Appendix A to Chapter II
(Refers to Paragraphs 5 and 6 of Chapter II of DAP 2020)

REQUEST FOR INFORMATION FOR ACTIVE ELECTRONIC SCANNED ARRAY RADAR BASED GUN CONTROL SYSTEM FOR GUN ENGAGEMENT

1. The Ministry of Defence, Government of India, intends to induct an Integrated Active Electronic Scanned Array Radar based Gun Control System (AESA-GCS) for gun engagement based upon operational experience gained and evolving threat scenario. The MoD, GoI, intends to install this system onboard *IN* ships.

2. This Request for Information (RFI) for AESA-GCS consists of three parts as indicated below:-

(a) **Part I**. The first part of the RFI incorporates operational characteristics and features that should be met by the System. Important technical parameters of the proposed System are also mentioned.

(b) **Part II**. The second part of the RFI states the methodology of seeking response of vendors. Submission of incomplete response format will render the vendor liable for rejection.

(c) **Part III**. This part lays down the guidelines for framing Criteria for Vendor Selection/ Pre-Qualification in Buy Indian (IDDM), Buy (Indian) and Buy & Make (Indian) Cases.

PART - I: OPERATIONAL AND TECHNICAL REQUIREMENTS

3. **Introduction**. The *IN* intends to induct the AESA-GCS to direct and control gunnery engagements (air and surface) for naval gun mounts of varying caliber. The system is envisaged with the following components:-

(a) AESA Radar to enable tracking and engagement of aerial and surface targets.

(b) Gun Control System (GCS) to undertake Threat Evaluation and Resource Allocation (TERA) for automatic engagement as also based on manual input.

(c) EO/IR Device.

4. AESA-GCS Radar.

(a) General Requirements. AESA-GCS Radar shall have the following capabilities:-

(i) Automatic search, threat alert and tracking of air and surface targets including sea skimming in all three dimensions viz azimuth, range and height.

(ii) Automatic search and detection of micro/ mini/ swarm drones and other aerial targets of RCS 0.01m^2 or bigger.

(iii) Multi target dedicated tracking.

(iv) Automatic acquisition and dedicated tracking of air and surface targets with update rate that enables effective weapon control of Guns.

(v) AESA-GCS Radar antenna assembled as a hollow triangle/ rectangle to be installed forward and aft displaced configuration to provide 360 deg coverage. The radar tracker shall have feature of sectoral transmission.

(vii) Target classification.

(viii) Target tell back to the ship's Combat Management System.

(ix) Enable Gun Control System to undertake simultaneous and automatic engagement of detected targets.

(x) Target kill assessment support on completion of engagement.

(xi) Advanced ECCM capability such as Side Lobe Blanking, Frequency Agility, Staggered PRF, Least Jammed Frequency mode, etc.

(xii) Capability to extract all targets (air and surface) for display.

(xiii) Suppression of stationary target and slow-moving clutter.

(xiv) Inbuilt recording facility for 4 or more hours.

(b) Frequency. The AESA-GCS radar should operate in X Band.

(c) **Operator-Defined Sectors**. The AESA-GCS Radar should be capable of operating in sectors defined by the operator either relatively to the ship or by true bearings.

(d) **Target Acquisition from External Designation**. AESA-GCS should have the capability to acquire targets designated from other external sources including that from the Combat Management System.

(e) **False Alarm Rates**. AESA-GCS radar should have the following False Alarm Rates:-

(i) **Threat Alert False Alarm Rate**. A threat false alarm rate of **not more than 1 every 12 hrs** (Defined as false report of track with approaching velocity **greater than 200 msec** and Time-To Go **less than 50 sec**).

(ii) **False Alarm Rate**. A false alarm rate of **not more than 1 every 1 hr** (Defined as false report of track with approaching velocity **greater than 100 m/sec** and range **less than 100 km**).

(f) **War and Peace Time Frequencies**. The AESA-GCS radar should have a provision to operate with a limited set of discrete frequencies during "peace time", so that the whole range of its frequency agility and hopping capability are not exposed to an adversary's ELINT. This is intended to 'conserve' some frequencies for use during war, which would not already be available in the ELINT libraries of the adversary and would not give away the ship's identity during war (atleast 40 spot frequencies for war and peace time).

(g) **Operability in Dense EM Environment**. The AESA-GCS radar should be capable of adapting to the dense EM environment, which prevails in an AA/ AMD scenario, by automatically adapting its power, frequency, waveform, dwell time signal processing etc, thereby ensuring no interference during search, detection, tracking and gun engagement.

(h) **ECCM**. The ECCM features of the AESA-GCS Radar should include but may not be limited to the following:-

(i) PRF/ Frequency agility.

(ii) Least Jammed Frequency (LJF).

(iii) Jam Strobe Presentation (JSP).

(iv) Track-on-Jam.

(v) ECM environment waveforms.

(vi) Wideband coded waveforms.

(vii) Side Lobe Blanking and Side Lobe Cancellation.

(viii) Clutter mapping.

(ix) Low antenna side lobes.

(x) Countermeasures against deceptive jamming.

(xi) Transmit sector blanking.

(j) **Chaff Discrimination**. AESA-GCS radar should be able to discriminate between chaff and air targets.

(k) **MTI**. The AESA-GCS radar should have MTI capability with an improvement factor of **45 dB or more**. The MTI should be based on adaptive MTI design and be capable of automatic cancellation of clutter.

(l) **Power Output**. The power output should be sufficient to achieve an instrumented detection range of **≥ 80 km**. There should be a facility to transmit at reduced power settings, when so desired by the operator. System should include self-calibration and inbuilt power output measurement.

(m) **Scan and Track Coverage**. The AESA-GCS radar scan and track coverage (as combined feature emanating from forward and aft configuration of hollow triangle antenna) should be as follows:-

(i) Azimuth : 360 degrees.

(ii) Elevation : 0 to 70 degrees or more.

(n) **Ranges**.

(i) **Maximum Instrumented Detection**. The maximum instrumented detection of the AESA-GCS radar should be as follows:-

(aa) Surface **more than 25 km.**

(ab) Air **more than 80 km.**

(ac) Drone **more than 08 km.**

(ii) **Minimum Range. Approximately 500 m.**

(p) **Range Performance.** AESA-GCS radar should be capable of detecting and initiating Automatic Track (including movement computation) of targets in open sea, under clear weather conditions and Sea State 5 at ranges as follows:-

(i) **Maritime Patrol Aircraft (MPA) - RCS 10 m^2.** The assured detection range of RCS **10 m^2 shall be ≥ 80 km.**

(ii) **Fighter Aircraft - RCS 2 m^2.** The assured detection range of RCS 2 m^2 shall be **≥ 60 km.**

(iii) **High Speed Missile - RCS 0.1 m^2.** The assured tracking range of high-speed (**about 1000 m/s or more**) missile of RCS 0.1 m^2 at a height of **minimum 10 m shall be ≥ 40 km.**

(iv) **Drones.** Assured tracking range for micro/ mini/ swarm drones and other aerial targets of **RCS 0.01m^2 or bigger** is as follows: -

RCS	Assured Tracking Range (km)
RCS 0.01 m^2	≥ 5 km
RCS 0.5 m^2	≥ 7 km.
RCS 1 m^2	≥ 10 km.

(v) **Sea Skimming Missile.** The assured tracking range of a sea skimming missile (**about 1000 m/s**) of **minimum RCS 0.1 m^2** at **minimum height of 5 m shall be ≥ 25 km.**

(vi) **Surface Ships.** The assured tracking range of surface targets shall be as follows:-

Type of Vessel	Assured Tracking Range (km)
Small boats (5-10 m^2)	≥ 20
FAC	≥ Radar Horizon
Frigate	≥ Radar Horizon

(q) **Resolution.**

(i) **Range.**

(aa) Tracking < 50m.

(ab) Search Mode < 100m.

(ii) **Bearing**. ≤ 0.25°.

(r) **Accuracy**.

(i) **Range**. ≤ 30m (one sigma).

(ii) **Azimuth**. ≤ 0.25° (one sigma).

(iii) **Elevation**. ≤ 0.3° (one sigma).

(iv) **Doppler**. ≤ 2 m/s (one sigma).

(s) **AESA-GCS Radar Antenna**. AESA-GCS radar should operate with a fixed phased array antenna arranged as a hollow triangle/ rectangle in forward and aft configuration generating electronically steered beams in azimuth (0-360 deg) and in elevation (**0 to 70 deg or more**) at ship Roll of upto ±20° and Pitch upto ±10°.

(t) **Antenna Size and Weight**. AESA-GCS radar antenna should be amenable (by size and weight), for fitment on the faces of the mast (s)/ superstructure as per design of ***IN*** ships of tonnage in the range of 750 T to 3500 T. The antenna weight, inclusive of all associated sub-systems required to be accommodated above or within the mast structure, is to be **≤ 1000 kg**.

(u) **Transmitter**.

(i) The radar should be built around GaN/ GaAs Transmit/ Receive (T/R) module technology.

(ii) The transmitter should be distributed in design using T/R modules resulting in graceful degradation of the system performance in case of T/R module failures, rather than a catastrophic failure.

(iii) A suitable cooling system is to be provided for the transmitter.

(v) **Receiver**.

(i) A fully coherent receiver with advanced processing techniques (Kalman filter) or better, that is a digital receiver with low noise amplifiers.

(ii) The Constant False Alarm Rate (CFAR) logic should have an adaptable and robust clutter cancellation algorithm, to effectively cancel rain, sea and atmospheric clutter.

(iii) The Probability of False Alarm (P_{fa}) should be **better than 10^{-6}**, with a Probability of Detection (P_d) of **at least 0.9** at maximum range.

(iv) The receiver should have pulse compression features.

(w) **Radar Data Processing**. The radar must have an integral data processor, which enables the following:-

(i) Automatic tracking of $\geq$ 100 surface targets up to speeds of $\leq$ 60 knots.

(ii) Automatic acquisition and tracking of $\geq$ **200 air targets** with speeds $\leq$ 1000 m/s.

(iii) Update rate of $\geq$ **100 Hz.**

(iv) Association of primary and secondary radar detection.

(v) The radar data processor should be capable of providing target designation for multiple guns of varying calibre. Target data would consist of range, bearing, height, course and speed.

(vi) A provision for manual track initiation by the operator should be available to cater for targets that have not been initiated automatically.

(vii) Facility for Tracker console for radar displays to accept cueing information, at display level, of more than 50 tracks from the Combat Management System (CMS) and Weapon control console with radar display for simultaneous and automatic gun engagement.

(x) **Mutual Interference**. The radar must have options in order to prevent mutual interference:-

(i) Providing blanking pulse to ESM receiver.

(ii) Provide a pre-sync pulse for the ship's Mutual Interference Suppression Unit in addition to the Tx pulse envelope.

(iii) Provide the transmitted pulse envelope.

(iv) The leading edge of the pulse should be advanced and the trailing edge should be delayed, with respect to the actual transmission. The delay and advance should be selectable from 1 to 20 micro sec.

(v) Stand-alone operation on its own internal sync pulse.

(vi) **Minimum separation between two transmitting AESA-FCR antennas to be indicated.**

5. **EO/ IR Device**. AESA-GCS should be complemented with an EO/ IR system which can be slewed on tracked target to augment identification. Targets detected by EO/ IR system shall be included in threat evaluation and engagement. The EO/ IR device shall include:-

(a) Electro Optical Camera (CCD Camera or better).

(b) Thermal Imager/ IR Camera with ranges more than 20 Km.

(c) Laser Range Finder with automatic and manual mode. Number of possible lasing to be provided.

6. **AESA-GCS**. AESA-GCS Fire Control System shall have the following functions:-

(a) **Functionalities**.

(i) Gun Control Stations (GCS) with ability to undertake automatic engagement of detected targets (based on threat evaluation) with an option of manual intervention.

(ii) Enable control of $\geq$ **05** Gun mounts of varying caliber to undertake simultaneous and automatic engagement of targets.

(iii) Target kill assessment on completion of engagement.

(b) **Shipboard Interfaces**. AESA-GCS should be capable of being interfaced with (but not limited to) the following shipboard systems:-

(i) CMS.

(ii) Gun Systems (varying caliber guns).

(iii) IFF.

(iv) Inertial and Ship's Navigation System (Gyro, Log, Anemometer, GPS, etc).

(v) ESM Systems.

(vi) Data Link System.

(vii) COTs Radars.

7. **Additional Technical Parameters**. In addition to parameters elucidated from Para 3-6, following technical parameters be included (not be limited to):-

(a) **Additional Features**. The system should have the following additional features:-

(i) Remote Control panel.

(ii) Capability of integrating with on board Combat Management System and target designation to Gun Fire Control Systems.

(iii) Operational control of the radar and EO/IR from the Combat Management Systems.

(iv) The radar and EO/IR should be capable of providing track data to Combat Management System.

(v) The beam pattern of the AESA-GCS radar and EO/IR camera should be electronically stabilised against the ship's movement to cater for a non-simultaneous Roll of Limit of 20° and a Pitch Limit of 10°.

(vi) The AESA-GCS radar should have Track While Scan capability using Automatic Detection & Tracking schemes provided in the signal and data processor, with a P_{fa} better than 10^{-6}.

(vii) Digital video output from AESA-GCS radar and EO/IR should be available for display.

(viii) The system should be provided with the following displays:-

(aa) A dedicated display for local control and for monitoring the radar and EO/IR system performance.

(ab) AESA-GCS controls should be operable from an Tracker and Weapon Console through a user-friendly HMI. The display should utilise editable symbology, according to the Navy's symbology guidelines.

(ix) Modular design for reduction in single point failures, easy serviceability and quick replacement of modules/ sub-assemblies.

(x) The AESA-GCS should be capable of providing virtual targets under different scenarios for operator training.

(b) **Alignment**. The AESA-GCS radar and EO/IR should not require any alignment after its shipboard installation, except if such alignment is necessitated by major reason, like lifting of the associated antennae. The alignment procedures and facilities are to be simple, documented and provided. Additionally, alignment of radar with guns to be included with simple procedures without any physical/ mechanical changes to AESA-FCR and gun mount. Details of alignment tools are to be provided.

(c) **Power Supply**. The system should be capable of functioning on ship specific power supply of 380 - 415V.

(d) **Structural Wind Speed Limitations**. The radar antenna and EO/IR above deck equipment should be capable of surviving relative **speeds of up to 100 knots** and be able to operate at **relative wind speed up to 75 knots**.

(e) **Environmental Specifications**. The AESA-GCS should comply with environmental specification for ship borne applications, as specified in MIL STD 810G. The radar should be capable of operating under the following environmental conditions:-

(i) **Temperature**

(aa) **Operating Temperature**. 0^0 to 55^0 C or more.

(ab) **Storage Temperature**. -10^0 to 70^0 C or more.

(ii) **Humidity**. Minimum 95% RH at 40^0 C

(iii) **Shock**. As specified in MIL STD JS-55555.

(iv) **Sea State**.

(aa) **Operation**. Up to Sea State 5.

(ab) **Survivability**. Up to Sea State 8.

8. **Maintainability and Ergonomic Parameters**.

(a) **Reliability and Maintainability**. AESA-GCS design should cater for following reliability and maintainability aspects:-

(i) Modular design for quick and easy replacement of unserviceable modules and components.

(ii) Overall systems availability should be greater than 90% for the entire duration of its service life.

(iii) A comprehensive reliability analysis should be carried out on the system and documented.

(iv) The system should be amenable to easy maintenance

(v) Detailed maintenance/repair methodologies, of various levels, from 'O' to 'D' should be included in the documentation.

(vi) Common use test equipment for electronic equipment should be specified.

(b) **Product Support**. Life time product support for minimum 15 years (without upgrade) should include the following:-

(i) Identification and categorisation of Onboard and Base & Depot Spares.

(ii) Provision of special test jigs/ test equipment for undertaking fourth level maintenance in the repair yards.

(iii) Upgradation and modifications as and when available.

(c) **MTBF/ MTTR**. The reliability figures in terms of MTBF/ MTTR shall be estimated and documented.

(d) **BITE Capabilities**. BITE up to LRU/ PCB level is to be provided.

(e) **Documentation**. IETMs Level 4 as per *IN* SOTR DIT/IETM/2022/ Ver 1.0 dated 08 Feb 23 are to be provided with the respective systems. Documentation should include the following: -

(i) **Exploitation Documents**

(aa) Technical description.

(ab) Operating instructions.

(ac) Combat exploitation document.

(ad) Interface protocols.

(ae) Functional diagrams, block diagrams, schematic circuit diagrams for all electronic modules and schematic drawings for mechanical parts.

(af) Maintenance manuals.

(ag) Software documentation providing details of algorithm, software loading and reloading methods and diagnosis of software faults.

(ii) **Repair Technical Documents**

(aa) Installation and dismantling procedures.

(ab) Alignments, adjustment and testing of units and assemblies of system.

(ac) Hydraulic and pneumatic connection diagram.

(ad) Data on Inter-device and Intra-device cables.

(f) **Standardisation and Metrication**. The equipment and all its components are to be in metric system with an option to display range and speed in nm, yards, kiloyards and knots.

(g) **Quality Assurance**. The details of quality assurance/ control programmes, proposed to be adopted for the system, would be laid down by the designer/ OEM, along with the guidelines to be followed. These checks will be carried out by the Authorised Inspection Agency, as appointed by the Indian Navy.

(h) **Product Support**. The supplier should undertake to ensure continuous and guaranteed product support for a period of 15 years, form the date of supply of the systems and associated equipment.

(j) **Military Specifications**. The radar must satisfy the following or latest mil specs as applicable at the time of induction, or their equivalent:-

(i) MIL-Q-9858A - Quality Assurance Program Requirements.

(ii) MIL-STD-202 - Test Methods for Electronics and Electrical Component Parts.

(iii) MIL-STD-242 - Electronic Equipment Parts.

(iv) MIL-STD-454Cs(Ch2) - Standard General Requirements for Electronic Equipment.

(v) MIL-STD-470 - For maintainability.

(vi) MIL-STD-756A - Reliability Prediction.

(vii) IEEE 12207 - Software Standard, Configuration Management.

(viii) MIL STD JS-55555 - Environmental Tests for High Temperature, Low temperature, Humidity, Driving Rain, Salt, Fog, Mould Growth, Shock Standards, Vibration, Immersion Sealing and Wind Velocity.

(ix) DQA (N) Guidelines/ MIL STD 2164A/ 344A - Environmental Stress Screening.

(x) MIL STD 1686C - Electrostatic Discharge Control Programme.

(xi) MIL STD 882C - Standard Practice for System Safety.

(xii) MIL DTL 23659 - Initiators, Electric, General Design Specifications.

(xiii) MIL STD 1629A - Failure Mode and Effect Analysis (FMEA).

(xiv) MIL - STD 462 and 449D - System Safety Program Requirements.

(xv) MIL STD 901D - Shock Test.

(xvi) MIL STD 461G- EMI/ EMC.

9. Vendors should confirm that following conditions are acceptable:-

(a) The solicitation of offers will be as per 'Single Stage -Two Bid System'. It would imply that 'Request for Proposal' would be issued soliciting the technical and commercial offers together, but in two separate sealed envelopes. The validity of commercial offers would be at least 18 months from the last date of submission of offers.

(b) The technical offers would be evaluated by a Technical Evaluation Committee (TEC) to check its compliance with RFP.

(c) The equipment of all TEC cleared vendors would be put through a trial evaluation in India on a No Cost No Commitment' basis. A staff evaluation would be carried out by IHQ MoD (N) to analyse the result of field evaluation and shortlist the equipment for introduction into service.

(d) Amongst the vendors cleared by GS evaluation, a Contract Negotiations Committee would decide the lowest cost bidder (L1) and conclude the appropriate contract.

(e) Vendor would be bound to provide product support for time period specified in the RFP, which includes spares and maintenance tools/ Jigs/ fixtures for field and component level repairs.

(f) The vendor would be required to accept the general conditions of contract given in the Standard Contract Document at Chapter VI of DAP.

(g) **Offset (if applicable)**. Not Applicable.

(h) **Integrity Pact (if applicable)**. An Integrity pact along with appropriate Earnest Money Deposit (EMD) is a mandatory requirement in the instant case in accordance with provisions of Annexure I to Appendix O of Schedule I Chapter II of DAP -20.

(j) **Performance-cum-Warranty Bonds**. Performance-cum-Warranty Bond both equal to 5% value of the contract inclusive of taxes and duties is required to be submitted after signing of contract. Confirmation of submission of PWBG at the rate as promulgated by MoD at the time of tender submission is to be provided.

(k) **ToT (if applicable)**. Not Applicable.

(l) **Warranty**. The equipment shall be covered by warranty for replacement by the vendor for a period of **minimum two years**.

(m) **Delivery Period**. The equipment to be delivered within 24 months from the effective date of the contract.

(n) **Spares**. List of Onboard (OB) and Base & Depot (B&D) spares required for supporting the equipment must be provided with cost. Quotations for spares should have a minimum validity of 18 months. Adequacy and continued availability of spares must be ensured prior to placement of orders for procurement of equipment .The list should be split in two parts as follows:-

(i) **Onboard (OB) Spares**. OB spares should cater for one-year exploitation needs of the equipment and comprise spares, which can be replaced by the ship's staff. OB spares normally comprised items like PCBs, modules, sub-assemblies etc.

(ii) **Base and Depot (B&D) Spares**. B&D spares are required to cater for at least five-year exploitation needs of the equipment. They must also comprise adequate quantities of all items included in the OB spares especially more PCB/ modules instead of discrete electronic components.

(p) **Training**. The vendor shall be responsible for the training of operators and maintainers. Details of training schedule for operators and maintainers are to be indicated accordingly. The vendor must provide computer aided instruction packages in CD, instruction notes and special training aids to enable subsequent in-house training being conducted for following categories of personnel : -

(i) Operators.

(ii) First/ Second level maintenance personnel.

(iii) Third/ Fourth level depot maintenance personnel.

(iv) Training establishment staff.

(q) **Life Cycle Support**. Vendor would be bound to provide product support for time period specified in the RFP. This would include spares and maintenance tools/ jigs/ fixtures for field and component level repairs. The equipment is to be supported till the service life of the equipment. In the event of non-availability of the components/ sub-assemblies due to obsolescence, the sub-assemblies identical in the form, fit and function shall be provided. Overall life of the equipment should be at least 12 years from date of delivery to *IN*. Each set is to be provided with set of OBS and consolidated set for B&D spares to ensure maintainability of the equipment for 5 years post expiry of warranty.

(r) **Documentation**. Documentation for the equipment must be supplied as per the latest guidelines promulgated by Indian Navy meeting the requirements Reliability Action Plan. Technical and Operators manuals and other associated technical documents should include internal circuitry details that are required to undertake in-house repairs/ support by Indian Navy.

(s) **Upgrading of System**. The vendor shall give an undertaking to make available all future upgrades to the system software and hardware. As for as possible, such upgrades should be possible with minimal change of system configuration.

(t) **Relaxation**. Relaxation or review of any feature or parameters specified herein which could lead to major reduction in cost, complexity or development and production timeframe of the system shall be informed to the user for consideration.

(u) **CAMC**. CAMC for hardware and software as part of life cycle management is to be provided by the OEM.

PART - II

10. **Procedure for Response**.

(a) Vendor must fill the form of response as given in **Annexure II to Appendix A to Chapter II of DAP - 20**. Apart from filling details about company, details about the exact product meeting other generic technical specifications should also be carefully filled. Additional literature on the product can also be attached with the form.

(b) The filled form should be dispatched at under mentioned address:-

Directorate of Staff Requirements
Room No 206, D Block
Africa Avenue
Integrated Headquarters
Ministry of Defence (Navy)
New Delhi 110026
Fax: 011-26771320
Email ID: dsr.navy@nic.in
PoC - CDR (SR) - Gun, Contact details 011-26771336

Planning Officer (Electronic System)
Dte Gen of Planning and Coordination, DDP
Ministry of Defence
Room No 516, C Block, Defence Offices Complex
KG Marg, New Delhi - 110001
Email ID: poes-ddp-mod.nic.in

(c) Last date of acceptance of filled form is ***eight weeks*** from the date of posting of this RFI on MoD website. The vendors short listed for issue of RFP would be intimated.

11. The Government of India invites responses to this request only from Original Equipment Manufacturers (OEM)/ Authorised Vendors/ Government Sponsored Export Agencies (applicable in the case of countries where domestic laws do not permit direct export by OEMs). The end user of the equipment is Indian Navy.

12. The information is being issued with no financial commitment and the Ministry of Defence reserves the right to change or vary any part thereof at any stage. The Government of India also reserves the right to withdraw it should it be so necessary at any stage. The acquisition process would be carried out under the provisions of DAP.

PART - III

GUIDELINES FOR FRAMING CRITERIA FOR VENDOR SELECTION/ PREQUALIFICATION IN 'BUY (INDIAN-IDDM)' 'BY (INDIAN)'

13. The guidelines prescribed for short-listing/pre-qualification of Indian vendors in Buy (Indian-IDDM) and Buy (Indian) cases are enumerated in the succeeding paragraphs. **Paragraph ~~12~~ 14** deals with the parameters that may be considered for short-listing of vendors, whereas **Paragraph ~~13~~ 15** amplifies the process for applying selected parameters to the process of vendor short listing.

14. **Parameters**.

(a) **General Parameters**.

(i) Applicant Entity should be an Indian Vendor as defined at Paragraph 20 of Chapter 1 of DAP 2020.

(ii) Business dealing with applicant Entity or any of its allied entities should not have been suspended or banned, by MoD/ SHQ or any Government Department or organization(as defined in Guidelines for Penalties in Business Dealings with Entities issued vide Ministry of Defence, D (Vigilance) MoD ID No 31013/1/2006-D (Vig) Vol II dated 21 Nov 2016). None of the Promoters and Directors of applicant entity should be a wilful defaulter.

(iii) "Entities" will include companies, with whom the Ministry of Defence has entered into, or intends to enter into, or could enter into contracts or agreements.

(iv) Applicant entity" may be a company, subsidiary, an associate company (as defined in the Companies Act, 2013) a consortium or a Joint Venture (JV).

(b) **Technical Parameters**.

(i) Vendor should be a manufacturing entity or a system integrator of defence equipment and not a trading company, except in case where the OEM participates only through its authorized Vendors.

(ii) Minimum **two Years'** experience in **broad areas like manufacturing/ electronics etc as applicable in the instant procurement case.** If not, then cumulative experience of at **least three years in above areas,** resulting in gaining of competence for manufacturing the proposed product.(In case the SHQ feels that for a particular equipment a lesser experience could be accepted, then the same should be got approved by the competent authority before including the same in the RFP).

(iii) Where product involves integration, previous experience **of not less than one year/one project** in integration of systems/equipment shall be required.

(iv) **ICT Cases**.

(aa) Certification to be included if linked to scope of work-Gartner Quadrant/ISO9001/CMMi3 or more (specifying development /service /acquisition models) /ISO27001. For information security and large value projects preferably CMMi5 may be specified.

(ab) Compliance with IEEE/ITU standards depending upon nature/type of project or solution required.

(c) **Financial Parameters**.

(i) **Average Annual Turnover**. Minimum average annual turnover for last three financial years, ending 31st March of the previous financial year, should not be less than 30% of estimated cost of the Buy (Indian-IDDM) and Buy (Indian) project.

(ii) **Net Worth**. Net worth of entities, ending 31st March of the previous financial year, should not be less than 5% of the estimated cost of the Buy (Indian-IDDM) and Buy (Indian) project.

(iii) **Insolvency**. The entity should not be under insolvency resolution as per Indian Bankruptcy Code at any stage of procurement process from the issuing of RFP to the signing of contract.

(iv) **Credit Rating (Desirable Financial Parameter)**. Long term credit rating equivalent to CRISIL rating on Corporate Credit Scale as **CCR-BBB or better**, and **SME-04 or better for SMEs** issued by credit rating agencies recognized by SEBI. Credit rating should be as on 31st March of the previous financial year.

(d) **Other Parameters**.

(i) **Industrial License (IL)**. Vendors should be either holding a valid defence industrial license or should have applied for the same before responding to RFP. In any case the vendor must confirm holding of IL before commencement of FET. (Items requiring IL will be as per DIPP Press Note 3 of 2014 as amended from time to time).

(ii) **Registration**. Registered for a minimum of two years (one year for SMEs). Minimum number of years not applicable for JVs constituted specifically for a project.

(iii) Maintenance, Repair & Overhaul. Vendors should be capable of carrying out comprehensive Maintenance, Repair & Overhaul, calibration and obsolescence management of the equipment / platform / system indigenously, along with associated jigs, fixtures and test setups, during the designed service life of the equipment.

(iv) Input / Output Protocols. Vendors should be able to provide indigenously, the Input / Output Protocols of devices / Line

Repair Units envisaged to be replaced by indigenous equivalents or interfaced with equipment of own choice.

15. **Stipulations for Applying Parameters**.

(a) Areas like manufacturing/electronics/explosive etc. Referred to at Paragraph 2 (b) (ii) should be defined in each case of procurement.

(b) In case the Applicant Entity is unable to meet the Financial Parameters by itself, it may rely on its **holding Company** (as defined in the Companies Act, 2013 and amendments thereof) ("Companies Act") for fulfilment of the Financial Parameters, in which case reliance must be placed on the Holding Company towards fulfilment of **ALL** the Financial Parameters.

(c) In case the Applicant Entity is unable to meet one or more of the Technical parameters by itself, it may rely on a Group Company (ies) for fulfilment of the Technical parameters. A Group Company in relation to the Applicant Entity may be:-

(i) A Company of which the Applicant Entity it is an Associate Company such company should have ownership, directly or indirectly, of at least 26% of the voting shares of the Applicant Entity.

(ii) A Company which is an Associate Company of the Applicant Entity. The Applicant Entity should have ownership directly or indirectly, of at least 26% of the voting shares of such Associate Company.

(iii) A Company with whom the Applicant Entity is commonly owned, directly or indirectly, for at least 26% of the voting shares by another company. For example: An Applicant Company A is an Associate Company of Company B, in which B holds at least 26%. Further, C is also an Associate Company of B, in which B holds at least 26%. In this case the Applicant Company may use the credentials of C as well.

(iv) The Holding Company and Subsidiary companies (as defined under the Companies Act) of the Applicant Entity.

(d) The Applicant entity may be a single entity or a group of entities (the "consortium"), coming together to implement the project. In such case:-

(i) The credentials of only those members of their related entities may counted, who have at least 26% equity stake in the Consortium.

(ii) Each Consortium should have a designated **Lead Member.**

(iii) For Technical Parameters, **any of the consortium members of their Group Companies** may meet the criteria.

(iv) For Financial Parameters. The Turnover and Net Worth of the Consortium Member shall be reckoned **proportionate to Consortium Member's equity stake** in the Consortium, and each Consortium member should meet the other criteria pertaining to Insolvency and Credit Rating. In case the Consortium Member relies on its Holding Company for any one of the above-mentioned Financial Parameters, then reliance must be placed on the Holding Company for meeting **all the financial Parameters.**

(e) Vendors should provide all necessary self-authenticated document in support of their achievement of criteria. Such documentation should inter-alia include:-

(i) Details of projects/supply orders successfully executed in the last two years.

(ii) Annual reports for three years of applicant entity, parent and associate companies, consortium and JV partners.

(iii) Details of shareholders, promoters, associated, allied and JV companies.

(iv) Details of vigilance action, viz ongoing investigation and suspension/ debarment/ blacklisting actions against the applicant entity or any of its allied entities, parent company or consortium and JV partners, if any by any Department/agency of Central Government.

(v) A Certificate from CA/ CS indicating the financial parameters for the last three years as per Paragraph 2(c).

(f) Any vendor furnishing false information will be liable for action as per existing guidelines.

Annexure I to Appendix A

REQUEST FOR INFORMATION: PROCEDURE FOR RESPONSE

Request for Information for AESA-GCS

1. The Ministry of Defence, Government of India, intends to induct Active Electronic Scanned Array Radar based Gun Control System (AESA-GCS) for gun engagement. The MoD, GoI, intends to install AESA-GCS onboard *IN* ships. OEMs/ Authorised Vendors are requested to forward information on the product which they can offer. The parameters/ broad specifications of the item are mentioned in the questionnaire attached as per Annexure III to Appendix A. In addition the vendors are required to furnish details as per Proforma at Annexure II to Appendix A.

2. Apart from the information as per the Appendices the vendors may also forward technical details/ product brochures/ literature etc pertaining to the items in question.

3. The required information/ details may please be forwarded at the following address by ***eight weeks from the date of posting of this RFI on MoD website***:-

(a) **User Directorate**.

Directorate of Staff Requirements
Room No 206, D Block
Africa Avenue
Integrated Headquarters
Ministry of Defence (Navy)
New Delhi 110026
Fax: 011-26771320
Email ID: dsr@navy.gov.in

(b) **Procurement Directorate**.
Directorate of Staff Requirements
Room No 206, D Block
Africa Avenue
Integrated Headquarters
Ministry of Defence (Navy)
New Delhi 110026
Fax: 011-26771320
Email ID: dsr@navy.gov.in

(c) **Planning Directorate.**
Directorate of Staff Requirements
Room No 206, D Block
Africa Avenue
Integrated Headquarters
Ministry of Defence (Navy)
New Delhi 110026
Fax: 011-26771320
Email ID: dsr@navy.gov.in

(d) **ADG Acquisition Technical.**
O/o Technical Manager (M & S)
Room No 5, D-2 Wing
Ground Floor, Sena Bhawan
Rajaji Marg
New Delhi 110011
Tel: 011-23011540,
Fax: 011-23017684

Annexure II to Appendix A

VENDOR INFORMATION PROFORMA

1. Name of the Vendor/Company/Firm.

(Company profile including Share Holding pattern, in brief, to be attached)

2. **Type (Tick the relevant category)**

Original Equipment Manufacturer (OEM) Yes/No

Authorised Vendor of foreign Firm Yes/No (attach details, if Yes)

others (give specific details)

3. Contact Details.

Posta Address.....;.....

City: ..... State:-

Pin Code.....Tele.....

Fax.....URL/Web Site.....

Email.....

4. Local/ Branch/ Liaison Office/Agent (if any) at New Delhi.

Name & Address:.....

Pin Code:.....Tel:.....Fax:.....

Email:.....

5. Financial Details: Category of Industry (Large/Medium/Small-scale):.....

6. **Certification by Quality Assurance Organisation**.

Name of Agency	Certification	Applicable from (Date &Year)	Valid till (Date &Year)

7. **Details of Registration.**

Agency	Registration No	Valid till (Date)	Equipment
GeM			
DGQA/DGAQA/DGNAI			
OFB			
DRDO			
Any other Government Agency			

8. **Membership of FICCI/ ASSOCHAM/ CII or other Industrial Associations.**

Name of Organisation **Membership Number**

9. **Equipment/Product Profile (to be submitted for each product separately)**

(a) Name of Product:.....
(IDDM Capability be indicated against the product)
(Should be given category wise)

(b) Description (attach technical literature):.....

(c) Whether OEM or Integrator:.....

(d) Name and address of Foreign collaborator (if any):.....

(e) Industrial Licence Number:.....

(f) Indigenous component of the product (in percentage):.....

(i) Overall IC (in percentage):

(ii) IC for material/ components/ software manufactured in India (in percentage):

(g) Status(in service/design& development stage):

(h) Production capacity per annum:

(j) Countries/agencies where equipment supplied earlier (give details of quantity supplied):

.....

(k) Estimated price of the equipment.....

(l) Indigenously produce subsystems, Line Repair Units, software and critical spares of the product:

(m) Devices / Line Repair Units for which Input / Output Protocols are indigenously available for enabling replacement by indigenous equivalents or interfacing with equipment of own choice:

(n) Capability for carrying out Comprehensive Maintenance, Repair and Overhaul, calibration and obsolescence management of the equipment / platform / system along with associated jigs, fixtures and test setups, during the designed service life of the equipment within India:

10. Alternatives for meeting the objectives of the equipment set forth in the RFI.

11. Any other relevant information:.....

12. **Declaration**. It is certified that the above information is true and any changes will be intimated at the earliest.

(Authorised Signatory)

Annexure III to Appendix A

REQUEST FOR INFORMATION: QUESTIONNAIRE

Ser	Specifications/ Parameters	Reply
1.	Do you comply with complete ORs (operational and technical requirements) mentioned in Part I of RFI? Please provide feature wise compliance?	
2.	Any new specifications/ features/ technology development not included in QRs and are being offered by the OEM?	
3.	Will you provide complete support for software and hardware issues?	
4.	Provisioning of AESA-GCS under Buy Indian (IDDM) (preferred) (Indigenous Design & IC content ≥60 %) / Buy Indian categorisation (IC content ≥60%) iaw DAP 20?	
5.	Have you supplied AESA-GCS to Indian/ Foreign Armed Forces? Its performance and difference vis a vis QRs in Part I?	
6.	What is the maximum time that you would take to deliver AESA-GCS post contract?	
7.	What is the status of AESA-GCS Technology Readiness Level (TRL) with your firm?	
8.	How would you ensure that operational requirements projected in RFI are met in totality?	
9.	Does the system cater for easy de-bugging and follow the laid down industry standards? If yes, what standards are followed? Does the architecture of the system cater for easy re-loading of corrected embedded software / firmware by *IN* maintainer?	
10.	What is experience in integrating with associated systems iaw Part I of RFI?	
11.	Give details of component specific ship configuration?	
12.	Please provide details wrt Antenna configuration for small ships (corvette and below) and large ship configuration?	
13.	Please provide if any AI technology is incorporated in AESA-GCS? Will it utilize hybrid AI algorithm?	

Ser	Specifications/ Parameters	Reply
14.	In case of failure of one antenna plate/ TRG, will other antennas/ TRGs would be available for exploitation?	
15.	In case of network failure, will individual hardwired Tracker and Weapon console be available for exploitation at all time?	
16.	In case of more than one power amplifiers, is the power supply common or do the amplifiers have independent power supplies? Also, in case of failure of one amplifier, will the other amplifiers continue to stay in operation mode?	
17.	Does the system have a high visibility display providing brightness and contrast control? Give details of display viewing angles and limitations, if any. Also list the details of parameters/features available for viewing on the front panel display.	
18.	Provide detailed information of Tracker and Weapon Console?	
19.	What is the system readiness time from powering up till transmission stage?	
20.	Functionality of GCS calculation and Threat Evaluation Resource Allocation?	
21.	Will the system be able to undertake simultaneous and automatic engagement? Define maximum number of gun mounts which can be integrated.	
22.	Will the displays undergo UI-UX heatmapping?	
23.	What is the specification of above deck equipment to ensure protection from weather/ marine environment?	
24.	Details of COTs, MOTs and MIL STD component be provided	
25.	Utilisation of Indigenous Military Material and Indigenous Software, indicating plan for material sourcing iaw Para 11 and 13 of Ch II of DAP 20 be indicated.	
26.	Details regarding repairable LRUs/ Shop Replaceable Unit (SRUs)/ Modules/ Blocks which shall be repaired upto component level at the repair facility offered for the system indicating all critical and high population module.	
27.	Cost estimate including taxes and duties is to be provided.	
28.	Mode of FET (Physical trials/ documentation/ certification/simulation) and trial methodology as per	

Ser	Specifications/ Parameters	Reply
	parameters in QRs, including parameters for product evaluation is to be provided.	
29.	Vendor information and relevant documents wrt vendor being MSME and /or startup may be provided iaw Para 23, Chapter II of DAP 20.	
30.	Inputs on alternatives to meet the same/ better operational requirements is to be provided	
31.	Any dependency on Foreign OEM for critical component/ technology along with long term plan for indigenization of such foreign components/ technology	
32.	Inputs on compliance and/or conformity to various industrial and military standards as applicable as per QRs, related to operations and safety be provided.	
33.	Undertaking is to be provided stating that "The vendors/ firms (name) have never been banned/ debarred from doing business dealing with MoD /GoI/or any other Govt organisation.	
34.	Confirmation is to be provided wrt submission of PCIP, EMD and all BGs at the rate as promulgated by MoD at the time of tender submission.	
35.	How will the vendor rnhance indigenization and setup dedicated manufacturing line, including design, integration and manufacturing processes in India, in case of a joint venture with foreign OEM	
36.	What would be depth of ToT envisaged	

34. **After Sale Support**. The following details will be provided by the vendor:-

(a) Repair methodology being proposed.

(b) What kind of Engineering Support Package (ESP) and life time support can be provided alongwith financial implications?

(c) How are similar kind of systems being maintained by the vendor?

(d) Will the requisite spares, SMT/ STE be provide by the vendor for carrying out component level repairs?

(e) What would be the training mechanism for operators and maintainers?

(f) Proposal for CAMC/ RRC with cost implications.

35. **Product Support and Upgradability**. The vendor shall indicate and give details of the information sought listed below:-

(a) All major repairs and overhaul facilities for major assemblies and component level owned by the vendor India.

(b) Base overhaul facilities and availability of infrastructure in India.

(c) Management of repairs and spares post warranty.

(d) Upgrade for software (as applicable).

(e) Upgradability of hardware for enhanced performance features or due to modifications required to obviate recurring defects.

(f) Vendor shall indicate conformity to submission of Manufacturers Recommended List of Spares (MRLS), Illustrated Spare Part List and Technical Manuals including for STEs.

(g) Vendor shall indicate compliance to Tangible Obsolescence Management Plan and plane for upward compatibility with latest modules.

(h) Vendor shall provide details of vendors/ sub-vendors and readiness/ lead time towards provisioning of spares.

36. **Manufacturing and Production Aspects**.

(a) Vendor shall provide details of all R&D and manufacturing infrastructure.

(b) **Indigenization**. Vendor shall give out ability and willingness to supply the product to meet the requirements of **Buy (Indian-IDDM) and/ or Buy (Indian)** to meet the aim of indigenization as per the provisions and spirit of DAP 2020.

(c) **Production Capacity**. Vendor will give out his current and planned annual production capacity and proposed delivery schedule of the equipment. The timeline required to deliver required quantity of the equipment for trials and post contract, time required to deliver the equipment. Vendor shall obtain necessary export/ import clearances in due time to ensure expeditious production

(d) Vendor should indicate willingness to participate in trials as per DAP 2020 in India on NCNC basis.

(e) Vendor should give details on use of indigenous military material and software indicating plan for sourcing material and cost implications vis-à-vis foreign sourcing of material.

37. **Test Standards**. Inputs on test standards adopted for similar equipment type be indicated. Equipment procured by Indian Navy has to undergo environmental test and other relevant checks by nominated CQAE, FATs as per Mil Std/ JSS 55555 requirements.

38. **Certification**. Parameters for which certifications can be made applicable and provided in lieu of trials evaluation. Details of parameters of the equipment which can be certified from NABL accredited labs will be indicated.

39. **Financial Aspects**. Vendor shall intimate the cost of 10 AESA-FCR system as mentioned in Part I of RFI, inclusive of taxes and duties. Details of cost should also include product support package, training, additional details as deemed appropriate. Additionally, vendor shall indicate acceptability to the terms pf payment as per DAP-20.

40. **Compliance with Provisions of DAP 20**. Vendor should indicate compliance with all provisions of DAP-20. If not, which Para/ clause of DAP-20 not agreed with reasons be indicated.

41. Vendor should also indicate willingness for option clause as per DAP 2020.

42. **Training**. Vendor shall indicate ability and willingness to offer following: -

(a) Training aggregate for conduct of training like technical literature, slides, blow up diagrams, training work modules, brochures and Computer Based Training package.

(b) Vendor shall indicate the facilities available at Vendor's premises to conduct training. Vendor should also indicate training for user, maintainers, and QA personnel.

(c) Recommended training period for users, maintainers and QA personnel.

(d) Availability and cost of simulators if any.

(e) Availability of willingness of the vendor to provide hard and soft copies of the User Handbook, Design Specifications, Technical Manuals along with CBT for training.

43. If vendor is MSME and/ or Startup, relevant information and supporting documents are to be provided.

44. Vendors to specify the protocols/ security features being followed to maintain cyber security of the transmitter. Please indicate acceptability and implementation of provisions with respect to security/ malicious codes as per DAP-20.

45. **Undertaking on Debarment**. Vendor should provide an undertaking that it was never banned/ debarred from doing business dealing with MoD/ GoI/ or any other Govt organization.

46. Indicate if same or similar system has been supplied to any other customer along with details of deviation in capabilities and cost, if any.

47. **Miscellaneous**.

(a) Extract of relevant technology perspective, and capability roadmap to be included.

(b) Any futuristic plans for modification and or modernization plans for the equipment being offered.

(c) Vendor may consider RFI as advance information to obtain requisite government clearances.