

Radome for LCA Mk-1A

Introduction:

Radome for Light Combat Aircraft (LCA) is used for housing an active antenna array. Primary function of Radome is to provide protection to antenna against environmental with minimal impact to the electrical performance of the antenna. The radome forms part of primary structure of an aircraft. R&DE(E) has successfully developed a radome for LCA Mk1A to house radar system. It provides structural integrity against flight loads like aerodynamic, inertia and against impact loads - bird and hail strike. Developed radome complies all the mechanical and electrical requirements as per environmental map of LCA.

Necessity of Technology for Radome of LCA Mk1A:

Presently, production order of LCA Mk1A is underway along with prospects of future production order. LCA Mk1A is designed to carry radar. The radar requires a high performance radome to function efficiently. Currently, imported radomes are used in the aircraft. There is a thrust to develop a radome indigenously for the aircraft. Considering these, R&DE(E) has developed the technology to realize a radome, which meets technical requirements of radar of LCA Mk1A.

Technical Specifications of Radome for LCA Mk1A:

- Conical shape composite structure with variable thickness
- Interfacing with fuselage using bolted connection with front fuselage of the aircraft.
- Outer surface is painted with EM transparent anti-static rain erosion resistant paint.
- Caters provision to install Nose Air Data Probe (NADP).
- Lightning protection scheme in compliance with MIL-I-83456 standard.

Salient Features:

- Monolithic Fiber Reinforced Polymer Matrix composite construction
- Quartz fiber as reinforcement and Cyanate Ester resin as matrix
- Manufacturing using Resin Film Infusion (RFI) process
- Lightning protection using diverter strip
- Integrated with aircraft fuselage using metallic interface ring

ToT in brief:

This technology delineates complete manufacturing methodology in detail that addresses all the steps required for realization of the radome meeting the requirement of LCA Mk1A. Transfer of technology broadly contains the following.

- 1) Bill of Material (BoM)
- 2) Manufacturing drawings of radome and associated sub-components
- 3) Process details for FRP composite manufacturing
- 4) QAP/ATP

.

1. Interested companies/industries are requested to apply against this EoI to following address:-

To,

**The Director
Research & Development Establishment (Engineers)
DRDO, Govt. of India, Ministry of Defence,
Kalas, Alandi Road, Dighi P. O., Pune- 411015, India
Phone No: 020-27044002/4012
Email-director.rde@gov.in
Fax No: 020-27044009**

2. A copy of interest may be sent to the following address without any attachment:-

To,

**The Director,
Directorate of Industry Interface & Technology Management (DIITM),
Room No. 447, DRDO Bhawan, Rajaji Marg, New Delhi-110 011
Email-diitm.hqr@gov.in
Fax-011-23793008
Ph:011-23007446**

All industries interested in seeking ToT are requested to apply in the format given below. Kindly fill in the fields. The list of documents to be attached is provided in Annexure – I. Kindly provide the reference of page no. of supporting document in the relevant field of form.

PART-1

General Information

(Please enclose documents in support of information provided)

1.	Name of the Technology requested for Technology Transfer (Technology name and concerned Lab, Category)	
2.	Name of the industry/ organization	
3.	Complete Address and other details	
	Registered Office State Phone No Fax Email Website	
	Factory State Phone No Fax Email Website	
4.	Point of Contact Name Designation Address Mobile No Ph No Email ID	
5.	NAME OF CMD/ MD /PARTNERS/ PROPRIETOR/ etc Name Designation Address Mobile No Ph No Email ID	
6.	Date of Incorporation of company	
7.	Foreign Direct Investment in company (if any in %)	
8.	Shareholding pattern	
9.	Turn over as per Audited Balance Sheet for the preceding three years. Year _____ Year _____ Year _____	
10.	Annual budget for R&D during last three years (if any) Year _____ Year _____ Year _____	
11.	Income Tax returns for the preceding three years period Year _____	

	Year _____ Year _____	
12.	Nature of company DPSU, Private Limited, Public Limited, Partnership, Proprietary, Ex- Serviceman Unit	
13.	Category of industry Large Scale, Medium Scale, Small Scale, Micro, Startup	
14.	MSME Registration No	
15.	Certificates of registration as a manufacturing unit, if any.	
16.	If Startup, DPIIT Registration No	
17.	UDYOG AADHAR No	
18.	PAN Number	
19.	Details of Industrial license for defence manufacturing issued by DPIIT (if any)	
20.	Details of PESO license (if any)	
21.	GST Number	
22.	Nature of business Manufacturing/ Sole Selling or Authorized Agent/ Assembler/ Traders/ Dealer/ Processor/ Repacker/ Others	
23.	Details of current products and services Products and services Supplied (please specify Govt/ Domestic market/ Export)	
24.	Record of past performance (e.g., Supply orders executed against of Ministry of Defence orders, Public Sectors and Paramilitary Forces, if any).	
25.	Details of registration with NSIC / SSI, DGS&D, other Defence Department, other Govt. Dept, membership of FICCI/ASSOCHAM/CII or other Industrial Association (Attach relevant copies of registration letters)	
26.	Have you already taken any technology from DRDO (If yes, give details attaching separate sheet) Name of the Technology, Lab, Year, License number & Status	
27.	ISO/ ISI certification or any other certification (If yes, give details)	
28.	Relevant clearances form the authorities/ ministries (if any)	
29.	Capacity and capability to undertake developmental work and to accept attendant financial and commercial risks.	
30.	Capacity/capability to market the product through the marketing network, sales and service network, reliability to maintain confidentiality.	

PART-2

Infrastructure and other Information

1.	Total area of factory Covered (m ²), Uncovered (m ²), Bonded space available (m ²)	
2.	Ownership of factory Self-owned, partnership, rental	
3.	Electric power Sanctioned Installed Standby (if any)	
4.	Availability of adequate infrastructure (List of machines and their production capacities) and technical expertise	
5.	Name of bank & A/c No Name of bank A/c type A/c no Address of the bank Phone: Email:	

6. Details of current products:

S.No	Type	Description	Licensed/installed capacity	Annual production for preceding 3 years

7. Details of foreign collaboration, if any

S.No	Product	Name and address of collaborator	Year	Remarks

8. Details of products developed for services

S.No	Nomenclature of stores	Order No. and date	Remarks

9. Please give details of important facilities & infrastructure as per following format for:

- (a) Production
- (b) Unconventional, special m/c
- (c) Testing & quality control facilities

S.No	Description of m/c	Make & model	Qty	Date of purchase	Remarks

10. Furnish the following details with relevant certificates and documents

- (a) R&D facilities available :
- (b) Inspection quality control of raw material components :
- (c) Assistance from central agency for testing / calibration etc. :

(d) laboratory and drawing office facility

:

11. Principal customers:

S. No	Name & address	S.O No and date	Date of last supply	Products supplied	Value

12. Future plans (if any) in respect of expansion programme/ installation of additional machines/ test facilities etc.

13. Name of the technology requested for transfer

(give self-assessment of your capability to absorb the technology)

14. Details of employee as on date on firm's pay roll

PERMANENT					
Category	Post Held	Number	Qualification	Total Service	
Technical	Prod. Manager Q.C. Manager Supervisor Testing Staff (QC) Skilled workers Unskilled workers, etc				
Administrative	Purchase Manager Accounts Officer Office Superintendent Clerical Others, etc				

TEMPORARY					
Category	Post Held	Number	Qualification	Total Service	
Technical	Prod. Manager Q.C. Manager Supervisor Testing Staff (QC) Skilled workers Unskilled workers, etc				
Administrative	Purchase Manager Accounts Officer Office Superintendent Clerical Others, etc				

DECLARATION:

I / we confirm that the information furnished in Part 1 & 2 above is correct. In the event of any information given by me / us is found incorrect / false at any time, I / we understand our EoI for ToT will be cancelled/ rejected without notice, beside any other appropriate action against me / us.

Industry seal

Authorized signatory

Name(s) in capital

Designation and seal of authorized signatory

Date:

Place:

List of Support documents to be attached with EoI

- (a) Memorandum and Articles of Association (Should be incorporated as per Indian Companies Act, as amended time to time)
- (b) Certificates of registration as a manufacturing unit, if any.
- (c) Audited Balance Sheet for the preceding three years.
- (d) Income Tax returns for the preceding three year period
- (e) Details of shareholding/ownership pattern especially foreign partners/ shareholders, foreign employees, directors, etc. The company must adhere to the prevailing Govt of India policies and regulations on Foreign Direct Investment (FDI)/DIPP norms as applicable.
- (f) Annual budget for R&D during last three years.
- (g) Numbers and details of IPR or patents, etc., held by the company.
- (h) Number of technically or professionally qualified personnel.
- (i) Record of past performance (e.g., Supply orders executed against of Ministry of Defence orders, Public Sectors and Paramilitary Forces, if any).
- (j) Availability of adequate infrastructure (List of machines and their production capacities) and technical expertise.
- (k) List of Testing and Support equipment's
- (l) ISO/ ISI certification or any other certification
- (m) Relevant clearances from the authorities/ ministries (if any)
- (n) Capacity and capability to undertake developmental work and to accept attendant financial and commercial risks.
- (o) Capacity/capability to market the product through the marketing network, sales and service network, reliability to maintain confidentiality.
- (p) PESO and DPIIT license for explosive handling if ToT is for high energy Material, explosives, propellants, and component/ system dealing with it etc.
- (q) Under taking from company seeking ToT that none of its Directors, Independent Directors, non-executive Directors, Key management personnel are involved in any corrupt practices, unfair means and illegal activities.
- (r) Details of the industrial license for defence manufacturing be provided by the industry seeking ToTs.
- (s) Application cum Industry Assessment Form