

Date Corrigendum and Proceedings of the Pre-Bid Conference held on 16th December 2022 at CSIR-NAL, Bengaluru towards Production Partnership for Supply, Marketing and After-Sales Support for HANSA-3 (NG) Aircraft.

The Pre-bid Conference was held and the following Technical Sub- Committee (TSC) members attended the meeting.

Sl.No	Name & Designation		Role
1	Mr. Abbani Rinku	PD-Hansa	Chairman
2	Dr. C M Ananda	Head ALD & PGD (CAP)	Invitee
3	Mr. R Venkatesh	Head, BDG	Member
4	Mr. T H Samiulla	Dy. Head ACD	Member
5	Mr. H. Sreedhara	Sr.Pr. Scientist, KTMD	Member
6	Mr. Naga Charan K V	Sr.Pr. Scientist, RNCAC	Member
7	Mr. M Kothapalli S R S	Pr. Scientist, QAAD	Member
8	Mr. P Hari Babu	DCoD- Hansa	Member
9	Mr. Shijo K Francis	Asst. PD-Hansa	Member
10	Mr. A.K Tiwari	FAO	Member
11	Mr. Srinivasa Rao Yella	A.O	Member
12	Mr. Vasant Pilare,	Pr.Scientist, KTMD	Member Convenor

The list of prospective bidders who attended the Pre-Bid Conference is as per **Annexure-1**

Bidder may please note that:

- **As requested, the last date for submission of Technical Bid is extended up to 20th February 2023 till 4 PM.**
- **The opening of Technical bid will be on 21st February 2023 at 11 AM.**

At the outset, the Chairman welcomed all the Members, invitees and the representatives of the bidders and briefed in general the scope of the RFP. The DCoD and Head, BDG has made detailed presentation on technical and commercial aspects respectively and the TSC addressed the clarifications sought by the bidders and the replied there to as detailed in **Annexure -2.**

The representatives present were satisfied with the replies given and it was informed that the corrections/additions/ clarifications given, as discussed during the Pre-bid Conference would be hosted on the website of CSIR-NAL and all prospective bidders are required to take cognizance of the proceedings of the Pre-Bid Conference before formulating and submitting their bids as stipulated in the RFP document.

The meeting ended with visit to the NAL Hansa aircraft facilities and with vote of thanks to the Chair

Sd/-

Signature of Members, Invitee and Chairman

Annexure-1

Industry delegates attended the Pre-Bid Conference

SI.No	Participating organisation	Name of the Delegate	Designation
1	Lakshmi Machine Works Limited, Coimbatore	Mr. Chanabasappa Shirkoli	Head Business Development
		Mr. Suresh Kumar Mishra	Head Composites
		Mr. Rahul Kumar Chature	Head, Process Engineering and Estimation.
2	Taneja Aerospace and Aviation Limited, Bengaluru	Mr. S. Soundrarajan	Senior General Manager
		Mr. Krishna Kumar	QM
3	Apollo Computing Laboratories (P) Limited, Hyderabad	Mr. Ajay Sharma	Vice President
		Mr. Shekhar Ghosh	GM, Design n Technical,
		Mr. Johnson Verghese,	GM(Partnership)
4	Gopalan Aerospace India Pvt. Ltd, Bengaluru	Dr Ramesh	Technical Advisor
		Mr Karthikyan. V	Vice President
5	Godrej & Boyce Mfg. Co. Ltd. Mumbai	Wg Cdr Avinash Gupta (Retd)	
6	HAL, Nasik	Mr. Taral katiyar	Chief manager
	HAL, Kanpur	Sanjeev Pal	Chief Manager
		Harish Dhapwal	Senior Manager
	HAL Corporate Office, Bengaluru	Mr. Tribawan Koul	AGM(Marketing)
		Mr. Jitendra Choudhary	Manager (Marketing)
		Mr. Balarama Krishna T	DGM (Assembly, Projects & BD) - Aircraft Division
		Mr. Lakshmi Narasimha	DGM- ACD
Mr. Amit Kumar	CM(BD)- Aircraft Division		
7	Royal Nag Aviation, Bengaluru	Mr. Naresh Kumar Ganesh	Proprietor
		Dr. Gajendran Chandran	

		Mr. Vigneswaran Rengasamy Paramathayalan	CEO
8	Aerospace Engineers Pvt Limited, Hosur	Mr. D.Rajasekaran	General manager
		Mr. V Natarajan	Executive Director
		Mr. Ravi	Executive
9	SA Air Works India Pvt. Ltd. Hosur	Mr. Rakshit Rastogi	Dy.Manager
10	RR Industries, Hyderabad	Mr. V. Sreenivasa Rao	C.E.O.
		Mr. A. Vaidyanathan	VP Business Development
11	Metalcloth Products Pvt Ltd., Bangalore	Mr. Anil kumar Katti	
12	Focus Industrial Solutions, Bengaluru	Mr. Raghu	
		Mr. Austin	
13	Valdel Advanced Technologies Private Limited, Bengaluru	Mr. Tilak P C	Senior manager
14	Genser Aerospace & Information Technologies Pvt. Ltd. Bengaluru	Mr. Kumar Rishikesh	BDM (Manufacturing)
		Ms. Rashmi Rau	BDM (Design)
15	Reinforced Plastic Industry, Bengaluru	Mr. Prahlad	
		Mr. Maran	



**CSIR-NATIONAL AEROSPACE LABORATORIES
BENGALURU**

QUERIES & CLARIFICATION

RFP No. : KTMD/BDG/Hansa-3(NG)/RFP/2022-23/1
Item Description : Production Partnership for Supply, Marketing and After-Sales Support for HANSA-3 (NG) Aircraft.

A. Queries from Prospective Bidders During the Pre-Bid Meeting 16.12.022

Sr. No.	Query / Clarification Sought	Clarification/Amendment
1	Can two or more firms with different capabilities can bid by forming the consortium?	<ul style="list-style-type: none"> • As per the RFP conditions, the firm shall be a Company registered under the Indian Company Act, 1956 or under the new companies act 2013. • Hence, technical capability bids will be considered only from the legally registered firms under the Indian companies act 1956 or 2013. Since Hansa-(3) NG production rights will be given to legally registered company which is responsible for end to end solution, after sales support, statutory approvals etc. CSIR-NAL will not consider any sort of consortium applying for the bid. • Further, as per the technical evaluation methodology, the basic minimum qualification criteria of bidding firm are to have composite manufacturing facility with the requisite skilled manpower as per RFP with experience & expertise in assembly, equipping, & integration of aircraft components & production flights. Any firm bidding without these basic minimum criteria will be summarily rejected. The primary bidder is allowed to have long term legally binding agreement with supporting firms only for manufacturing of metallic parts and after sales service/maintenance support (CAR-145), type training organisation (CAR-147). However, the primary bidder shall be

		responsible for production, supply, marketing and after sales support for the aircraft.
2	Can NAL place firm orders on the successful bidder?	<ul style="list-style-type: none"> • CSIR-NAL will not be placing any order on the successful bidder nor giving any guarantee on potential orders. The bidder firm can carry out market survey and demand forecast analysis, business case analysis before bidding. CSIR-NAL is providing details of LOI received with this proceeding. • Only production rights with all the manufacturing drawings, process flow, assembly & integration etc., will be transferred to successful bidder under a production partnership agreement. The IP rights of the technology given for production of [Hansa-3(NG)] under the RFP shall rest solely with CSIR-NAL. • CSIR-NAL will handhold the successful bidder in the manufacturing of 2 aircraft (on job production training against firm orders, not involving expenditure from CSIR-NAL of any sort)
3	Will NAL facility is offered to successful bidder for manufacturing of the aircraft?	<ul style="list-style-type: none"> • It is the firm's responsibility to market, take orders, produce/execute and take care of after sales support as per their terms and conditions with the customers (FTOs). • As indicated in the RFP and pre-bid conference, successful bidder has to set-up the facility and obtain necessary approvals from DGCA (like Production Organisation Approval under Sub-Part G of CAR-21, CAR-145 for MRO, CAR-147 for type training etc.,) within 1 year from the date of signing of the production partnership agreement. • The firms already having production facility and requisite approvals will have advantage/add to weightage in pre-qualification.

		<ul style="list-style-type: none"> Initially, production tools (moulds)/jigs/fixtures available at CSIR-NAL will be provided to selected partner at a mutually agreed concessional rate.
4	What are the commercial aspects for entering partnership agreement with CSIR-NAL?	<ul style="list-style-type: none"> As indicated in RFP page 17, the firm has to pay min. 2% royalty on ex-factory sale price of the aircraft to CSIR-NAL. Further, the firm has to guarantee the sale price offered to the customers for first 10 aircraft. After 10 aircraft, it is the firm's pricing strategy based on the market demand analysis.
5	Are the production rights being territory based, can we produce and market abroad?	<ul style="list-style-type: none"> The present RFP is for manufacturing and sales in India only. Based on the business opportunities abroad, CSIR-NAL may provide appropriate support for international certification.
6	Can NAL help in promoting and marketing of Hansa-3 (NG)	<ul style="list-style-type: none"> CSIR-NAL will provide all necessary technical and business development support in promoting and marketing of the aircraft.
7	Can commercial bid format be shared by NAL?	<ul style="list-style-type: none"> As indicated in the RFP, this is a Two-Stage bidding process. The Commercial Bid format will be shared/issued to only those firms who qualify in the Technical Capability Bid under the NDA.
8	The submission of EMD of Rs. 4 lakhs may please be waived in the technical bid, instead to consider in the commercial bid	<ul style="list-style-type: none"> The same has been considered by CSIR-NAL.
9	Can NAL share the technical and commercial aspect presentation to aid bidders to understand the product and business case analysis.	<ul style="list-style-type: none"> Yes, it is being shared with these proceedings.
10	Firms have to carry out market analysis, meeting FTOs to evaluate demand forecasting, business case studies, investment options, infrastructure creation etc., all these needs time and effort, hence the submission of technical bids date needs extension at least 45 days	<ul style="list-style-type: none"> The last date for submission of Technical Capability Bids is extended up to 20th February 2023 till 4 PM and the opening of bids will be on 21st February 2023 at 11 AM.

B. Queries from Bharat Forge

Sr. No.	Query / Clarification Sought	Clarification/Amendment
1	What is initial qty of RFQ? Is it 15 nos. or 10 nos. for 2 years?	<ul style="list-style-type: none"> • There is no RFQ. It is RFP for production partnership. CSIR-NAL is not going to place any orders on the successful bidder, however only production rights for manufacture of aircraft shall be given. • The firm has to manufacture/produce, market and provide after sales support for Hansa-3(NG). It is firm's responsibility to set-up facility and obtain Production Organisation Approval under Subpart G of CAR-21, CAR-145 for MRO, CAR-147 for type training etc., as required by DGCA, within 1 year from the date of signing the agreement. CSIR-NAL will provide handholding assistance for setting-up facility and for production of first 2 aircraft. • As per the LOIs received by CSIR-NAL, there is a requirement of about 85 aircraft from various FTOs. It is expected that about 10 aircraft may realize into initial orders for the next 2 years.
2	What would be its future business projection for upcoming years?	<ul style="list-style-type: none"> • As per survey carried out by CSIR-NAL in 2017, about 70-80 number of trainer aircraft are required in the country. By looking at the present market trends, with about 35 FTO's and demand for pilots in the country it is expected that the requirement may further increase in next 6 to 7 years' time.
3	How NAL is going to support us in current RFP and what would be the exact work share?	<ul style="list-style-type: none"> • Please refer CSIR-NAL's Workshare & Responsibilities in page no. 9 of the RFP document.
4	What would be the approximate RM & Consumable cost per aircraft?	<ul style="list-style-type: none"> • The details are provided in the attached commercial

		presentation with this proceeding.
5	Approximate unit price of aircraft?	<ul style="list-style-type: none"> As compared to the aircraft in the similar class, the best unit price to sell in the market would be below Rs. 2 crore excluding taxes.
6	What about Engine? Is it supplier scope or NAL going to purchase? If yes, what would be the price of Engine?	<ul style="list-style-type: none"> Engine is imported from Austria (Rotax 912 iSc3 Sport engine). The engine has to be purchased directly by the successful firm for manufacturing of the aircraft at their facility. The approximate cost of the engine with propeller and accessories would be about Rs. 50 lakhs.
7	How NAL will distribute its share, profit & partnership for this project?	<ul style="list-style-type: none"> The RFP is for production partnership only and the successful firm has to pay the min. royalty of 2% (plz. refer clause 7.4, page 17 of the RFP) on ex-factory sale price of each aircraft sold by the firm to the customers.
8	Once we have manufactured the aircraft how NAL will support us in supplying future qty of aircraft?	<ul style="list-style-type: none"> There is no RFQ. It is RFP for production partnership. CSIR-NAL is not going to place any orders on the successful bidder, however only production rights for manufacture of aircraft shall be given.
9	After Successful development of Aircraft. Do we have market for this? If yes, please provide details?	<ul style="list-style-type: none"> Please refer sl.no 1 & 2 response in section B.
10	Require approx. investment details and Business forecast for Business analysis?	<ul style="list-style-type: none"> The indicative investment required is given in the commercial PPT made during the pre-bid conference and the same is attached with this proceedings.

C. Queries from HAL

Sr. No.	Query / Clarification Sought	Clarification/Amendment
1	Unique selling proposition of Hansa -3 NG with respect to other aircraft in the market	<ul style="list-style-type: none"> As compared to the aircraft in the similar class, the best unit price to sell in the market would be below Rs. 2 crore excluding taxes.

		<ul style="list-style-type: none"> • Good range and endurance, low operating cost of Rs.6000-7000/hr and low maintenance cost. • State of the Art Glass cockpit with IFR compliant instruments.
2	Indigenous content	<ul style="list-style-type: none"> • Overall configuration, aerodynamic design, airframe & system design, aircraft manufacturing, equipping & integration, testing & certification.
3	Whether the Indian operators (Flight Training Organisations) can still source from the foreign sources?	<ul style="list-style-type: none"> • As on date as such no restrictions from the government on FTO's sourcing the trainer aircraft from foreign sources
4	What is Status of domestic and international certifications?	<ul style="list-style-type: none"> • DGCA TCDS for Hansa-3(NG) is expected by January,2023. • Based on the business opportunities abroad, CSIR-NAL may consider International certification.
5	As per RFP, CSIR-NAL has received about 80 Letter of Intent (LOI) and a tentative immediate requirement of about 15 aircraft for Hansa-3 (NG) is envisaged in the next 2 years. Details of LOI and requirement of 15 Aircraft would be required for further understanding of demand and market exploration.	<ul style="list-style-type: none"> • These aspects were covered in the commercial presentation. The PPT is shared with these proceedings.
6	Possibilities of DRE funding by NAL/ Government for the facilities	<ul style="list-style-type: none"> • Initially, production tools (moulds)/jigs/fixtures available at CSIR-NAL will be provided to selected partner at a mutually agreed concessional rate.
7	Royalty terms and conditions	<ul style="list-style-type: none"> • As indicated in RFP page 17, the firm has to pay min. 2% royalty on ex-factory sale price of the aircraft to CSIR-NAL. Further, the firm has to guarantee the sale price offered to the customers for first 10 aircraft. After 10 aircraft, it is the firm's pricing strategy based on the market demand analysis.
8	As per RFP, Production facilities to be established for 10 aircraft in 2 years. How has this requirement been derived?	<ul style="list-style-type: none"> • This order has been derived based on the indications provided by FTOs.

9	Can the aircraft be modified for defence reconnaissance requirements?	<ul style="list-style-type: none"> If any need arises in future, depending on the payload and certification criteria the same will be evaluated for the technical feasibility by CSIR-NAL.
10	Manufacturing and integration ToT from NAL will be required.	<ul style="list-style-type: none"> CSIR-NAL will be giving full production, supply, marketing and after sales service rights which enables firms print to manufacture and sell & provide service anywhere. At present ToT is not being offered.
11	BOM and drawings of fabricated items would be required. When will SOP/BOM be shared?	<ul style="list-style-type: none"> As indicated in the RFP, this is a Two-Stage bidding process. Under NDA, the aircraft SOP/BOM/Drawings etc., will be shared (to be shown only at NAL) only to those firms who qualify in the Technical Capability Bid.
12	Status of Tech publications and Simulators required?	<ul style="list-style-type: none"> Will be shared with those firms who qualify in the Technical Capability Bid.

D. Queries from SA Air Works

Sr. No.	Query / Clarification Sought	Clarification/Amendment
1	What is the expected manufacturing cost of single Aircraft ?	<ul style="list-style-type: none"> The indicative manufacturing cost of the aircraft is about Rs. 2 crore + taxes extra. Further details can be seen in the attached commercial presentation presented during the pre-bid conference.
2	What is the ex-factory cost of the Aircraft?	<ul style="list-style-type: none"> The above cost indication is for a non-profit R&D firm like CSIR-NAL. The firms have to work out their ex-factory costs involving their overheads, profit, advertising etc.,
3	Can the Bidder decide on final price of the Aircraft?	<ul style="list-style-type: none"> As indicated in RFP page 17, the firm has to guarantee the price it is offering to its customers for the first 10 aircraft. After 10 aircraft, it is the firm's pricing strategy

		based on the market demand analysis.
4	Please share details of equipment installed on HANSA 3 (NG) aircraft as requested in Appendix A.	<ul style="list-style-type: none"> As indicated in the RFP, this is a Two-Stage bidding process. The SOP/BOM/Drawings etc., will be shared (to be shown only at NAL) only to those firms who qualify in the Technical Capability Bid under the NDA. The major details are shared in Technical presentation and brochure shared during pre-bid meeting and the same is attached.
5	Can the Approved Bill of Materials (BOM) of each systems and subsystems be shared? If yes, please provide the same.	Response as above in sl.no 4
6	Can the Approved SOP for fabrication of components be shared. If yes, please provide the same.	Response as above in sl.no 4
7	List of make and model of all the equipment (Electrical, Avionics and Mechanical) manufactured by NAL	Response as above in sl.no 4
8	List of make and model of all the equipment (Electrical, Avionics and Mechanical) procured outside NAL	Response as above in sl.no 4
9	Are any sub-contractors involved for structural part manufacturing?	<ul style="list-style-type: none"> Major manufacturing was carried out in-house at CSIR-NAL. However outsourced vendor list will be shared with Technically qualified bidder under NDA.
10	Will the current sub-contracts and cost agreement remain valid with the Manufacturing Partner?	<ul style="list-style-type: none"> No, Firm shall have separate agreements with suppliers/OEMS/contractors.
11	Can the Manufacturing Partner change the sub-contractors and agreements, if any ?	<ul style="list-style-type: none"> Firm is free to choose the subcontractor for manufacturing activity which need to be approved as per applicable procedures under CAR-21. Whereas, the Firm is not allowed to alter the aircraft SOP/ESOP.
12	How much Royalty will have influence on L1 decision ?	<ul style="list-style-type: none"> it is not applicable for initial technical qualification of the

		bidder at this stage. Firms qualifying the technical bid will be issued commercial bid format which gives the requisite details.
13	What is the full scope of After-Sale Support ?	<ul style="list-style-type: none"> • Maintenance Repair and Overhaul support • Warranty claim support • Spare parts support/supply • Type training support to engineers • Type specific familiarisation training to pilots
14	Can the Manufacturing Partner supply the LRUs or give repair / service support to Aircraft Operator- Exclusively?	<ul style="list-style-type: none"> • Yes, it is the responsibility of manufacturing partner.
15	Does the training involve the simulator training for Pilots?	<ul style="list-style-type: none"> • No, training responsibility is with manufacturing partner as mentioned in Sr.No.13 above
16	If simulator training involved, Does CSIR-NAL has the simulator related hardware and software ready	<ul style="list-style-type: none"> • Simulator is under development and it is not part of this RFP.
17	Will NAL provide the Simulator at additional cost ? Who will maintain the simulator and the parts ?	<ul style="list-style-type: none"> • After the certification of the simulator, it can be supplied at additional cost. Other aspects will be addressed at a later stage with mutually agreeable terms and conditions.
18	Will NAL Handhold / help in the procurement of minimum basic facilities if some are not available?	<ul style="list-style-type: none"> • Yes, CSIR-NAL can consider this on case to case basis.
19	What are CSIR guidelines for charges beyond production of 2 aircrafts and who will bear the same?	<ul style="list-style-type: none"> • CSIR-NAL will handhold the successful bidder in manufacturing of 2 aircraft (on job production training against purchase orders obtained by the bidder, not involving expenditure from CSIR-NAL of any sort) • Any training or handhold support beyond 2 aircraft for manufacturing and integration of the aircraft is at extra cost. Which usually

		involves cost of CSIR-NAL manpower, facility used, overheads, contingencies, laboratory charges, intellectual charges etc., as per CSIR guidelines which will be discussed and further details will be shared with the firms who qualifies in the technical capability bid.
20	Whose responsibility is to take the international approval / certificate?	<ul style="list-style-type: none"> • It is the responsibility of OEM, CSIR-NAL. • Based on the business opportunities abroad, CSIR-NAL may consider International certification
21	(a) Whose responsibility is to select the vendor (b) How will be the pricing for the raw material decided	<ul style="list-style-type: none"> • It is the responsibility of the firm to select approved vendors and negotiating the price of systems, sub-systems and raw materials
22	Initial flight testing to be whose responsibility	<ul style="list-style-type: none"> • Production flight testing is the responsibility of the manufacturing partner/firm.
23	Is the infra list mentioned in 7.3.2 is enough for the production of 10 a/c in two years? Has NAL done this assessment?	<ul style="list-style-type: none"> • Yes, List provided in 7.3.2 & Annexure 2 of the RFP is sufficient to produce 10 aircraft in 2 years' time frame.
24	What is the expected Man-hour for single a/c for the production estimated by NAL?	<ul style="list-style-type: none"> • Based on CSIR-NAL assessment the manpower requirement envisaged for the production of Hansa-NG, 6 - 8 a/c per year is provided in page 36 of the RFP. Firms to assess the man-hour required accordingly.
25	Whether the bidder will be procuring the equipment from approved vendor under NAL's approved pricing or the bidder needs to negotiate with the vendor.	<ul style="list-style-type: none"> • Bidder needs to negotiate the pricing with the approved vendor.
26	What if in the course of manufacturing some design defects are observed, how will this be notified.	<ul style="list-style-type: none"> • As a OEM and TC holder, CSIR-NAL will provide the necessary support.

		<ul style="list-style-type: none"> Notification Procedures will be finalised with the successful bidder.
27	What about customer choice of equipment? There might be different mandates for different countries. How will this be taken care of?	<ul style="list-style-type: none"> Based on the demand, design modifications can be considered which requires additional certification.
28	Does the production includes preparation of the Manuals too ? Who will provide the Manuals as per S/N ?	<ul style="list-style-type: none"> All technical publications will be provided by CSIR-NAL to the manufacturing partner. However, it is responsibility of the partner to print and supply the same. Any amendments to the technical publications will be the responsibility of CSIR-NAL.

E. Queries from R R Industries

Sr. No.	Query / Clarification Sought	Clarification/Amendment
1	Our annual turnover average for the last 3 years is only Rs. 27.09 Crores and our company is making average more than Rs.200 Crores delivered including the FIM's provided by customers. Since the FIM cost is not involved in the S.O's it is showing the deliverables cost less. But the tender says Rs.200 Crores.	<ul style="list-style-type: none"> As per RFP terms, the firm should have a minimum average annual turnover of INR 200 CRORE in the last three (3) financial years. The annual turnover reflected in the Profit & Loss Statement and Balance Sheet certified by CA will only be taken for the annual turnover purpose and no other statements will be considered. The turnover of the primary bidder shall be considered.

A. Technical Presentation

OVERVIEW HANSA-NEW GENERATION AIRCRAFT



Hansa – NG aircraft program

OUTLINE

- HANSA-3
- HANSA-NG
 - KEY FEATURES & THREE VIEW
 - AIRFRAME & SYSTEMS
- MAJOR EQUIPMENT & OEMS
- MATERIALS & STANDARD PARTS
- MANUFACTURING REQUIREMENTS
- FACILITIES FOR AIRFRAME FABRICATION
- MILESTONES
- FLIGHT TESTING & PERFORMANCE
- SUMMARY

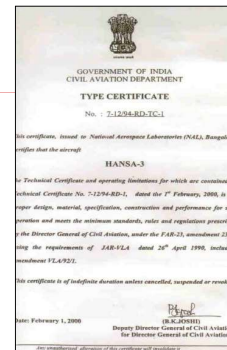


Hansa – NG aircraft program

HANSA-3



- ❑ India's first all composite aircraft
- ❑ Certified by DGCA in the year 2000
- ❑ Completed 4000+ Hrs of flying
- ❑ Conventional configuration and systems
- ❑ Manufactured 14 a/c
- ❑ Delivered 11 a/c to various flying clubs through DGCA



Engine	: Bombardier Rotax 914-F3
Max. T.O weight	: 750 kg
T.O. distance	: 540 m, ISA, SL
Landing distance	: 415 m, ISA, SL
Cruise speed	: 96 KIAS
Max. RoC	: 650 fpm
Endurance	: 4 h

Design to meet JAR-VLA requirements



Hansa – NG aircraft program

HANSA-NG KEY FEATURES

- Advanced Fuel Efficient Engine
- Glass Cockpit & Digital Engine Monitoring
- Electromechanical Flap Actuation
- Bubble Canopy
- Steerable Nose Wheel (Optional) *
- Excellent Performance
 - Range ~ 1150 km + 30 min res
 - Endurance ~ 7 hrs + 30 min res



Business potential

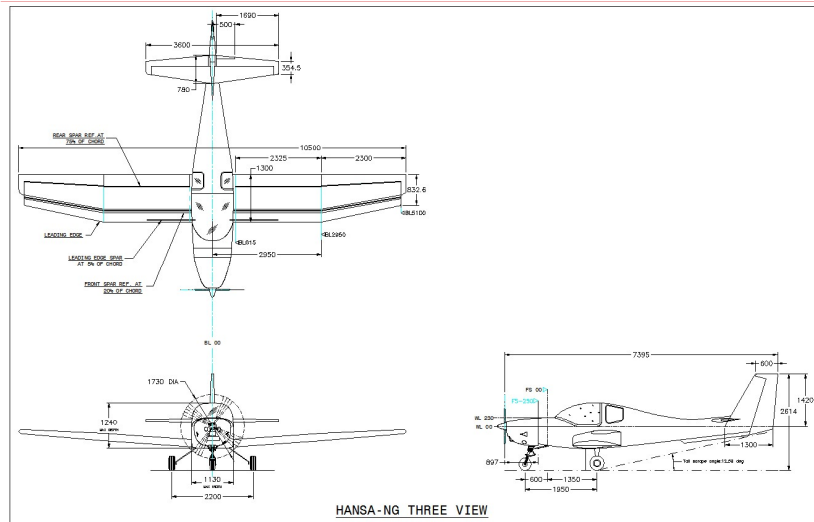
- Market survey (2017) by M/s Price Waterhouse Coopers Private Ltd. estimated an immediate requirement of 70-80 trainer aircraft for flying training in the country.
- ❖ TCDS Approval by December, 2022

* Under development



Hansa – NG aircraft program

HANSA NG- THREE VIEW



HANSA-NG THREE VIEW

Hansa - NG aircraft program

HANSA-NG FEATURES - SYSTEMS



100 hp Rotax 912 iSc Sport Engine

- Fuel efficient
- Digitally controlled

Flight Controls ^{1/2}

- Dual controls
- Adjustable Rudder pedals
- Electric Flaps
- Trim: Electric tab on Elevator

Fixed tabs on Rudder & Aileron

Fuel Tank

Capacity: 95 lts



Full Glass Cockpit

DAY VFR & NIGHT VFR Operations

- Dual PFD
- Dual COM
- NAV & GPS
- Transponder & ELT

Electrical System

- 14V DC
- Two 15.6 Ah TSO certified Li-ion batteries
- Two internal generators & an external alternator

Composite Propeller

MTV-21-A-175-05

Nose Landing Gear

- > **Standard:** Free caster type
Rubber stack shock absorber
- > **Optional:** Steerable NLG (under development)

Main Landing Gear & Brakes ^{1/2}

- Leaf spring shock absorber
- Steering through differential braking
- Manual toe-operated Hydraulic Disc Brakes

Hansa - NG aircraft program

HANSA-NG FEATURES - AIRFRAME

Lightning Protected

- Al shell embedded
- Cu jumper braids
- Polyurethane Conductive coating

Bubble Canopy
Easy ingress/egress

Airframe

- Sandwich construction: PVC foam core and BD GLASS layer face sheets
- Uni-directional CARBON fabric at high stress regions
- Single piece through Wing

Improved Cockpit Ergonomics Provision for Baggage
~43" wide cabin
10 kg Baggage behind seat

Increased Range & Endurance
Optimized Cowl & Fairings
620 nm, 7hrs + 30min reserve

Just in time Prepreg
Consistency in weight & higher production rate

Hansa - NG aircraft program

POWER PLANT & FUEL SYSTEM

□ Advanced 100 hp Rotax 912 iSc Sport engine + MT propeller

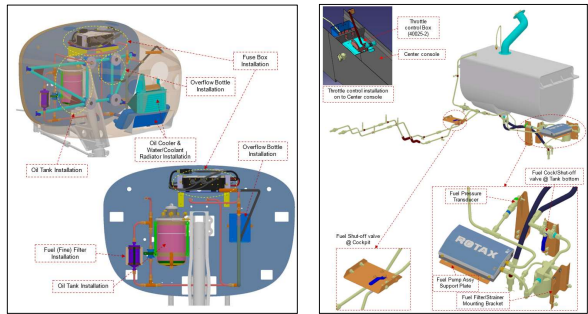
Rotax 914 F3 (HANSA-3)	Rotax 912 iSc Sport (HANSA-NG)
<ul style="list-style-type: none"> Turbo supercharged Max. take-off power of 115 hp @5800rpm Max. continuous power of 100 hp @5500rpm Hoffmann propeller Runs on AVGAS fuel 	<ul style="list-style-type: none"> Naturally aspirated Max. take-off power of 100 hp @5800rpm Max. continuous power of 98 hp @5500rpm MT propeller (MTV-21-A-175-05) Option of using MOGAS or AVGAS fuel



Rotax 912 iSc Sport Engine

ADVANTAGES

- Lower Cost
- Less fuel consumption
- Digitally controlled
- Compatible with digital display of engine parameters
- * MOGAS fuel option



Powerplant & Fuel System Installation

* MOGAS Fuel usage is yet to be certified. Currently cleared for AVGAS 100LL fuel

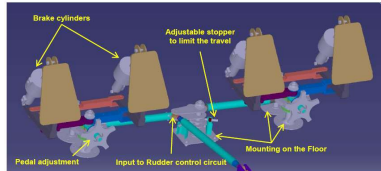


Hansa - NG aircraft program

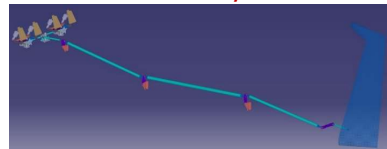


FLIGHT CONTROL SYSTEM

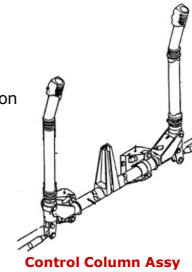
- ❑ Dual control system with inter-connection in the cockpit region
- ❑ Manually operated Elevator, Rudder and Ailerons using push pull rod systems
- ❑ Adjustable Rudder pedals to facilitate tall and short pilots
- ❑ Electric Trim tab on Elevator & ground adjustable fixed tabs on Rudder & Aileron
- ❑ Electric Flaps



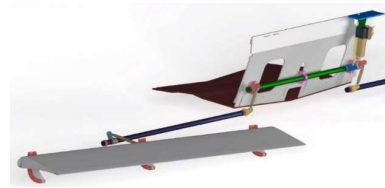
Rudder Pedal Assy



Push-pull Rod Control Assy



Control Column Assy



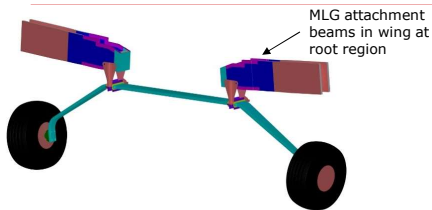
Electro-mechanical Flap Control Assy



Hansa – NG aircraft program

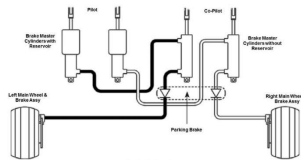


LANDING GEAR & BRAKES



- Single continuous leaf spring shock absorber strut made out of Alloy Steel SAE4340.

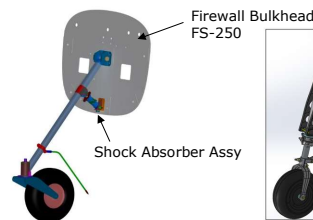
MAIN LANDING GEAR



BRAKE SYSTEM

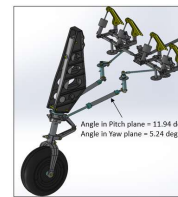


Hansa – NG aircraft program



- Free caster type nose wheel
- Rubber stack- Shock absorber
- Differential braking for steering

NOSE LANDING GEAR



Optional Steerable Nose Landing Gear

- Low pressure tires
 - 6.00-6 4 Ply tires – MLG
 - 5.00-5 4 ply tires – NLG



MAJOR EQUIPMENT & OEMS / SUPPLIERS

POWERPLANT & FUEL SYSTEM

Engine & Accessories – BRP Rotax
Propeller along with Governor – MT Propeller

AVIONICS

EFD1000 pro PFD – Aspen Avionics
NAV/COM/GPS, Transponder, AMU – Avidyne Corp
COM2 – Garmin
Engine Management Unit (EMU) – Stock (RS) Flight Systems
ELT – ACK Tech Inc
Antennae – Combham

ELECTRICAL

Li-ion Batteries – EarthX
Lights: Internal & External – Whelen & Soderberg
Flap & Trim Actuator – Ewellix & Ray Allen

LANDING GEAR & BRAKES

Wheels, Brakes & Master Cylinders – Cleveland Wheels & Brakes
Tyres & Tubes – Air Trac



Hansa – NG aircraft program

MATERIALS & STANDARD PARTS

Major Composite Materials, OEM/Suppliers:

- BD 4MIL Glass cloth – PD Interglas
- Carbon UD – BHOR Chemicals
- PVC Foam – GURIT
- 5052 Epoxy Resin System – Huntsman Corp
- Brominated Vinyl Ester Resin – Naphtha Resin & Chemical (P) Ltd

Other Major Materials:

- Aluminium: 2024 Alloy
- Alloy Steel: AMS 6359, MIL-S-6758, AMS 5659, MIL-T-6736
- Phosphor Bronze PB102, A/c Quality Nitrile Rubber, A/c Qty Plywood, Plexi Glass DTD 5592, Primer, Conductive Paint, etc

Fasteners & Standard Fittings:

- Inch Standard: AN Bolts, AN/MS Rivets. Metric fasteners (as needed)
- AN Fittings for Fuel System & Brake System
- Rubber Hoses (Aeroquip) for Fuel & Oil lines
- Al 2024 Tubes for Fuel System, Brake system, FCS push pull rods, etc



Hansa – NG aircraft program

MAJOR MANUFACTURING REQUIREMENTS

Composite Manufacturing

Foam Sandwich Construction with Room Temperature Curing followed by Post Curing

- Just-in-Time Prepreg Facility
- Composite Tools & Vacuum lines
- Oven for Post Curing: 11.5 m x 2 m x 2.5 m
- Airframe Assembly Jig
- Filament Winding for Fuel Tank

Metallic Manufacturing

- Sheet Metal Forming
- Conventional & NC Machining
- Welding of CM steel

Process/Protective Coatings:

- Anodizing
 - Passivation
 - Cadmium Plating
 - Heat Treatment
- # MLG Strut requires 2 meter wide Heat treatment furnace & Cadmium bath

Other Requirements

- Jigs & Fixtures
- Bonded Stores to Store Finished Parts & BOI
- Storage space for Raw Materials
- Tool-Crib

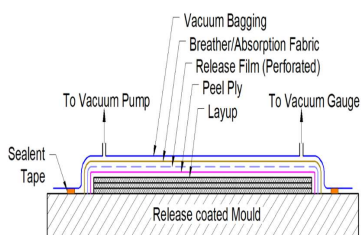
NDT

- Woodpecker & Coin Tapping – Composites
- Fluorescent Liquid Penetrant
- Ultrasonic / Radiographic
- MPI



Hansa – NG aircraft program

FACILITIES FOR AIRFRAME FABRICATION



Typical Vacuum Bagging Process



Just-in-time Prepreg Facility
from M/s TARTLER, Germany

- Controlled resin thickness
 - Faster rate of production
 - Consistency in weight and quality
- Indigenously developed Machine by DOPAG Pvt Ltd, Bangalore.



Hansa – NG aircraft program

AIRFRAME FABRICATION



Wing Bottom Mould



Fuselage Bottom Mould



Airframe Assembly JIG



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AIRFRAME COMPONENTS



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POST CURING OF THE FINISHED PARTS



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INTEGRATION OF AIRFRAME



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INTEGRATION & EQUIPPING



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MILESTONES



Hansa-3(NG) VT-HNG Roll-out on 31st March 2021



Hansa-3(NG) VT-HNG 1st Taxi on 10th August 2021



Hansa-3(NG) VT-HNG Maiden Flight on 3rd Sept 2021



Hansa - NG aircraft program

FLIGHT TESTING

- ❑ Hansa-3(NG) Reg. No. VT-HNG aircraft had successful maiden flight on 3rd Sept, 2021
- ❑ Hansa-3(NG) has completed a total of 58 flights (including 09 flights towards Wings India-2022, ferry flights & demonstration flights) covering ~70 hours of flying, 08 taxi & 128+ EGRs.
- ❑ 49 Certification flights (~60 hours) carried out at HAL Airport, Bangalore, Puducherry Airport (Sea level trials) & DRDO ATR facility, Chellakere (Engine relight tests).
- ❑ Flight testing towards DAY & NIGHT VFR certification is completed.
- ❑ Aircraft was flown by Capt Amit Dahiya and ASTE Test Pilots (Wg Cdr KV Prakash and Wg Cdr Dilip Reddy)



Hansa – NG aircraft program

HANSA-NG PERFORMANCE

Design Empty Weight: 550 kg

Max. AUW: 750 kg

Service Ceiling: 10,000 ft

Stall speed (Flaps up)	48 KCAS
Stall Speed (Takeoff/ landing, Flap 20 deg)	43 KCAS
Maximum cruise speed @ SL & ISA	98 KCAS
Max rate of climb @ SL, ISA	570 fpm
Take-off to 50ft with Max AUW @ SL & ISA	1607 ft
Landing from 50ft with Max AUW @ SL & ISA	1476 ft
Max Range @ 8,000 ft & ISA	
• 2 Pilots (150 kg)	440 nm + 30 min reserve
• 1 Pilots (75 kg)	620 nm + 30 min reserve
Endurance @ 8,000 ft & ISA	
• 2 Pilots (150 kg)	5 hr + 30 min reserve
• 1 Pilots (75 kg)	7 hr + 30 min reserve



Hansa – NG aircraft program

HANSA-NG

- ❑ All ground & flight test towards certification are completed.
- ❑ Certification is expected by December, 2022.
- ❑ HANSA-3 (NG) aircraft had a successful flying demonstration at WINGS INDIA-2022, Hyderabad in March, 2022 and was well appreciated by the user community.
- ❑ Received LOIs for 85 a/c from Flying clubs.



THANK YOU



Hansa - NG aircraft program

B. Commercial Presentation

RFP for Production Partnership for Supply, Marketing and After-Sales Support for HANSA-3 (NG) Aircraft

Pre- Bid Conference @ CSIR-NAL, Bengaluru

16th December 2022



Team, CSIR-NAL

Clarifications on Hansa-3(NG) RFP

- ✓ **THERE IS NO RFQ.** It is RFP for production partnership. **CSIR-NAL IS NOT GOING TO PLACE ANY ORDERS ON THE SUCCESSFUL BIDDER, HOWEVER ONLY PRODUCTION RIGHTS FOR MANUFACTURE OF AIRCRAFT SHALL BE GIVEN. IP RIGHTS RESTS WITH NAL**
- ✓ The successful firm shall find customers and market Hansa-3 (NG) directly by taking orders. The firm has to manufacture/produce, market and provide after sales service support for Hansa-3(NG).
- ✓ It is firm's responsibility to set-up facility & obtain CAR-21 (Sub-part G) production organization approval, CAR-145 for MRO, CAR -147 for training organization etc. as required by DGCA, **within 1 year from the date of signing the agreement.** CSIR-NAL will provide handholding assistance for setting-up facility and for production of 2 aircraft.
- ✓ As per the LOIs received by NAL, there is a requirement of about 85 aircraft from various FTOs. It is expected (MOST LIKELY) that about 10 aircraft may realize into initial orders aircraft for the next 2 years.
- ✓ **Delivery/Production Capabilities:** successful bidder, shall have the facility and manpower having capability to deliver **10 aircraft in 2 years' time** from the date of receiving the purchase order/s from FTO's and/or signing of the agreement with NAL whichever is earlier.

Clarifications on Hansa-3(NG) RFP

- ✓ It is a **TWO STAGE BIDDING – NOT TWO BID SYSTEM**
- ✓ IN THE FIRST STAGE : The bidder is expected to carryout a detailed survey or investigation and undertake a comprehensive assessment of risks, costs and obligations associated with the particular procurement.
- ✓ All the eligible **Technical Capability Bids** will be evaluated by a Technical Sub-Committee including site visits to verify the facts as per the terms of the RFP.
- ✓ Any amendments to the RFP after the pre-bid conference will be uploaded in the NAL Tender web page and will be informed on the same.
- ✓ **FIRMS ARE NOT TO SUBMIT THE COMMERCIAL OFFER IN THE FIRST STAGE TECHNICAL BID**
- ✓ Those firms **QUALIFY IN THE TECHNICAL CAPABILITY BID WILL BE ISSUED COMMERCIAL BID FOR SUBMISSION** within a specified time. RFP gives a broad criteria of Commercial Bid.

Clarifications on Hansa-3(NG) RFP

7.4 INDICATIVE COMMERCIAL BID EVALUATION CRITERIA

The indicative commercial bid parameters/criteria for the firms qualifies the successful Technical Capabilities have been provided in the table below.

Sl. No.	Criteria	CSIR- NAL Terms	BIDDER	Remarks
1.	Price of the aircraft Offered to be manufactured at Prod Partner facility	Expect the industry partner to supply the aircraft to Indian FTO's at lowest competitive price considering the market dynamics & competition.	Bidder's Price Rs. Cr (including custom Duty, freight etc.,) + GST as applicable per a/c to be maintained for at least first 10 a/c	
2	Royalty payment to CSIR-NAL	Min. expected 2% on ex-factory sales	Bidder offer% of Ex-factory sale	
3	Delivery/Production capabilities of aircraft	10 aircraft in first 2 years	Acceptance to CSIR-NAL terms	
4	Readiness of production Facility at Bidders premises.	Within 6 months from the date of signing partnership agreement	Acceptance to CSIR-NAL terms	
5	Obtaining CAR 21, CAR 145 & CAR 147 certification from DGCA	Within 1 year from the date of signing partnership agreement	Acceptance to CSIR-NAL terms	

Clarifications on Hansa-3(NG) RFP

6	Readiness in engaging & deployment of manpower as per Annexure-1 page 35 @ Bidder facility	Immediately after signing the Agreement	Acceptance to CSIR-NAL terms	
7	Warranty & After sales support	CSIR-NAL standard terms to customers – will be provided to all successful technical bids	Acceptance to CSIR-NAL terms	
8	Readiness in accepting PO from prospective FTOs	Immediately	Acceptance to CSIR-NAL terms	
9	Acknowledgement for The product: Hansa-3(NG)	The name Hansa-3(NG) shall be displayed on each of manufactured aircraft with "Technology of CSIR-NAL"	Acceptance to CSIR-NAL terms	

Note:

- (i) The short listed firm/s from the technical capabilities offer shall be invited to NAL to evaluate the facilities, manufacturing process, drawings, BOM, SOPs, vendor list etc., for submitting the commercial offer under submission of NDA/Undertaking/Indemnity
- (ii) The Commercial Offer format will be prepared by CSIR-NAL team and sent only to the Firms who qualify in the Technical Capabilities Offer

Approximate Investment for Setting-up Production Facility

CIVIL INFRASTRUCTURE :

- Production shops with stores – 3000 sq.mt (32300 sq.ft)
- Equipping & Assembly Hangar - 3000 sq.mt (32300 sq.ft)
- Air Strip & Flight Trials – 1 km
- MRO Hangar – 10000 sq.mt (108,000 sft)

Approx. Rs. 15 Crore excluding land

COMPOSITE FACILITY & PRODUCTION TOOLING

Approximate estimation for setting up facilities is tabulated below.

Sl. No	Facility Required	Approx. Cost (Rs Lakhs)
Composite Shop:		
1	JIPREG Machine	85.00
2	Centralised Vacuum System	30.00
3	Centralised Compressed Air System	15.00
4	Curing Oven	60.00
5	Thermoforming Oven	20.00
6	Assembly Jig	50.00
7	Composite Tooling's (1 sets)	200.00
8	Surface Tables - 08 Nos	15.00
9	Working Tables - 10 Nos	10.00
10	General Tools	25.00
A. Sub Total		510.00

HANSA-3 (NG) BOUGHT - OUT ITEMS

No.	Description	INR in Lakhs (2022)
1	Power-plant & Propeller including Fuel System	50.00
2	Avionics	44.00
3	Electrical Items	13.00
4	Mechanical Items	16.00
5	Standard Parts	4.00
6	Metallic Raw Materials	7.00
7	Composite Raw Materials Incl. Bubble Canopy	18.00
8	Interiors/Seats , Paints – Conductive/Primer/Final Paint, Stickers etc.,	3.00
	TOTAL	155.00

HANSA -3 (NG) COSTING
INDICATIVE ONLY FOR R&D ORGANISATION

Fabrication Cost (for NAL- indicative manpower cost only)

No	Description	INR in Lakhs (2022)
1	Manufacture of Composite parts	20.00
2	Manufacture of Metallic parts including processing and NDT	12.00
3	Aircraft equipping and integration	16.00
4	Other Contingencies	1.00
	TOTAL	49.00

Manpower for Production (Indicative purpose only, firm to assess the manpower/man-hours requirement)

Sl. No	Area / Domain	Projected Manpower	
		Executives	Technicians
Production:			
1	MR(Production)	01	-
2	DLME	02	04
3	IWM & Sourcing	01	01
5	Fabrication - Composites	03	25
6	Fabrication - Metallic	02	05
7	Machining - Metallic components		03
8	Quality - Composites	03	-
9	Quality - Metallic		-
10	Subassemblies	01	02
11	Progress & Stores	01	01
Equip & Integration:			
14	Airframe & Controls	03	02
15	Powerplant		02
16	Avionics		02
17	Electrical		02
18	Landing Gear & Brake System		02
19	Inspectors		04
20	Ground Run	01	-
21	Test Pilot	01	-
Quality & Training:			
20	Quality Control - MR(QC)	01	-
21	Quality Assurance - MR(QA)	01	-
	Total	21	55

- ✓ The human resources identified are mandatorily to be qualified by DGCA to perform the assigned task.
- ✓ Manpower requirement envisaged for the production of Hansa-NG, 6 - 8 a/c per year

Indicative Operating Cost of Hansa-3(NG)

Components of Maintenance Cost include the following:

1. Scheduled maintenance (@ intervals of 25, 50 and 100 hours)
2. Oil change during scheduled maintenance
3. Engine (2000 hrs interval)
4. Propeller (1500 hrs interval)
5. Prop Governor (1500 hrs)
6. General spares
7. Tyre wear (every 500 hrs)
8. Airframe inspection

- The current price of AVGAS 100 LL is Rs.198/-
- Considering this Operating cost of HANSA NG per hour with AV GAS and one aircraft in operation would be approx.. Rs.7000/- per Hour

LOIs received by NAL for Hansa-3(NG)

Sl.No.	FTO	Dt. of LOI	No. of Aircraft
1.	Hercules Aviation Training School Pvt. Ltd. 203, 2 nd Floor, Bizness Square Jubilee Enclave, HT city, Hyderabad-500081, Contact: Capt. Abhinav Singh, CEO	5 th February 2021	3
2.	Trans Aviacons Pvt. Ltd., Ravi Plaza, Level-4 #1-8-303/40/3, PG Road, Hyderabad-500003, Contact: Ms. Teena Marina Oammen, Director	13 th March 2020	3
3.	Blue Ray Aviation Pvt. Ltd, 703 Wall Street Annexe Above J B Banquet, Near Gujarat College, Ellisbridge, Ahmedabad-380006 Contact: Rajiv Gandhi, Chairman	13 th March 2020	4
4.	Prayan Aviation Services Pvt. Ltd., A-8, Shyam Vihar, Phase-1 New Delhi-110043, Contact: Karan Bansal, Manager	13 th March 2020	2
5.	Redbird Flight Training Academy Pvt. Ltd, E-186, Greater Kailash, 1, New Delhi-110048, Contact: Mr. Anchit, COO	25 th September 2020	10
6.	FSTC Flying School Pvt. Ltd. No.46, Sector-35, HSIIDC, Gurugram-122001, Haryana, Contact: Capt. D S Basraon, Director	26 th April 2021	40
7.	Chetak Aviation, Hanger no.1, Dhanipur Airstrip, Milestone -10 NH-91 Etah Road, Post Panethi, Aligarah, UP-202001 Contact: Capt. Jagrit Singh, Accountable Manager	30 th April 2021	5
8.	Belagavi Aviation & Sports Enterprises LLP 303, Shivaprakruthi Apartments, Talacauvery Layout Amruthahalli, Banaglore-560092, Contact: Mr. Kuamarswamy, CEO	1 st October 2021	10
9.	Indira Gandhi Rashtriya Uran Academy Fursatganj Airfield, Amethi 229302 U.P. INDIA, Contact: Mr. Krishnendu Gupta, Director	MoU on 31 st March 2021	5
10.	Indian Flying Academy, T-5, Manish Global Mall, Sector 22, Dwarka, New Delhi 110077 Contact: Capt. Sunil Kumar Singh, Chief Flying Instructor, Yash Vikram Singh, CEO	19 th March 2022	3
	Total		85