INVITATION FOR EXPRESSION OF INTEREST (EOI) FOR DESIGN, DEVELOPMENT AND PROCUREMENT OF AUTOMATIC TAKE-OFF/LANDING RECORDING SYSTEM (ATORS) UNDER MAKE-II PROCEDURE OF DAP-2020

Reference:-	**Defence Acquisition Procedure 2020 (DAP - 2020)**	
Appendices:-	**A**	Format for EOI Response
	B	Financial and Technical Evaluation Criteria
	C	Confidentiality Agreement
	D	Correctness Certificate
	E	PSQRs

Layout

1. The EOI comprises the following parts:-

1.1. **Part-I** : General Information

1.2. **Part-II** : Scope of Project

1.3. **Part-III** : Evaluation Criteria

1.4. **Part-IV** : Procedure for submission of Response to the EOI

1.5. **Part-V** : Miscellaneous

2. The nodal officer for this project for all queries/ clarifications/ coordination will be Chairman, Project Facilitation Team, "Design, Development and Procurement of Automatic Take-Off/ Landing Recording System (ATORS) Address and contact details of the nodal officer are given at Para 26 of the EOI.

PART I: GENERAL INFORMATION

3. The brief on the equipment is as follows:-

3.1. Automatic Take Off/ Landing Recording System (ATORS) is an integration of modern arrays of sensors and technology to ensure autonomous recording of all take-offs and landings along with generation of alerts in case of animal, vehicular and human incursions in demarcated zones and birds in the specified zones near and on the runway. This system of systems includes EO/ IR/ LL, Thermal sensors, playback and recording stations, storage systems, software with all video and audio editing facilities. It will operate 24/ 7 for long operational requirements with minimum cooling/ rest times in all weather conditions. It will provide a gap free umbrella of coverage in the zones of interest to Aerospace safety for Accident and Incident Investigation/ Prevention and training. The entire operation of recordings will be conducted without human intervention.

3.2. ATORS will capture multiple aircraft from multiple angles simultaneously. The playback facility will be capable of zooming into a specific aircraft from the FOV covering multiple aircraft. The high quality playback along with photo/ video editing software, compression for transmission etc from large storage will be an incredible tool for Accident/ Incident investigation and training. Seamless playback, stitched from multiple sensors will ensure precise analysis when required.

3.3. Airfields operating multiple type of aircraft including helicopters approaching at steeper angles or during missed approaches etc will be adequately covered. The detailed coverage of aircraft in emergency and the aircraft in vicinity will provide the commanders great clarity in giving decisions and the safety services while providing assistance. The operations of safety services and ground crew on Runways/ PTTs and tarmacs adjacent to the same will get complete coverage through multiple sensors fed to common archiving/ playback system. It should be able to detect, facilitate recognition and identification of aircraft in all weather conditions on either side of runway threshold covering both take off and approach phases.

3.4. OEMs may propose additional types of sensors in case the addition expected to enhance the capabilities sought.

Objective.

4. The objective of this EOI is to seek responses from eligible Indian Entities to indigenously Design & Develop Qty 01 prototype Automatic Take Off/ Landing Recording System (ATORS) under the '**Make II**' sub-category of '**Make**'. Successful development would result in acquisition for total **Qty- 75 ATORS**, through '**Buy (Indian-IDDM)**' category as per the provisions of DAP 2020 with a minimum of **60%** IC.

PART II: SCOPE OF THE PROJECT

5. **Phases.** The project involves following two phases:-

5.1. **Design and Development Phase.** This phase involves indigenous Design and Development of prototype Automatic Take Off/ Landing Recording System. This phase will end upon approval of the trial report by the competent authority within Air HQs as per **Para 54 & 55** of **Chapter-III of DAP 2020** under the 'Make-II (Industry Funded)' sub-category with **minimum 60% IC**.

5.2. **Procurement Phase.** The procurement phase commences with issue of commercial RFP in accordance with Para 55A of Chapter-III of DAP 2020 to the qualifying DAs and subsequent acquisition of Qty-75 through the 'Buy (Indian-IDDM)' category as per the provisions of DAP 2020.

6. **Categorisation.**

6.1. **Design and Development Phase.** 'Make-II (Industry Funded)' Sub Category of Make Category in accordance with Chapter-III of DAP-2020.

6.2. **Procurement Phase.** **Buy (Indian-IDDM)**' category with **minimum 60%** IC in accordance with Para 6(d) of Chapter-III of DAP-2020 from qualifying Development Agencies (DAs).

7. **Quantities.**

7.1. **Design and Development Phase.** **One set** of Automatic Take Off/ Landing Recording System (along with associated equipment) as prototype.

7.2. **Procurement Phase.** **Total Qty-75 sets** of Automatic Take Off/ Landing Recording System (along with associated equipment) wherein quantities will be distributed between L1 and L2 firms in the ratio 60:40 in order to have multiple technology solutions in accordance with the provisions of Para 21 of Chapter -III of DAP 2020. In case only one DA qualifies full quantity would be awarded to L1. Distribution of airfields will be decided by PFT.

8. **Make-II Procedure.** Detailed guidelines on Make II Procedure (Chapter III of DAP 2020) may be downloaded from MoD website for reference.

9. **Preliminary Service Qualitative Requirements (PSQRs).** The PSQRs for indigenous Design and Development of the prototype of "ATORS" is attached as Appendix 'E' The Essential Requirements at Part II of the PSQRs must be met, as verified during SSCT, prior to conversion of PSQR to JSQR. However, in case all DAs involved in D&D are able to successfully demonstrate any particular desirable parameter/s, the same shall be included as Essential Parameter 'A' in JSQRs.

Timelines & Milestones.

10. **Single Stage Composite Trials.** SSCT will be conducted in accordance with Para 55 of Chapter III of DAP 2020. Trials will be undertaken within India at IAF units or any other testing location as decided by IAF.

11. **Milestones.** Automatic Take Off/ Landing Recording System are planned to be inducted as per timeline brought out below. The estimated timeline for induction/ delivery is as follows (Appendix-L to Chap-III of DAP 2020):-

Ser No	Activity (a)	Remarks (b)	Timeline (Weeks) (c)	Cumulative Timelines (Weeks) (d)
1	Issue of EOI	By PFT	-	T_0
2	EOI Response Submission	By EOI Respondents	08	T_0 + 8
3	EOI Response Evaluation	By PFT	06	T_0 + 14
4	Issue of Project Sanction Order (PSO) for Prototype Development	To selected DAs	02	T_0 + 16
5	Prototype development	-	52	T_0 + 68
6	Single Stage Composite User Trials (QT trails included) & Acceptance of Trial Report	-	07	T_0 + 75
7	Conversion of PSQRs to JSQRs	-	02	T_0 + 77
8	Issue of Commercial RFP	-	02	T_0 + 79
9	Solicitation of Commercial Offer	-	04	T_0 + 83
10	Finalisation of Cost Negotiation Committee (CNC)	-	04	T_0 + 87
11	Signing of Contract	-	02	T_0 + 89

Development of Prototype and Trials.

12. ATORS should be developed as per PSQRs. Any clarification related to functional or operational aspects of development as sought by the DAs will be provided by the Project Facilitation Team (PFT).

13. After the prototype of ATORS has been developed as per PSQRs and confirmed by the PFT in a collegiate manner, the PFT with requisite empowered members, would carry out SSCT of the prototype. If the prototype is assessed as meeting the desired standards, the PSQRs would be converted to JSQRs. Once the JSQRs are finalised, the DAs shall submit the certificate as per **Appendix A** and **Annexure I & II** to **Appendix B**

of Chapter I of DAP-2020. Necessary technical literature pertaining to the design, material and verification of IC will be provided by the DAs prior to the conduct of SSCT of the prototype ATORS. Quarterly updates on the progress of the project need to be forwarded by the DAs to the PFT. Quarterly review of the D&D progress shall be carried out by the PFT with each DA and towards the culmination of the D&D (i.e. last 03 months) fortnightly feedback need to be provided.

14. DAs will be required to produce the following documents for vetting and approval by IAF, DGAQA and Design Certification Agency as per PSQRs. The documents must be provided to the PFT during prototype development stage and documents must be finalised at prototype development stage, prior to conduct of SSCT.

14.1. Environmental Qualification Test Procedure (EQTP).

14.2. Detailed Specification Sheet.

14.3. Detailed drawings.

14.4. Manufacturing Process Document.

14.5. Quality Assurance Plan (QAP).

14.6. Acceptance Test Procedure (ATP).

14.7. **User manual/ Brochure containing the following**:-

14.7.1. Detailed drawings, specifications, standards & capabilities of ATORS & its accessories.

14.7.2. Detailed guidelines/ procedure for installation & removal, data acquisition and downloading, operating instructions and storage facility.

14.7.3. Training documents.

15. Design & Development (including developmental testing/ trials) of the ATORS is to be undertaken by the DAs. In case any IAF facility is required during trials, the vendor may provide a list of such facilities in his response (Para 36 of **Appendix A** of EOI refers).

Solicitation of Commercial Offers.

16. A commercial Request for Proposal (RFP) for 'Buy (Indian-IDDM)' phase would be issued to all DAs **who have cleared the 'Single Stage Composite Trials' of prototype** to solicit their commercial offers and additional technical information/ documentation, as may be necessary.

17. The project is envisaged to have the following deliverables and the details of procurement phase will be further amplified in the Commercial Request for Proposal (RFP):-

17.1. **Prototype Development Phase.** Qty-01 set of Automatic Take Off/ Landing Recording System (along with associated equipment), **as prototype**.

17.2. **Procurement Phase.**

17.2.1. A total of Qty-75 Automatic Take Off/ Landing Recording System along with associated equipment.

17.2.2. Requisite training, technical literature including user handbook, operations & technical documents, manuals and MRLS.

Intellectual Property Rights (IPRs)

18. Policy on IPRs is mentioned at Para 59 of the Chapter III of DAP-2020 for Make-II Procedure.

PART III: EVALUATION CRITERIA

Financial and Technical Evaluation Criteria

19. **Eligibility.** Indian Entity satisfying criteria given at para 6(b) of Chap III and Para 20 of Chap I to DAP 2020 is considered as an eligible "Indian Entity" for the project.

20. EOI respondents will be evaluated by the PFT for compliance to Financial and technical criteria as per **Appendix B**.

Indigenous Content (IC)

21. Indigenous Content of minimum 60% is to be ensured at prototype stage and during procurement stage. After successful development of ATORS, further procurement will be as per the 'Buy (Indian-IDDM)' procedure in accordance with DAP-2020. IC content will be assessed as per guidelines at Para 21 of Chapter I of DAP 2020. All relevant deliveries made under contract shall be accompanied by a certificate of IC issued by the Chief Financial Officer (CFO) of the prime/ main contractor. All final deliveries under contract shall be accompanied by its Company Auditor's certificate, in addition to the certificate issued by the CFO of the prime (main) contractor as aforesaid, by its Company Auditor's certificate. Break down of IC in terms of components, materials and software "for the entire system" is to be provided.

22. The DA shall certify compliance w.r.t Ministry of Finance (MoF), Department of Expenditure (DoE) order (Public Procurement No. 4) No.F.7/10/2021-PPD (1) dated 23 February 2023 (available on Department of Expenditure website with link https:// doe.gov.in/procurement-policy-divisions) and submit an undertaking that *"I have read the clause regarding restrictions on procurement from a vendor of a country which shares a land border with India; I certify that the vendor is not from such a country or, if from such a country, has been registered with the Competent Authority. I hereby certify that this vendor fulfils all requirements in this regard and is eligible to be considered. [Where applicable, evidence of valid registration by the Competent Authority shall be attached.]"*. Vendor from a country which shares a land border with India for the purpose of this EOI means the following:-

22.1. An entity incorporated, established or registered in such a country sharing a land border with India.

OR

22.2. A subsidiary of an entity incorporated, established or registered in such a country

OR

22.3. An entity substantially controlled through entities incorporated, established or registered in such a country

OR

22.4. An entity whose beneficial owner is situated in such a country

OR

22.5. An Indian (or other) agent of such an entity

OR

22.6. A natural person who is a citizen of such a country

OR

22.7. A consortium or joint venture where any member of the consortium or joint venture falls under any of the above

23. **Foreign Collaboration.** If the EOI Respondent is collaborating/ plans to collaborate with a foreign technology provider, the nature of such collaboration and the technology areas being transferred must be stated in the response (please refer Paras 13,23,27&28 of **Appendix A**). Also, with such collaboration, EOI Respondent must justify compliance to IDDM requirement for the D&D and subsequent manufacturing of ATORS.

PART IV: PROCEDURE FOR SUBMISSION OF RESPONSE TO THE EOI

24. **Guidelines for Submitting EOI Responses.**

24.1. The responses should be submitted as per format placed at **Appendix A**. Should a vendor need to mention any other information, a separate column/ row/ additional pages may be added.

24.2. All responses as per Appendices should be submitted in a single file/ folder. Supporting documents/ additional references should be submitted in a separate folder with proper reference mentioned against each parameter/ sub parameter in respective appendices.

24.3. Any supporting document/ evidence without any reference to specific parameter of criteria will not form part of assessment. Such document may be used only at discretion of review committee/ person.

25. **Rejection Criteria for Selection as EOI Respondent.** The following may lead to rejection of EOI response:-

25.1. Failure to meet the Financial and Technical Evaluation Criteria given at **Appendix B**.

25.2. Failure to offer compliance to any of the terms and conditions given in the EOI.

25.3. Failure to agree with the project timelines.

25.4. Failure to offer desired indigenous content.

25.5. Any other parameter of the response considered inadequate.

26. The envelopes shall be addressed as under:-

Chairman, Project Facilitation Team
Design, Development and Procurement of ATORS
Gp Capt AS
Wing 3, First Floor
Air HQ (RK Puram),West Block-06
New Delhi-110066
Telephone- 011-26172738
Fax: 011- 26172638
E-Mail ID: Phan-tom1@gov.in

27. The response to this EOI must be submitted by 1200 on 04 May 26 at the address mentioned above.

28. The Industry will be required to sign and honour the 'Confidentiality Agreement' with MoD, Govt of India. The 'Confidentiality Agreement' will be furnished by each EOI respondent at the time of issue of PSQRs as per format given at **Appendix C**.

PART V: MISCELLANEOUS

29. **Pre-EOI Response Meeting.** Companies may submit written queries/ clarifications/ amplifications on specific issues within 15 days of the issue of EOI. A pre-response meeting will be held in about **four (04) weeks** after the issue of EOI to clarify issues/ queries raised by the participating firms to facilitate submission of response. Date of pre-response meeting will be promulgated by the PFT.

30. Guidelines for penalties in business dealings with entities as promulgated by Government from time to time will be applicable on procurement process & bidders.

31. The Pre-Contract Integrity Pact (PCIP), listed as detailed in Para 119 of Chapter II of DAP 2020, shall apply mutatis mutandis to 'Buy (Indian-IDDM) phase of the project.

32. Respondents would be subject to disqualification if they make false, incorrect, or misleading claims in their response to this EOI. A 'Correctness Certificate' as per the format at **Appendix D** will be furnished as part of the response.

33. Please acknowledge the receipt of this invitation for EOI.

(V Ahluwalia)
Gp Capt
Gp Capt AS
03 Mar 26

Appendix A
(Refers to Para 15, 23 & 24.1 of EOI)

FORMAT FOR EOI RESPONSE

PART I - INDUSTRY DETAILS

General Information

1. Project Name:

2. Name of the Company:

3. Mailing Address of the Registered Office/ Contact/ Phone/ Email/Website (If factory site is located differently, indicate address of the same also):

4. Name/ Particulars of CEO:

5. Date of incorporation:

6. Brief history of company:

7. Nature of Company:

(Public / Private / Limited / Sole proprietorship etc.)

8. Category of Industry:

(Large / Medium / Small / Micro / Start Up)

9. CIN:

10. Shareholding patterns:

Business Information.

11. Nature of business (*Manufacturer/ Trader/ Sole Selling or Authorised Agent / Dealer/ Assembler / Processor / Re-packer / Service Provider*):

12. Attach a certificate, if company has a valid Defence Industrial Licence (DIL).

13. Details of current products:-

(Type / Description, Licensed / Installed Capacity, Annual Production for Preceding 3 Years):

14. Details of foreign collaboration(s), if any, related to execution of the project.

(Include details related to name(s) of the entity, work share planned during design, development, as well as manufacture):

Note: **In case of foreign collaboration, compliance to Para-3 of Chapter-III of DAP 2020 to be clearly established.**

15. Have you supplied any product/ services to MoD, Indian Army / Indian Air Force / Indian Navy / Indian Coast Guard / DPSUs / DRDO labs / Ordnance Factories, any other defence organisation, etc.? (Provide indicative list, if applicable)

16. Details of ISO/ AS, Quality Assurance and other Certification.

Financial Information.

17. Average Turn Over of the last three financial years:

18. Net worth of the company, as on 31 Mar of last FY (should be positive).

Technical Information.

19. Availability of area for factory (including covered, uncovered and bonded space).

19.1 Covered area (Sq M):

19.2. Uncovered area (Sq M):

19.3. Any other space available (Sq M):

20. Details of Developmental Facilities:-

20.1 Strength of permanent manpower:-

20.1.1. Technical:

20.1.2. Administrative:

20.2 Inspection and Quality Control.

20.3 Laboratory and Drawing Office Facility.

21. Integration capabilities for system-of-systems projects.

22. Is the factory space adequate to undertake design, development and manufacture of ATORS along with its associated equipment?

23. Have you ever developed or manufactured any equipment/ sub-assemblies/ parts for any project of similar capability of ATORS? If yes, then the product details to be provided.

24. Any other information, relevant to the case.

PART II: PROJECT SPECIFIC INFORMATION

25. Outline the proposal to undertake prototype development for ATORS.

26. Stages/phases of development, with indicative time schedules.

27. Critical and Niche technologies planned to be developed as a part of this project.

28. Identify sub-systems, payloads, sensors, LRUs, software and hardware as per the following headings:

28.1 To be indigenously designed & developed by the company.

28.2 To be sourced from other companies who have indigenously designed & developed.

28.3 To be sourced from Foreign OEM (FOEM) under JV/ ToT/ COTS. Indigenisation status and plan for the same also to be provided.

29. Life cycle support and obsolescence management aspects on the product need to be provided.

30. Milestones that can be demonstrated to facilitate project monitoring.

31. Role, responsibility and expertise details of the firm, if any, and if applicable.

32. Role of foreign technology provider, if any. In case of foreign collaboration, along with scope, depth & range of ToT, details of formal acceptance by foreign partner's government (i.e. country of origin) that any license required to transfer the technology will be granted in case selected. If any inter-governmental agreement is required, same also needs to be stated.

33. Requirement of specialised testing assistance, where such facilities are available only with Armed Forces / DRDO / DGAQA / DGQA / DGNAI or any other Govt facility. (Please provide a list of such requirements, with time period for which required).

34. Information to prove design/ developmental capability for the project of ATORS:-

35.1. Past examples of indigenous design and development.

35.2. R&D facilities available in house, if any;

35.3. Technical/ R&D manpower/ expertise available.

35.4. Institutional tie-ups, MoU, laboratory and drawing office facility, CAD / CAM facility.

35.5. Percentage of total turnover spent on R&D during last three years etc.

36. Details of important facilities:

36.1. Production facilities,

36.2. CAD/CAM/Robotics, other advanced technology tools, environmental testing facilities, tool room, metrology and test equipment, facilities, instrumentation etc.

37. Please furnish an undertaking that design and development will be as per provisions and guidelines of Chap III of DAP 2020, especially related to Indigenous Design, Indigenous Content and IPR.

38. Documents to be submitted along with this appendix, by the EOI respondent:-

38.1. Copy of latest certificate of incorporation by the Registrar of Companies.

38.2. Audited Financial Statements (Profit & Loss Account and Balance Sheet) with Auditors Report for last three financial years.

38.3. Acceptance Certificate, clause wise of all terms and conditions given in the EOI.

38.4. Confidentiality Agreement (As per format at **Appendix C**).

38.5. Correctness Certificate (As per format at **Appendix D**).

38.6. Undertaking as per **Para 37** of this Appendix.

38.7. Self-certification for adequacy of engineering and technical ability for undertaking the D&D of ATORS.

38.8. Certificate for broad technical requirements compliance.

Note:-

1. All submissions must be supported by referenced documents duly authenticated.

2. Any input with incorrect or missing reference will not be assessed.

3. No separate financial, commercial criteria will be applied for start-ups.

4. Attach additional pages, as necessary.

Appendix B
(Refers Para 20 & 25.1 of EOI)

FINANCIAL AND TECHNICAL EVALUATION CRITERIA

1. **Financial Evaluation Criteria**

Ser No	Information (a)	Pass Criteria (b)
1	Annual Turnover	Average annual turnover of the applicant company for the last three financial years ending 31st March of the previous financial year should **not be less than 5%** of the estimated cost of the project.
2	Net Worth	Net worth of the entities ending 31st March of the previous financial year should be "**Positive**".

2. **Technical Evaluation Criteria**

Ser No	Criteria and Sub Criteria (a)	Pass Criteria (b)
1	Engineering and technical ability	Based on Self-certification submitted by EOI respondent and evaluation of PFT
2	Proposed indigenous content in percentage of total cost at prototype stage and final stage	As per Chapter III of DAP 2020
3	Total Land area	Statement of firm for adequacy
4	PSQRs Compliance	Based on Self-certificate of compliance by EOI respondent (this step will be completed, post issue of PSQRs to the EOI respondent, once it is found compliant to other requirements as specified in the EOI)
5	Intellectual Property Rights (IPR)	Vendor to confirm IPR as per **Para 18** of **EOI**
6	Project Proposal for D&D of ATORS	Evaluation by PFT

Appendix C
(Refers Para 28 of EOI)

CONFIDENTIALITY AGREEMENT

1. It is certified that Expression of Interest document for the project of Design, Development and Procurement of Automatic Take Off/ Landing Recording System will not be shared with any agency in part or in full. Only relevant details, as applicable, will be shared with technology partners including foreign technology partners. However, the EOI document itself will not be shared with any technology partners.

2. The company understands the security sensitivity of such operational system and any information pertaining to deployment and usage of the system including system scaling will not be discussed with third party without a written permission from the Project Facilitation Team. The company understands that failure to observe this agreement will lead to disqualification from the project without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

Signature with Company Seal

Appendix D
(Refers Para 32 of EOI)

CORRECTNESS CERTIFICATE

It is certified that information submitted in the documents as part of the response to Expression of Interest (EOI) for the project of Design, Development and Procurement of Automatic Take Off/ Landing Recording System is correct and complete in all respects. It is acknowledged that the company will be disqualified from further participation if any information provided is found to be incorrect.

Signature with Company Seal

PRELIMINARY SERVICES QUALITATIVE REQUIREMENTS (PSQRs): DEVELOPMENT OF AUTOMATIC TAKE OFF/ LANDING RECORDING SYSTEM (ATORS)

1. This documents contains following parts: -

(a)	Part I	-	Introduction and Purpose.
(b)	Part II	-	**Essential Parameters A** (compliance as per Para 14 (a) Chap-III of DAP-2020).
(c)	Part III	-	**Essential Parameters B** (compliance as per Para 14 (b) Chap-III of DAP-2020).
(d)	Part IV	-	**Enhanced Performance Parameters** (compliance as per Para 14 (c) Chap-III of DAP-2020).
(e)	Part V	-	Reference documents.

PART I: INTRODUCTION AND PURPOSE

2. 'ATORS' is used for recording of take-off and landing through an array of sensors including EO/IR/Thermal and LL cameras. It will provide a round-the-clock view of all ground operations, take offs, landing from the main runway as well as from PTT. The aim of the video recording is to preserve vital evidence for utilization during post-accident/ incident investigation {including bird/animal hits on runway and short finals (1 km or less). The recorded data is additionally used as a debrief tool for aircrew training. All the data would be recorded and archived, and will be available for play back, when required. It is sought to undertake design and development of 'ATORS' for various types of items under the Make II procedure of DAP 2020.

3. This document lays down the Preliminary Staff Qualitative Requirements (PSQRs) for 'Development of ATORS'.

4. The purpose of this document is to serve as a referral / guidance document for use by potential Developmental Agencies (DAs) involved with the Make II project for "Development of ATORS". The DAs are encouraged to exceed the minimum performance requirements as specified by this document, in consultation with the Project Facilitation Team (PFT) nominated for the ibid case.

5. The process for design and development will be undertaken as per Chap III of DAP 2020.

6. After completion of prototype development, a Single Stage Composite trial will be undertaken as per provisions of Chap III of DAP 2020 and this document will be suitably amended/ converted to Air Staff Qualitative Requirement (ASQR). The commercial RFP will be issued only in response to the ASQRs.

PART II: ESSENTIAL PARAMETERS A

7. **Operational Parameters**.

(a) **General**.

(i) System should be capable of automatically tracking and recording and archiving flight path of aircraft during take-off, approach, missed approach and landing phase by day (CCD/EO/Digital) and night (IR/Thermal/LL) along with date and time stamp.

(ii) The system should be able to detect, recognise and identify aircraft in good visibility conditions on either side of runway threshold covering both take off and approach phases as given below:

Ser No	Aircraft Type	Range
(aa)	Wide bodied Aircraft	Detection 10 Km
(ab)	Fighter Class	Detection 8 Km
(ac)	Visual Recognition of class of Aircraft (Fighter/Transport/Rotary wing)	6 Km
(ad)	Visual Identification of critical features and landing configuration of the airframe as visible on screen and playback with zoom	6 to 4 Km

(iii) In poor visibility conditions (less than 4 Km), system should be able monitor the flight path of the aircraft from 2 Km. Also, during light to moderate rainfall, the system should be able to provide fairly clear recording from all sensors below 2 kms. Simultaneous operations on runway and parallel taxy track have to be covered. The system should be able to operate both day and night without any human intervention for need to adjust IFOV/Gain/Contrast/Focus etc.

(iv) The system should be able to cover take-off and landing catering to routine path and deviations there from.

(v) The IR/ Thermal system should be capable of picking up animals of the size of a rabbit within the designated zones along the runway and parallel taxy track including the shoulders and Aerospace Safety (AS) zone along the aircraft operating surfaces. The system should be able to record birds on the runway and taxy track surface.

(vi) **Synchronised Multiple Camera/ Tracking Cameras/ Panorama Solutions etc**. Should record the aircraft on approach up to touch down and further till completion of landing roll, starting from a distance of 8 Kms with seamless recording from six km in good visibility and four Km in poor visibility conditions. Same ranges for Take Off path will also be obtained. Also, the system should be capable of providing data for at least

three aircraft on approach simultaneously. DAs may seek a visit to an Airbase to understand the time gap between aircraft recovering as formations.

(vii) **Incursion Detection and Alert**. The EO/IR/Thermal Sensors should provide recording with alert in case on incursion by animals, humans and vehicles in restricted zones. The alerts should be able to indicate the location and record the event with time and date automatically. This data should be stored as a separate directory. The system will be capable of providing data with type and location of alerts generated and should be able to transmit instantaneous alert reports to designated addressee monitoring station.

(viii) The system should be able to cover steeper than standard approaches by Helicopters and during Practice force landings at training academies.

(b) **Environmental Conditions**.

(i) The system should be deployable at all altitudes in India. The system should be capable of geographical and environmental specialisation which includes tropical, coastal, desert and mountainous conditions.

(ii) System should be robust and should be able to withstand extreme weather conditions prevailing over Indian subcontinent.

Temperature	- 30^0 C to + 60^0 C
Wind Speed	Operational up to 35 Knots. Should be able to withstand 50 Knots.
Humidity	RH-40-100% and water proof.

(iii) **System Mounting and Housing**.Suitable mounting and housing for all weather operations prevailing over Indian subcontinent and storage.

8. **Technical Parameters**.

(a) The system should be capable of automatic recording during day, night and poor visibility conditions.

(b) **Storage Capacity**. The system should be capable of storing minimum 30 days of data backup with selectable and auto over write feature. The system should have high speed download capability to external memory device (portable) with data rates equivalent to USB 4.0 or above. The system will be capable of displaying the processed output to minimum four geographically displaced locations with each location comprising of minimum three monitors.

(c) **Redundancy**. The system should ensure 24X7 operational sustenance without any degradation in overall performance with upto 10% sensor failures.

(d) **Remote Operation**. System should have facility to remotely control power and recording.

(e) **Control Panel**. Control panel to control the zoom, pan, tilt, FOV, contrast, focus and brightness of the sensors manually when desired and required. The information being controlled and the feedback should be visible to the operator and be available in playback. Provision for imprint/super-imposable text by user (like Call sign) should be provided. Any change in the control setting must be logged in the playback recording. All manual operations should be protected for use by authorised personnel only.

9. **Maintainability and Ergonomic Parameters**.

(a) **Power Supply**. The system should work on commercial supply and should have a floating power back up at site for minimum of two hours to cater to power failures.

(b) **Operational/ Service Life**. The equipment to have minimum operational/ service life of 10 years.

(c) **Warranty**. The vendor should provide warranty for two years and assure of AMC/ spare support for total 10 years after installation of all systems at various bases.

(d) **Quality Assurance Methodology**. Relevant provision of following QA aspects as per the Qualification Test Procedure approved by DG AQA are as follows:

(i) EMI/EMC provision as per MIL STD 461F/G.

(ii) Screening of COTS components as per JSG : 0667 2023.

(iii) Applicable tests as per JSS 55555/MIL 810G.

(e) **Software**. Firm is to have proprietary rights on the software code. The GUI should be user friendly. IV & V of the software will have to be carried out by an accredited agency or CERT IAF.

PART III: ESSENTIAL PARAMETERS B

10. Nil.

PART IV: ENHANCED PERFORMANCE PARAMETERS

11. **Display of Target Coordinates**. In WGS84/Lat-Long format with EGM 2008 correction. (proposed credit score of 1% as per provisions of Para 14(c) of Chapter II of DAP-2020)

12. External audio input for recording (R/T transmission / commands of personnel)-Jack mic and mic for ambience audio. Facility for audio extraction from the video. Facility for audio super-imposition. (proposed credit score of 0.5% as per provisions of Para 14(c) of Chapter II of DAP-2020)

13. Software capability of identifying aircraft (in Indian inventory) on approach. (proposed credit score of 0.5% as per provisions of Para 14(c) of Chapter II of DAP-2020)

14. EO capability of alert generation of static FOD and identification of bird species captured Flying Bird on runway. (proposed credit score of 1% as per provisions of Para 14(c) of Chapter II of DAP-2020)

PART V: REFERENCE DOCUMENTS

15. DAP 2020.

Note: The testing and validation of prototype will be done at diverse locations (catering for geographical diversity and climate variability).