

**NHQ/ DIRECTORATE OF AIR PROJECTS AND PLANS (DAPP) INVITES
RESPONSE TO REQUEST FOR INFORMATION (RFI) FOR INDIGENOUS
DESIGN AND DEVELOPMENT OF AUTOMATED TEST EQUIPMENT FOR
FGM-129 AIRBORNE RADAR OF MiG-29K AIRCRAFT**

RFI Ref No. : AP/ 0797/FGM129 ATE

Date of Issue: 23 Apr 26

1. Indian Navy invites response to Request for Information (RFI) for “*Indigenous Design and Development of Automated Test Equipment for FGM-129 Airborne Radar of MiG-29K aircraft*” from reputed Indian firms based in India having technical and financial capability, infrastructure and experience to execute the project.

System Description of FGM-129 Radar.

2. FGM-129 is an all weather multi-mode airborne radar of MiG-29K/ KuB aircraft of the Indian Navy. The FGM-129 radar monoblock consists of the following Line Replaceable Units (LRU):-

- 2.1. Antenna
- 2.2. Transmitter.
- 2.3. Secondary power source.
- 2.4. Receiver.
- 2.5. Avionics and Armament Interface unit.
- 2.6. Analog to Digital Converter, ADC
- 2.7. Exciter (Master generator and synchronizer)
- 2.8. Primary power supply commutator.
- 2.9. Antenna feeder system
- 2.10. Frequency switching over panel
- 2.11. Data processor.
- 2.12. Programmable Signal Processor
- 2.13. Wiring Kit
- 2.14. Wiring kit (internal cable network)

3. Presently, the individual LRUs mentioned in Para 2 *ibid* are tested independently using OEM supplied test benches (ORP) towards undertaking defect identification/ repair activities and connected to aircraft prior powering up for undertaking BIT test and operational checks. To preclude the mandatory requirement of aircraft and to undertake in-depth DI/ DR of FGM-129 radar at workshop, there exists a requirement to design and develop a comprehensive ATE for undertaking testing of FGM-129 radar at workshop level.

4. **Broad QRs of FGM-129 ATE.** The broad requirements *wrt* the functionalities of the proposed FGM-129 ATE are as follows:-

4.1. The ATE should be able to test the FGM-129 radar monoblock for serviceability without installation on aircraft.

4.2. The ATE should possess functionalities as a surrogate aircraft environment by providing all electrical/ control/ clock/ interlock data and interfaces required for radar operation.

4.3. The ATE should support standalone, integrated and system-level testing of the radar, selectable via software.

4.4. The ATE should be designed for Depot ('D') level maintenance with provision for future scalability.

4.5. The ATE should be able to fully emulate the aircraft power supply including

4.5.1. Nominal voltages.

4.5.2. Power sequencing logic.

4.5.3. Inrush and transient characteristics.

4.5.4. Protection and interlock logic.

4.6. The ATE should be able to fully emulate the radar control and command interface including:-

4.6.1. Mode selection.

4.6.2. Initialisation and reset commands

4.6.3. Built-in Test initiation.

4.7. The ATE should emulate the aircraft data buses and signal interfaces relevant to the radar operation.

4.8. The ATE should enable end-to-end functional testing of the complete radar system including the following:-

- 4.8.1. Power up and initialisation.
- 4.8.2. Mode transition.
- 4.8.3. Command response verification.
- 4.8.4. Data flow between LRUs.

4.9. The ATE should be capable of verifying inter-LRU communication integrity.

4.10. The ATE should be capable of independent functional testing of each LRU, in addition to undertaking testing of the radar monoblock as a whole.

4.11. The ATE should be able identify the defective LRU during integrated radar testing.

4.12. The ATE should allow selective isolation and testing of individual LRUs while connected to the radar monoblock for testing.

4.13. The ATE should be able to provide fault isolation beyond LRU level down to the following:-

- 4.13.1. Sub-module.
- 4.13.2. SRU/ PCB level (where design permits).

4.14. The ATE, in addition to identifying the probable faulty sub-module, must also be able to indicate the nature of fault (open/ short/ drift/ logic failure/ RF degradation etc.,)

4.15. The fault isolation logic should be of rule based and data driven which must be configurable through software.

4.16. The ATE should be able to provide RF stimulus generation compatible with the FGM-129 radar operating frequencies and bandwidth.

4.17. The ATE must be capable of measuring the following:-

- 4.17.1. Output power.
- 4.17.2. Frequency accuracy.
- 4.17.3. Phase/ timing parameters.
- 4.17.4. Signal stability.

4.18. The ATE must provide fully automated test sequences for

- 4.18.1. System level tests.
- 4.18.2. LRU level tests.
- 4.18.3. Sub module diagnostics.

4.19. The ATE must contain provision for manual intervention for the following:-

- 4.19.1. Debugging.
- 4.19.2. Engineering analysis.
- 4.19.3. Special tests.

4.20. The ATE software must be capable of providing the following:-

- 4.20.1. Graphical test flow.
- 4.20.2. Real time status indication.
- 4.20.3. Alarm and warning displays.

4.21. The ATE should be able to support historical fault correlation to enable identification of repetitive failure modes and trend analysis.

4.22. The ATE must be able generate automated test reports and defect confirmation certificates along with logging of following parameters:-

- 4.22.1. Test parameters.
- 4.22.2. Measured values.
- 4.22.3. Pass/ fail status.
- 4.22.4. Fault isolation results.

5. **Eligibility Criteria.**

5.1. Only Indian companies/ industries/ firms having requisite expertise and experience in the field of design and development of Automated Test Equipment for aircraft/ avionics/ radar applications are to respond to the subject RFI.

5.2. They must have the technical capability, financial capability, infrastructure, familiarity with Quality Assurance aspects and experience in design and development of Automated Test Equipment. The developed equipment will be accepted only after it successfully passes all the acceptance tests and functional trials, as necessary.

5.3. The interested firms willing to undertake this design and development project are required to submit a detailed report (on completion of feasibility study) along with necessary documents/ evidence covering, but not limited to the following:-

5.3.1. **Company Details.**

- 5.3.1.1. Name and registered office address.

5.3.1.2. Factory/ Work address.

5.3.1.3. Category of industry – Large scale/ SME/ MSME.

5.3.1.4. Organisation structure and details of manpower held {Technical (skilled and unskilled) and Administrative}.

5.3.2. **Financial Capacity.** Details of the financial capability in the form of Balance Sheet and ITR of last three/ five financial years including average turnover, certified by a CA.

5.3.3. **Certification by QA Organisations.**

Name of the Certification Agency	Applicable from (date and year)	Valid till (date and year)

5.3.4. **Registration.** Details of registration status of the firm as per Companies Act including MSME/ NSIC certification, if any. Copy of the Registration certification issued by any Defence PSU/ IAF/ Army/ DRDO/ Defence PSU, in case the firm is registered with any of these organisations.

5.3.5. **Work Experience.** Following would be considered towards work experience:-

5.3.5.1. Details of any such/ similar projects undertaken for any Defence PSU/ DRDO/ Army/ IAF or other organisations, in the past.

5.3.5.2. Details of current/ similar projects in hand, their valuation and completion dates.

5.3.6. **Technical Capability.**

5.3.6.1. Details of R&D infrastructure and technical manpower employed in R&D activities.

5.3.6.2. Manufacturing and fabrication facility/ outsourcing (indicate plan and extent of outsourcing) as applicable to the project.

5.3.6.3. In-house test facilities/ outsourcing (indicate plan and extent of outsourcing) as applicable to the project.

5.3.7. Activity Roadmap. Detailed roadmap, indicating how the firm proposes to develop the ATE including development of Acceptance Test Procedures and QA coverage.

5.3.7.1. It should include recommended stages/ phases of development scheme with priorities, time schedules and roles/ responsibilities.

5.3.7.2. Proposed testing methodology and its stages.

5.3.7.3. Details of standards to be followed for development, manufacture and testing.

5.3.7.4. Since the existing ORP test benches to undertake testing of individual LRUs are analog go/ no-go based devices, ability of the firm/ industry to undertake mapping of testing methodology towards development of ATE should be clearly indicated.

5.3.7.5. The firm must clearly bring out the depth of testing that can be undertaken by the proposed ATE and its efficacy in undertaking defect identification of sub-modules/ components of each LRU.

5.3.7.6. Any other activity, the firm needs to bring out.

5.3.8. Timelines.

5.3.8.1. Estimated timelines for development and supply of prototype with milestones.

5.3.8.2. Estimated timelines for production of final product.

5.3.9. Costing. A non-obligatory Budgetary Quote (BQ), indicating the development cost, product cost and their basis must be submitted. (It is to be noted that this is only a BQ and hence does not imply that an order will be placed).

5.3.10. Any other details that the firm would like to put forward in the feasibility study board.

6. Responses received will be evaluated based on the supporting documents and if need be, by physical verification of company's credibility and expertise.

7. Based on requirement, a meeting may be held for evaluation/ clarification of proposals submitted by industrial partners with participation of industrial bodies. The date and venue of this meeting will be intimated at a later date.

8. **Feasibility Study.** The interested firms may undertake a visit to Naval Aircraft Yard (NAY), Goa for feasibility study towards design and development of FGM-129 ATE based on available technical documentation and field inputs. All the technical queries related to development may be clarified during the feasibility study visit to NAY (Goa). Contact details are as follows:-

The Commodore Superintendent
 Naval Aircraft Yard (Goa)
 Dabolim
 Goa – 403801
 PoC at NAY (Goa) : Chief Manager (Sensors),
 Contact details : 0832-2585703/ 9865089042
 E-mail : naygoa-navy@nic.in

9. For feasibility study purpose, firms are to project visit request to NAY(Goa) providing details of representatives (aadhaar and contact details) through email (naygoa-navy@nic.in) so as to facilitate security clearance for the visit.

10. The response to the subject RFI can be submitted through email or through courier or speed post to reach the following address before 1700 Hrs on 05 Jun 26 superscribed "Response to RFI AP/0797/FGM129 ATE dated 23 Apr 26":-

The Commodore Superintendent
 Naval Aircraft Yard (Goa)
 Dabolim
 Goa – 403801
 E-mail : naygoa-navy@nic.in

11. Clarification, if any, pertaining to this RFI may be sought, through letter, tele fax, e-mail, prior to 29 May 26 (details as per para 9 above).

Place : New Delhi

Date : 23 Apr 26