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भारतसरकार / Government of India
रक्षामंत्रालय / Ministry of Defence
रक्षाअनुसन्धानएवंविकाससंगठन
Defence Res. & Dev. Organisation
उच्चऊर्जाप्रणालीएवंविज्ञानकेंद्र
Centre for High Energy Systems & Sciences
विज्ञानकाँचा (डाकघर), हैदराबाद – ५०००६९.
Vignyanakancha, Hyderabad – **500 069.**

E-Mail: mmg@chess.drdo.in
director@chess.drdo.in

सभी पत्रादि निदेशक को सम्बोधित होने चाहिए।
All communications must be addressed
to the Director only



Date: 19/10-04-2024

Invitation for Expression of Interest
for the “Design and Development of Beam Control System for High Power
Laser”

The Director, CHES, DRDO, Vignyana Kancha PO, Hyderabad invites Expression Of Interest (EOI) from Indian firm (as defined under the Companies Act, 2013), owned and controlled by resident Indian citizens, to find suitable developmental partner towards Design and Development of Beam Control System for High Power Laser for specific application of DRDO.

CHES intends to assess the indigenous firm capability in this direction as per the scope of work given below. The sole purpose of this EOI is to identify and pre-qualify the prospective bidders in India to design, develop Beam Control System (BCS) for High Power Laser (HPL) and provide technical support during Integration of developed BCS with High Power Laser and also during the Lab check out test and field testing of the integrated BCS & HPL system.

Selected firms through this Eoi, will be issued detailed scope of work for the development case upon signing of Non-disclosure agreement (NDA). On submission of quotation, winner of the subsequent tender related to this development shall also be nominated as the Development cum Production Partner (DCPP) subsequent to the successful technical trail of the developed system. The nominated Production Agency shall be responsible for supply, maintenance and support during the entire


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life-cycle of the product and also will be one of the supply chain for future development of this system (if any).

1. Scope of Work in brief:

The qualified development partners (bidders) are required to design/ develop, Beam Control System (BCS) for High Power Laser (HPL) and provide technical support during Integration of developed BCS with HPL and also during the Lab check out test and field testing of the integrated BCS & HPL system, which includes the following major activities under the following brief scope of work:

- (i) Design & development of Integrated Beam Control system with below mentioned modules/ technologies
 - a) Detailed design & development of integrated BCS. (Preliminary design & configuration and technical support & inputs to be provided by CHESS).
 - b) Development of Large Aperture (dia of 500-700mm) Beam Directing Telescope in reflective configuration using Conic/ Aspheric/ Spherical mirrors with provision to focus HPL beam onto a distant target.
 - c) Large aperture, optical Periscopic head adaptable to the beam emerging from beam directing telescope to steer the beam in the field of regards (FOR) of Azimuth (± 180 deg) and Elevation (-15deg to +70deg) towards the intended target.
 - d) Beam transportation module with combination of multiple fold mirrors, in order to launch HPL beam to the Beam directing telescope
 - e) Atmospheric jitter compensation with high band-width close loop control module integrated with the shared aperture imaging through beam directing telescope system integrated with suitable sensor incorporating active imaging technology or similar long range imaging technology.
 - f) Laser illuminator module will be consisting of Illuminator laser and beam delivery optical system having controlled divergence in order to implement active gated imaging technique for target acquisition/ precision tracking and beam jitter compensation.
 - g) An Electro Optic Course Tracking module with day-night capability (integrated with periscopic system) equipped with MWIR Thermal Imager and Day Camera/ SWIR sensors along with high speed Video

Tracker Module with associated electronics and S/w required to control the periscope movement in order to acquire and track the distant aerial target within the range of 0.5km to 20km.

- h) EOTS should also be equipped with RF module along with the EO sensors. RF for longer ranges should have the capability to acquire, range and track the aerial target having RCS not less than 0.1m^2 , from a distance of approximately 25km. Range information from this RF module to be also fed to focusing mechanism of beam directing telescope module. EO sensors (MWIR & Day) for shorter ranges should be able to auto detect and track high speed aerial target (HALE/ MALE UAV type) from a distance of approximately 20km.
 - i) Course Tracker Optical Gimbal module should have provision to get cue from the external target designation sensor/ RADAR.
- (ii) Optical, Opto-mechanical, structural design & analysis.
 - (iii) Development of course tracking module using EO/IR & RF sensor in EOTS
 - (iv) Development & implementation of beam fine pointing system incorporating close loop control with suitable FSM and SWIR/ QD.
 - (v) Integration and bore sighting of various sensor and beam director module.
 - (vi) Generation of Integrated BCS.
 - (vii) Lab check out test of Integrated BCS.
 - (viii) Integration of BCS with HPL.
 - (ix) Technical support during Lab check-out testing of BCS & HPL integrated system.
 - (x) Technical support during Field Testing of BCS & HPL.

2. Eligibility Criteria:

Based on the response to EOI, the firm would be evaluated as per the following eligibility criteria. The firm should furnish relevant documents in support of their claims.

2.1 Technical & Infrastructure

Various modules to be developed under the scope of work incorporate, design development of large aperture Optical Telescope Systems (OTS) as well as Electro Optical Tracking Systems (EOTS), High band-width beam

steering system, understanding to generate integrated Beam Control System (BCS), carrying out integration of BCS & HPL and also to functionally test the integrated BCS in Lab as well as field.

The eligible developer should have the following expertise & infrastructure for executing the proposed development activity:

- a. The interested firms should have expertise in the field of optics and opto-mechanical design-analysis.
- b. Capability of structural & Thermal design & analysis for optical and opto-mechanical components.
- c. Knowledge and expertise in Assembly and optical alignment of large aperture optical system or telescope/ multi-element optical systems etc.
- d. Expertise & prior knowledge for development of Optical periscopic head / 2-axis gimbal system.
- e. Experience of Design & development of long range Electro Optical Tracking System having day-night capability along with 2-axis Gimbal platform.
- f. Firm should have experience in Design & development of servo control module, image processing module etc. for implementation of EO tracking.
- g. Experience of Integration of multi element optical systems, EOTS, sensors etc and their bore sighting.
- h. Knowledge of process, technique and equipment for testing of integrated optical system.

Firm should have following infrastructural capabilities in order to execute the said scope of work:

- a) Firm should have in-house capability for running the optics, mechanical and thermal design & analysis software.
- b) The firm should have optical & mechanical fabrication facility and the firm should have experience and expertise for fabrication and handling of large aperture optics of diameter larger than 500mm. OR the firm should have tie up with an external organization for realization of precision optical & opto-mechanical components having dimensions of this order.


के.सुनिल कुमार / K.SUNIL
मंडार अकिलरी / Stores
कृते निदेशक / For Di
उच्च दर्जा प्राप्त
For High Quality

- c) In-house facility for realization and testing of of High LIDT, high reflectivity dielectric coating for large aperture optical elements OR should have tie-up with related industry for realization of the same.
- d) Firm should have in-house clean room facility with interferometers, arc second accuracy theodolites, optical benches, interferometers, high power laser characterization facilities etc. for optical alignment / integration.
- e) Firm should have in-house facility or tie-up with related industry for testing, to design, configure, integrate and test EOTS.
- f) Firm should have in-house facility or tie-up with related industry for testing and calibration of the EO/IR and RF sensors and optical modules selected for EOTS.
- g) Firm should have requisite in-house facility like clean-rooms, optical benches, optical testing – characterization equipment etc.
- h) Firm should have in-house Integration hangers with material handling equipment and other necessary mechanical integration tools & equipment for assembly, alignment and Lab check out test of the optical system.
- i) Firm should have in-house facility or tie-up with related industry for electronic system integration facility with major electronic test, measurement equipment.
- j) Firm should have of capability to approach professional consultants if required for the development of the required system as per the scope of work.

2.2 Quality

- a) Firm must submit certificate of registration with any of the following departments DRDO, DGQA, other Defence Departments or Defence PSUs, and other Government Department.
- b) Firm should have a Quality policy, in-house quality control processes/practices, records & internal review mechanisms for ensuring quality of the deliverable.

2.3 Organizational capability

- a) Prior experience of at least 5 years minimum is essential in working with PSUs/ DPSU s/ Government agencies / Defence organisations.
- b) Firm should have experience in multi-disciplinary system design, development, integration, qualification testing of military equipment and should have experience in supply to Indian armed forces / DRDO/ DPSUs.

- c) Firm should have qualified manpower with domain expertise, past experience and related infrastructure in the field of design development of large aperture Optical Systems (OS) as well as Electro Optical Tracking Systems (EOTS). Firm needs to provide details of its co-developer, if any, against the sub-system/ technology module at Part I (Table 16). Also letter of agreement from such co-development partners to be produced. It's an EOI for a development case; firms just doing trading should not participate in this EOI.

2.4 Financial

- a) Firm should furnish Consolidated Turnover for last three years not less than 15 Crores.
- b) Firm should have successfully executed/ in-hand total orders, of value greater than or equal to Rs 50 crores in the past 5 years excluding any Free issue of Material (FIM).
- c) Proof of single purchase order / development contract value greater than or equal to Rs. 15 crores in the past five years in DRDO/ PSUs/ DPSUs/ Government agencies/ defence organizations, in the specified format.

Details for all the above points from 2.1 to 2.4 to be filled in relevant sections of part-I

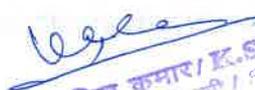
2.5 General Terms and Conditions

- a) Firms are required to send their EOI to

**The Director,
CHESS, Vignyana Kancha PO,
Hyderabad - 500 069**

on or before the date & time as given in the advertisement with the details as required in para 2 above of EOI.

- b) This EOI is not to be treated as a request for quotation/proposal and is issued with no commitment. CHESS reserves the right to withdraw the EOI or change or vary any part thereof at any stage. CHESS also reserves the right to disqualify any firm/proposal, should it be so necessary at any stage.
- c) By submitting a proposal, each firm shall be deemed to acknowledge of having fully and carefully read the EOI, and understood all existing terms and conditions.


के.सुनिल कुमार/ K.SUNIL KUMAR
निर्देश अधिकारी / Director Officer
कृते निमित्त
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- d) Firm shall compulsorily enclose all proofs as Annexures to EOI. EOI which are not in compliance with our EOI conditions will be rejected, without assigning any reasons thereof. CHESS reserves the right to request for any additional information, if required. Failure to furnish all requisite information or and/or documents shall result in repudiation of the EOI, without assigning any reasons thereof.
- e) The firm should have a valid GST registration. The Firm should submit Self attested copy(ies) of the Certificates of Incorporation and other certificates that are legally required for carrying out its business activities.
- f) Income Tax Returns of the last three years, duly certified by a Chartered Accountant, have to be submitted.
- g) An undertaking (self-certificate) is to be submitted that, the Organization hasn't been blacklisted by any Central/ State Government Department/ Central Government funded organizations/ State Government funded organizations/ World Bank, or other World Bank organizations and is not under any illegal expression by Government of India.
- h) An undertaking (self-attested) is to be submitted that there has been no outstanding bankruptcy, judgment or pending legal action against the firm.
- i) The brief specifications described in EOI are provided to understand the requirements by the firm and do not reflect the final design parameters and detailed specification. Detailed specifications and design inputs will be shared with shortlisted firms after signing a Non-Disclosure Agreement (NDA).
- j) After receiving the EOI, Firm Evaluation Committee (FEC), if so desires will carry out visits and evaluate firm's suitability. The FEC will evaluate the firms based on the qualification criteria defined in para 2 above.
- k) All designs and general assembly, Manufacturing drawings and part/component drawings, alignment, integration and test process and documents generated within the scope of this work, will be sole property of CHESS and CHESS will have the IPR for the same. All the documents should be submitted to CHESS as the deliverables.
- l) All hardware & software design and any other IPR generated, under the scope of work, will be sole property of CHESS. CHESS shall have the IPR for the same. All the s/w codes generated under this development should be submitted to CHESS as the deliverables.

m) Further, the firm must not quote any of these works, designs, drawings, documents, integration methods, test and trail results in any publications or to any of their customers without explicit written permission from CHESS and adhere to strict confidentiality.

3. EOI format:

The proposal and all correspondence and documents shall be written in English.

Sl.No	Contents	Page No
1.	Covering Letter	
	Part-I	
2.	General Details of Firm	
3.	Quality Management	
4.	Firm Experience	
5.	Firm Expert Manpower	
6.	Infrastructure Capabilities	
7.	Financial Details	
	Part-II	
8.	Compliance Matrix as per format given	
List of Annexures		
	Annexure- A	Brief Profile
	Annexure-B	Quality Certification copies
	Annexure-C	Copies of PO/Work order/Contract copy
	Annexure-D	Infrastructure related brochures
	Annexure-E	Auditor certified statements for preceding three Financial years
	Annexure- F	Any other details

EOI Response Format

Cover Letter

(Firm letter head)

Bees
 के. सुनील कुमार / K. SUNIL
 भंडार अधिकारी / Stores Officer
 कृषि निदेशक / For Director
 उच्च ऊर्जा प्रणाली / For High Energy
 खाना / Food

[Date]

To,

**HEAD, MMG
Centre for High Energy Systems & Sciences (CHESS)
VignyanaKancha (PO),
Hyderabad – 500 069**

Dear Sir,

Ref: Expression of Interest for -----

Having examined the Expression of Interest (Eol), the receipt of which is hereby duly acknowledge, we, the undersigned, intend to submit our response to the Expression of Interest (Eol).

Primary and Secondary contacts for our firm are:

	Primary Contact	Secondary Contact
Name:		
Title:		
Firm Name:		
Address:		
Phone :		
Mobile:		
Fax :		
E – mail :		

We fully understand and agree to comply that on verification, if any of the information provided here is found to be misleading the short listing process, we are liable to be dismissed from the selection process or termination of the contract during the execution of the contract.

We agree for unconditional acceptance of all the terms and conditions set out in the Eol document.

It is hereby confirmed that I / We are entitled to act on behalf of our company/ corporation/ firm / organization and empowered to sign this document as well as such other documents, which may be required in this connection.

Dated this

(Signature)

(In the capacity of) (Name)


के.सुनिल कुमार / K.SUNIL KUMAR
मुख्य अधिकारी / Stores Officer
मुख्य निदेशक / For Director
बिस्व ऊर्जा प्रणाली एवं
Center For High Energy Sys
Hyderabad, India. Reg. No. 172

Duly authorized to sign the EoI Response for and on behalf of :

(Name and Address of Company)

Seal / Stamp of Firm

(Firm Seal)

के सुनिल कुमार / K.SUNIL KUMAR
भंडार अधिकारी / Stores Officer
इलेक्ट्रॉनिक्स विभाग / For Director
उच्च ऊर्जा प्रणाली एवं रिसर्च
Center For High Energy System
डी.आर.डी.ओ., रक्षा मंत्रालय
WD, Ministry of Defense
रि. - दिल्ली - 110 054

Part-I

General Details of the Firm:

1	Name of the Firm	
2	Year of Establishment	
3	Core capabilities of the Firm	Type brief profile of the Firm in Annexure A (without referring to attachment of any report/s)
4	Details of development contracts related to large aperture optical systems and electro-optical tracking systems (EOTS).	
5	Details of development contracts related to optics design, opto-mechanical and thermal design and analysis of large aperture optical system and design and analysis of EOTS.	
6	No. of years expertise in Design, Development and Realisation of customized multi-disciplinary large aperture optical system and EOTS in line with the present scope of work and supply to government agencies like DRDO/ ISRO/ PSUs/ DPSUs.	
7	Prior experience of working with DRDO/ PSUs/ DPSUs / Government agencies / Defense organisations.	
8	Head office location and address with contact number, fax & email id:	
9	Local address in Hyderabad, if any, with contact number, fax & email id:	
10	Addresses of manufacturing plant, design & analysis centres, Integration and test facilities and other development offices setup in India (Highlight the address where CHES representative will visit for audit)	1. 2. 3.
11	Corporate website URL:	

(Handwritten signature)
के. सुनील कुमार / K. SUNIL
भंडार अधिकारी / Stores Officer
कुर्से निदेशक / For Dir.
एचएच डीएस
Center For High Energy Study
DRDO, Mir. Hyderabad
2000, Mir. Hyderabad

Quality Management:

12	State the Quality Policy of the Firm (max in 200 words)	(Type overall Quality management system and mention about quality department reporting, non-conformance management system, quality control practices, records maintenance, onsite activity QMS, internal review mechanism)
13.1	Quality Standards/ certifications obtained by the Firm from DGQA, DRDO, other defence departments and other Government departments (provide certification copy in Annexure-B)	
13.2	ISO certification	

14) Details of Purchase order / work orders with DRDO/ PSUs/ DPSUs/ Government agency/ Defense organisations and organization details

In case the Firm is having/had any Purchase order/work order/Contract in the past five years, provide the details in the specified format for each work / purchase order.

Purchase Order:

Details required	>15 Cr	>5 Crores	> 2 Crores
Name of the Organisation			
Scope of Work			
PO Date			
PDC of PO			
Present Status of the PO / Date of completion of PO			
Type of System			
Application			

* Please attach proof to substantiate your claim.

(Handwritten Signature)
 के सुनिल कुमार / K.SUNIL
 संचालक अधिकारी / Stores Officer
 कृते निर्देशक / For Director
 उच्च ऊर्जा प्रणाली एवं तंत्र
 Center For High Energy System
 डी.आर.डी.ओ., रक्षा मंत्रालय
 DRDO, Ministry of Defence
 भवन, बंगलूरु-५६००१५
 भारत

Organization:

Sl.No	Organization	Number
1.	Large Aperture Optical system and EOTS development experience (years)	
2.	Technical Manpower (number)	
3.	Govt./DRDO Customer base (number)	

15) Are you an offset Partner/subcontractor to any foreign Industry (Prime contractor), If yes provide the details in the given format

Sl. No	Name of the Foreign Industry with Address	Name of the project (specify total contract value)	Responsibility of Prime Contractor	Responsibility of offset partner (your firm) (specify total subcontract value)

16) Firm Technical Expertise:

Sl.No	Streams/Discipline	In-house (Yes/No)	Outsource (Yes/No)
1.	Design and develop large aperture beam directing system		
2.	Design and develop EOTS		
3.	Selection, availability, test & calibrate EO/IR & RF sensor		
4.	Design & develop long range imaging and laser beam fine pointing system for atmospheric jitter compensation in real time		
5.	Precision Manufacture, high LIDT HR coating, light weighting and mounting of large aperture mirror optics		
7.	Assembly & alignment of large		

(Handwritten signature and stamp)
 के. सुनील कुमार / K.SUNIL
 सहायक अधिकारी / Sr. Asst.
 कृषि विभाग / Agr.
 पञ्ज कर्मा १२

	aperture beam directing system		
8.	Integration of beam directing system into periscopic optical gimbal to generate integrated BCS		
9.	Bore sighting and Lab check out test of integrated BCS		
10.	Integration of BCS with HPL and handling of HPL		Participation & technical support with the help of CHES
11.	Technical support during integrated testing of BCS & HPL in Lab		Participation & technical support with the help of CHES
12.	Technical support during integrated testing of BCS & HPL in field		Participation & technical support with the help of CHES

17) Mention the levels of technical hierarchical structure (from entry level to highest cadre) of your organization.

18) Infrastructure Capabilities

List of **major** infrastructure presently available with firm or its co-developer to meet the EOI requirement

Sl.No	Name of Infrastructure/Facility	Year of commissioning	Brief specifications*	Utilization Factor (%)**
1.	Design & analysis centre for large aperture optics and EOTS with address			
2.	Large aperture HR optics precision manufacturing, high LIDT coating, metrology plant with address			
3.	Large aperture optics assembly, alignment, lab check out test facility with address			
4.	Software licenses (Zemax, Solidworks /Ansys, etc.)			

Cover
 के. सुनील कुमार / K. SUNIL KUMAR
 संचालक अधिकारी / Stores Officer
 कृपे निदेशक / For Director
 कक्षा प्रशासकीय एवं त्रि.

5.	Test & calibration facility for EO/IR & RF sensor			
6.	Integration and bore sighting of EOTS and also with beam directing telescope			
7.	Lab check out test for integrated BCS			

*kindly specify the type of hardware/software. Photographs/Brochure of above listed facilities may be given in Annexure D.

**no of days utilized/year

19) Mandatory Supporting Documents:

19.1 Auditor certified financial statements for the last three years with annual turnover should not be less than 15 Crores, Annexure-E (please provide the profit and loss statement and balance sheet)

Part-II

Acceptance to Compliance Matrix – to be filled by firm

Compliance Matrix			
Refer Chapter No	Description	Compliance (Yes/No)	Remark
1	Acceptance to EOI Scope of work (brief)		
2	Acceptance to general Terms & Conditions of EOI		
3	EOI Response Format duly filled		
4	List of Annexures as per EOI format		


 के.सुनिल कुमार / K.SUNIL KUMAR
 संचालक / Stores Officer
 कृते निर्देशक / For Director
 उच्च ऊर्जा प्रणाली संशोधन केंद्र
 Center For High Energy System
 डी.आर.जी. ऑफिस, राई ४
 १२००, दिल्ली

