

वैमानिकीय विकास संस्थापन  
भारत सरकार, रक्षा मंत्रालय  
न्यू तिप्पसंद्राबेंगलूर , - 560 075  
080-2505 7835/7840

☎️☎️:080-2505 7843



**Aeronautical Development Establishment**  
Govt. of India, Ministry of Defence,  
New Thippasandra, Bangalore - 560 075.  
Phone: (080) 2505 7835/7840  
Fax: (080) 2505 7843  
Email: mmdtec.ade@gov.in; headmmd.ade@gov.in

Date: 16/04/2024

### **INVITATION FOR EXPRESSION OF INTEREST (EOI)**


The Director, ADE, Bangalore on behalf of the President of India, invites “Expression of Interest” from reputed Indian Industry Partners for the following: -

EOI Ref No.	Description	Due Date
<b>ADE/MMD/EOI-04/EUAV/23-24</b>	“Design & Development of Sense and Avoid System for Medium / High Altitude Long Endurance UAVs”	<b>15/05/2024 @ 10:30Hrs</b>

This EOI consists of Part-I (Technical Details) and Part-II (Terms and Conditions).

Yours sincerely,

(Amstrong Enose A, TO A)  
For & on behalf of President of India

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## **Part-I: Technical Details**

### **1.0 Brief Introduction:**

Aeronautical Development Establishment (ADE) is a premier aeronautical laboratory under Defence R&D Organisation (DRDO) and is presently in the process of developing technologies for Sense and Avoid system for unmanned aerial vehicle (UAV). In this regard, Director-ADE, on behalf of President of India, seeks an expression of interest (EoI) for the same from interested and competent Indian Industry Partners only (henceforth identified as Partner). Reputed Indian Partners who have the expertise and adequate experience in the field of indigenous development of radars, AESA antennae, radar processor and software, airborne computers, Interrogator Friend or Foe (IFF), ADS-B and with experience in integration of indigenous IFF with TCAS should only participate in this EoI. The Industry partner must also have experience in CEMILAC certification and CEMILAC approved documentation. The response from the Partners will be evaluated by a technical committee. The proceedings and findings of this committee will be used to shortlist capable Partner(s) for the activities to issue subsequent proposal.

### **2.0 Broad Scope of Work:**

The broad scope of work across multiple phases / milestones will include generation of various project documents such as Route to Certification, System and Sub-system level Requirements and Design documents (with consultation and guidance by ADE), Design & Development of specific airborne AESA radar, airborne sense and avoid processor sub-system, ADS-B, associated ground displays, qualification of sub-systems as per agreed airborne qualification requirements and integration of the newly developed sub-systems with existing TCAS-IFF systems.


It may be noted that a pre-EoI submission meeting with the interested / prospective Partners will be organized at ADE to discuss more details about the proposed workshare plans across various domains and also to clarify any doubts of the prospective respondents. It is mandatory for any partner interested in responding to the EoI to participate in the pre-EoI submission meeting at ADE. All participants will be required to sign Non-disclosure Agreement (NDA) with ADE before this meeting (authorized signatories with company seals must be present in the meeting).

### **3.0 Tentative Quantity:**

The RFP / Supply Order will consist of activities in phases and the selected / shortlisted Partner will have to undertake the activities for all the following phases.

**Phase 1:** Project documentation leading to finalization of system architecture and sub-system level specifications.

**Phase 2:** Design & Development of 03 sets of sub-systems (one SOFT qualified and 2 ESS qualified sets) including hardware and software / firmware design and development as per airborne standards (MIL-STD-810 D/E/F, MIL-704D/E/F, MIL-461 D/E, etc. for Hardware and DO-178B, DO-254, etc. for Software / Firmware) and associated displays portable into existing Ground Control Station.

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**Phase 3:** Generation of standalone and integrated Acceptance Test Plan documents, extensive testing of the developed sub-systems and off-the-shelf subsystems on ground in standalone and integrated modes as per system architecture, as well as support in flight testing.

It may be noted that although the above numbers shall be for quantities required during the developmental phase of the project, the winner of the bid is likely to be considered as prospective DcPP / PA / LSI subject to success of technical trials. For the production phase, additional quantities are also expected. However, all these numbers / quantities should be treated as indicative only, with no assurance / commitment from ADE at present. It may also be noted that ADE may facilitate the utilization of certain test / integration facilities within DRDO (including ATR) and its established work centers based on mutual agreement with the Partner.

#### 4.0 Industry Partner Qualification Criteria:

**4.1. Mandatory Pre-requisites:** Following are the mandatory pre-requisites for participation in the EoI proceedings.

##### 4.1.1 Technical:

4.1.1.1 Partner must have demonstrated capabilities in past in the field of indigenous development of radars, AESA antennae, radar processor and software/ firmware, Interrogator Friend or Foe (IFF), ADS-B, integration of indigenous IFF with TCAS, onboard computers (hardware and software/ firmware) and CEMILAC approved documentation and certification through successfully closed supply orders.


4.1.1.2 Partner should have successfully executed past orders for aerospace / defence systems to Indian / foreign aeronautics / defence / space customers for afore-mentioned avionics and radar systems.

**4.1.2 Management: Partner must be certified for the following standards and must submit proof of the same along with the EoI response.**

4.1.2.1 AS 9100D / equivalent or better (Certificate to be submitted)

4.1.2.2 CMMi Level 3 / equivalent or better (Certificate to be submitted). In case such certification is not available, the Partner organization structure must have an independent Software Verification and Validation division / group for Software Quality Assurance, and past experience of handling SW V&V / IV&V as per CEMILAC guidelines to be submitted by the partner.


**4.2. Detail Industry Partner Qualification Criteria:** Table 1 gives a top level description of the requirement and the Industry Partner qualification criteria (more details will be discussed during pre-EoI submission meeting and shared in RFP). Relative weightages (as %) of each of the requirements have also been enlisted alongside. All interested partners are requested to do a thorough self assessment on

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each of the requirements and assign the self assessed scores against each line item, along with comprehensive justification, case studies etc. in support of the same. However, it may be noted that these scores are only to understand the partners' internal evaluation; but the final selection process will be depending on the evaluation and scoring of the technical evaluation committee constituted by competent authority, as brought out earlier.


**Table 1. Requirements, Scope of Work & Industry Partner Qualification Criteria**

Sl. No.	Section	Description	Weightage (%)	Self Assessment by interested Partner (%) with justification / case studies etc.
1.0	<b>Brief Introduction</b>	As per Section 1.0 above	N.A.	For info & compliance
2.0	<b>Broad Scope of Work</b>	As per Section 2.0 above	N.A.	For info & compliance
3.0	<b>Tentative Quantity</b>	As per Section 3.0 above	N.A.	For info & compliance
4.0	<b>Industry Partner Qualification Criteria</b>	As per Section 4.0 above and details below	N.A.	For info & compliance
4.1	<b>Technical Capabilities</b>	The following major capabilities must be available with the Partner. The primary respondent will be the Tier-1 supplier to ADE and will be responsible for all engineering / manufacturing / assembly / integration activities. Tier-1 supplier must essentially demonstrate all the engineering and manufacturing capabilities listed below. However, for certain very specific limited activities not exceeding 20% of billable value as reflected in Section 4.1.1 and 4.1.2 below, Tier-1 Partner can enlist the support of Tier-2 / Tier-3 suppliers with ADE's prior approval (any such supplier must be reflected by name in the EoI response itself). The approved Tier-2 / Tier-3 suppliers must meet the necessary aerospace standards and it will be the responsibility of the Tier-1 Partner to ensure the same. It may also be noted that in all stages of development, the items used for manufacturing / integration must be as specified by ADE during development phase or have ADE's prior approval. The Tier-1 Partner will be responsible for sourcing raw materials, Bols, LRUs from the sources as identified / approved by ADE.		
4.1.1	<b>Engineering capability</b>	The Partner must have in-house RF antenna and sub-system design tools such as HFSS/ FEKO, ADS/ SystemVue, Matlab, etc. as well as Software and Firmware Design tools such as ModelSim, etc. (List may be provided by the partner) The Partner must have in-house engineering team with design and development expertise in radar systems The Partner must have in-house engineering team with design and development expertise in Active Electronically Scanned Array Antennae	60%	To be filled by Partner


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		<p>The Partner must have in-house capability of design and development of radar processors including IP of radar software / firmware as part of any previous supply of radar systems to Indian / foreign aeronautics / defence / space customers.</p> <p>The Partner must have in-house expertise in design, development and qualification for airborne application (including IP rights on hardware, software and firmware) of Interrogator Friend or Foe (IFF) transponders.</p> <p>The Partner must have in-house expertise in design, development and qualification for airborne application (including IP rights on hardware, software and firmware) of Automatic Dependent Surveillance - Broadcast (ADS-B) In and Out.</p> <p>The Partner must have in-house expertise in integration of the in-house developed transponders with standard bought-out TCAS systems.</p> <p>The Partner must have in-house expertise in design, development and qualification for airborne application (including IP rights on hardware, software and firmware) of onboard computers.</p> <p>The Partner must have undergone CEMILAC / equivalent aeronautical certifying agency's design approval process for airborne Line Replaceable Units (LRUs) in the past (documentary evidence to be submitted).</p>		
4.1.2	<b>Manufacturing capability</b>	<p>The Partner must have in-house manufacturing capabilities, including but not restricted to the following (documentary evidence to be submitted). The Partner must also have adequate strength of production managers and shop floor supervisors in its present strength (at least 5 and 10 respectively; across various types of manufacturing units).</p> <p><b>4.1.2.1 PCB Design &amp; Fabrication</b></p> <p>The Partner must have in-house PCB design tools (List may be provided by the partner)</p> <p>The Partner must have in-house Thermal Analysis tools (List may be provided by the partner)</p> <p>The Partner must have in-house Signal Integrity Analysis tools (List may be provided by the partner)</p> <p><b>4.1.2.2 Unit level Assembly</b></p> <p>The Partner must have in-house facilities for assembly at PCB, LRU, sub-system and system levels. (Details may be provided by partner)</p> <p><b>4.1.2.3 Test and measurement facilities</b></p>	5%	To be filled by Partner
			5%	




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		<p>The Partner must have in-house RF test and measurement facilities such as Signal Generators, Spectrum Analyzers, Vector Network Analysers, Mixed Signal Oscilloscopes, Waveform Generators, Logic Analyzers, etc. (List may be provided by the partner)</p> <p>Partner must have in-house NABL/ equivalent accredited ESS test facilities or have access to the same for conducting all ESS, QT/ SOFT/ EMI/EMC/ MIL-704D testing. (Details may be provided by partner)</p> <p>Partner must have in-house Software Testing tools such as LDRA, etc. (List may be provided by the partner)</p>	10%	To be filled by Partner
4.1.3	<b>Quality Inspection / Testing</b>	<p>The Partner organization structure must cater for separate and independent division / group for hardware Reliability and Quality Assurance.</p> <p>The Partner organization structure must have an independent Software Verification and Validation division / group Software Quality Assurance.</p> <p>Partners shall follow appropriate internationally approved quality procedures, including but not restricted to those mentioned in Section 4.0 A.</p>	5%	To be filled by Partner
4.1.4	<b>Aircraft integration, flight trials &amp; other engineering supports</b>	<p>The Partner chosen for this system development is likely to be the production partner for this system in future and hence, needs to demonstrate the capabilities in-house integration and testing expertise. Hence, Partner must provide evidences to prove its competence in the following main technical domains:</p> <p>Partner should submit documentary evidences to prove competence in integration of RF and digital systems for any platform (like aircraft / ship / submarine etc.).</p> <p>Partner should have in-house capability of manufacturing / sourcing from reputed manufacturers and integrating qualified airborne loom for interconnections between the LRUs of this SAA system</p> <p>Partner should be capable of allocating appropriate engineering and technical manpower resources in the domains of system integration, technical documentation (including engineering drawings) supports, trial supports etc. during execution of different phases of the activities.</p>	5%	


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4.3	<b>Financial capabilities</b>	Partner must have a consistent profitable financial record showing profits in at least last three years and no accumulated losses. To this effect, Partner must provide financial standing through latest A.I.C.C. Annual report (balance sheet and profit & loss account) of last 3 years.	5%	To be filled by Partner
4.4	<b>Management capabilities</b>	Past case studies to prove Partners' capabilities to maintain strict secrecy and confidentiality during design / manufacturing / assembly / testing; Partner must have past experience of executing classified projects within restricted access area.	5%	To be filled by Partner
<b>Total</b>			<b>100%</b>	To be filled by Partner
5.0	<b>Qualification / Acceptance Criteria</b>	1. The partner(s) must comply with all the mandatory pre-requisites listed in Section 4.0 A. 2. The partner(s) selection will be based upon the evaluation and scoring (as per criteria listed in Section 4.0 B and Table 1) by the competent committee. A minimum cut-off mark of 80% must be scored by the Industry Partner in order to qualify for the subsequent proposal.		
6.0	<b>Inputs Required from Partner by ADE</b>	1. Comments / compliance statement from Partners in terms of the scope of work. 2. Comments & self assessment from Partners (along with detail justification and documentary evidences) in terms of compliance with Partner Qualification Criteria. 3. List of capabilities & infrastructure with Partners. 4. List of Certifications available with Partners, such as AS9100D, ISO 9001:2015, CMMi etc. 5. Details regarding past associations with the certification agencies such as CEMILAC, DGAQA, MSQA etc. 6. Copy of the audited balance sheet of preceding three years. 7. Details of shareholding / ownership pattern. 8. Number of technically / professionally qualified executives / experts presently in the permanent payroll of the company. 9. Brief description of each of the relevant aerospace / defence related projects undertaken so far, relevant systems manufactured and delivered, and quality process followed. This should include the volume of contract, time period of completion, cost, customer feedback etc. 10. List of proposed Tier-2/3 Industry Partners with respective work shares. 11. Any other information that the Partner may find relevant to the present EoI / subsequent RFP.		

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7.0	Other Points	<ol style="list-style-type: none"> <li>1. This EOI is issued on "no cost and no commitment" basis.</li> <li>2. Reputed Indian Partners who have the expertise and adequate experience in the field of indigenous development of radars, AESA antennae, radar processor and software, Interrogator Friend or Foe (IFF), ADS-B, integration of IFF with TCAS, and CEMILAC approved documentation and certification, should only participate in this EoI. All the industries meeting this criterion and willing to respond to this EOI will be called for initial discussion / partner meet before the EOI submission, and it is mandatory for interested Partners to attend the same meeting for detail understanding of the scope of work.</li> <li>3. The Partner must note that ADE will be the sole authority and owner for the entire IPR of design and development of the SAA system. The design document, engineering documents, drawings, solid models, S/W &amp; Firmware Source codes, Gerber files, etc. (all documents related to this project) shall be handed over to Director ADE. All the tools, drawings, jigs, fixtures, process planning sheets, assembly procedures records, inspection record, documents etc. will also be the sole property of ADE and should be returned to ADE in both the soft and hard copy.</li> <li>4. Director, ADE has the right to use the information provided by the Partners for future issuance of the tender. Mere participation in EOI does not assure eligibility for participating in the tender. Based on the details provided in the proposal, Director, ADE has the right to select the Partner for participating in the tender.</li> <li>5. Final RFP / contract will have defined exit options. Director ADE reserves the right to exercise the exit option at any stage / phase of the development without assigning any reason for the same.</li> <li>6. A technical screening committee will be evaluating the EoI responses, and may visit prospective work centers for physical inspection of capabilities, expertise and infrastructure.</li> <li>7. Unit cost (excluding NRE) during the developmental phase will be treated as the basis of calculating the unit cost during production phase.</li> <li>8. Though the activity is confidential; any existing tie-ups with Indian / foreign companies shall not be a hindrance for participation in this programme. Industry partners, already having foreign collaboration and interested, shall explicitly bring out the details in their response and furnish necessary NDA and detail plan to ensure that the data / information from this program will be kept isolated from any such collaborator.</li> <li>9. In production phase and thereafter, the DcPP / PA shall be the single point of contact (SPOC) and shall be responsible for supply, maintenance and support during entire life cycle of the system.</li> <li>10. ADE will have the right to visit Tier-2/3 Industry Partners (as identified by Tier-1 and approved by ADE) to inspect, review the work progress, conduct sample audits etc. with or without prior notice and with and without Tier-1 representative.</li> </ol>
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## **Part-II: Terms and Conditions**

1. The Director, ADE reserves the right to accept/reject any or all the EOI without assigning any reason and also will not be responsible for postal delays. Final RFP / contract will also have defined exit options.
2. Industry Partners are required to submit their bid along with the eligibility conditions specified. **The interested Firms have to attend the Pre-Eoi submission Meeting at ADE Bangalore.**

### **Pre-Eoi Submission Meeting Details**


Pre-Eoi Submission Meeting Date: **24/04/2024 @ 10:30 Hrs.**

**Note:** This meeting will mostly happen over video conference, all interested parties must communicate their interest to the contact persons listed by 21/09/2020 for more details about the meeting.

### **For participation contact following:**

1. **Smt. Nandita Bhattacharya, Scientist 'F', Ph: 080-2505 8261, nanditabhat.ade@gov.in.**
2. **Shri. Akilan J, Scientist. 'E' (Ph: 080-2505 7166).**

3. **Last Date and Time for Depositing (submission of) the EOI:** On **15/05/2024 (dd/mm/yyyy) at 10:30Hrs.** The sealed Bid should be deposited / reach by the Due Date and Time. Responsibility to ensure this lies with the Bidders.
4. **Location of the Tender Box: Security Office, Raman Gate, ADE, Bangalore.**
5. **Manner of Depositing the EOI:** Sealed EOI should be either dropped in the Tender Box or sent by post at the address given, in the " Invitation of EOI", so as to reach by the due date and time. Late EOI will not be considered. No responsibility will be taken for postal delay or non-delivery/non-receipt of documents. EOI sent by FAX or e-mail will not be considered unless they have been specifically called for by these modes.
6. **Time and Date for Opening of EOI:** On **16/05/2024 (dd/mm/yyyy) at 10:30Hrs.**  
If due to exigency, the due date for opening is declared a closed holiday, the EOI will be opened on the next working day at the same time or on any other day/time, as intimated by the Buyer.
7. **Place of Opening: Security Office, Raman gate, ADE, Bangalore.**  
The Bidders may depute their representative, duly authorized in writing, to attend the opening of EOI on the due date and time.
8. The cover containing the proposals, duly completed in all respects must be addressed to "The Director, ADE" indicating the EOI No. **ADE/MMD/EOI-04/EUAV/23-24** and Description: **Expression of Interest'** and the **Due Date and Time**. The Proposal should reach not later than the Due Date.

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**9. Eligibility Conditions: Refer Section – 4 of Part – I of EOI document.**

- Please note that response to EOI is accepted only from the “**reputed Indian Industry Partners**”.
- Industry Partner shall provide Financial standing through latest Annual report (balance sheet and profit & loss account) of last 3 years.
- Company with consistent profitable financial record showing profits in at least three years and with no accumulated losses. Submit detail Report.
- It is compulsory for the firm to attend the Pre-EoI Submission Meeting in order to submit their proposal which will be further shortlisted by ADE committee.
- The respective representative from the Industry Partner must possess the authorization letter from the firm to sign the Non-Disclosure Agreement (NDA) as per ADE terms & conditions. The authorized person has to ink sign the NDA and put the company seal on it before entering the Pre-EoI Submission Meeting Room.
- Mere participation in EOI does not assure eligibility for participating in the tender. Based on the details provided in the proposal, Director, ADE has the right to select the Industry Partner for participating in the tender.
- Director, ADE has the right to use the information provided by the Industry Partners for future issuance of the tender.


10. Request for quotations will be issued to the short listed Industry Partners and also others who are already well known in the field.

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|------|---|---|--|
| 10.1 | Queries & to be addressed to            | : | <b>The Director ADE.</b>   |
| 10.2 | Postal address for sending the Proposal | : | ADE, DRDO, New Thippasandra<br>Bangalore-560075, Karnataka , India |
| 10.3 | Fax Number                              | : | 080-2505 7843  |
| 10.4 | Email                                   | : | Headmmd.ade@gov.in<br>mmdtec.ade@gov.in                            |

11. The Director, ADE reserves the right to accept/reject any or all the EOI without assigning any reason and also will not be responsible for postal delays

(.....)

For Director  
For & on behalf of President of India

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Check Sheet				
Sl. No.	Technical Terms		Confirmation of Industry Partners to ADE Terms	
1.	Company Profile	Details of Registration, License, etc. enclosed	Yes/No	<input type="checkbox"/>
2.	Infra-structure details	Provided the details of infrastructure	Yes/No	<input type="checkbox"/>
3.	Technical Experience details	Provided the details of Technical Experience details	Yes/No	<input type="checkbox"/>
4.	Company financial Capacity	Provided the details of Company financial Capacity	Yes/No	<input type="checkbox"/>
5.	P/O Contracts taken up/ finished details	Provided the details of P/O Contracts taken up/ finished details	Yes/No	<input type="checkbox"/>
6.	Details of ISO/AS certification & other certifications	a) ISO 9001 / 14001 b) AS 9100 c) NADCAD d) Any other	Yes/No	<input type="checkbox"/>
7.	Compliance statement on SoW	As per Section 2 of Part – I	Yes/No	<input type="checkbox"/>
8.	Compliance Statement and all additional supporting documents on Industry Partner Qualification Criteria	As per Section 4 of Part – I	Yes/No	<input type="checkbox"/>
<p><b>Note:</b> Industry Partners are requested to submit this format duly completed with their seal and signature along with their quotation. Non submission of this format may lead to rejection of your offer.</p>				