



गैस टरबाइन अनुसंधान स्थापन, बेंगलूरु
Gas Turbine Research Establishment

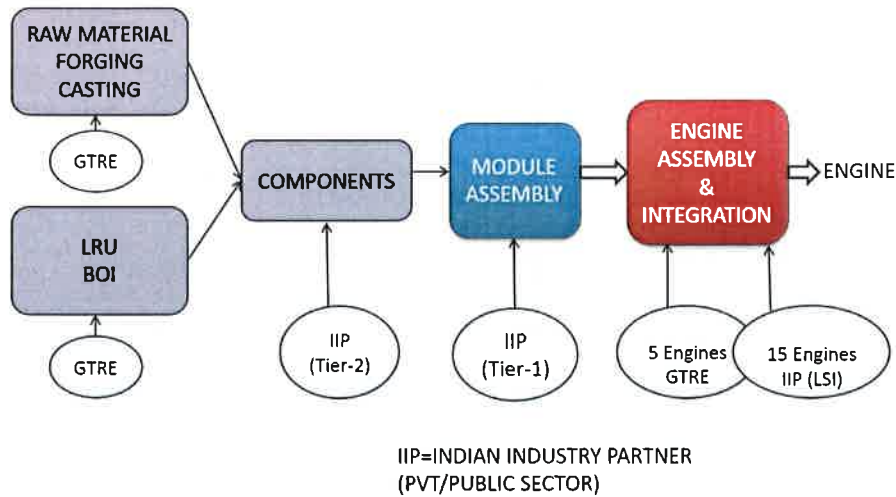
रक्षा मंत्रालय, रक्षा अनुसंधान विकास संगठन
Ministry of Defence, Defence R&D Organisation
सी.वी.रामन नगर, बेंगलूरु – ५६० ०९३

C V Raman Nagar, Bengaluru 560 093

EXPRESSION OF INTEREST (EOI) NOTIFICATION
EOI No : GTRE/KPG/PMO/EOI-01/2020

Gas Turbine Research Establishment (GTRE), C.V. Raman Nagar, Bengaluru-560093, India, is developing aero gas turbine engines. Director, GTRE, on behalf of the President of India invites "Expression of Interest (EOI)" from reputed Indian industries/organisations for the following activities with an objective of component manufacturing, module level assembly, engine level integration and delivery to GTRE for 50 kN thrust class aero engine. Each engine consists of 2000 varieties of components totalling about 20,000 part count.

2. It is planned to manufacture and assemble various modules for 5 engines in the next 3-4 years which will increase to 20 engines over a total period of 7-8 years. An indicative number of 70-80 engines are envisaged during the production stage in a time span of 10-12 years, the decision for which will be taken subsequently.
3. This gas turbine engine consists of modules such as (i) Low Pressure Compressor (Fan) (ii) High Pressure Compressor (iii) Intermediate Casing (iv) By-pass Casing (v) Combustion Chamber (vi) High Pressure and Low Pressure Turbines (vii) Exhaust cone (viii) Jet pipe (ix) Engine Gear Box (EGB). It also includes Line Replaceable Units (LRU) like lubrication system, Engine Fuel Control System, Instrumentation, Electronic Control Units etc.
4. It is planned to identify Indian industry partner(s) in the capacity of Lead System Integrator (LSI) and Module supplier (Tier-1) as part of this EOI. The brief details of the proposed model is given below:



For the first five engines, GTRE will be the LSI which will be transferred to the industry for the next 15 engines and for the production engines. The identified LSI shall associate with GTRE during the first 5 engine assembly and rebuilds for the knowhow of engine assembly and integration and acquire experience.

The LSI should have the technical expertise to handle the various modules and carry out the assembly of the engine as per the requirement. The LSI should have the technical expertise to absorb the technical requirements for carrying out the gas turbine engine assembly. LSI should have the prior integration/assembly experience of aerospace/gas turbine systems, which will be further enhanced during the assembly of 5 engines in association with GTRE.

The essential infrastructure for next 15 engine assembly and rebuild such as assembly, machining, inspection facilities and other infrastructure typically required will be provided at GTRE engine assembly facility in Bengaluru. However, for the production phase, the LSI has to create its own assembly and integration infrastructure.

The module level supplier (Tier-1) will be responsible for fabrication of the component and module level assembly for both first 5 engine and the subsequent 15 engines. However, Tier 1 industry partner will have the choice for identification and/or selection of Tier 2 industries for fabrication of components as per the guidelines provided by GTRE and mutually agreed between GTRE and all stakeholders. In order to enhance the technical know-how w.r.t manufacturing of components, module assembly, quality assurance and technical documentations, Indian industry partner shall associate with GTRE specialists.

For the production stage of 70-80 engines, LSI will be responsible for sourcing of raw materials, BOIs, LRUs from the sources which were identified by GTRE for the first 20 engines. Also the LSI will source various modules and components from the identified Tier 1 and Tier 2 industries only. All the module level suppliers Tier-1 and Tier 2 should closely work with LSI and deliver modules as required by LSI for engine assembly and integration. Tier 1 module supplier along with the LSI in association with GTRE will be responsible for the supply chain management ensuring non-negotiable requirement of timely delivery with aerospace quality standard.

5. The broad scope of the activities for Indian industries is outlined below:

- (i) Module level assembly (Major Assembly) and delivery need to be executed by the Tier-1 Indian Industry Partner(s) for the modules broadly enumerated in para 3 above as module suppliers. The scope of the Tier -1 industry partner(s) as a module supplier includes manufacturing of components/sub-assemblies, assembly, pass-off tests (if applicable) and delivery of accepted complete module. The infrastructure if any for the pass off test (if applicable) for a particular module has to be established by partner(s) mutually agreed between GTRE and Industry partner.
- (ii) The engine level assembly of these modules (final integration) will be the responsibility of GTRE in association with Lead System Integrator (LSI) for the first 5 engines. The LSI will be identified at the start of the manufacturing phase of the first 5 engine itself and for the next 15 engines, LSI will be responsible for the assembly and integration of the engine at GTRE facility with the assistance of GTRE.
- (iii) GTRE will supply the castings, forgings, mill forms, Bought Out Items (BOIs) and LRUs wherever applicable as FIM (Free Issue of Material) to the industry partner for the first 20 engines. During the production stage, the same has to be sourced by the Tier-1 IIP/ LSI from the GTRE approved sources.
- (iv) Manufacturing of components, sub-assemblies and assemblies from forgings, castings and mill forms will be based on manufacturing drawings provided by GTRE. All associated manufacturing processes are to be established by the industry partner in consultation with GTRE, based on the mutually agreed Master Production Plan (MPP) and Quality Acceptance Plan (QAP) with GTRE.
- (v) All the procedures/practices including material storage, handling, transportation, measurements, documentation, traceability, inspection,

calibration and testing facilities, if any, need to be established by the industries or outsourced from qualified agencies, conforming to contemporary aerospace industry standards and certified by Centre for Military Airworthiness and Certification (CEMILAC) and Director General Aeronautical Quality Assurance (DGAQA).

- (vi) The industry partner shall tie-up (if required) with established & reputed organisations and experienced technical experts from India or foreign countries with experience in aero engine manufacturing for their technical support and for manufacturing processes, quality assurance conforming to contemporary aerospace industry practice.
 - (vii) The industry partner, interested in participation, shall possess gas turbine aero engine component manufacturing infrastructure, engineering and technology knowledge, past experience, expertise, financial and manpower resources in executing this type of activity. Critical infrastructure for the special processes if not available with the industry, can be utilized from GTRE on mutual agreement between GTRE and Indian Industry partner, subject to availability and spare capacity of the same at GTRE.
 - (viii) Qualification and certification process to be adhered in association with GTRE, CEMILAC and DGAQA.
 - (ix) The industry partner shall be accredited to Aerospace Quality Management System (QMS) standard and shall have qualified (e.g. NADCAP and similar) special processes.
 - (x) The industry partner shall possess or access certified infrastructure and personnel for execution of critical processes pertaining to component manufacturing and assembly.
6. For the first five engines the component and sub assembly is planned to be realized at 3 months interval, which will be 2 months for the subsequent engines. The details of the same will be discussed during the Partner's meet at GTRE.
7. General Information
- (i) This EOI is issued on "no cost and no commitment" basis.
 - (ii) The industries having prior experience of manufacturing of aerospace standard components/assemblies of minimum 2 years and demonstrated capabilities will be considered for evaluation. All the industries meeting this criterion and

responding to this EOI will be called for initial discussion/partner meet during April 2020.

- (iii) Director GTRE may constitute an expert committee to evaluate the industries for its capability for aero engine component manufacturing, assembly and technical coordination and select the probable LSI and Tier 1 Industries.
- (iv) Director, GTRE has the right to use the information provided by the firm for future issuance of Request for Quotation (RFQ).
- (v) Mere participation in EOI does not assure eligibility for participating in tender. Based on the details provided in the EOI, Director, GTRE has the right to select the industry partner(s) for participating in the tender. GTRE may select one and/or two industries per module as per the technical expertise of the industry and complexity of the manufacturing and assembly.
- (vi) Unit cost of the module without Non Recurring Expenditure (NRE) will become the basis for calculating the unit cost during the production phase.
- (vii) In the production phase and thereafter, identified LSI shall be the single Point of Contact and shall be responsible for supply, maintenance and support during the entire life cycle of the engine.

8. The industries/organisations interested to participate and undertake the above task must submit sealed offer of EOI enclosing following details:

- (a) Certificate of registration as a manufacturing/development organisation for aeroengine components/assemblies.

Proof of experience in system level integration of aerospace /gas turbine major system (for LSI)

- (b) List of association with the certification agencies such as CEMILAC, DGAQA and Missile Systems Qualification Agency (MSQA).
- (c) Copy of the audited balance sheet of preceding three years.
- (d) Details of shareholding/ownership pattern especially shareholders, directors, etc.
- (e) Copy of quality management system certification such as AS9100D, ISO 9000:2015 etc.
- (f) The existing tie-ups with Indian/foreign companies shall not be a hindrance for participation in this programme. Industry partners, already having foreign

collaboration and interested, shall obtain necessary clearance/approval from the collaborator to participate in this programme.

(g) Number and details of technically/professionally qualified executives/experts presently in the permanent payroll of the company.

(h) Brief description of each of the aerospace/defence related projects undertaken so far, components/assemblies manufactured, and quality process followed. This should include the volume of contract, time period of completion, cost etc.

Last Date for submission of EOI	10th March 2020 upto 1500 hrs
Opening of offers	11th March 2020
Important Note	<p>a) EOIs shall be sent either by speed post/courier/deposited in the tender box kept at CV Raman Nagar gate of GTRE.</p> <p>b) Envelope should be duly superscripted with EXPRESSION OF INTEREST FOR MANUFACTURE OF AERO ENGINE WITH EOI NO:</p> <p><u>Postal Address :</u></p> <p>The Director, Gas Turbine Research Establishment, P.B. No. 9302, DRDO, Ministry of Defence, C V Raman Nagar, Bengaluru – 560 093</p> <p>c) EOIs received late for reasons due to postal delay and incomplete information will be summarily rejected.</p> <p>d) Director GTRE reserves the right to reject the offer without assigning any reason.</p>
Contact details (for queries)	<p>Technical : subrata@gtre.drdo.in</p> <p>Commercial : mmgfe@gtre.drdo.in</p>