

**INVITATION FOR EXPRESSION OF INTEREST (EOI) FOR DESIGN, DEVELOPMENT  
AND PROCUREMENT OF LIGHTNING DETECTION SYSTEM (LDS)  
UNDER MAKE II PROCEDURE OF DAP 2020**

**Reference:** - Defence Acquisition Procedure 2020 (DAP - 2020)

**Appendices:** -

- A Preliminary Service Qualitative Requirements (PSQRs) for Indigenous Design, Development and Procurement of Lightning Detection System (LDS)
- B Format for Eoi Response
- C Commercial and Technical Evaluation Criteria
- D Confidentiality Agreement
- E Correctness Certificate

**Layout:-**

1. The Eoi comprises the following parts:-

- (a) Part I : General Information
- (b) Part II : Scope of Project
- (c) Part III: Evaluation Criteria
- (d) Part IV: Procedure for submission of response to the Eoi
- (e) Part V: Miscellaneous

2. Tri-services project for Design, Development & Procurement of Lightning Detection System (LDS) comprising Central Lightning Processing System (CLPS) with Qty-87 sensors (Qty-50 for IAF, Qty-25 for IA and Qty-12 for IN) has been initiated under Make-II. The Chairman and Nodal/ Project Officer would be from initiating Dte. Composition of Project Facilitation Team (PFT) is as follows:-

- (a) Chairman Gp Capt Met (CMS) Dte of Met, IAF
- (b) Rep from DDP
- (c) Rep from DGAQA
- (d) Rep from IFA Capital
- (e) Rep of Make PMU Dte of Aerospace Design, IAF
- (f) Rep of Indian Army
- (g) Rep of Indian Navy
- (h) Project/ Nodal Officer Dte of Met, IAF

**Note:** Address for correspondence is given at Para 26 of the Eoi.

## PART I: GENERAL INFORMATION

3. A Lightning Detection System consists of a network of sensors that detect electromagnetic (EM) radiation emitted during atmospheric lightning events. Lightning may be either Intra Cloud, Cloud to Cloud or Cloud to Ground. Each of these lightning types may theoretically have a different emission frequency of EM radiation. EM data is collected and processed centrally to determine the type, polarity, amplitude, time of occurrence and location (GPS based) of lightning with the help of scientifically proven software algorithms. LDS will not only detect Lightning strikes associated with Cumulonimbus (CB) Clouds at some distance from the airfield, but also infer information about its intensity. LDS is utilised for real time alerting, situational awareness and assists in enhancing accuracy of short term weather forecast/ Nowcast. This increased objectivity in tracking the lightning strikes associated with convective/ thunderstorm cells will result in enhanced operational preparedness, Aerospace safety and effectiveness of the weather services provided in IAF. With the existing capability of Indian Industry, the design & development of Lightning Detection System (LDS) under Make – II Category has been considered highly suitable.

### Objective

4. The objective of this EoI is to seek responses from eligible Indian Entity (criteria defined at Para 6 of Chapter III of DAP 2020) for the design, development and procurement of LDS comprising of Central Lightning Processing System (CLPS) with Qty-87 sensors.

### Make-II Procedure

5. Detailed guidelines on Make II Procedure (Chapter III of DAP 2020, as amended) may be downloaded from MoD website for reference.

## PART II: SCOPE OF THE PROJECT

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

(a) **Phase I: Prototype Development Sanction.** This phase involves selection of Developmental Agency (DA) for Design and Development of Lightning Detection System (LDS). This phase will end upon issue of Project Sanction Order (PSO) to the selected DA.

(b) **Phase II: Prototype Development and Procurement Phase.** This phase will commence with Design & Development of prototype by the selected Development Agency and conclusion of contract as per Chap-III of DAP 2020.

7. **Categorisation.**

(a) **Design and Development Phase.** As per Chapter-III of DAP-2020 under the 'Make-II (Industry Funded)' sub-category.

(b) **Procurement Phase.** 'Buy (Indian-IDDM)' with 50% IC in accordance with Chapter-III of DAP-2020 from qualifying DAs.

8. **Quantities.**

(a) **Prototype Development.** Prototype development would involve development of lightning detection sensors as well as Central Lightning Processing System (CLPS). Qty - 05 sensors and CLPS of prototype Lightning Detection System (LDS) will be required for undertaking Single Stage Composite Trials (SSCT). SSCT in accordance with Para 55 of Chapter III of DAP 2020 to be undertaken at different locations of IAF airfields, IA bases and IN stations in India based on varied climatic conditions. Vendor will undertake qualification and testing through concerned QA agency. A Draft Trial Directive is to be submitted by the DA encompassing all aspects of PSQRs with suggestion of Demonstration/ Lab Trials/ Field Trials. A separate Trial Directive will be issued by the BUYER for undertaking SSCT, which shall be comprehensive encompassing Operational, Maintenance and other allied software aspects like Data format, Storage and Networking. Further, Power ON BIT, Continuous BIT and Initiated BIT is to be provided to monitor the health of the system. The DA should ensure compliance of all these parameters.

(b) **Procurement.** LDS comprising of CLPS with 87 Sensors would be procured upon successful completion of SSCT. At present, there are 87 locations (50 in IAF, 25 in IA and 12 in IN) PAN-India.

9. **Preliminary Service Qualitative Requirements (PSQR).** The PSQRs for Design and Development of Lightning Detection System (LDS) are placed at **Appendix-A**. The Essential Requirements at Part III of the PSQRs must be met prior to conduct of SSCT.

**Timelines & Milestones**

10. **Stages.** Stages of the development and procurement process will be as per the Make-II Procedure of Chapter III of DAP 2020.

11. **Milestones.** The timelines as stipulated in DAP 2020 is as follows:-

Ser No	Activity	Remarks	Timelines	Cumulative Timelines
(a)	Issue of EoI	By PFT	-	T <sub>0</sub>
(b)	EoI response submission	By EoI Respondents (Indian Vendors)	08 weeks	T <sub>0</sub> + 08 weeks
(c)	EoI Response evaluation	By PFT	06 weeks	T <sub>0</sub> + 14 weeks
(d)	Issue of Project Sanction Order (PSO) for Prototype Development	To Selected DAs	02 weeks	T <sub>0</sub> + 16 weeks
(e)	Prototype Development Phase	By DAs	30-48 weeks	T <sub>0</sub> + 46 weeks to T <sub>0</sub> + 64 weeks
(f)	Single Stage Composite User trials & Acceptance of Trial Report.	-	07 weeks	T <sub>0</sub> + 53 weeks to T <sub>0</sub> + 71 weeks
(g)	Conversion of PSQRs to JSQRs	-	02 weeks	T <sub>0</sub> + 55 weeks to T <sub>0</sub> + 73 weeks

Ser No	Activity	Remarks	Timelines	Cumulative Timelines
(h)	Issue of Commercial RFP	-	02 weeks	T <sub>0</sub> + 57 weeks to T <sub>0</sub> + 75 weeks
(j)	Solicitation of Commercial Offer	-	04 weeks	T <sub>0</sub> + 61 weeks to T <sub>0</sub> + 79 weeks
(k)	Finalisation of Cost negotiation Committee (CNC)	-	04 weeks	T <sub>0</sub> + 65 weeks to T <sub>0</sub> + 83 weeks
(l)	Signing of contract	-	02 weeks	T <sub>0</sub> + 67 weeks to T <sub>0</sub> + 85 weeks

#### Development of Prototype and Trials

12. **Prototype Development Phase.** The indigenous Lightning Detection System (LDS) should be developed as per PSQRs at **Appendix 'A'**. Incorporation of AI/ ML during data processing needs to be explored. Any clarification related to functional or operational aspects of development as sought by the DA will be provided by the Project Facilitation Team (PFT) for the Project. During prototype development phase, more than one review may be conducted on required basis. Dates will be promulgated by the PFT, as per progress of the project. The review would be conducted through physical visit by PFT or in-person presentation/ VC by the DA.

13. After the prototype has been developed as per PSQRs given at **Appendix 'A'**, the PFT would carry out Single Stage Composite Trials (SSCT) of the prototype. The SSCT would involve verification/ evaluation of requirements of Buy (Indian - IDDM), examination for completion of certification/ qualification and trials of the equipment. If the prototype has qualified and equipment is validated for its performance during the SSCT, upon acceptance of report of SSCT, the PSQRs would be converted to JSQRs. Necessary technical literature pertaining to the design & material and verification of design and Indigenous Content would be provided by the DA for the SSCT on the prototype.

14. DA may be required to produce one or more of the following documents for vetting and approval by IAF, QA agencies and Design Certification Agency as per applicable Standards / Specifications.

- (a) Environmental Qualification Test Procedure (EQTP).
- (b) Detailed Specification Sheet.
- (c) Detailed drawings.
- (d) Manufacturing Process Document.
- (e) Quality Assurance Plans (QAP), as applicable, in accordance with:-
  - (i) Inclusion of JSS-55555 (as per table 3-4 class L-3) at test sequence 1,2,3,4,5,6,8,9,11,12,14 & 20 / MIL-STD-810G or other equivalent National/ International military standard.



- (ii) Ingress Protection 66 / 67 / 68, as applicable.
- (iii) EMI / EMC as per MIL STD 461F or equivalent National/ International standard references.
- (iv) Environmental Stress Screening (ESS) of Electronic systems / sub systems as per MIL STD 2164 or equivalent standard.
- (v) Total Technical Life (TTL) of Equipment is to be specified.
- (vi) Procedure for design, development and production will be as decided by design agency.
- (vii) Malicious code certificate for hardware and software used in LDS.
- (f) Acceptance Test Procedure (ATP).
- (g) User manual/ Brochure containing the following:-
  - (i) Detailed drawings, specifications, standards & capabilities of Lightning Detection System (LDS).
  - (ii) Training documents.
- (h) Plan for routine & scheduled maintenance including calibration cycle, MTBF, MTTR, Obsolescence management, product support, Operational life, Earthing of sensor, Fault identification along with text message at on site & CLPS location, Analysis and rectification methodology.
- (j) Design Evaluation / Certification by an authorised agency.

15. Design & Development (including developmental testing/ trials and certification/ qualification) of the prototype is to be undertaken by the Developmental Agencies (DA). In case any IAF facility is required during trials, the vendor may provide a list of such facilities in his response (Para 24 of **Appendix 'B'** refers).

#### **Solicitation of Commercial Offers**

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

#### **Deliverables**

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

- (a) **Prototype Development Phase.** Qty 05 sensors (LDS comprising of CLPS and 05 Sensors) of prototype Lightning Detection System (LDS) will be required for undertaking SSCT.

(b) **Procurement Phase.**

(i) Lightning Detection System (LDS) comprising of CLPS with Qty-87 Sensors (IAF-50, IA-25, IN-12)

(ii) Tools, Testers and Ground Equipment (TTGE), requisite training, Technical literature including user handbook, operations & technical documents and manuals.

**Intellectual Property Rights (IPRs)**

18. IPRs will be as per policy mentioned at Para 59 of the Chapter III of DAP 2020 for Make-II Procedure.

**PART III: EVALUATION CRITERIA**

**Commercial and Technical Evaluation Criteria**

19. **Eligibility.** Indian Entity satisfying criteria given at Para 20 of Chapter-I of DAP 2020 is considered as an eligible "Indian Entity" for the project.

20. EoI respondents will be evaluated for compliance to commercial and technical criteria as per **Appendix 'C'**.

**Indigenous Design and Indigenous Content (IC)**

21. **Critical Technology.** Critical technology to be developed indigenously, which has been identified in this Make project are "sensor for Lightning Detection" and "LDS software".

22. Indigenous Design needs to be demonstrated by the Developmental Agency after completion of prototype development. DA are to submit documentation, as necessary, for verification of Indigenous Design as mandated in Appendix A of Chap I, DAP 2020 (as amended). Indigenous Content of minimum 50% is to be ensured at prototype stage and during procurement stage. After successful development of prototype, further procurement will be as per the 'Buy (Indian-IDDM)' procedure in accordance with DAP 2020. Indigenous Content will be assessed as per guidelines at Appendix B to Chapter I of DAP 2020.

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 Para 13 & 23 of **Appendix 'B'**).

**PART IV: PROCEDURE FOR SUBMISSION OF RESPONSE TO THE EOI**

24. **Guidelines for Submitting Eol Responses.**

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

(b) 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.

(c) 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 Eol Respondent.** The following may lead to rejection of Eol response:-

(a) Failure to meet the Commercial and Technical Evaluation Criteria given at **Appendix C**.

(b) Failure to offer compliance to any of the terms and conditions given in the Eol.

(b) Failure to agree with the project timelines.

(c) Failure to offer desired indigenous content.

(e) 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 LDS  
Gp Capt Met (CMS), (Room No-10)  
Directorate of Meteorology  
RCPO Complex, Air Force Station, New Delhi  
Air HQ (Vayu Bhawan)  
New Delhi-110003  
Telephone: 011-23019569  
Fax: 011-23011042  
E-Mail: [megha3@iaf.nic.in](mailto:megha3@iaf.nic.in)**


27. The response to this Eol must be submitted by **1700hrs on 03 Nov 2023** at the address mentioned above.

28. The Company will be required to sign and honor the 'Confidentiality Agreement' with MoD, Govt of India. The 'Confidentiality Agreement' will be furnished by each Eol respondent at the time of submission of Eol responses as per format given at **Appendix 'D'**.

**PART V: MISCELLANEOUS**

29. **Pre EoI Response Meeting.** Companies may submit written queries/clarifications/ amplifications on specific issues on EoI by **27 Sep 2023**. A pre-response meeting will be held **within 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-IDD) 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 'E'** will be furnished as part of the response.
33. Please acknowledge the receipt of this invitation for EoI.

File No: AIRHQ/17363/2/METCMS(EQPTII) BM-II

  
(Birendra Nepal)  
Wing Commander  
Project/ Nodal Officer  
Design, Development  
and Procurement of LDS

Date : 01 Sep 23

**Distribution list:-**

- |                               |   |  |
|-------------------------------|---|--|
| DDP, MoD                      | - | Gp Capt RJ Atre, 'C' Block, V <sup>th</sup> floor, Def offices Complex, KG Marg, New Delhi- 01   |
| DGAQA                         | - | Dir (E&I), DGAQA, 'A' Block, VII <sup>th</sup> floor, Def offices Complex, KG Marg, New Delhi- 01  |
| IFA (CAPITAL)                 | - | Room No. 454B, Air HQ (VB)   |
| Indian Army (IA)<br>New Delhi | - | GSO-I, Avn-6, DG Army Aviation, Carriappa Parade Ground, New Delhi   |
| Indian Navy (IN)              | - | Directorate of Naval Oceanology and Meteorology (DNOM)<br>Room No.602, 6 <sup>th</sup> floor, Chanakya Bhawan, Chanakaypuri, New Delhi- 21 |
| Make PMU (DAD)                | - | 'A' Block, 8 <sup>th</sup> Floor, Def Complex, KG Marg, New Delhi- 01  |



**PRELIMINARY SERVICES QUALITATIVE REQUIREMENTS (PSQRs)**  
**FOR DEVELOPMENT OF LIGHTNING DETECTION SYSTEM (LDS)**  
**UNDER MAKE II PROCESS**

1. This document contains the following parts:-
  - (a) Part I - **Introduction**
  - (b) Part II - **Purpose** (purpose of the document)
  - (c) Part III - **Essential Parameters** (list of parameters which the design/development agency must comply on prototype)
  - (d) Part IV - **Desirable Parameters** (list of parameters which are desirable in the prototype)
  - (e) Part V - **Technical Specifications** (these are technical specifications of the item, provided for guidance of the design/development agency)
  - (f) Part VI - **Reference documents**

**PART I: INTRODUCTION**

2. A case for Indigenous Design, Development and Manufacturing (IDDM) of Lightning Detection System (LDS), for use at IAF bases was projected under the 'Make in India' category of DAP-2020. AIP for LDS was accorded by MoD on 27 Oct 20. The IDDM of LDS was subsequently brought under the 'Make-II' category.

3. A Lightning Detection System consists of a network of sensors that detect the electromagnetic (EM) radiation emitted during atmospheric lightning events. Lightning may be either Intra Cloud, Cloud to Cloud or Cloud to Ground. Each of these lightning types may theoretically have a different emission frequency of EM radiation. The EM data is collected and processed centrally to determine the type, polarity, amplitude, time of occurrence and location (GPS based) of lightning with the help of scientifically proven software algorithms. The LDS is utilised for real time alerting and situational awareness.

4. This document lays down the Preliminary Staff Qualitative Requirements (PSQRs) for 'Development of Lightning Detection System'. Part-II of this document describes the purpose of LDS. The parameters at Part III and IV of this document relate to Lightning Detection System for prototype development purposes under Make II case. Part-V of this document contains information on reference documents utilised while preparing the PSQRs.

## PART II: PURPOSE

5. 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 Lightning Detection System". 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 extant case.

6. The process for design and development will be undertaken as per Chap III of DAP 2020. After completion of UTRR (User Trial Readiness Review) as per provisions of Chap III of DAP 2020, this document (PSQR) will be suitably amended / converted to Air Staff Qualitative Requirement (ASQR) or Joint Staff Qualitative Requirement (JSQR), as the case may be. The commercial RFP will be issued only in response to the ASQR / JSQR.

## PART III: ESSENTIAL PARAMETERS

7. The essential parameters are as follows:-

(a) **Lightning Sensor.**

(i) The Lightning Sensors must be capable of monitoring Intra Cloud, Cloud to Cloud and Cloud to Ground lightning.

(ii) The Sensors must have an in-built discrimination technology to reject noise with high confidence level with further rejection / filtering at the Central Lightning Processing System (CLPS).

(iii) Sensor site equipment shall consist of Lightning Stroke Antenna, GPS antenna, Sensor electronics assembly and GPS receiver.

(iv) The collection of data by Lightning Sensor subsystem and its further transmission to the CLPS, through the network, should be fully automated.

(v) The Lightning Sensor should be able to measure the characteristics of lightning such as type, polarity, amplitude, time of occurrence and location (GPS based).

(vi) The number of LDS Sensors is anticipated to be 50 for IAF, 25 for IA and 12 for IN (total 87 sensors), presently. However, this number may vary based on actual requirements depending upon the optimum base line distance required and area to be covered, which may be decided at a later stage of the procurement process.

(b) **Location of Lightning Sensors.** The LDS must use lightning Sensors located PAN-India with suitable separation and overlap catering to appropriate redundancy.

(c) **Design.** The LDS must be modular in design so as to enable quick and easy replacement of modules which may become unserviceable.

(d) **Central Lightning Processing System (CLPS).**

- (i) The CLPS should be compatible with the Lightning Sensors provided.
- (ii) CLPS must be able to receive the lightning data from the sensors and process the data.
- (iii) The CLPS must also facilitate analysis and visualisation of lightning data.
- (iv) The CLPS must be equipped with the latest server level Operating System.
- (v) The CLPS must have the capability for addition of sensor(s) at a later stage.
- (vi) The CLPS must consist of redundant servers in DC / DR architecture at two different geographical locations, so as to provide automatic fail over in the event of one of the servers failing or getting off network domain.

(e) **Field Lightning Display System (FLDS).**

- (i) FLDS must be able to display lightning type, polarity, amplitude, time of occurrence, location and density in near real time over a GIS based map.
- (ii) FLDS must enable remote access to the Lightning Detection System Network Data.
- (iii) FLDS will be located at various designated field stations at about an anticipated 87 locations (50 in IAF, 25 in IA and 12 in IN), presently. However, this number may vary based on actual requirements which may be decided at a later stage of the procurement process.

(f) **LDS Software.**

- (i) Lightning data obtained from the sensors must be displayed near real time on a GIS based user friendly Graphical User Interface (GUI) on user defined customised map backgrounds with control (eg, zooming) facilities.
- (ii) The GIS based map must offer Google earth or better display solution.
- (iii) The LDS software must be able to display lightning type, polarity, amplitude, time of occurrence, location with desired accuracy and density in near real time.
- (iv) The LDS software must have the provision to display the expected track of the thunderstorm movement based on extrapolation techniques.
- (v) The LDS software must have the provision of setting-up of automated audio / visual alarm system or notification through e-mail / SMS over pre-selected locations and range, based on lightning frequency exceeding a critical specified frequency.

(vi) The LDS software must have the capability to overlay additional layers of Met data like Satellite, DWR and other similar data formats on a GIS based map display.

(vii) The data format of LDS must be such as to enable direct assimilation of LDS data into NWP models.

(viii) It should also be possible to connect any standard ASCII data terminal directly to the sensor at the installation site, or at the end of communication cable.

(ix) A mobile based user friendly application must also be developed to display the lightning and associated information.

(x) The LDS software must also provide easy access to archived LDS data.

(g) **LDS Network.** The network used for LDS may be either the internet or any other appropriate secured network, which may be decided by the user(s) at a later stage of the procurement process. The LDS should be designed so as to align with the future network protocols / network upgrades requirement for adhering to security protocols mandated by the user(s) from time to time. The requisite domain expertise and documentation should be made available to the user(s) to carry out the necessary future upgrades required in the network.

(h) **Performance Management System.** The LDS must include a GUI based centralised, sensor level, system performance management and support system. The software must provide easy monitoring of sensor level health and network performance. This system should enable remote configuration, calibration and diagnostics of Lightning Sensors.

(j) **Data Archival.** The LDS must consist of a robust data archival system with archival of complete lightning data till the end of operational life of LDS.

(k) **Certification.** LDS Sensor should comply with the international norms for Radiation, Power, Electrostatics and Communication.

(l) **Prototype Validation.** The validation and comparison of prototype developed will be done at locations catering for geographical diversity and climate variability.

#### **PART IV: DESIRABLE PARAMETERS**

8. Following are the desirable parameters for the LDS:-

(a) The vendor should have its lightning detection network currently operational with any Govt / National agencies. Documentary evidence in support of above must also be submitted. These evidences will be verified during the technical evaluation of technical offers.



**PART V: TECHNICAL SPECIFICATIONS**

9. **Technical Specifications of Lightning Sensor.** The LDS must use Lightning Sensors located PAN-India with suitable separation and overlap catering to appropriate redundancy, in order to achieve the following:-

Ser. No	Elements	Desired Output
(a)	Lightning Classification	LDS should be Capable of detecting Cloud to Ground (CG) Intra-Cloud lightning Inter Cloud lightning
(b)	Detection efficiency	Desired at 100% but not less than 90% at any time
(c)	Coverage	Coverage across the entire contiguous Indian sub-continent and Indian islands of interest
(d)	Classification Accuracy	Desired at 100% but not less than 90% Classification Accuracy of lightning types at any time
(e)	Network location accuracy	Less than 100 meters
(f)	Performance Monitoring	Automatic system for calibration and self-tests
(g)	Remote Configuration	The parameters should be remotely configurable from Central Lightning Processing System (CLPS)
(h)	GPS clock accuracy	20 ns or better
(j)	Response Time	Sufficient enough to capture all the lightning events in case of very high lightning frequency (100 µsec or less)
(k)	False Alarm rate	Not more than 2%
(l)	Power Requirement	230 Volt, 50 Hz AC
(m)	Communication Interface	TCP / IP

10. **Specifications of Computer Hardware for LDS.**

(a) **LDS Server.** LDS Server must have a contemporary and robust hardware configuration to carry out all its stated tasks without any apparent time lag. The Server must report health status to the administrator on Email / SMS in case of failure. The administrator must be notified on Email / SMS during both Server fail over and fall back. The server should be loaded with original Software. The data base should be updated in real time. The memory for data base server should be sufficient to enable archival of Lightning data for the entire operational life of LDS.

(b) **FLDS.** The FLDS must be a contemporary and robust PC with suitable hardware configurations so as to enable it to carry out its stated functions without any apparent time lag.



11. **Environmental Conditions.** The Lightning Sensor must be self-contained for operation in external environment. The LDS Sensors must be able to operate within the following environmental conditions:-

<b>Environmental Conditions</b>	<b>Permissible Range</b>
Temperature Range	- 40°C to + 50°C
Wind Speed	200 kmph
Relative Humidity	0 to 100%
Hail	up to a size of 5 cm
Rain Intensity	up to 15 cm/ hr
Elevation of Sensor Location	up to 20,000 ft

#### **PART VI: REFERENCE DOCUMENTS**

12. While preparing the PSQRs, reference was made to the technical manuals of the previously procured LDS which is still functional in IAF. Reference has also been made to "World Meteorological Organisation (WMO) document on Electromagnetic methods of Lightning Detection".

**Appendix B**  
(Refers to para 24 (a)  
of EoI )

**FORMAT FOR EOI RESPONSE**

**PART I – VENDOR DETAILS**

1. Name of Case:
2. Name of EoI Respondent:
3. Mailing Address/Contact/Phone/Email/Website (If factory site is located differently, indicate address of the same):
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. Nature of business *(Manufacturer/ Trader/ Sole Selling or Authorised Agent/ Dealer/ Assembler/ Processor/ Re packer/ Service Provider):*
10. Average Turn Over of the last three financial years:
11. Net worth of the company, as on 31 Mar of last FY (should be positive).
12. Details of current products:-  
*(Type/ Description, Licensed/ Installed Capacity, Annual Production for Preceding 3 Years):*
13. 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):*
14. 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)
15. Details of permanent manpower:-
  - (a) Technical:

- (b) Administrative:
- 16. Total Area of Factory:
  - (a) Covered area (Sq M):
  - (b) Uncovered area (Sq M):
  - (c) Any other space available (Sq M):
- 17. Is the factory space adequate to undertake design, development and manufacture of the Lightning Detection System (LDS)?
- 18. Any other information, relevant to the case.

#### **PART II: PROJECT SPECIFIC INFORMATION**

- 19. Outline proposal of the company to undertake prototype development.
- 20. Stages/phases of development, with indicative time schedules.
- 21. Milestones that can be demonstrated to facilitate project monitoring
- 22. Role, responsibility and expertise details of the firm, if any, and if applicable.
- 23. Role of foreign technology provider, if any.
- 24. Requirement of specialised testing assistance, where such facilities are available only with Armed Forces/DRDO/DGAQA/DGQA/DGNAL or any other Govt facility. (Please provide a list of such facilities, with time period for which required).
- 25. Information to prove design/developmental capacity:-  
*(Any past examples of indigenous design and development, R&D facilities available in house, if any; Technical/ R&D manpower/expertise available, institutional tie ups, MoU, laboratory and drawing office facility, CAD/CAM facility, percentage of total turnover spent on R&D during last three years etc)*
- 26. Details of important facilities:  
*(Production facilities, CAD/CAM/Robotics, other advanced technology tools, environmental testing facilities, tool room, metrology and test eqpt facilities, instrumentation etc).*
- 27. Please furnish an undertaking that design and development will be as per provisions and guidelines of Chap III of DAP 2020, especially as they relate to Indigenous Design, Indigenous Content and IPR.
- 28. Documents to be submitted along with this appendix, by the EoI respondent:-
  - (a) Copy of latest certificate of incorporation by the Registrar of Companies.

- (b) Audited Financial Statements (Profit & Loss Account and Balance Sheet) with Auditors Report.
- (c) Acceptance Certificate, clause wise of all terms and conditions given in the EoI.
- (d) Confidentiality Agreement (As per format at **Appendix D**).
- (e) Correctness Certificate (As per format at **Appendix E**).
- (f) Undertaking as per **Para 27** of this appendix.
- (g) Self-certification for adequacy of engineering and technical ability for D&D of Lightning Detection System (LDS).
- (j) Certificate for PSQR 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 C**

(Refers to Para 25 (a) of EoI)

**COMMERCIAL AND TECHNICAL EVALUATION CRITERIA****Commercial Evaluation Criteria**

SI No	Information	Pass Criteria
(a)	Nature of the Company	As per <b>Annexure I to Appendix F</b> of Chapter III of DAP 2020
(b)	Ownership Status	
(c)	Category of Industry.	Large/Medium/ Small/ Micro/Startup
(d)	Annual Turnover	Average annual turnover of the applicant company for the last three financial years ending 31 <sup>st</sup> March of the previous financial year should not be less than 5% of the estimated cost of the project.
(e)	Net Worth	Net worth of the entities ending 31 <sup>st</sup> March of the previous financial year should be " <b>Positive</b> ".

**Technical Evaluation Criteria**

SL No	Criteria and Sub Criteria	Pass Criteria
(a)	Engineering and technical ability	Self-certification by EoI respondent
(b)	Proposed indigenous content in percentage of total cost at prototype stage and final stage	As per Chapter III of DAP 2020
(c)	Total Land area	Statement of firm for adequacy
(d)	PSQRs Compliance	Self-certificate of compliance by EoI respondent
(e)	Intellectual Property Rights (IPR)	Vendor to confirm IPR as per <b>Para 18 of EoI</b>



**Appendix D**  
(Refers Para 28 of Eol)

**CONFIDENTIALITY AGREEMENT**

1. It is certified that Expression of Interest document for the project of Design, Development and Procurement of Lightning Detection System (LDS) 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 Eol 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 E**  
(Refers Para 32  
of Eol)

**CORRECTNESS CERTIFICATE**

It is certified that information submitted in the documents as part of the response to Expression of Interest (Eol) for the project of Design, Development and Procurement of Lightning Detection System (LDS) 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