer requests for clarifications/justifications in a later stage. This is also a factor influencing the decision for Contract award. All individual costs shall be stated in EURO or US Dollars and be computed to constitute the total Contract Price, excluding taxes.

(ii) In principle the Commission is exempt from taxes. Since the arrangement under which such exemption is respected varies from country to country, the selected bidder will be informed by the Commission whether tax exemption will occur at source or whether taxes paid by the selected bidder will be reimbursed by the Commission upon submission of the original supporting documentation.

"Taxes" means all direct and indirect taxes (including value added tax, general sales tax or goods and services tax), assessments, fees, customs duties, liens and charges in as much as they are levied in conclusion or implementation of the Contract, including customs restrictions and charges of similar nature in respect of articles imported or exported for the Commission's official use.

(1) For Austrian companies

The price quoted shall be net of Taxes. All applicable Taxes payable by the selected bidder at the conclusion or implementation of the Contract in respect of the goods/services shall be quoted separately or be separately identified on the Proposal together with information on the nature of the tax and its method of calculation.

(2) For European Union (EU) Companies

The price quoted shall be net of Taxes. All applicable Taxes payable by the selected bidder at the conclusion or implementation of the Contract in respect of the goods/services shall be quoted separately or separately identified on the Proposal together with information on the nature of the Tax and its method of calculation. Due to the VAT exemption applicable to the Commission, no VAT will be charged to the Commission by the EEC Suppliers under the Contract (Ref. EU VAT Council Directive 2006/112/EC, Article 151).

(3) For Non-EU Companies

The price quoted shall be net of Taxes. All applicable Taxes payable by the selected bidder at the conclusion or implementation of the Contract in respect of the goods/services shall be quoted separately or be separately identified on the Proposal together with information on the nature of the tax and its method of calculation. For deliveries to Vienna, Austria, and due to the tax exemption at source applicable to the Commission, no Taxes shall be charged to the Commission under the Contract.

10. Completeness and Correctness of the Proposal

The Commission reserves the right to verify all information furnished by you in the Proposal through a source of its choice. Any inaccurate information so given may lead to the rejection of the Proposal.

11. Validity of the Proposal

The Proposal shall be valid for 90 (ninety) days after the deadline for its submission to the Commission, unless an extension of validity has been requested by the Commission.

12. Correction of Errors

The Commission will check the Proposal for any arithmetic errors. If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected.

13. Evaluation of the Proposal

(a) The Commission will conduct the evaluation and selection based on the criteria and method specified in Attachment 2 "Evaluation Criteria and Method".

(b) The Commission reserves the right, as it deems appropriate, to award to a single bidder, to award to multiple bidders in any combination or not to award to any of the bidders as a result of this RFP.

14. Clarifications and Negotiations of the Proposal

The Commission reserves the right to request clarifications on the Proposal and to enter into negotiations regarding the Proposal before awarding the contract under this RFP.

15. Modification and Withdrawal of the Proposal

Bidders may modify or withdraw their Proposals after their submission, provided that written notice of the modification or withdrawal is received by the Commission by the closing date and time for the submission of the Proposal. The Proposal may not be modified subsequent to the closing date and time.

16. The Commission's Right to Reject the Proposal

The Commission reserves the right to accept or reject the Proposal or to annul this procurement process at any time prior to the award of contract without having to inform the bidders of the grounds therefore, without thereby incurring any liability to the bidders.

17. Costs of preparation and submission of the Proposal

Bidders shall bear all the costs associated with the preparation and submission of their Proposal and the Commission will not be responsible or liable for those costs, regardless of the outcome of this RFP.

18. Proprietary Information

All documentation and information contained in this RFP are proprietary to the Commission and shall not be duplicated, used or disclosed -in whole or in part- for any purpose other than

to evaluate them and respond to the Commission's request for Proposal or otherwise without prior written agreement of the Commission.

19. Data Privacy Notice

Any personal data provided to the Commission as part of this procurement exercise, via an offer or otherwise, and required for assessing offers will be treated by the Commission as confidential information and used on a 'need to know basis'.

The personal data that is provided in an offer will be processed by the Commission for the specific purpose of assessing the offer submitted in response to this solicitation and, in the event of award, contract implementation. This personal data forms an integral part of the offer and to any ensuing contracting arrangement and cannot be accessed, verified, rectified or deleted following the offer's submission other than through the Bidder's express notification to the Commission of any changes or errors or clarifications requested by the Commission during the evaluation process. This data includes, but is not limited to, the following:

- First and last name;
- Contact information, such as telephone numbers, or mailing addresses;
- Email addresses; and
- Information on skills, expertise and work experience.

In the event of award, Clause 49 (Personal Data Protection) of the Commission's General Conditions of Contract shall apply.

Nothing in this RFP shall constitute a waiver, either express or implied, of the privileges and immunities of the Commission and its employees, which are specifically reserved.

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BIDDER'S STATEMENT
PLEASE STATE BELOW & SUBMIT WITH PROPOSAL

Delivery Time:

Shipping weight (kg) and Volume (m^3) – if applicable:

List of recommended consumables and spares including prices and details on local availability, if applicable (please tick):

☐ For one year period ☐ For a period of …….

Warranty period applicable (it shall be for a **minimum of 24 months**, starting from the acceptance of the goods/services by the Commission) – please tick below:

☐ For a two-year period ☐ For a period of …….

Availability of local service in Vienna, Austria (if any):

State country of origin or assembly of all items quoted:

Quantity discount and early payment discount (if any):

Include documentary evidence of qualifications to perform the order, which shall establish to the Commission's satisfaction that the bidder has the financial, technical and production capability necessary to perform the order in its entirety and to provide spare parts and other necessary on-going services as required.

Included in this quotation : **Yes** ☐ **No** ☐

Confirmation that the bidder has reviewed the Commission's License Agreement, the Commission's General Conditions of Contract, Model Contract, and agreed to all terms and conditions.

Yes ☐ **No** ☐

Remarks:

With regards to the software provided with the equipment, state and confirm whether the software licenses are transferable to third parties, i.e. the Commission or the Commission's State Signatories - list available at www.ctbto.og under Status of Signatures and Ratifications | CTBTO.

Yes ☐ No ☐ Not applicable ☐

Remarks:

Name:

Name & Title of Contact Person:

Signature & date:

MINIMUM CONTENT OF TECHNICAL PROPOSAL AND TECHNICAL COMPLIANCE MATRIX

RFP No. 2026-0108/MOGAPI

PROVISION OF THE SERVICES PERTAINING TO SOFTWARE DEVELOPMENT AND MAINTENANCE OF NET-VISA ON A CALL-OFF BASIS

Below sets out the ***Minimum content of the Proposal and the Mandatory Requirements of the Technical Proposal****.* Bidders are requested to demonstrate compliance with the requirements and add any further information in support of their Proposal. Please refer to the relevant section of the Terms of Reference for further explanation of the requirements. The information provided will form an integral part of the technical evaluation process.

Part II of this document must be completed and returned as part of the Proposal.

Part I

Item	Minimum content
1. Executive Summary	Provide an overview of the proposal
2. Experience, Resources and Project Management	
2.1 Corporate Profile and Values	• Brief background of the company, mission/vision, ownership, size, location, number of personnel by type profile, etc. • Company business structure and its authority to execute all Work under the Contract. • If a consortium, provide a clear explanation of the business relationship between the members and governance for the execution of this project. • In case the Bidder requires the services of subcontractors, the Proposal shall include: a) Relationship of the Bidder's business to any subcontractor(s) that will be used. b) Names, addresses, legal status, and qualifications of major sub-contractor(s) proposed by your organization. c) The scope of work and nature of subcontracting.
2.2 Corporate Experience	The proposal should detail the Bidder's experience in executing work of similar scope and complexity.
2.3 Requirements for the Contractor	The Proposal should address and describe all requirements spelled out under Section 5 of the Terms of Reference (ToR).

3. Meeting the Requirements	
3.1 Understanding of the ToR	• Please describe your understanding of the services that are to be provided under this ToR, detailing key assumptions that impact the Technical Proposal. • Please discuss how you propose to address the tasks listed in Section 3 (Scope of Work) and Section 4 (Provision of Software Engineering Services) of the ToR.
4. Contractor's key staff	
4.1. Visa & Work Permits	Provide written confirmation that the Bidder understands and agrees to take responsibility for obtaining any Visa and/or work permits, which may be required to perform the Work under the Contract. The CTBTO does not sponsor work permits for contractors.
4.2. Documentation and Reporting	• Provide written assurance that all reports, documentation, and communication (written and oral) supplied to the Commission shall be in English and submitted in electronic form. • Provide written assurance that all documentation will adhere to the IDC Documentation Standards, samples of which will be provided to the successful Contractor.

Part II – Compliance Matrix

Ref No. of ToR	Requirements *A section-by-section response to each section of the Terms of Reference is included in the Proposal*	Bidder's Response *Please tick whichever is applicable*		Indicate the section in your Proposal and ensure that it is sufficiently described in the Proposal
		"Yes"	**"No"**	
Quality of the proposal				
Overall	Extent to which all aspects of the ToR have been addressed in sufficient detail and clarity.			
Overall	Understanding of the scope of work and the responsibilities of the Contractor			
Overall	The proposed Team Roster demonstrates the capacity to tackle Services described in Section 4 and is explained in sufficient detail. Curricula Vitae contain relevant information demonstrating the proposed personnel's ability to perform the specific tasks under this Contract. The following information is provided for each staff member: Name, Role, Employed since, Type(s) of Service(s) from Section 4 in which the staff member may be involved, Curriculum Vitae			
5.8	It is desirable that the Bidder has demonstrated access to subject-matter experts in seismology, hydroacoustic and infrasound who may be engaged when required. The Bidder has identified the available experts and provided information on their qualifications, areas of expertise and availability.			
Requirements for the Contractor				
5.1	The Bidder is a company/organization/institution established for at least 7 years.			

5.2	The Bidder has demonstrated a minimum of 7 years of experience with all elements of the project management and software development lifecycle: eliciting and documenting business process flows, use cases, requirements, quality management plans, user acceptance testing, and end-user training. Please list and provide information.			
5.3	The Bidder has demonstrated a minimum of 7 years of experience in developing, maintaining and managing software systems of comparable scientific complexity and operational criticality. The Bidder has demonstrated practical expertise in Bayesian methods, machine learning, scientific computing, large-scale data processing, performance optimization, and industrial C++ and Python development.			
5.4	The Bidder has demonstrated a minimum of 7 years of experience in developing database-driven operational systems, automated testing, CI/CD, containerized deployment and maintenance of legacy scientific software.			
5.5	The Bidder has confirmed that the working hours of its relevant staff (e.g. project manager and lead developers), assigned to a Software Team, will overlap at least three hours with the Commission's working hours (9am to 5pm CET).			
5.6	The Bidder has confirmed that under exceptional circumstances support will be fully available during the working hours of the Commission (9 AM – 5 PM Vienna local time (CET/CEST)), without additional costs. This would be no more than one week per year.			
5.7	The Bidder has confirmed that English will be used for all written and oral communication with the Commission.			
7.2	The Bidder has confirmed that they shall submit Sprint reports to document completed work, personnel involved, time spent, open issues and blockers.			

6.1	The Bidder has proposed at least three (3) staff members for the Team Roster and has confirmed that the Team Roster will be maintained throughout the duration of the Contract.			
Requirements for Staff and Team Roster **Skills and experience for each staff on the Team Roster**				
6.4.1	Each proposed staff member has an advanced university degree in computer science, data science, mathematics, physics or a related field (with accompanying explanation).			
6.4.2	Each proposed staff member has demonstrated a minimum of five years of recent professional experience within the last seven years using Python and C/C++ in substantial production-grade software projects of significant complexity.			
6.4.3	Each proposed staff member has demonstrated a minimum of five years of recent professional experience within the last seven years with SQL and database programming, ideally using Oracle and/or PostgreSQL databases, including experience designing data access layers and data models for an application.			
6.4.4	Each proposed staff member has demonstrated a minimum of three years of recent professional experience within the last seven years providing software maintenance and support services for complex and custom software systems.			
6.4.5	Confirmation that each proposed staff member has good communication skills in written and spoken English.			
Skills and experience available amongst Team Roster staff				
6.5	The Bidder has demonstrated that the following combined skills and experience are available in the proposed Team Roster; at a minimum, two (2) of these requirements under *Section 6.5 "Skills and experience available*			

	amongst Team Roster staff" are met by each individual in the Team Roster, and all of these skills and experience are available in the Team Roster in aggregate.			
6.5.1	The Bidder has demonstrated that the following skill and experience is available in the Team Roster: A minimum of three years of recent professional experience within the last seven years with CI/CD (continuous integration/continuous delivery) software deployment environments.			
6.5.2	The Bidder has demonstrated that the following skill and experience is available in the Team Roster: A minimum of three years of recent professional experience within the last seven years with the elements of the software development lifecycle: documenting requirements, user acceptance testing, and end-user training.			
6.5.3	The Bidder has demonstrated that the following skill and experience is available in the Team Roster: A minimum of three years of recent professional experience within the last five years as a Data Scientist, including practical experience in the development, validation and deployment of machine-learning or statistical models.			
6.5.4	The Bidder has demonstrated that the following skill and experience is available in the Team Roster: Minimum of one year of recent professional experience within the last two years designing, developing or integrating agent-based or agentic software systems.			
Experience of Team Roster Staff				
6.4.2	Staff member demonstrates a minimum of five years of recent professional experience within the last seven years using Python and C/C++ in substantial production-grade software projects of significant complexity.			

6.4.3	Each proposed staff member demonstrates a minimum of five years of recent professional experience within the last seven years with SQL and database programming, ideally using Oracle and/or PostgreSQL databases, including experience designing data access layers and data models for an application.			
6.4.4	Each proposed staff member demonstrates a minimum of three years of recent professional experience within the last seven years providing software maintenance and support services for complex and custom software systems.			
6.5.3	Peer-reviewed relevant publications indexed in the Web of Science Core Collection or Scopus, or published in the proceedings of conferences ranked A* in the ICORE 2026 Conference Rankings, are desirable.			
6.5	Adequacy of the number and composition of proposed staff to ensure full coverage of all required skills and experience. Each team member shall meet at least two (2) requirements, while all requirements shall be covered collectively by the Team Roster. (6.5.1; 6.5.2; 6.5.3; 6.5.4)			
RISK MANAGEMENT AND BUSINESS CONTINUITY				
9	Provide and maintain a business continuity/communication plan and a thorough risk assessment plan for the execution of the activities under these Terms of Reference, in accordance with Section 9			

Attachment C
Evaluation Criteria and Method

Software Development and Maintenance of NET-VISA

Ref No. in TOR	QUALIFICATION REQUIREMENTS (PASS/FAIL)	
	Requirements for the Contractor (PASS /FAIL)	**PASS/FAIL**
5.1	The Bidder is a company/organization/institution established for at least 7 years.	**PASS**/FAIL
5.2	The Bidder has demonstrated a minimum of 7 years of experience with all elements of the project management and software development lifecycle: eliciting and documenting business process flows, use cases, requirements, quality management plans, user acceptance testing, and end-user training.	**PASS**/FAIL
5.3	The Bidder has demonstrated a minimum of 7 years of experience in developing, maintaining and managing software systems of comparable scientific complexity and operational criticality. The Bidder has demonstrated practical expertise in Bayesian methods, machine learning, scientific computing, large-scale data processing, performance optimization, and industrial C++ and Python development.	**PASS**/FAIL
5.4	The Bidder has demonstrated a minimum of 7 years of experience in developing database-driven operational systems, automated testing, CI/CD, containerized deployment and maintenance of legacy scientific software.	**PASS**/FAIL
5.5	The Bidder has confirmed that the working hours of its relevant staff (e.g. project manager and lead developers), assigned to a Software Team, will overlap at least three hours with the Commission's working hours (9am to 5pm CET).	**PASS**/FAIL
5.6	The Bidder has confirmed that under exceptional circumstances support will be fully available during the working hours of the Commission (9 AM – 5 PM Vienna local time (CET/CEST)), without additional costs. This would be no more than one week per year.	**PASS**/FAIL
5.7	The Bidder has confirmed that English will be used for all written and oral communication with the Commission.	**PASS**/FAIL
7.2	The Bidder has confirmed that they shall submit Sprint reports to document completed work, personnel involved, time spent, open issues and blockers.	**PASS**/FAIL
6.1	The Bidder has proposed at least three (3) staff members and their CVs for the Team Roster and has confirmed that the Team Roster will be maintained throughout the duration of the Contract.	**PASS**/FAIL
	Requirements for Staff and Team Roster (PASS /FAIL)	**PASS/FAIL**
	Skills and experience for each staff on the Team Roster	
6.4.1	Each proposed staff member has an advanced university degree in computer science, data science, mathematics, physics or a related field (with accompanying explanation).	**PASS**/FAIL
6.4.2	Each proposed staff member has demonstrated a minimum of five years of recent professional experience within the last seven years using Python and C/C++ in substantial production-grade software projects of significant complexity.	**PASS**/FAIL
6.4.3	Each proposed staff member has demonstrated a minimum of five years of recent professional experience within the last seven years with SQL and database programming, ideally using Oracle and/or PostgreSQL databases, including experience designing data access layers and data models for an application.	**PASS**/FAIL
6.4.4	Each proposed staff member has demonstrated a minimum of three years of recent professional experience within the last seven years providing software maintenance and support services for complex and custom software systems.	**PASS**/FAIL
6.4.5	Confirmation that each proposed staff member has good communication skills in written and spoken English.	**PASS**/FAIL
	Skills and experience available amongst Team Roster staff	**PASS**/FAIL
6.5	The Bidder has demonstrated that the following combined skills and experience are available in the proposed Team Roster; at a minimum, two (2) of these requirements under *Section 6.5 "Skills and experience available amongst Team Roster staff"* are met by each individual in the Team Roster, and all of these skills and experience are available in the Team Roster in aggregate.	**PASS**/FAIL
6.5.1	The Bidder has demonstrated that the following skill and experience is available in the Team Roster: A minimum of three years of recent professional experience within the last seven years with CI/CD (continuous integration/continuous delivery) software deployment environments.	**PASS**/FAIL
6.5.2	The Bidder has demonstrated that the following skill and experience is available in the Team Roster: A minimum of three years of recent professional experience within the last seven years with the elements of the software development lifecycle: documenting requirements, user acceptance testing, and end-user training.	**PASS**/FAIL
6.5.3	The Bidder has demonstrated that the following skill and experience is available in the Team Roster: A minimum of three years of recent professional experience within the last five years as a Data Scientist, including practical experience in the development, validation and deployment of machine-learning or statistical models.	**PASS**/FAIL
6.5.4	The Bidder has demonstrated that the following skill and experience is available in the Team Roster: Minimum of one year of recent professional experience within the last two years designing, developing or integrating agent-based or agentic software systems.	**PASS**/FAIL

Only bidders who pass all above criteria will be considered for the point system evaluation (2nd stage)

No.	2.TECHNICAL REQUIREMENTS - EVALUATION CRITERIA AND METHOD	Points		
	Quality of the Proposal	**Max Points**	**Factor**	**Weighted score**
General	Extent to which all aspects of the ToR have been addressed in sufficient detail and clarity.	5	4	20
General	Understanding of the scope of work and the responsibilities of the Contractor	5	2	10
General	The proposed Team Roster demonstrates the capacity to tackle Services described in Section 4 and is explained in sufficient detail. Curricula Vitae contain relevant information demonstrating the proposed personnel's ability to perform the specific tasks under this Contract. The following information is provided for each staff member: Name, Role, Employed since, Type(s) of Service(s) from Section 4 in which the staff member may be involved, Curriculum Vitae	5	3	15
5.8	It is desirable that the Bidder has demonstrated access to subject-matter experts in seismology, hydroacoustic and infrasound who may be engaged when required. The Bidder has identified the available experts and provided information on their qualifications, areas of expertise and availability.	5	2	10
	Experience of Team Roster Staff	**Max Points**	**Factor**	**Weighted score**
6.4.2	Staff member demonstrates a minimum of five years of recent professional experience within the last seven years using Python and C/C++ in substantial production-grade software projects of significant complexity.	5	4	20
6.4.3	Each proposed staff member demonstrates a minimum of five years of recent professional experience within the last seven years with SQL and database programming, ideally using Oracle and/or PostgreSQL databases, including experience designing data access layers and data models for an application.	5	1	5
6.4.4	Each proposed staff member demonstrates a minimum of three years of recent professional experience within the last seven years providing software maintenance and support services for complex and custom software systems.	5	3	15
6.5.3	Peer-reviewed relevant publications indexed in the Web of Science Core Collection or Scopus, or published in the proceedings of conferences ranked A* in the ICORE 2026 Conference Rankings, are desirable.	5	3	15
6.5	Adequacy of the number and composition of proposed staff to ensure full coverage of all required skills and experience. Each team member shall meet at least two (2) requirements, while all requirements shall be covered collectively by the Team Roster. (6.5.1; 6.5.2; 6.5.3; 6.5.4)	5	1	5
	TOTAL - Technical Evaluation	45		**115**

Technical Evaluation:

The technical evaluation process will be done in two stages:

1) Stage 1: Technical proposals will first be evaluated against the mandatory requirements outlined in section 1 above, on a PASS/FAIL basis.

Compliance with all mandatory requirements is required in order to pass stage 1 of the technical evaluation and to be further considered for stage 2 of the evaluation process;

2) Stage 2: The technical proposals that have passed stage 1 of the technical evaluation process, will be evaluated against the weighted criteria set forth in the evaluation matrix above.

In order to pass this stage, bidders must obtain a minimum weighted score of 75 and in accordance with the scoring indicated in the "Table 2 – Scoring" below.

Failing one of the criteria in Stage 2 will not result in the entire technical proposal failing; provided that the technical proposal obtains a minimum weighted score of 69 as already stated.

TABLE 2

Points	Scoring
0	Unsatisfactory - Response incomplete, inadequate and/or non-responsive to the criterion. Bidder does not clearly understand the criterion.
1-2	Weak - Does not meet the minimum requirements of the criterion
3	Good - Meets the minimum requirements of the criterion
4	Very good - Exceeds the minimum requirements of the criterion in some areas
5	Excellent - Exceeds the minimum requirements of the criterion in all areas

2. Financial and commercial evaluation

Once the technical evaluation is finalized, the financial offers of the technically compliant bidders will be evaluated in accordance with the formula given below:

X= Max Available Points * Y/Z

Legend:

X= points to be assigned to the offer being evaluated

Y= price of the lowest priced, technically compliant offer

Z= price of the offer being evaluated

The weight of the technical and financial components is 60% and 40% respectively.
The Contract will be awarded to the bidder who receives the highest combined score resulting from the technical and financial evaluations, subject to contractual acceptability.

Attachment 4 - Price Schedule Format

Provision of the Services Pertaining to Software Development and Maintenance of Net-Visa on a Call-Off Basis

		Person-days Split and Travel Days	CALL-OFF PERIOD 1 (FIRM) (36-months) Estimated 1,065 person-days		Person-days Split and Travel Days	CALL-OFF PERIOD 2 (OPTIONAL) (12-months) Estimated 355 person-days		Person-days Split and Travel Days	CALL-OFF PERIOD 3 (OPTIONAL) (12-months) Estimated 355 person-days	
	Unit		Daily Rate (EUR/USD)	Total		Daily Rate (EUR/USD)	Total		Daily Rate (EUR/USD)	Total
Fees										
Person-day rate (Off-site)	Person-Day	**1,005**			**335**			**335**		
Person-day rate (On-site)	Person-Day	**60**			**20**			**20**		
Subtotal										
Travel costs										
Number of Return travel trips		**12**			**4**			**4**		
Daily Subsistance Allowance (DSA) (if applicable)	Per Day									
Subtotal										
Other costs (specify, if any)										
Overall Total										

NOTES:

1) Please specify currency (USD or Euro only). The rates shall be firm and fixed throughout the term of the Contract.

2) This is a unit-based Contract. The exact number of working days will be determined/called-off in the form of Work Order(s) (WO) at the rates quoted in this Attachment.

3) The person-days noted for each Call-off Period **form part of the cumulative maximum upper limit of 1,775 person-days under the Contract**, and the Commission reserves the right, at its sole discretion, to call off fewer person-days or no person-days at all.

4) Estimated costs for travel based on the most economic and direct route shall be specified in the Financial Proposal. Bidders shall indicate whether the travel costs (without DSA) are firm and fixed for the duration of the Contract, or they are estimated. In the case the travel costs are estimated, payment shall be based on actual costs against relevant supporting documentation e.g. invoices for travel, and shall not exceed 10% of the estimate.

5) If applicable, Daily Subsistance Allowance (DSA) shall be calculated based on the values provided by the International Civil Service Commission (ICSC) https://icsc.un.org/. Daily subsistance/per diem will be reimbursed at the applicable Daily Subsistance Allowance (DSA) rate of the United Nations (and UN EUR/USD exchange rate, if applicable).

Attachment 4

"Procedure for Submission of Electronic Offers in 2 Sealed Files"

The Commission invites you to submit your sealed offer (Bid, or Proposal) in response to the solicitation forming part of this request.

Please be sure to follow the instructions below very carefully, so that the documents you submit are encrypted, and cannot be opened without an encryption key (password). If the documents are not encrypted, they will not be accepted as part of this tender process.

CRITICAL INFORMATION:

Create separate zip files for the technical offer and the financial offer (labelling them clearly in the title) with different encryption keys. Instructions for how to do this are provided below.

Step 1: You provide the encryption key (password) for the *Technical Offer only* (in accordance with the below instructions)!

Step 2: After the Commission has performed the evaluation of the Technical Offer, if your Technical Offer is considered to be acceptable, the Commission will request the encryption key (password) for the Financial Offer you have already submitted by the tender Deadline.

Should you have any questions, please send an email to procurement@ctbto.org.

We recommend that you leave yourself plenty of time to complete the below process (including getting any necessary assistance from the Commission), as late offers will not be accepted.

INSTRUCTIONS:

1. In a **WINDOWS** environment, one way of meeting the requirements is as follows.

   We recommend using the open-source, free software **7-zip**, but if you are comfortable with other tools, the result should be the same, as long as you can apply encryption to the archive. In the below, we'll use 7-zip as an example. (You can download the 7-zip code for Windows at: 7-zip.org)

2. In **LINUX** environment, you can use, for instance, "sha1sum" on the command line.

Creating the archives for submission

Regardless of whether the offer is a single file, or a collection of files, the files are easier to manage if delivered as a single, compressed file. Compressing the archive is a common way to meet size limitations in email systems.

As an example of how to submit your offer in the required format: assuming you are supplier "SOFTCOMP" and have the following files related to the offer for "RFP 2020-0010/EDWALD". *(You will need to replace these elements with the real information for your actual offer in line with the relevant Instructions for Preparation and Submission of Proposals/Bids.)* Assuming further that you have installed the 7-zip software on the Windows system you are using.

We will only go through the creation of the Technical Offer (Proposal/Bid) component; the Financial Offer (Proposal/Bid) component is similar.

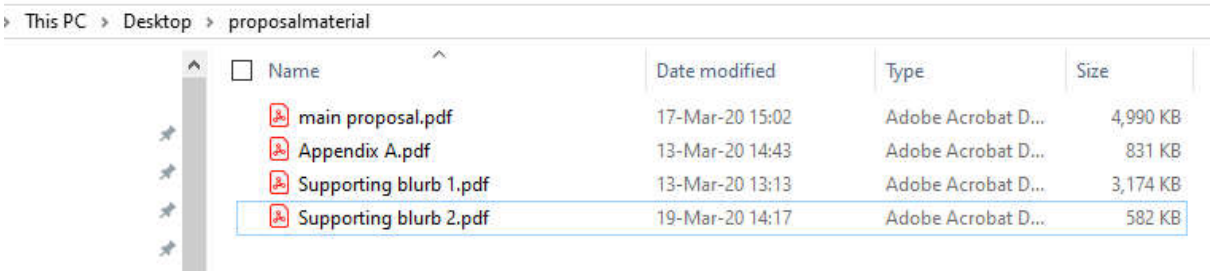


Figure 1 An example set of files to be submitted

Select the four files and right-click; a Dialog box pops up, with one of the options being "**7-ZIP >**". Hover your cursor over the " >" part and a few more options appear, select the "**Add to archive**" option.

Another dialog box pops up (see 'Figure 2, *Creating an Archive*', next page):

Using the standard Windows methods, select a suitable location for the archive (if you don't change it, the archive gets created right where the selected files are), and give it a name in the form of: "SOFTCOMP-2020-0010-EDWALD-TECHNICAL-BID", of course replacing all the elements with the true values for the offer in question: the actual company indicator, and the actual RFP/ITB identification string. Note that it is not possible to put a slash "/" in the file name, and therefore put a dash "-" instead. Leave the file extension ".zip' as is.

Leave all the other settings as is, except: **add a password to the encryption** (see figure 2 below). This is done by typing the same password (of your choosing) twice in the two text fields in the lower right hand corner.

Make a note of this password. You must choose different passwords for the two zip archives, that is, the Technical and the Financial Proposal/Bid.

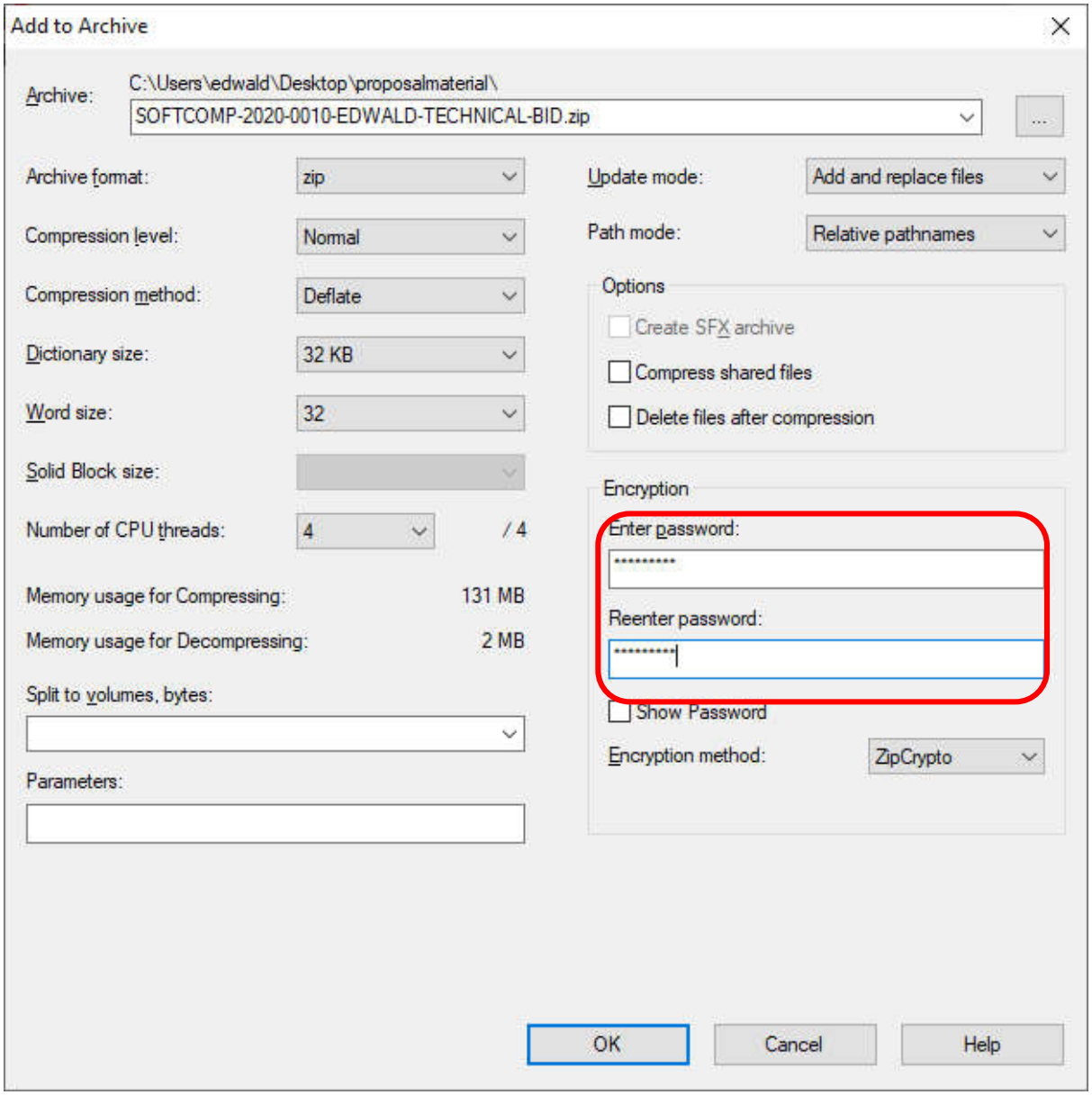


Figure 2 Creating an Archive

Now, we seek the "SHA1 Hash", and electronic fingerprint of the archive you have just created. The hash is a string calculated from your file(s) and can be used to guarantee that the file has not been modified since you created it. Any change to the file will result in a different hash value.

There are many ways of calculating this; two common options are decribed below.

If the appropriate functionality is available in your Windows environment: Select the compressed archive in the Windows file manager, (eg. SOFTCOMP-2020-0010-EDWALD-TECHNICAL-BID.zip) and right click. One of the options to select is "**CRC SHA >**". Hovering over the " >" brings a few more options to light, select the **SHA-1** option. A smaller dialog pops up: (see Figure 3, *SHA1* below). Clicking Ctrl-C grabs the contents of this box. You can close the box after copying the contents. (You can paste the contents into a mail message, for instance.)

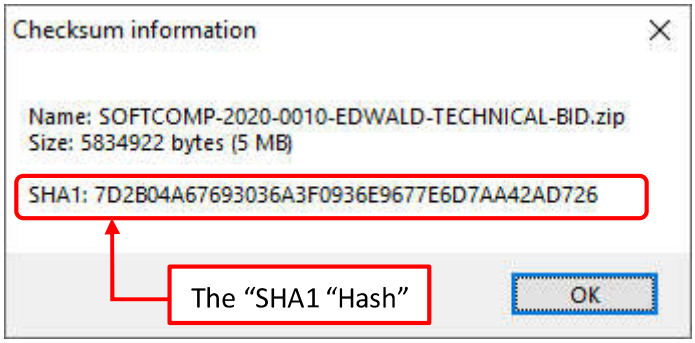


Figure 3 SHA1

If this CRC SHA function is not available by 'right-click' on your Windows version, you can also do this from 'the command line', a slightly more complicated way. Open a CMD window (see sidebar below), move to the folder where your archive is, and execute the command: "`certutil -hashfile SOFTCOMP-2020-0010-EDWALD-TECHNICAL-BID.zip sha1`" where you obviously replace the name of the file with your real file name. The output of this command is the SHA1 "hash". You can copy-and-paste the string for use in the email (below).

Sidebar: How to open a CMD window in Windows:

The way to open a Command window (or 'terminal') depends on the version of Windows you have. The different methods are very clearly described in the following article, but a quick internet search will find multiple descriptions.

https://www.lifewire.com/how-to-open-command-prompt-2618089

Finally,

1. Create a new email, Subject: example- "SOFTCOMP-2020-0010-EDWALD". Add the two compressed archives, that is, the Technical Offer and the Financial Offer archives as attachments. The text of the email should contain the SHA1 information for both archives. **SEND THIS TO:** sealed_bids@ctbto.org (note that there is an underscore "_" between "sealed" and "bids"). (Should the email become larger than your mail system allows, you can

try sending the two archives in separate emails. Take care to include the right SHA1 information with each file.)

2. Create a new email, Subject: example- "SOFTCOMP-2020-2010-EDWALD-Technical Offer" the contents of which must contain the Encryption Key for the Technical Offer (the password you used when creating the Technical Offer). (Again, note the underscore between 'bid' and 'keys'.)
   SEND THIS TO: bid_keys@ctbto.org

   IMPORTANT NOTE: As stated above, only send the Encryption Key for the Technical Offer to the bid_keys@ctbto.org mailbox when sending your Technical and Financial Offer to the sealed_bids@ctbto.org mailbox. You shall only send the Encryption Key for the Financial Offer to the Commission if and when informed by the Commission that your Technical Offer had been evaluated as "technically acceptable".

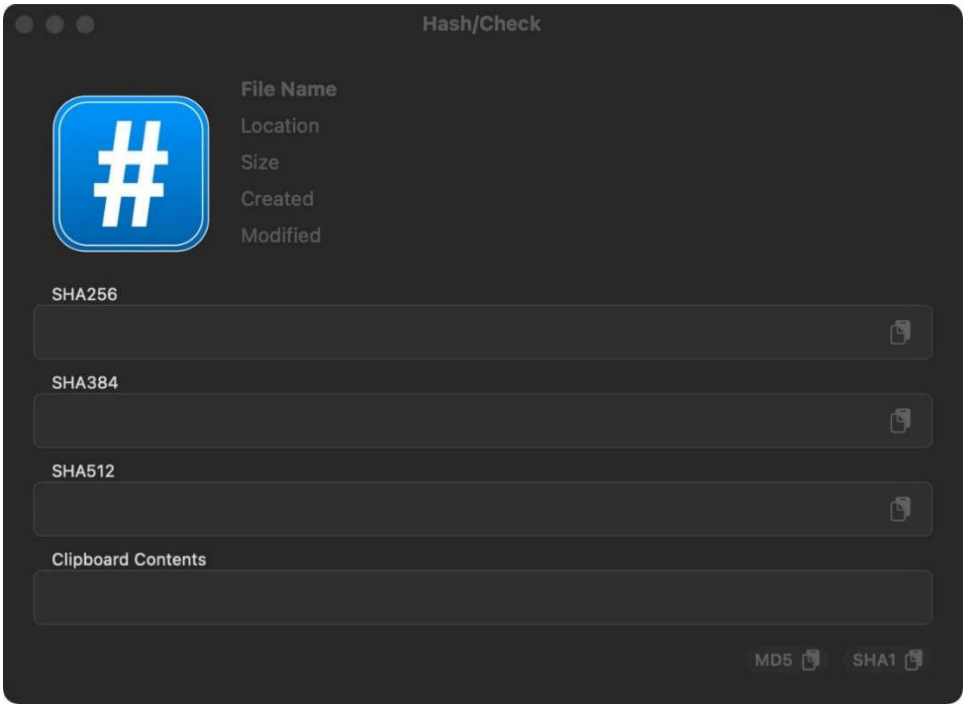
   The Financial Offer Encryption Key will need to be provided by you to the same e-mail (bid_keys@ctbto.org) within 48 hours of the Commission's request, clearly marked in Subject: Encryption Key for (example):"SOFTCOMP 2020-2010 EDWALD-Financial Offer". If your Offer is not considered "technically acceptable", the Commission will not request an Encryption Key for your Financial Offer, and it will remain unopened.

   As mentioned above, should you have questions or difficulties, please send an e-mail to procurement@ctbto.org.

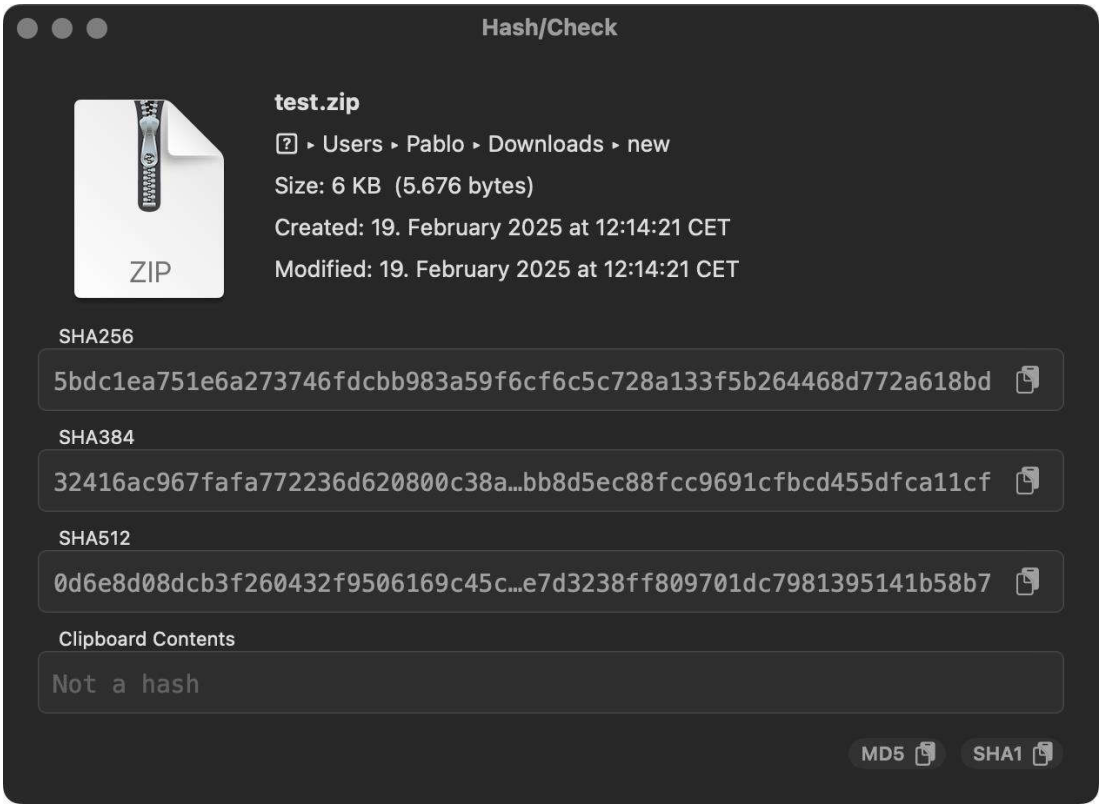
For MAC users:

1. Please download Hash/Check app:
   https://apps.apple.com/at/app/hash-check/id1550525767?l=en-GB&mt=12

2. It is very simple to use. After installing, just open the app and click on "File" to open the zip file you want to inspect.

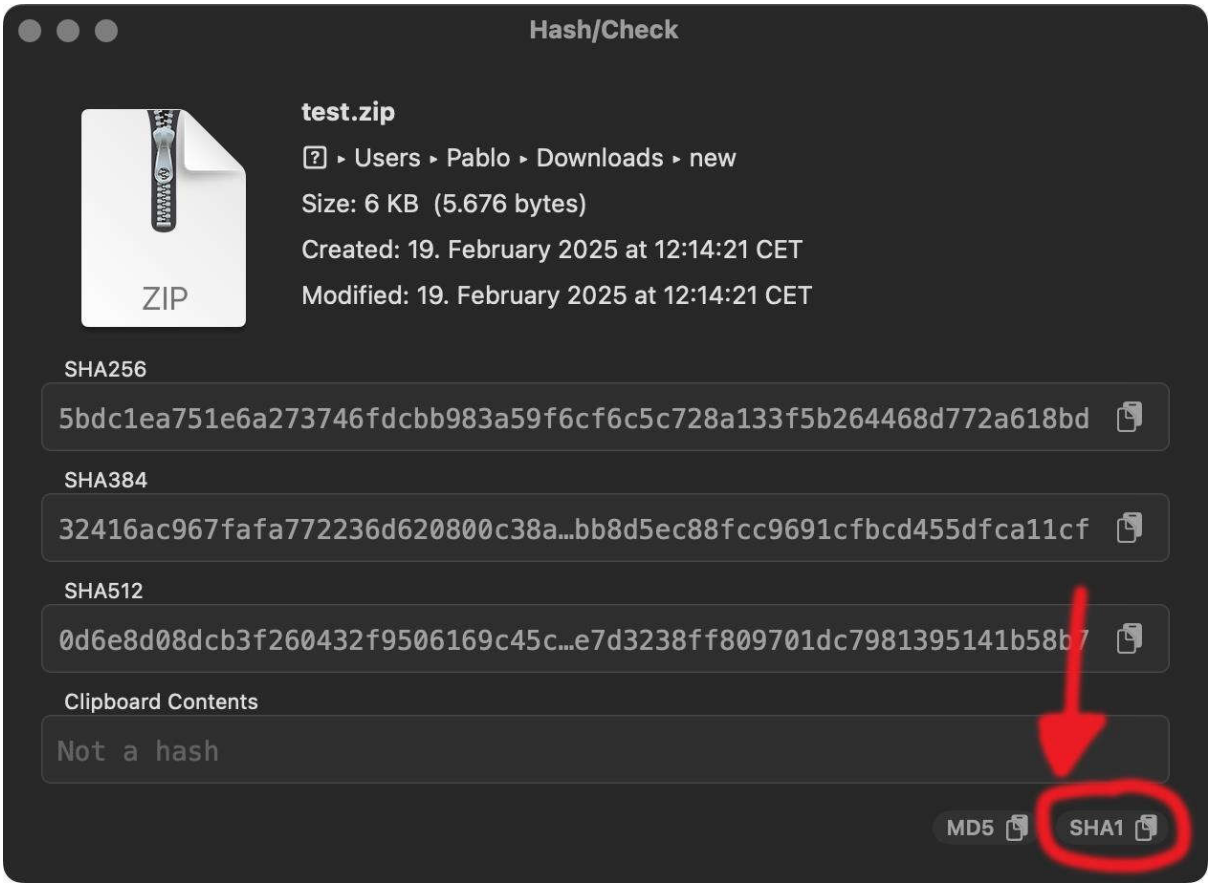


3. Please use your submitted technical and financial proposals

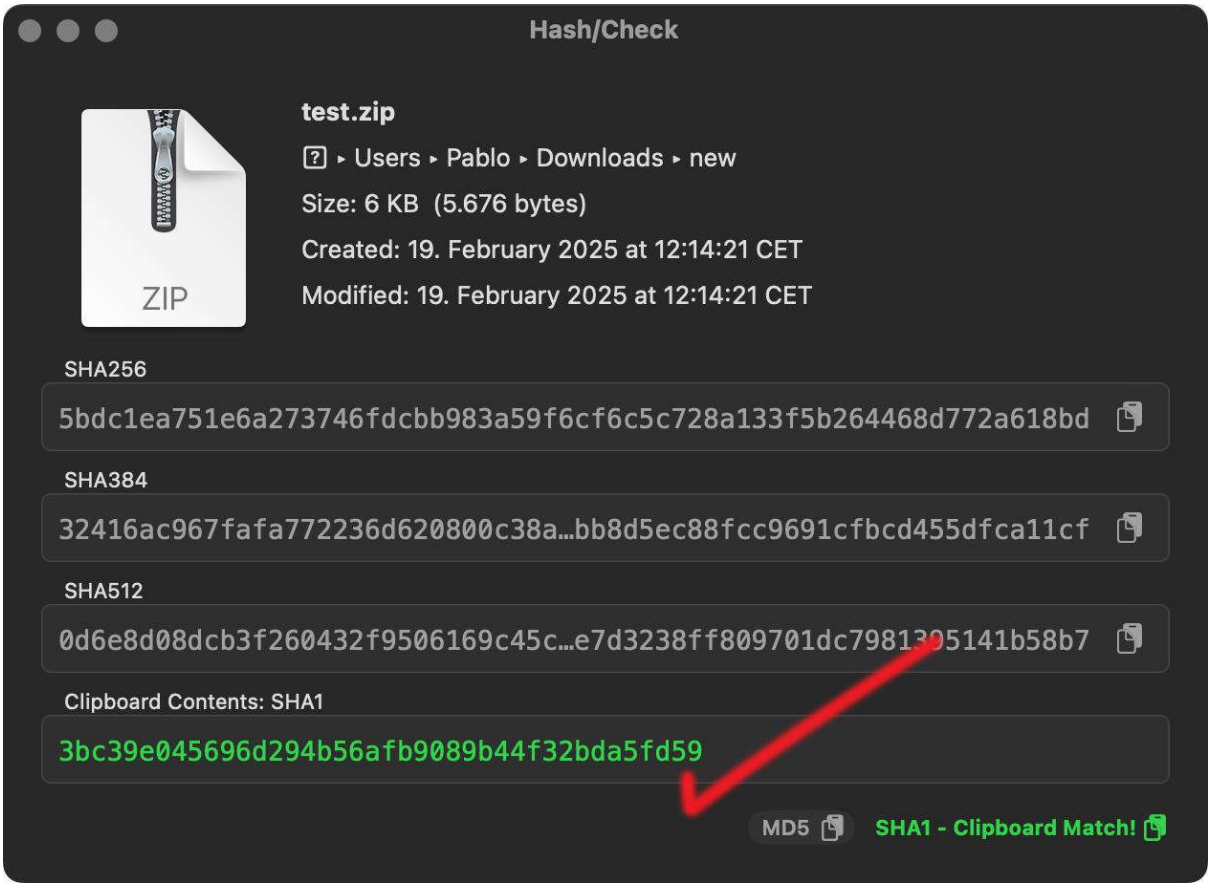


4. And it automatically creates several different hash values … --- But the one we need SHA1 is not there …

   So you press on the little SHA1 icon on the bottom right …



5. The SHA1 hash is calculated and copied to the clipboard automatically for further use.



----------OR----------

Another alternative would be to use the terminal and the command: shasum /path/to/file Here is a little tutorial on how to use it. It is strait forward and simple to use. Please see attached the instructions as a pdf as well.
https://osxdaily.com/2012/02/05/check-sha1-checksum-in-mac-os-x/

Finally,

1. Create a new email, Subject: example- "SOFTCOMP-2020-0010-EDWALD". Add the two compressed archives, that is, the Technical Offer and the Financial Offer archives as attachments. The text of the email should contain the SHA1 information for both archives. **SEND THIS TO:** sealed_bids@ctbto.org (note that there is an underscore "_" between "sealed" and "bids"). (Should the email become larger than your mail system allows, you can try sending the two archives in separate emails. Take care to include the right SHA1 information with each file.)

2. Create a new email, Subject: example- "SOFTCOMP-2020-2010-EDWALD-Technical Offer" the contents of which must contain the Encryption Key for the Technical Offer (the password you used when creating the Technical Offer). (Again, note the underscore between 'bid' and 'keys'.)
   SEND THIS TO: bid_keys@ctbto.org

   IMPORTANT NOTE: As stated above, only send the Encryption Key for the Technical Offer to the bid_keys@ctbto.org mailbox when sending your Technical and Financial Offer to the sealed_bids@ctbto.org mailbox. You shall only send the Encryption Key for the Financial Offer to the Commission if and when informed by the Commission that your Technical Offer had been evaluated as "technically acceptable".

   The Financial Offer Encryption Key will need to be provided by you to the same e-mail (bid_keys@ctbto.org) within 48 hours of the Commission's request, clearly marked in Subject: Encryption Key for (example):"SOFTCOMP 2020-2010 EDWALD-Financial Offer". If your Offer is not considered "technically acceptable", the Commission will not request an Encryption Key for your Financial Offer, and it will remain unopened.

   As mentioned above, should you have questions or difficulties, please send an e-mail to procurement@ctbto.org.

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CTBTO PREPARATORY COMMISSION | COMPREHENSIVE NUCLEAR-TEST-BAN TREATY ORGANIZATION

MODEL CONTRACT

(Shopping Cart No.)
(SAP No.)

between

THE PREPARATORY COMMISSION

FOR THE COMPREHENSIVE NUCLEAR-TEST-BAN TREATY

ORGANIZATION

and

[NAME OF THE CONTRACTOR]

for

THE PROVISION OF THE SERVICES PERTAINING TO SOFTWARE DEVELOPMENT AND MAINTENANCE OF NET-VISA ON A CALL-OFF BASIS

This Contract comprises this cover page, a table of contents, 9 (nine) pages of text, a signatories page, a List of Annexes and 3 (three) Annexes (A to C)

October 2026

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MODEL CONTRACT

This CONTRACT is entered into between the PREPARATORY COMMISSION FOR THE COMPREHENSIVE NUCLEAR-TEST-BAN TREATY ORGANIZATION (hereinafter referred to as the "Commission"), having its office located at Wagramer Strasse 5, 1400 Vienna, Austria, and [NAME OF THE CONTRACTOR] (hereinafter referred to as the "Contractor"), having its registered office located at _____ [address] (both hereinafter individually referred to as the "Party" and collectively as the "Parties").

The Parties hereto mutually agree as follows:

1 DEFINITIONS

In this Contract, words and expressions shall have the same meanings as respectively assigned to them in the General Conditions of Contract and the Terms of Reference. In addition, the following words and expressions shall have the meanings hereby assigned to them:

"Annex A" means the Commission's General Conditions of Contract.

"Annex B" means the Commission's Terms of Reference.

"Annex C" means the Contractor's Proposal dated …..

"Contract" means this document, its Annexes and any further modifications or such further documents as may be expressly incorporated in this Contract by the Parties in accordance with Clause 21 (Contract Amendment) below.

"Contractor" means the legal entity named in the preamble of this Contract or its successors. The Contractor shall be the only interface for all matters pertaining to execution of the Work under this Contract.

"Party(ies)" means the Commission and/or the Contractor, as the context requires.

"Rule(s)" means any regulation(s), official directive(s), ordinance(s), guideline(s), customs and practices.

"Services" means the activities or tasks to be performed by the Contractor under the Contract as requested by the Commission under the WO.

"Work" means all the goods and services to be provided by the Contractor, including its affiliates and/or subcontractors, in order to fulfil all its obligations under the Contract, and the remedying of any defects therein.

"Work Orders ('WO')" mean orders issued by the Commission which specify the (parts or portions of) Work to be performed by the Contractor upon request by the Commission in accordance with Annexes B and C.

"Software" means the software and the source code described in Annex B and developed by the Contractor under this Contract.

2 AIM OF THE CONTRACT

The aim of this Contract is to provide Goods and Services namely, THE PROVISION OF SERVICES PERTAINING TO SOFTWARE DEVELOPMENT AND MAINTENANCE OF NET-VISA ON A CALL-OFF BASIS (hereinafter referred to as the "Work") to the Commission.

3 ENTRY INTO FORCE AND DURATION OF THE CONTRACT

The Contract shall enter into force upon the date of the last signature by the authorized Representatives of the Parties (hereinafter referred to as the "**Effective Date**") and shall be valid until the Parties fulfill all their obligations hereunder.

4 COMMENCEMENT AND COMPLETION OF THE WORK

(i) The Commission shall have the right, but not obligation, to call-off the Work in the form of WO within a period of thirty-six (36) months from the Effective Date or the performance of 1,065 (one thousand and sixty-five) person-days by the Contractor, whichever occurs first (hereinafter referred to as the "**Call-off Period**"). The commencement and completion date for the performance of the Works (hereinafter referred to as "**Commencement Date**" and "**Completion Date**", respectively) will be set out in the respective WO.

(ii) The Commission shall have the option to extend the Call-off Period two (2) times, subject to the availability of funds, under the same terms and conditions as those of this Contract. Each optionally extended Call-off Period shall be for a period of twelve (12) months or the performance of 355 (three hundred and fifty-five) person-days by the Contractor. The Commission will inform the Contractor about its intention to extend the Work at least one (1) month prior to the expiry of the Contract. The optional extensions will be implemented through a written notification to the Contractor by the Commission.

(iii) The Commission shall have the option to carry over any unused person days balance from one Call-off Period to another upon written notification to the Contractor; provided, however, that any such carryover shall not result in the total number of person days exceeding the maximum cumulative limit assigned in total for all Call-off Periods combined as specified in Sub-Clauses 4(i) and (ii) above.

5 STANDARD OF WORK

The Contractor shall perform the Work in a workmanlike manner in conformity with standard professional practices, using qualified personnel and in strict accordance with the Contract. The Contractor shall furnish the highest skill and judgement and cooperate with the Commission, including all the Commission's consultants and agents, in best furthering the interests of the Commission and the aim of this Contract. The Contractor shall provide efficient business

administration and supervision, and it shall perform the Work in the best way and in the most expeditious and economical manner consistent with the requirements of the Contract.

6 RESPONSIBILITIES OF THE CONTRACTOR

(a) The Contractor shall provide the Work described in Annexes B and C.

(b) The Contractor shall provide qualified English-speaking personnel as necessary to perform the Work under this Contract. The key persons shall be available for possible tasks related to the Work throughout the duration of the Contract period. Any replacement of the key personnel shall be made in accordance with Clause 7 of Annex A.

(c) The Contractor shall provide the Software and Services described in Annexes B and C.

(d) The Contractor acknowledges that after the completion of the Work under this Contract, the Commission shall own the Software and source code described in Annex B and developed under this Contract, and the Contractor shall have no rights in that Software or source code unless granted by the Commission under Clause 24 of this Contract or in writing under a separate agreement".

7 ORGANISATION OF CONTRACT IMPLEMENTATION

(a) During the term of the Contract, the Commission has the right, but not the obligation, to initiate performance of the Work through the issuance of individual WOs in accordance with Annex B based on the firm fixed unit prices set out in Annex C. The Contractor shall not perform any Work if not requested by the Commission through an WO. However, the Contractor may propose a WO for the Commission's evaluation.

(b) The WO issued by the Commission shall be the basis for acceptance, invoicing and payment of any Work performed by the Contractor.

(c) The performance of the Work shall be made in full in accordance with the respective WO. Partial service performance of a WO will not be accepted and reimbursed without prior written agreement by the Commission.

(d) The Work shall be performed at the place and within the approved Work Plan specified in the relevant WO.

(e) The Commission may revise a WO as and when it may deem necessary.

8 WARRANTY

(a) The provisions of Clause 33 of Annex A shall apply to the Work performed by the Contractor.

(b) The Contractor shall ensure that the Commission shall experience no loss of service or support level by sub-contractors or repair agents acting on behalf of the Contractor.

9 PERMITS, NOTICES, LAWS AND ORDINANCES

(a) The Contractor shall obtain and pay for all permits and inspections necessary for the proper execution and completion of the Work that are customarily obtained upon execution of this Contract and that are legally required at the time the Proposal is received by the Commission. This shall include, but not be limited to, work permits, visa, or similar.

(b) The Contractor shall give all notices required by the nature of the Work.

(c) If the Contractor notices that the Work or any part thereof required under this Contract is not in accordance with applicable laws and Rules, or with technical or safety standards, it shall promptly notify the Commission thereof in writing.

10 PROTECTION OF PERSONS AND PROPERTY

(a) The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programmes in connection with the Work.

(b) The Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury and loss to:

(i) all employees on the Commission's premises and all other persons who may be affected thereby;

(ii) all the Work, equipment, its spare parts, materials and supplies to be incorporated therein, whether in storage on or off the Commission's premises, which are under the care, custody or control of the Contractor or any of its subcontractors; and

(iii) other property on the Commission's premises or adjacent thereto.

(c) The Contractor shall give all notices and comply with all applicable laws and Rules bearing on the safety of persons and property and/or their protection from damage, injury and loss.

(d) The Contractor shall erect and maintain, as required by existing conditions and progress of the Work, all reasonable safeguards for the safety and protection of persons and property, including posting danger signs and other warnings against hazards and promulgating safety regulations.

(e) When the use or storage of combustible, explosive or other hazardous materials is necessary for the execution of the Work, the Contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel.

(f) The Contractor shall be responsible for the prevention of accidents on the Commission's premises during the execution of the Work.

(g) In any emergency affecting the safety of persons or property, the Contractor shall promptly act to prevent threatened damage, injury and loss.

(h) The Contractor shall promptly remedy all damage and loss to any property, referred to in Sub-Clause (b) above, caused in whole or in part by the Contractor, any subcontractor, or

anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable and for which the Contractor is responsible under Sub-Clause (b) above, except damage and loss attributable to the acts or omissions of the Commission or anyone directly or indirectly employed by it, or of anyone for whose acts the Commission may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to its obligations under Clause 9 of Annex A.

11 RESPONSIBILITIES OF THE COMMISSION

The Commission shall designate members of its staff to act as points of contact for the Contractor to ensure that the Work is carried out in accordance with Annexes B and C and shall promptly notify the Contractor thereof. The Commission shall respond promptly to requests for information by the Contractor regarding the Work.

12 CONTRACT PRICE

(a) The Commission shall pay to the Contractor, in consideration of the full and proper performance of its obligations under the Contract, as follows:

(i) For each WO issued during the firm Call-off Period specified in Clause 4(i) above, the firm fixed day rate pursuant to Annex C and, if applicable, the variable costs (travel costs and other expenditure) mentioned in section 8 of Annex B for each issued WO, pursuant to Annex C;

(ii) subject to sub-clause (b) below, for each WO issued during the first optional extension of the Call-off Period specified in Clause 4(ii) above, the firm fixed unit prices pursuant to Annex C and, if applicable, the variable costs (travel costs and other expenditure) mentioned in section 8 of Annex B for each issued WO, pursuant to Annex C;

(iii) subject to sub-clause (b) below, for each WO issued during the second optional extension of the Call-off Period specified in Clause 4(ii) above, the firm fixed unit prices pursuant to Annex C and, if applicable, the variable costs (travel costs and other expenditure) mentioned in section 8 of Annex B for each issued WO, pursuant to Annex C;

(hereinafter referred to as the "Contract Price").

(b) In the event that the Commission decides to extend the Call-off Period before the end of the initial 36-month period, as foreseen in Clause 4(ii) of this Contract, the Contactor will be reimbursed for the person-days called off in this period as follows:

(i) until the expiry of the initial Call-off Period, the daily rate set out in subparagraph (a)(i) above;

(ii) after the expiry of the initial Call-off Period, the daily rate agreed for the optional extension (subparagraph (a)(ii), or (iii) above).

(c) The unit prices set out in Annex C shall be held fixed for the entire duration of the Contract.

(d) The Contract Price shall cover all costs and expenses incurred by the Contractor for the full and proper performance of all relevant obligations under the Contract (including travel, allowances, management and remuneration of the personnel, national income tax, medical insurance, and social security contributions).

(e) **[PLEASE IDENTIFY WHETHER TAXES ARE APPLICABLE UNDER THIS CONTRACT AND SELECT ONE OF THE FOLLOWING OPTIONS AT THE TIME OF AWARD]:**

The Contractor shall be reimbursed by the Commission for such taxes on the basis of actual amounts paid and duly documented by the Contractor as per Clause 13(e) below.

OR

No Taxes are applicable under this Contract.

13 PAYMENT

(a) The Contract Price shall be paid upon satisfactory completion of each deliverable for the Work and satisfactory completion of each WO and submission of the following:

i) Invoice drawn up in accordance with this Clause 13;

ii) Any other documentation that might be required under the applicable WO.

(b) The Commission will make the payments to the Contractor on the basis of an invoice submitted by the Contractor as per Sub-Clause (d) below. All payments shall be made within 30 (thirty) days of the receipt and acceptance of the invoice, provided that the Work has been satisfactorily completed and has been accepted by the Commission.

(c) The making of any payment hereunder by the Commission shall not be construed as an unconditional acceptance by the Commission of the Work accomplished by the Contractor up to the time of such payment.

(d) The Contractor shall submit an invoice electronically, from the Contractor's official e-mail address in PDF format, duly signed and stamped by the Contractor and submitted to the Commission's email address specified in Clause 22 below. Each invoice shall contain the Contract number (CTBTO and SAP numbers), detailed banking instructions, including the name and address of the Contractor's bank, account number, account holder's name and SWIFT, IBAN and/or ABA codes for payment by electronic transfer.

[PARAGRAPH (e) BELOW ONLY APPLIES IF THERE ARE TAXES (SEE CLAUSE 12 (d) ABOVE). IF NO TAXES ARE APPLICABLE UNDER THIS CONTRACT, PARAGRAPH (e) SHOULD BE OMITTED.]

(e) Applicable Taxes payable by the Contractor and/or its subcontractor(s) in respect of the Work shall be invoiced separately or be separately identified on the invoice. Actual payment of the Taxes must primarily be supported by original documentation such as invoices, bank account statements, transfer orders, or receipts issued by the local tax or customs authorities. If submission of such original documentation is not possible for justifiable reasons, their copies

could be accepted by the Commission provided that they are duly signed and certified by local tax or customs authorities. In case the currency in which the Taxes are levied is not the currency of the Contract, bank statements (or equivalent) showing the exchange rate used for the conversion should be submitted to the Commission, in addition to any other supporting documentation.

14 TEMPORARY SUSPENSION OF WORK

The Commission may, at any time, temporarily suspend the Work, in whole or in part, being performed by the Contractor under this Contract by giving 30 (thirty) days' advance notice in writing to the Contractor. The Work so suspended shall be resumed by the Contractor on the basis of a revised time schedule and on terms and conditions to be mutually agreed upon between the Parties.

15 DELAYS AND EXTENSION OF TIME

(a) If the Contractor is delayed at any time in the progress of the Work by any act or omission of the Commission or by any of its employees, or by any other contractor employed by the Commission, or by changes in the Work ordered by the Commission, or by any causes beyond the Contractor's reasonable control, or by any other cause which the Commission determines may justify the delay, then the time for completion of the Work shall be extended by an amendment to this Contract in accordance with Clause 21 below for such reasonable time as the Commission may determine.

(b) Any request for extension of the time for reasons referred to in Clause 15(a) above shall be submitted to the Commission not later than 20 (twenty) days after the commencement of the delay, otherwise said request shall be deemed to be waived. Such request shall state grounds for the delay and shall provide an estimate of the probable effect of such delay on the progress of the Work.

16 CONTRACTOR'S CLAIMS AND REMEDIES

In no event shall the Contractor make any claim against the Commission for or be entitled to additional costs or compensation resulting from any delays in the progress or completion of the Work or any portion thereof, whether caused by the acts or omissions of the Commission, including, but not limited to, damages related to overheads, loss of productivity, acceleration due to delay and inefficiency. The Contractor's sole remedy in such event shall be an extension of time for completion of the Work, provided the Contractor otherwise meets the requirements and conditions set forth in this Contract.

17 ENTIRE AGREEMENT

This Contract represents the final agreement in respect of the Work and shall supersede all prior agreements and representations between the Parties in this respect. Annexes A to C shall constitute integral parts of this Contract and shall be of full force and effect.

18 DISCREPANCIES

If there are discrepancies or conflicts between any of the documents that are part of this Contract, the document to prevail shall be given precedence in the following order:

(i) This document;

(ii) The Commission's General Conditions of Contract (Annex A);

(iii) The Commission's Terms of Reference (Annex B);

(iv) The Contractor's Proposal (Annex C);

(v) The relevant WO.

19 SEVERABILITY

If any term and/or provision of this Contract is or becomes invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions of this Contract shall not in any way be affected or impaired thereby.

20 NO WAIVER

Failure by a Party to enforce a right shall not be deemed to be a waiver of that right unless otherwise expressly provided in this Contract.

21 CONTRACT AMENDMENT

No modification of, or change in, this Contract, or waiver of any of its provisions, or additional contractual relationship with the Contractor shall be valid unless approved in the form of a written amendment to this Contract, signed by duly authorized Representatives of the Parties.

22 TRANSMISSION OF NOTICES AND OTHER DOCUMENTS

Notices, invoices, reports and other documentation under the Contract shall be delivered or sent to the relevant Party as follows (or to such person/title, address or email address as the Party may substitute by notice after the date of the Contract):

(a) The Commission:

For Contractual Issues:

Chief, Procurement Section
Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO)
Vienna International Centre
Wagramerstrasse 5, P.O. Box 1200
1400 Vienna, Austria
Tel: + (43 1) 26030 6350
E-mail: procurement@ctbto.org

For submission of invoices:

Accounts Payable
CTBTO Financial Services Section
Vienna International Centre
Wagramerstrasse 5, P.O. Box 1200
1400 Vienna, Austria
Tel: + (43 1) 26030 6292
E-Mail: Payable_Invoices@ctbto.org

For invoices related enquiries:
Payments@ctbto.org

(b) The Contractor:

For Contractual Issues and Invoices and Related Enquiries:

Name: ……..
Title ……..
Address ……..
Tel: ……..
Email: ……..

23 EFFECTIVENESS

(a) Except as provided below, any communication in connection with the Contract will be deemed to be given as follows:

(i) if delivered in person, at the time of delivery;

(ii) if by registered mail or courier, when received;

(iv) if by electronic communication, when retrievable by the Commission in document form.

(b) A communication given under Clause 23(a) above that is received or becomes retrievable on a non-working day or after business hours at the seat of the Commission will only be deemed to be given on the next working day of the Commission.

24 SOFTWARE LICENCE

The Commission hereby grants the Contractor a non-exclusive, non-transferable, irrevocable license to use the Software for the duration of the Contract and for the purpose of doing the Work under the Contract. The use of the source code is only for the duration of the Contract and for the Work required under the Contract. All title, ownership rights and intellectual property rights in and to the Software shall remain with the Commission. The Contractor acquires no title, right or interest in the Software, other than the license(s) specifically granted herein by the Commission.

IN WITNESS hereof, the duly authorized Representatives of the Parties have executed this Contract:

For and on behalf of **the PREPARATORY COMMISSION FOR THE COMPREHENSIVE NUCLEAR-TEST-BAN TREATY ORGANIZATION:**

_____

Name and Position

Date: _____ Place: Vienna, Austria

For and on behalf of **[REGISTERED NAME OF THE CONTRACTOR]:**

_____

Name and Position

Date: _____ Place: _____

LIST OF ANNEXES

ANNEX A: THE COMMISSION'S GENERAL CONDITIONS OF CONTRACT

ANNEX B: THE COMMISSION'S TERMS OF REFERENCE

ANNEX C: THE CONTRACTOR'S PROPOSAL

Annex B

TERMS OF REFERENCE

PROVISION OF THE SERVICES PERTAINING TO SOFTWARE DEVELOPMENT AND MAINTENANCE OF NET-VISA ON A CALL-OFF BASIS

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1. INTRODUCTION

The Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organisation (hereafter referred to as the "CTBTO", "Commission", and/or the "PTS"), located in Vienna, Austria, is the international organization establishing the global verification system under the provisions of the Comprehensive Nuclear-Test-Ban Treaty (CTBT), which bans any nuclear explosion below or above the Earth's surface, underwater and on the surface of the water or in the atmosphere. The verification system includes the International Monitoring System (IMS), a global network of monitoring stations that employ waveform technologies (seismic, hydro-acoustic and infrasound) and radionuclide technologies (particulate and noble gases), a global satellite communications infrastructure (the GCI), an International Data Centre (IDC), and the capability to carry out on-site inspections (OSI). More information on CTBTO is available at https://www.ctbto.org/.

2. BACKGROUND

NET-VISA stands for NETwork processing - Vertically Integrated Seismic Analysis. NET-VISA is the main SHI (seismic, hydroacoustic and infrasound) event detector. NET-VISA is based on Bayesian-inference machine-learning techniques. The package is composed of a physics-based, probabilistic model and a heuristic inference algorithm designed to find the most probable set of seismic events which can explain a series of arrivals detected by a global seismic network.

NET-VISA integrates seamlessly with the upstream and downstream components of the IDC software through the Oracle database for data input and output. NET-VISA is written in the Python scripting language and C programming language and calls functions from the IDC C language libraries. The two main components of NET-VISA for the purpose of pipeline processing are the idcnetvisa_learn and idcnetvisa_infer scripts. NET-VISA is also distributed as part of NDC software package, or 'NDC in a Box'- to support National Data Centres. 'NDC in a Box 'is provided as a virtual machine, and NET-VISA supports the PostgreSQL database used inside this environment.

NET-VISA has both a significant scientific role and a business-critical operational role in automatic SHI event detection and bulletin production at the IDC. It provides advanced probabilistic SHI event detection capabilities and is a core component of the IDC automatic processing pipeline. Its correctness, availability, performance and maintainability are therefore essential for event detection, bulletin production and downstream IDC operations.

A selection of relevant documentation is provided:

- NET-VISA Software Description Document (See Attachment A)
- IDC Database Schema – ODB (See Attachment B)

The Commission seeks to establish a Call-Off Contract for an initial period of three (3) years (the "Initial Call-Off Period"), with the option to extend the Contract twice for additional periods of one (1) year each (the "Additional Call-Off Periods").

For indicative planning purposes, the anticipated volume of Services is approximately 355 person-workdays per year. This figure is an estimate only and shall not constitute a minimum or maximum commitment, contractual ceiling, guaranteed volume, or limitation on the Services that may be called off under the Contract. At its sole discretion, the Commission reserves the right to call off more, fewer or no person days at all. These Terms of Reference (hereinafter referred to as "ToR") form the technical framework for the provision of the services pertaining to software development and maintenance of NET-VISA on a call-off basis (hereinafter referred to as "Services" or "Work") and define the technical requirements that the Contractor and its services shall meet.

3. SCOPE OF WORK

The Contractor shall provide the Commission with software engineering services related to:

1. Improvement of NET-VISA Bulletin Quality
2. Improvement of Infrasound Association
3. Improvement of Hydroacoustic Association, Including Implementation of New Hydroacoustic Travel-Time Tables and Blockage Maps
4. Support for 3D Seismic Models in NET-VISA Event Location
5. Modernization of NET-VISA Software Architecture and Improvement of Code Maintainability
6. Development of an Additional Automated Testing System to Assess the Impact of NET-VISA Modifications on Interactive Analysis
7. Maintenance, Documentation and Further Improvement of NET-VISA

4. PROVISION OF SOFTWARE ENGINEERING SERVICES

This section breaks down the description of the Services that shall be provided by the Contractor.

General Requirements

The Contractor shall be required to perform the following activities:

- define, review and refine requirements in accordance with IDC requirements engineering practices;
- prepare requirements documentation forming the basis for work planning;
- schedule deliverables and estimate the effort required to execute the work;
- design, develop, test and maintain new software, major enhancements and existing software systems;
- provide second-level support for existing software systems;
- maintain GitLab repositories;
- develop and maintain automated test suites;
- support delivery, acceptance and implementation of each deliverable through the established IDC change management and release processes;
- prepare and maintain software and procedural documentation, typically including Software Design Description documentation;

All Python code shall be written in accordance with the PEP 8 style guidelines:
https://peps.python.org/pep-0008/

All C++ code shall be written in accordance with the Google C++ Style Guide:
https://google.github.io/styleguide/cppguide.html

The use of Python docstrings shall be mandatory:
https://peps.python.org/pep-0257/

General Deliverables

Unless otherwise specified in the applicable Work Order, Contractor's deliverables for each Service shall include, where applicable:

- modified source code and configuration files;
- automated tests and test results;
- updated model files and model parameters;
- analysis of overlap and inconsistency metrics compared with the agreed baseline, using the same input data and processing conditions;
- Jupyter Notebook presenting the analysis and results, where appropriate.

Additional task-specific deliverables for the Contractor are specified under each Service below.

4.1 Improvement of NET-VISA Bulletin Quality

4.1.1 Service Description:

NET-VISA shall be further improved to increase the quality, completeness and reliability of automatically generated SHI bulletins (VSEL3). Long-term testing has shown that NET-VISA detects more than 80% of detectable SHI events responsible for signals observed in data from IMS stations. At the same time, analyst review of the resulting bulletins shows that approximately 40% additional seismic phases must be manually added to correctly detected sources, and approximately 20% of the seismic phases associated by NET-VISA are linked to incorrect origins and should instead be associated with other origins. The required improvement shall focus on associating more valid phases with the correct events, reducing missed phases, reducing incorrect phase associations, and improving the overall consistency of NET-VISA bulletins with analyst-reviewed reference bulletins.

The Contractor shall investigate and, where justified, implement improvements, including through the following activities:

:

- application of deep learning methods for cases where the target variable has a complex distribution and cannot be adequately represented or predicted by the current Bayesian probabilistic model;
- investigation and implementation of improved inference approaches. The current NET-VISA inference process is based on a greedy association algorithm, which may lead to suboptimal event and phase association results. More advanced approaches, including but not limited to reinforcement learning, shall be investigated to improve inference optimization and increase the probability of obtaining globally better bulletin solutions.

Where feasible, preference shall be given to inherently interpretable models.

The evaluation baseline, metrics and measurable objectives shall be specified in the applicable Work Order and agreed by the Commission and the Contractor before the commencement of the work.

4.1.2 Deliverables:

In addition to the general deliverables, the Contractor shall provide a comparison of the investigated model and inference approaches, including the rationale for the selected approach.

4.2 Improvement of infrasound association

4.2.1 Service Description:

The Contractor shall further improve NET-VISA to increase the quality and completeness of infrasound processing. Although the quality of infrasound processing has improved in recent years, the number of manual analyst operations remains significant. This indicates that both the association of pure infrasound events and the association of infrasound detections with seismic events are not yet performing at the required operational quality level.

The required improvement shall focus on increasing the reliability of pure infrasound event detection, improving the correctness and completeness of infrasound phase association, and reducing the amount of manual analyst intervention required during bulletin review. The activity shall cover the full model development and evaluation cycle, including analysis of current performance limitations, feature engineering, model retraining, validation, integration testing and operational performance assessment, and, where justified by the results, integration and deployment into production.

4.2.2 Deliverables:

The Contractor shall provide:

- an analysis of the current limitations of infrasound event detection and association;
- an evaluation of the investigated methods against the current approach
- a report describing the methods tested, experimental results, limitations and conclusions;
- recommendations for further development or production implementation.

Where an investigated approach demonstrates sufficient improvement, the deliverables shall also include its implementation and integration into NET-VISA.

4.3 Improvement of Hydroacoustic Association, Including Implementation of New Hydroacoustic Travel-Time Tables and Blockage Maps.

4.3.1 Service Description:

In the first quarter of 2026, IDC received new blockage maps and travel-time tables for all hydroacoustic stations (hydrophone stations and T-stations), including 3D effects that more accurately reflect station

coverage areas. These 3D effects allow for the possibility of signals from a single event arriving via multiple paths due to acoustic diffraction, reflection, and scattering. This requires moving away from the traditional concept of hydroacoustic blockage, which is described to association algorithms in terms of range–azimuth pairs defining the maximum range from which sound can arrive as a function of horizontal angle. The inclusion of 3D effects makes it possible for sound sources at a given azimuth to be unblocked at short ranges, blocked within the acoustic shadow of an island, and then become unblocked again due to diffracted propagation paths around the island.

NET-VISA has already demonstrated the ability to read the new 3D travel-time tables. However, further research, development, testing, and verification are required to fully exploit the capabilities of the 3D approach for both hydrophone stations and T-stations. The full implementation of the new hydroacoustic travel-time tables and blockage maps in NET-VISA requires further investigation of the 3D tables, refinement of their use within NET-VISA association and inference logic, and verification of multi-path hydroacoustic signal handling. Additional testing and verification will also be required across a range of scenarios (e.g., H-phase and T-phase events, events detected solely by the hydroacoustic network, and events detected by both the seismic and hydroacoustic networks).

4.3.2 Deliverables:

In addition to the general deliverables, the Contractor shall provide:

- a report describing the methods tested, experimental results, limitations and conclusions;
- recommendations for further development or production implementation;
- implementation of the new hydroacoustic 3D travel-time tables and blockage maps in NET-VISA;
- validation for hydrophone stations and T-stations, including multi-path signals, hydroacoustic-only events and mixed seismic-hydroacoustic events.

4.4 Support for 3D Seismic Models in NET-VISA Event Location

4.4.1 Service Description:

As part of a previous contract, a proof of concept was developed for NET-VISA integration with GeoTess in order to support the use of the Salsa3D model. Further work is required to assess, extend and validate this approach, and to determine whether LocOO3D, Salsa3D and related GeoTess-based components can provide measurable improvements to NET-VISA event location.

The activity shall include a detailed comparison between the existing NET-VISA location workflow and an alternative using LocOO3D with Salsa3D models and GeoTess-based travel-time tables.

The comparison shall cover origin location accuracy, residual distributions, uncertainty estimates and supported phases.

A dedicated validation shall be performed using Ground Truth events.

The Contractor shall compare the current NET-VISA results with results obtained using LocOO3D/Salsa3D-based functionality for the same input data and processing conditions. Any observed regressions shall be analyzed and corrected, and the final deliverable shall be a NET-VISA version supporting 3D models.

4.4.2 Deliverables:

In addition to the general deliverables, the Contractor shall provide:

- implementation of GeoTess-based 3D seismic models in the NET-VISA location workflow;
- comparison with the current NET-VISA location workflow using the same input data and processing conditions;
- validation using Ground Truth events, including location accuracy, residual distributions, uncertainty estimates and supported phases;

- analysis and correction of identified regressions, or documentation of remaining limitations;
- configuration and documentation required to use the supported 3D models.

4.5 Modernization of NET-VISA Software Architecture and Improvement of Code Maintainability

4.5.1 Service Description:

NET-VISA shall be modernized to improve software maintainability, safety and testability. The initial development of NET-VISA started more than 15 years ago. As a result, the current codebase contains a significant amount of legacy C code, including low-level and potentially unsafe memory management practices. This substantially complicates further development, maintenance, debugging, testing and operational support. In addition, the integration between Python modules and C components is implemented manually, which increases technical complexity, reduces robustness and makes future evolution of the system more difficult.

The required improvement shall focus on eliminating unsafe software engineering practices, reducing technical debt and introducing standard, maintainable approaches for integration between Python and C components. This shall include review and refactoring of legacy C code, replacement or isolation of unsafe memory management patterns, adoption of established integration libraries and interfaces, improvement of modularity, and removal of duplicated or fragile implementation logic. Where feasible, legacy C components shall be migrated to modern C++ in order to improve type safety, memory safety, encapsulation and maintainability, without degrading computational performance or operational throughput.

The activity shall also include the development and integration of an automated test suite covering critical NET-VISA functionality, including unit tests, integration tests, regression tests and tests for Python/C interface behavior.

4.5.2 Deliverables:

In addition to the general deliverables, the Contractor shall provide:

- performance comparison with the current implementation, including any identified regressions or limitations.
- regression test results demonstrating that the modernized implementation produces functionally equivalent results for the same input data and configuration;
- documentation and justification of any output differences introduced by the modernization;

4.6 Development of an additional automated testing system to assess the impact of NET-VISA modifications on interactive analysis

4.6.1 Service Description:

An additional automated testing system shall be developed to improve the assessment of NET-VISA changes and their potential operational impact on interactive analysis.

At present, NET-VISA bulletin quality is primarily assessed using event-level metrics such as overlap, defined as the fraction of events in the reference bulletin that are recovered by the automatic bulletin, and inconsistency, defined as the fraction of events present in the automatic bulletin that are not found in the reference bulletin. Events are usually matched using arrival-based matching with a lax criterion, where two shared arrivals are sufficient to consider events as matched. While these metrics are generally sufficient for assessing the quality of automatic processing at the event level, they do not fully characterize the expected impact on interactive analyst work. For example, a large seismic event may contain more than 100 associated arrivals, and an event-level match based on only two shared arrivals may not adequately reflect the amount of manual correction, reassociation, phase addition, phase deletion or event editing required from analysts.

As a result, any significant NET-VISA modification currently requires substantial manual testing and expert review. This creates a dependency on scarce analyst resources and limits the efficiency, frequency and scalability of NET-VISA validation activities. The required improvement shall focus on the development of an automated agent-based testing system designed to estimate how NET-VISA modifications affect interactive analysis workflows. The purpose of the system is to provide a repeatable and objective assessment of how changes in NET-VISA output may influence the scope, type and amount of analyst work required during bulletin review. The system shall therefore assess not only event-level matching metrics, but also operationally relevant differences between automatically generated and analyst-reviewed bulletins that may affect analyst workload, including phase additions, phase deletions, incorrect associations, event splitting or merging, origin corrections and other bulletin-editing actions.

4.6.2 Deliverables:

In addition to the general deliverables, the Contractor shall provide:

- an implemented automated agent-based testing system;
- definitions of the analyst actions and workload metrics assessed by the system;
- reproducible workflows for comparing NET-VISA and analyst-reviewed bulletins;
- validation of the estimated analyst actions against representative analyst-reviewed cases;

4.7 Maintenance, documentation and further improvements for NET-VISA

4.7.1 Service Description:

NET-VISA is operational business-critical software. Continued maintenance, documentation and incremental improvement activities shall be provided to support its reliable use in both IDC and NDC in a Box environments. The required activities shall include maintenance and enhancement work driven by operational needs, user feedback, integration requirements and changes in the surrounding software ecosystem.

This may include, but is not limited to:

- implementation of requests from NDC in a Box users, including functional improvements, configuration changes and new integration requirements;
- implementation of modifications based on regular feedback from IDC analysts, in order to support continuous improvement of NET-VISA operational performance and usability;
- adaptation of NET-VISA to changes introduced by the IDC Reengineering project and other related projects, including changes in databases, containerization, IDC libraries, build systems, deployment environments and other upstream or downstream software components.

The activity shall also include the preparation and maintenance of documentation for both IDC and NDC in a Box deployments.

4.7.2 Deliverables:

In addition to the general deliverables, the Contractor shall provide, as applicable:

- implemented functional improvements and configuration changes requested by NDC in a Box users;
- implemented modifications resulting from feedback provided by IDC analysts;
- adaptations required by changes to databases, containerization, IDC libraries, build systems, deployment environments and interfacing software components;
- updated documentation for IDC and NDC in a Box deployments.

5. REQUIREMENTS FOR THE CONTRACTOR

The Contractor shall satisfy the following mandatory requirements:

	Mandatory requirements
1	To be a company/organization/institution established for at least 7 years
2	A minimum of 7 years of experience with all elements of the project management and software development lifecycle: eliciting and documenting business process flows, use cases, requirements, quality management plans, user acceptance testing, and end-user training
3	A minimum of 7 years of demonstrated experience in developing, maintaining and managing software systems of comparable scientific complexity and operational criticality. The Contractor shall demonstrate practical expertise in Bayesian methods, machine learning, scientific computing, large-scale data processing, performance optimization, and industrial C++ and Python development.
4	A minimum of 7 years of demonstrated experience in developing database-driven operational systems, automated testing, CI/CD, containerized deployment and maintenance of legacy scientific software.
5	The Contractor shall ensure that the working hours of its relevant staff (e.g. project manager and lead developers), assigned to a Software Team, overlap at least three hours with the Commission's working hours (9am to 5pm CET).
6	The Contractor shall ensure that under exceptional circumstances, support will be fully available during the working hours of the Commission (9 AM – 5 PM Vienna local time (CET/CEST)), without additional costs. This would be no more than one week per year.
7	Use of the English language for all written and oral communication with the Commission
	Optional requirements
8	It is desirable that the Contractor demonstrate access to subject-matter experts in seismology, hydroacoustic and infrasound who may be engaged when required. The Contractor should identify the available experts and provide information on their qualifications, areas of expertise and availability.

6. REQUIREMENTS FOR STAFF AND TEAM ROSTER

6.1 Constitution of the Team Roster

At least three (3) staff members shall be included in the Team Roster and maintained throughout the duration of the Contract. The Contractor shall manage an approved Team Roster containing details of staff who may be involved in the performance of on-site or off-site work for the Commission. At a minimum, the following information shall be provided for each of these staff:

- Name
- Role
- Employed since
- Type(s) of Service(s) from Section 4 in which the staff may be involved
- Curriculum Vitae

Each member of the Team Roster shall be appropriately skilled and experienced to carry out the role and service(s) listed in the Team Roster.

The Contractor shall demonstrate:

- The capacity of the suggested Team Roster to tackle Services described in Section 4**Error! Reference source not found.**.
- The compliance of the suggested Team Roster with requirements set out in this Section.

6.2 Maintenance of the Team Roster, conditions of revision

The Contractor shall maintain an up-to-date version of the Team Roster for the duration of the Contract. The Contractor shall be responsible to inform the Commission when staff are to be removed or added to the Team Roster, and if the details of a staff are modified.

If the Commission estimates that the Team Roster lacks capacity or capability to perform a specific work within the specified timeframe or quality, the Contractor shall provide, within three working days after a request is made by the Commission, the details of skilled and experienced staff (in the form of CV) to be added to the Team Roster for consideration by the Commission. Staff proposed for replacement shall have equal or better qualifications and experience. The Commission reserves the right to interview new team members for the Team Roster.

The Contractor shall estimate on-boarding or familiarisation time as a response to each Request. The Commission is not liable for on-boarding or familiarisation time. The onboarding of staff added to the Roster during the implementation phase shall be at the expense of the Contractor.

6.3 Project Team Management Requirements

The Contractor shall ensure that each staff of the Project Team:

- is dedicated to the project during the Contract period (unless otherwise agreed); and
- is not re-assigned from the project without the prior written consent of the Commission.

The Contractor shall:

- Have an established pre-screening process to identify suitable staff.
- Provide CVs of the proposed Project Team to demonstrate that the team member is appropriately skilled and experienced to carry out the work plan, along with the proficiency level of each member of the Project Team on this project (see Sections 6.4 and 6.5.).
- Provide Replacement of poor performing Project Team members or provision of specific training to address a gap in knowledge identified after a Project Team member has started his or her assignment, at no cost for the Commission, upon request by the Commission.

- Be pro-active in identifying and proposing additional resources and/or expertise to the Project Team based on the current needs of the Project.

The Commission reserves the right to seek an immediate replacement for any Project Team member from the Roster, as determined by the Commission. In such cases, the Commission will request a replacement Contractor staff, with equal or better qualifications and experience, to complete the tasks. If no suitable replacement can be agreed upon, the Commission reserves the right to terminate the assignment of the Project Team member with immediate effect. Continuity of staff is an important consideration. The Contractor shall therefore take necessary measures to ensure a seamless transition when taking over the services and keep changes to staff being assigned to the Commission to a minimum throughout the duration of the Contract.

6.4 Skills and experience for each staff on the Team Roster

Each of the Contractor's staff on the Team Roster shall meet the following minimum qualifications throughout the duration of the Contract:

	Skills and experience
1	Advanced university degree in computer science, data science, mathematics, physics or a related field (with accompanying explanation).
2	A minimum of five years of recent professional experience within the last seven years using Python and C/C++ in substantial production-grade software projects of significant complexity.
3	A minimum of five years of recent professional experience within the last seven years with SQL and database programming, ideally using Oracle and/or PostgreSQL databases, experience designing data access layers and data models for an application.
4	A minimum of three years of recent professional experience within the last seven years, providing software maintenance and support services for complex and custom software systems.
5	Good communication skills in written and spoken English

6.5 Skills and experience available amongst Team Roster staff

The following combined skills and experience shall be available in the Team Roster and shall be maintained for the duration of the Contract; at the minimum, two (2) of these requirements shall be met by each individual in the Team Roster, but all of these skills and experience shall be available in the Team Roster aggregate.

	Skills and experience
1	A minimum of three years of recent professional experience within the last seven years with CI/CD (continuous integration/continuous delivery) software deployment environments.
2	A minimum of three years of recent professional experience within the last seven years with the elements of the software development lifecycle: documenting requirements, user acceptance testing, and end-user training
3	A minimum of three years of recent professional experience within the last five years as a Data Scientist, including practical experience in the development, validation and deployment of machine-learning or statistical models. Peer-reviewed publications indexed in the Web of Science Core Collection or Scopus, or published in the proceedings of conferences ranked A* in the ICORE 2026 Conference Rankings, are desirable.
4	Minimum of one year of recent professional experience within the last two years designing, developing or integrating agent-based or agentic software systems.

7. ORGANIZATION OF WORK

The Commission may request Services as described in Section 4.

The work will be called off in the form of Work Orders (WOs). Each WO shall include the exact scope of work and the required deliverables to be performed and delivered by the Contractor.

7.1 Initiating Work

Since the IDC follows the Scrum software development methodology, WOs generally follow Scrum sprints and cover software development services to be performed within approximately two (2) to four (4) weeks. Therefore, a WO is issued during a sprint planning meeting, and the work items to be addressed in that WO (sprint) are recorded in the Commission's Issue tracking system (JIRA). Initiation of the sprint constitutes the issuance of the WO. In the case of a WO issued outside of the Scrum framework, the Commission will supply the work to be performed in writing to the Contractor. The Contractor shall respond with an estimate of the number of person-days required to complete the work and the delivery date. After the estimate and delivery date are accepted, the Commission will issue the WO to the Contractor.

The Contractor shall perform the work only after receipt of the WO.

Scrum meetings shall normally last approximately one hour and shall take place once or twice per week during PTS core hours, 9:00 AM–5:00 PM Vienna local time (CET/CEST). The exact frequency of such meetings shall be determined by the Commission's Project Manager based on project needs. The Contractor shall ensure the participation of personnel responsible for the tasks to be discussed at each meeting.

Each non-trivial JIRA ticket, defined as requiring more than three working days of effort, shall include a brief English description of the task, the expected result, the high-level NET-VISA workflow changes required, and the corresponding estimate. The scope may be refined during implementation, provided that updates are documented in the ticket.

JIRA tickets shall be the primary tool for discussing, tracking and documenting technical tasks. Organizational matters may be handled by email or Microsoft Teams. The Contractor shall ensure that the Project Manager, or an authorized substitute, responds to Commission requests as soon as possible and typically within one working day, as measured at the contractor's premises.

Critical software defects shall be acknowledged and triaged as soon as possible and typically within one working day, as measured at the contractor's premises, with a proposed workaround or corrective action plan where feasible. Resolution timelines shall be agreed with the Commission based on severity, operational impact and technical complexity, and tracked in the corresponding JIRA ticket. (A critical software defect is a defect causing an operational outage, data corruption, incorrect processing results, or the unavailability of a required function where no acceptable workaround exists.)

7.2 Work Order Management

At the start of each WO, the Contractor shall detail and implement a project management system that clearly defines how the work is to be managed and controlled. It should include at a minimum:

- Approval by the Commission project manager of the stages with defined milestones and deliverables
- Authorization to proceed from one stage to the other by the Commission project manager
- Approval by the Commission project manager of the scope, costs and schedule of each stage of the project
- Planning and assurance of quality for each stage of the project
- Monitoring of the progress of the project by the Commission project manager through continuous status reports (automated status reports are preferable) and timely issue escalation

procedures. Sprint reports shall document completed work, personnel involved, time spent, open issues and blockers.

- Final report and Lessons learned report at the end of the project.
- The Contractor shall follow a transparent and controllable development process based on Scrum practices where applicable. JIRA tickets and GitLab commits shall be small, clearly scoped and easy to review. JIRA tickets shall include links to relevant GitLab commits or merge requests where applicable.
- Documentation shall be updated and reviewed whenever changes affect functionality, configuration, deployment, operation, interfaces and testing.

All documentation produced by the Contractor shall adhere to the IDC Documentation Standards, templates of which will be provided to the Contractor during the kick-off meeting.

7.3 Completion and Acceptance

At the end of a particular WO, the Contractor shall submit to the Commission the agreed deliverables within the period of performance stated in the respective WO.

Typically, in accordance with the Scrum methodology, the Contractor will present the work performed during the sprint, including demonstrations of any newly developed software, within the Sprint Review meeting.

Task-specific completion and acceptance criteria shall be defined in each Work Order. For research tasks, acceptance shall be based on completion of the agreed work and a report describing the methods tested and results obtained. For implementation or deployment tasks, acceptance shall be based on the agreed tests, metrics and processing conditions.

The Contractor shall submit a Report to the Commission, electronically via email and within the first five (5) working days following the completion of each sprint, describing all the activities performed during the preceding sprint, including but not limited to summary of technical support activities done and working time spent on each work item.

8. WORK LOCATION

The Contractor shall provide a workspace for personnel at its own cost. Services under WOs shall be delivered off-site from the Commission's premises in Vienna, Austria. The Commission will provide the Contractor with a remote access to the relevant infrastructure in the PTS network. The infrastructure includes but is not limited to, software, servers, web services, LANs, and databases.

The Contractor may be required to travel to the Headquarters of the Commission in Vienna, Austria, as applicable, for up to 20 on-site person-days per year in total. Such on-site days are expected to be used primarily for participation in working groups, but may also be used for conferences, workshops, user support activities or other project-related meetings. The allocation of on-site days may be distributed among Contractor personnel as required, ranging from one person attending for up to 20 working days to several persons attending for shorter periods. The Commission shall agree upon the on-site days with the Contractor before issuing the relevant WOs. In case on-site work is required at the PTS headquarters in Vienna, Austria, the Commission will provide at its premises a suitable work environment (workspace, meeting rooms for presentations and trainings, standard stationery, internet connection) to the Contractor's personnel to perform the services under WOs, as required.

All travel arrangements shall be the Contractor's responsibility if travel is required (including visa, hotel). The Commission will reimburse return flight ticket costs based on the most direct and economical route upon presentation of supporting documents.

Per-diem amounts shall be based on the applicable United Nations Daily Subsistence Allowance (DSA) rates provided by the International Civil Service Commission (ICSC).

9. RISK MANAGEMENT AND BUSINESS CONTINUITY

The Contractor shall provide a business continuity/communication plan and a thorough risk assessment plan at the Contract commencement to identify potential risks that could impact the successful execution of the outlined software development services in these Terms of Reference, including contingency plans, as appropriate.

Risks may include but are not limited to technical challenges, changes in project requirements/scope, resource constraints, schedule delays, integration difficulties, and third-party dependencies. The risk assessment plan and a business continuity/communication plan should be consistently updated, aligning with the delivery of milestones or significant accomplishments.

Upon the Contract's satisfactory completion, the Contractor shall conduct a final review of the initially identified risks. Risks that have been effectively mitigated or did not materialize should be officially closed, accompanied by appropriate documentation.

The insights gained from the risk management process should be methodically documented and shared with the Commission.

STATEMENT OF CONFIRMATION

On behalf of (name of firm or organization):_____, I hereby attest and confirm that:

a) The firm/organization possesses the legal status and capacity to enter into legally binding contracts with the Commission for the supply of equipment, supplies, services or work.

b) The firm/organization is not insolvent, in receivership, bankrupt or being wound up, and not under administration by a court or a judicial officer, and that it is not subject to the suspension of its business or legal proceedings for any of the foregoing reasons.

c) The firm/organization has fulfilled all its obligations to pay taxes and social security contributions.

d) The firm/organization has not, and that its directors and officers have not, within the last five years been convicted of any criminal offense related to professional conduct or the making of false statements or misrepresentations as to their capacity or qualifications to enter into a procurement or supply contract.

e) The Commission, in the event that any of the foregoing should occur at a later time, will be duly informed thereof, and in any event, will have the right to disqualify the firm/organization from any further participation in procurement proceedings.

f) The firm/organization did not/will not attempt to influence any other bidder, organization, partnership or corporation to either submit or not submit a proposal/bid/quotation.

g) The firm/organization will not, in the absence of a written approval from the Commission, permit a person to contribute to, or participate in, any process relating to the preparation of a Quotation/Bid/ Proposal or the procurement process if the person:

   a. at any time during the 12 months immediately preceding the date of issue of the Solicitation was an official, agent, servant or employee of, or otherwise engaged by the Commission;
   b. at any time during the 24 months immediately preceding the date of issue of the Solicitation was an employee of the Commission personally engaged, directly or indirectly, in the definition of the requirements, project or activity to which the Solicitation relates.

h) Neither the organization/firm, its parent entities (if any), nor any of its subsidiary or affiliated entities (if any) have been identified on, or associated with any individual, groups, undertakings and entities identified on, the list established pursuant to the UN Security Council Resolution 1267 (Consolidated Sanctions List).[1]

i) Neither the organization/firm, its parent entities (if any), nor any of its subsidiary or affiliated entities (if any) are subject to any form of sanction imposed by an organization or body within the United Nations System, including the World Bank.

[1] The Consolidated United Nations Security Council Sanctions List can be found on the following website: **https://www.un.org/securitycouncil/content/un-sc-consolidated-list**

j) Neither the organization/firm, its parent entities (if any), nor any of its subsidiary or affiliated entities (if any), is engaged in any practice inconsistent with the rights set forth in the Convention on the Rights of the Child, including Article 32 thereof, which, inter alia, requires that a child shall be protected from performing any work that is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development.

k) Neither the organization/firm, its parent entities (if any), nor any of its subsidiary or affiliated entities (if any) will use the funds received under contracts/purchase orders with the Commission to provide support to individuals, groups, undertakings or entities associated with terrorism.

l) The prices in the firm/organization's proposal/bid/quotation have been arrived at independently, without consultation, communication or agreement with any other interested companies, competitor or potential competitor with a view to restricting competition.

m) The Commission shall have the right to disqualify the firm/organization from participation in any further procurement proceedings, if it offers, gives or agrees to give, directly or indirectly, to any current or former staff member of the Commission a gratuity in any form, an offer of employment or any other thing of service or value, as an inducement with respect to an act or a decision of, or a procedure followed by, the Commission in connection with a procurement proceeding.

n) The Commission shall have the right to disqualify the firm/organization from participation in any further procurement proceedings if it does not disclose to the Commission any situation that may appear as a conflict of interest, and if it does not disclose to the Commission if any official or professional under contract with the Commission have an interest of any kind in the firm/organization's business or any kind of economic ties with the firm/organization.

o) The firm/organization expressly agrees to abide by the United Nations Supplier Code of Conduct.[1]

Name (print):_____ Signature: _____

Title/Position: _____

Place (City and Country):_____ Date: _____

[1] https://www.un.org/Depts/ptd/about-us/un-supplier-code-conduct

VENDOR PROFILE FORM (VPF) – FOR PRODUCTS/SERVICES/WORK

1. Name of Company:	
2. Street Address:	3. Telephone:
P.O. Box: City:	4. E-Mail:
Zip Code: Country:	5. Website:
6. Contact Person*:	Title:
7. Legal Status (e.g. Partnership, Private Limited Company, Government Institution) PLEASE INCLUDE A COPY OF THE CERTIFICATE OF INCORPORATION	
8. Year Established:	9. Number of Employees:
10. Gross Corporate Annual Turnover (US$m)**:	11. Annual Export Turnover (US$m)**:
12. Type of Business/Products: Manufacturer ☐ Sole Agent ☐ Supplier ☐ Other ☐ (please explain)	
13. Type of Business/Services/Work: Engineering ☐ Civil Work ☐ Governmental Institution ☐ Other ☐ (please explain)	
14. References (your main customers, country, year and technical field of products, services or work): **	
15. Previous Supply Contracts with United Nations Organizations (over the last 3 years)*** Organization: Value in US$ Equivalent: Year: Organization: Value in US$ Equivalent: Year:	

* Please see Privacy Disclaimer on page 3
** Please provide a copy of the most recent audited annual report and accounts. Note: Export includes services or work performed abroad or for foreign clients.
*** Please provide supplementary documentation on these items.

16. Summary of any changes in your company's ownership during the last 5 years:

17. List of Products/Services/Work offered:

Product/Service/Work #	Product/Service/Work Description

18. This section shall be **signed and stamped** by an official legally authorized to enter into contracts on behalf of your organization:

Name: Title: Signature: Date:

Bank Details	**Beneficiary Details**
Bank Name: Bank Address: Exact Account Holder Name:	Beneficiary Name: (exactly as stated on bank statements) IBAN: (if applicable) Account number: SWIFT/BIC: ABA/Sort Code:

Additional Details (if applicable)

Correspondent bank:

Correspondent account number:

Correspondent SWIFT/BIC:

Tax Identification Number:

FOR CTBTO USE ONLY		
Evaluated By:	Initials	Date:
Updated By:	Initials	Date:
Remarks:		

Privacy Disclaimer for Suppliers Registering via on-line form (website) or physical Vendor Registration Form *

Any personal data provided to the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization ("CTBTO"), which is required for assessing your request for registration, will be treated by the CTBTO as confidential and used on a 'need to know basis'.

The personal data that you provide within your company profile through the registration process will be processed by the CTBTO for the specific purpose of procurement activities in performance of the CTBTO mandate. This data includes, but is not limited to, the following:

- First and last name;
- Contact information, such as telephone numbers, or mailing addresses; and
- Email addresses.

Subsequent to registration, you may request information regarding the processing of your personal data at any time by sending a request to supplier.registration@ctbto.org. The CTBTO will assess such requests on a case-by-case basis, in accordance with its internal policies.

Nothing in this disclaimer shall constitute a waiver, either express or implied, of the privileges and immunities of the CTBTO and its employees, which are specifically reserved.