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INDUSTRIAL DEVELOPMENT ORGANIZATION
Investment and Technology Promotion Office (ITPO), Tokyo

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OVERVIEW OF INDIAN AEROSPACE & COOPERATION OPPORTUNITIES

18 October 2024

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INDUSTRIAL DEVELOPMENT ORGANIZATION
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Expect from this presentation

- **SIATI**
- **What Characterises Indian Aerospace: Structure and Capabilities**
- **Recent Industry Initiatives**
- **Opportunities**
- **Cooperation Possibilities**
- **A typical SIATI Member at a glance**
- **Investment Ready Project Example**

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Growth Through International Partnership

SIATI Council & Membership

Lead Aerospace Organisations: HAL, NAL, DRDO, ISRO

Large Private Enterprises, MSMEs

Gateway to Indian Aerospace Industry & global cooperation

Interacts with Overseas Aerospace Associations & Organisations

Forum for interaction of industries, users, R&D institutions, Universities

Facilitation for collaborations & strategic partnership with Indian aerospace Industries.

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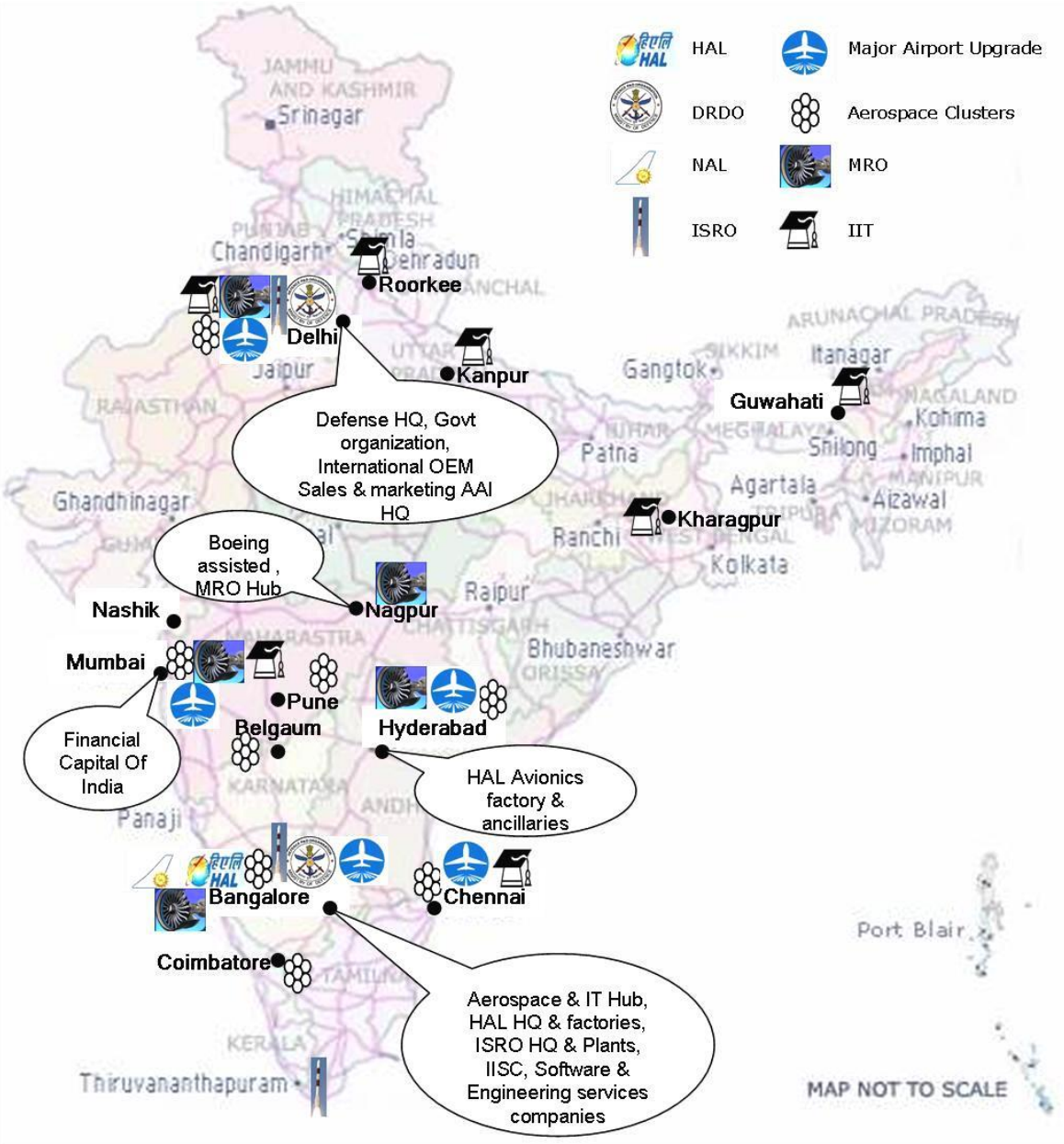
What characterizes Indian Aerospace:Structure and Capabilities

Foundations built over nine decades

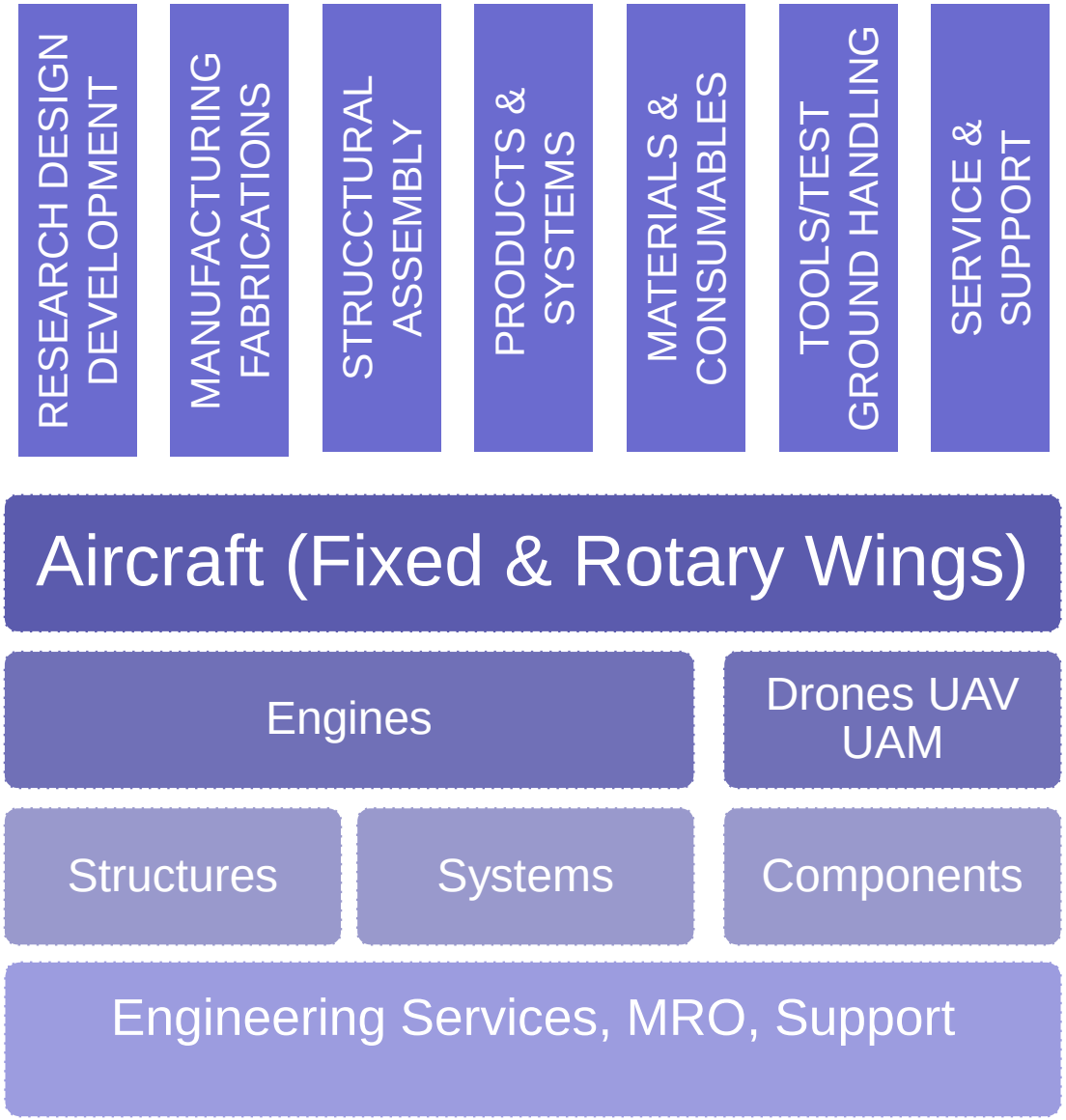
- **Into 9th decade**
- **4 lead organisations: HAL;ISRO;DRDO;NAL**
- **Large Business houses in India (TATA, Reliance, Adani, Mahindra, L&T and Godrej), shy of aerospace so far, have entered the fray in recent years.**
- **300+ support organisations**
- **300,000 engineers & technicians; 3 generations; largest group globally in less than 35 years age group**
- **185 organizations (including their branches) have AS9100 certification (OASIS database)**
- **The giants of the aerospace industry like Boeing, Airbus, RTX, BAe Systems, Rolls-Royce, Safran, Honeywell, GE, Bell Textron etc. have set up JVs or Technical Centres**
- **GDP growth:8%;Air Travel growth 30%**
- **Airlines : hyper-growth & consolidation cycle.**
- **~$20b investment being made in Aviation Infrastructure**

Aerospace & aviation activity centres in India



Civil Aircraft Programmes - a collage…

Core Competencies – Eco System



Alloys, Castings, Forgings, Extrusions, Rubber Seals, Gaskets. Hoses, Rivets, Fasteners, Standard Parts, Cables, Looms, Connectors, Composite Materials, Glass, Carbon Fibers, Prepregs, Phenolic/Epoxy/ Polyester Resins, Rigid Light Weight Foams, Honey Combs, Electronic Equipment & Systems, Mechanical/Electric al Equipment & Systems, Ground Support Equipment. Advanced Intelligent Structures, MEMS, UAVs, MAVs, Test Rigs, Automatic Test Equipment

100+ companies engaged in Aerospace manufacturing

- Lead government owned organizations form the core:
  - Hindustan Aeronautics Limited (HAL) - the premier aircraft Manufacturer in India
  - Indian Space Research Organisation (ISRO) - a global player in Space Research and launch of Space Vehicles.
  - National Aerospace Laboratories (NAL) and C-CADD (Centre for Civil Aircraft Design and Development) — Designers of HANSA and SARAS aircraft, with another 70 seat aircraft RTA-70 on the anvil, primarily focusing on civil aeronautics.
- Large business houses are creating parallel force in Aerospace/Aviation with potential to become key global players through JVs and acquisitions
- 300+ support organizations

50+ companies in Engineering Services…

- **Smaller and Medium Aerospace Engineering Services companies like Accord, BAeHAL, Axis Cades, GENSER have been catering to Engineering Services (incl. Software and Systems needs).**

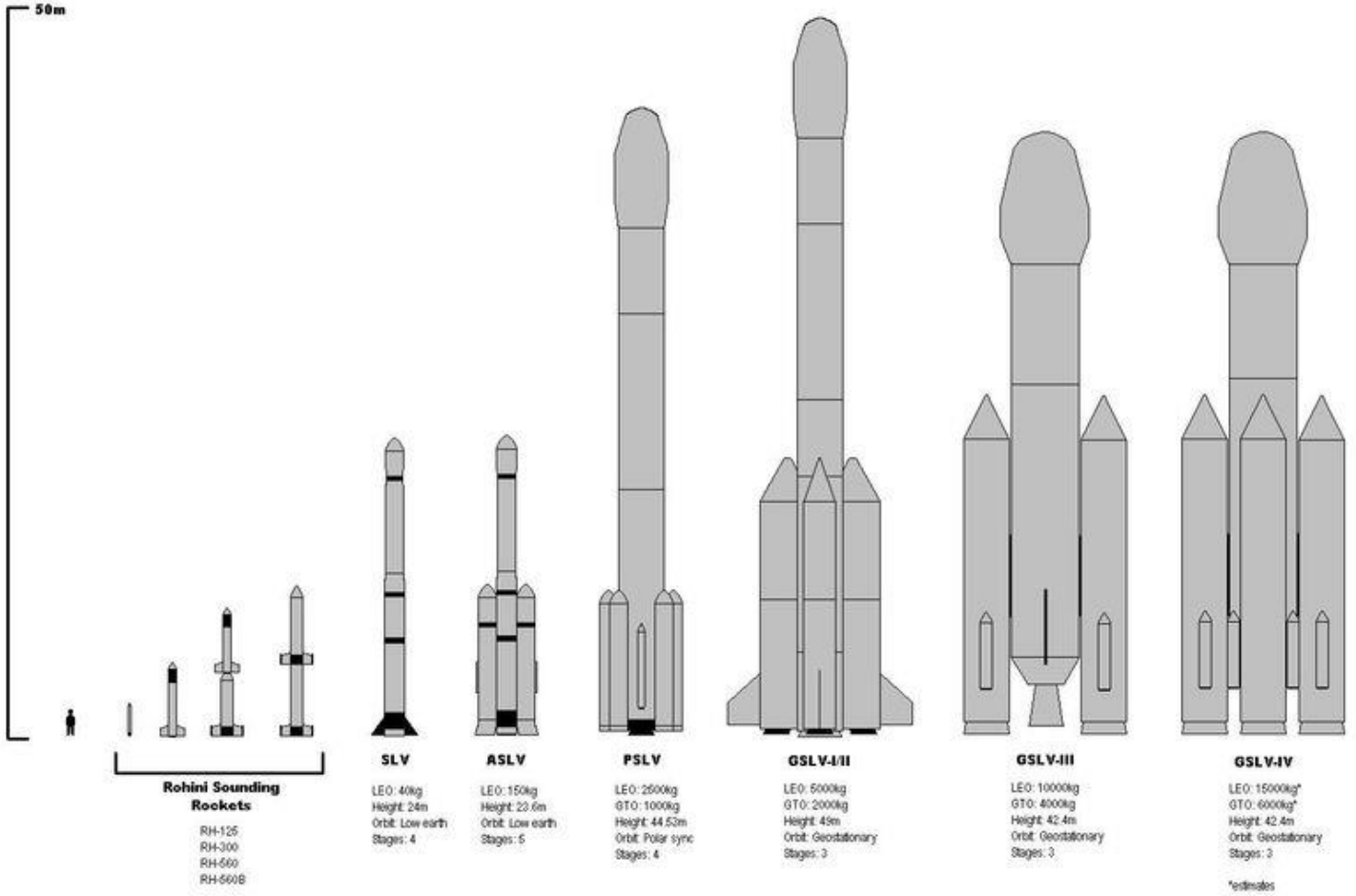
- **More recently, most leading Indian IT Services companies like Infosys, HCL, Wipro, Cyient, Tech Mahindra and TCS have got into in a big way into the aerospace engineering design services business. There are also promising start ups with deep aerospace background.**

- **Overseas companies like Airbus, Alten, Altran, Assystem, Atkins, Cap Gemini, Expleo, Honeywell, GE and Safran have set up their own captive centres to cater to the growing Engineering Services needs from Indian Shores.**

Airlines,MRO..

- **Full service carriers : Air India and Vistara**
- **LCCs are: Spicejet, Akasa, Indigo, Air India Express, Star Air, Air Kerala**
- **Cargo Airlines: Blue Dart and Deccan 360.**
- **Pawan Hans is the major Rotary Wing Fleet Operator.**
- **Key companies engaged in MRO services are Air India, Air Works, GMR, Indamer, Max Aerospace, Varman Aviation (for small engines)**
- **Airport Authority of India supported by a few private companies like Menzies Aviation Bobba Joint Venture, PSM, Globe Ground look after airport services;**
- **There are 35 basic pilot training schools and 110 basic aviation engineering training institutes.**

Among the Five Major Spacefaring Nations



Among the Five Major Spacefaring Nations

Space Based Augmentation System (Project GAGAN)

- (GPS Aided Geo Augmented Navigation) (GAGAN)
- GAGAN overlay covers from Africa to Australia.
- Potential for extension of GAGAN services to neighbouring countries.
- Development of a Technology Demonstration System by Dec. 2006 i n collaboration with ISRO.
- Proposed to be implemented in three phases.

[GPS Aided Geo Augmented Navigation]

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Recent Industry Initiatives

JVs,Acqusitions,MoUs…..

- **Safran Acquires Captronics**
- **Alten Acquires Accord**
- **Jeh Aerospace Acquires Maini**
- **Infosys-RR Collaboration (Aerospace Engineering and Digital Innovation Center)**
- **Mahindra JV with Shinmaywa**
- **Tata-Airbus JV; Tata-Sikorsky; Tata-Lockheed Martin JV**
- **CAE Acquires MACMET**
- **Saab (24%)JV with Quest (74%)**
- **QUEST acquires Engineering Services Division of GKN Aerospace**
- **L&T & CASSIDIAN JV**
- **SAMTEL & THALES**
- **KINECO & KAMAN AEROSPACE**
- **Many MoUs and Strategic Tie ups**

Special Economic Zones ….

- **SEZs are being created across the country for easing of trade. A business unit in an SEZ has to become net foreign exchange earner within 3 years.**
-
- **Key Benefits:**
- **Exemption from customs duty on import of capital goods, raw materials, consumables and spares**
- **Exemption from Central Excise duty on procurement of capital goods, raw materials, consumables, spares, etc. from the domestic market**
- **100% income tax exemption on export income for SEZ units under Section 10AA of Income Tax Act for first five years;50% tax exemptions for next five years; thereafter, 50% of the ploughed back export profit for next 5 years.**
- **Reimbursement of Central Sales Tax paid on domestic purchases.**
-
- **SEZ in aviation/aerospace sector:**
  - **Aerospace SEZ, Devanahalli (Bangalore, Karnataka)**
  - **Adani Aerospace Park (Hyderabad, Telengana)**
  - **GMR Aerospace & Industrial Park (Hyderabad, Telengana)**
  - **Hindustan Aeronautics Limited SEZ (Nasik, Maharashtra)**
  - **Belgaum Aerospace SEZ (Belagavi, Karnataka)**
  - **Tata Advanced Systems Aerospace SEZ(Hyderabad, Telangana)**

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Opportunities

The Opportunities….

- India is projected to have over 500 million air travelers by 2030, and by 2047, it may become the world's largest aviation market. The number of airports increased from 74 in 2014 to 147 in 2022, and it is expected to rise to 220 airports by 2025. Investments in airport infrastructure, under both public and private partnerships, continue to grow rapidly.

- The aircraft acquisition market remains robust. India is forecasted to need about 2,500 additional aircraft by 2040 to meet growing demand. This includes expansion in general aviation.

- India's Maintenance, Repair, and Overhaul (MRO) sector is growing due to rising fleet sizes and the push for domestic capabilities. The MRO market is expected to expand considerably to over $4 billion by 2028 from the earlier figures of $200 million.

India-Centric Global Aerospace trends

- The momentum generated by **Offset**
  - Magnitude of $3b per annum
  - Has positive ripple effect on aerospace activity globally
  - Investment in JV counted as offset
  - Investment in aerospace educational institution & labs counted as offset

India-Centric Global Aerospace trends

- Design & Analysis Services: ODCs(Overseas Development Centres)
- A large number of companies have stepped up machined components sourcing: Magellen Aerospace;GKN,Collins; GE; Snecma(Safran); Paulstra(Hutchinson); Kern Aerospace
- Raw Material Warehouses:Thyssenkrupp; others moving in…
- Central Services:NADCAP Approved Special Process Houses

India-Centric Global Aerospace trends

- A Flurry of activities from Aerospace majors and many sub-tiers to gain early foothold into one of the fastest growing India Centric opportunities
  - GE's R&D Centre
  - Honeywell Development Centre
  - Boeing India Engineering and Technology Center (BIETC)
  - Airbus Helicopter has made investments in India; Indian subsidiary, helicopter training school; helicopter MRO
  - RTX group's major sourcing initiative from India
  - Boeing Investing in MRO in Nagpur with a commitment of upto $100 mil

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Cooperation Possibilities

Partner with Indian Industries

Platforms

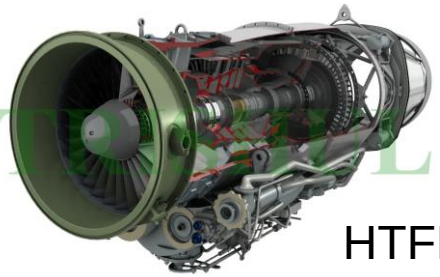
IMRH

RTA 70

ALH AMBULANCE

Engines

HTSE 1200



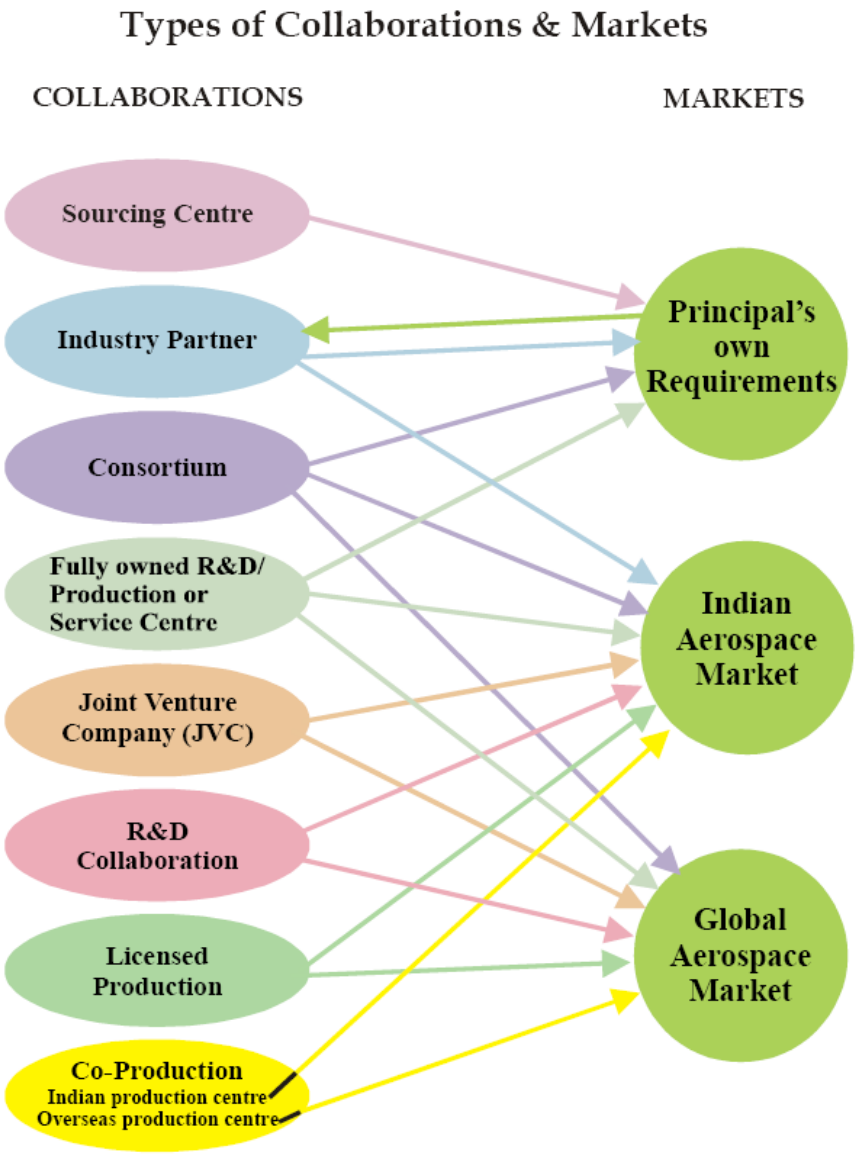
HTFE 25

Components

LI Batteries

Sensors

Collaborations & Markets



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Typical SIATI Member at a glance

Genser Aerospace

25 Years in Service of Aerospace

genser

Design Services | Manufacturing Services | Aviation Services | Research & Analytics

CUSTOMERS

ALLIANCES

- ESTABLISHED IN 1997, in Bangalore, India
- NICHE ENGINEERING SERVICES EXCLUSIVELY FOR AEROSPACE
- SERVICE MODELS FOR ALL ACTORS IN AVIATION/AEROSPACE
- GLOBAL AEROSPACE VISION & REACH
- AN ONGOING AIRCRAFT DESIGN AND INTEGRATION PROGRAMME (A BUSINESS JET-RAJAS)

Design
- Aircraft and Systems Specification
- Concept, Preliminary & Detail Design
- Document Engineering
- Aircraft Test Rig Design & Test Infrastructure Build
- Wind Tunnel Models & Engineering Mock-up

Manufacturing
- Manufacturing Supply Chain Development
- Production Engineering
- Contract Manufacturing
- Test Coupons-Special Process

Aviation
- Sourcing of parts
- Specialty Product Support
- In-Service Support

Consulting
- Consulting
- Research & Analytics


Aircraft Aerodynamics


Actuator Gears


Mind Maps

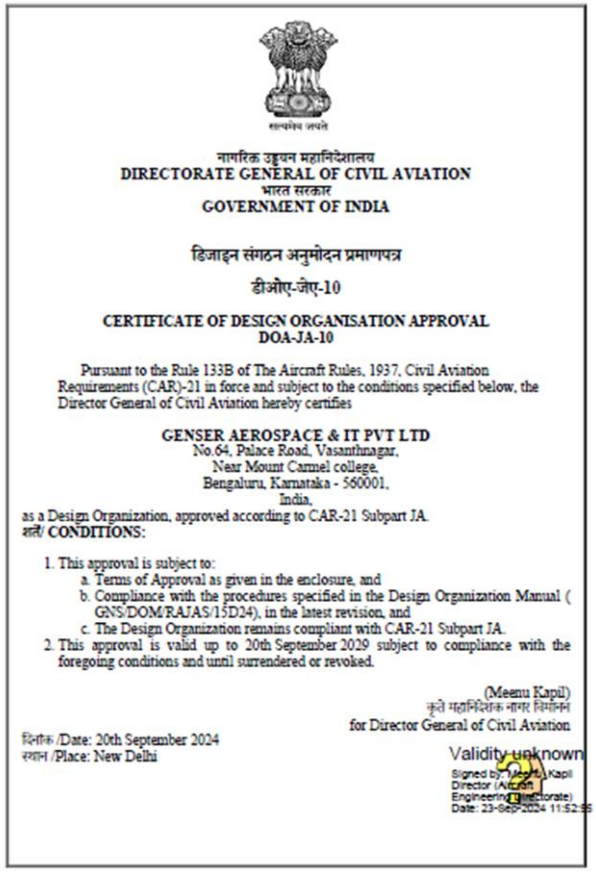

Document Engineering


Test Specimens


Test Rigs & Testing

GENSER AEROSPACE & IT PVT. LTD.
64, PALACE ROAD, VASANTH NAGAR
BANGALORE 560001
www.genser.com
E:SECRETARY@GENSER.COM
PH:+918022370417

Quality & Processes



नागरिक उड्डयन महानिदेशालय
DIRECTORATE GENERAL OF CIVIL AVIATION
भारत सरकार
GOVERNMENT OF INDIA

डिजाइन संगठन अनुमोदन प्रमाणपत्र

डीओए-जेए-10

CERTIFICATE OF DESIGN ORGANISATION APPROVAL
DOA-JA-10

Pursuant to the Rule 133B of The Aircraft Rules, 1937, Civil Aviation Requirements (CAR)-21 in force and subject to the conditions specified below, the Director General of Civil Aviation hereby certifies

GENSER AEROSPACE & IT PVT LTD
No.64, Palace Road, Vasanthnagar,
Near Mount Carmel college,
Bengaluru, Karnataka - 560001,
India,

as a Design Organization, approved according to CAR-21 Subpart JA.

शर्तें/ **CONDITIONS:**

1. This approval is subject to:
   a. Terms of Approval as given in the enclosure, and
   b. Compliance with the procedures specified in the Design Organization Manual (GNS/DOM/RAJAS/15D24), in the latest revision, and
   c. The Design Organization remains compliant with CAR-21 Subpart JA.
2. This approval is valid up to 20th September 2029 subject to compliance with the foregoing conditions and until surrendered or revoked.

(Meenu Kapil)
कृते महानिदेशक नागर विमानन
for Director General of Civil Aviation

दिनांक /Date: 20th September 2024
स्थान /Place: New Delhi

Validity unknown
Signed by: Meenu Kapil
Director (Aircraft Engineering Directorate)
Date: 23-Sep-2024 11:52:55

NVT QUALITY CERTIFICATION INTERNATIONAL

CERTIFICATE

Certificate Number: 349269

This is to certify that

GENSER AEROSPACE &
INFORMATION TECHNOLOGIES PVT. LTD.
No. 64, Palace Road, Vasanth Nagar,
Bengaluru, Karnataka – 560001, India.

has implemented and maintains a Quality Management System for its

SCOPE :

ENGINEERING SERVICES FOR DESIGN AND SUPPORT SERVICES IN MANUFACTURING FOR AEROSPACE APPLICATIONS AND AVIATION SERVICES

Certification structure: Single site

Through an audit, performed in accordance with the requirements of AS 9104/1 issued 2012-01, and including the implementation, meets the requirements of the standard:

AS 9100D

(Based on and including ISO 9001:2015)

Quality Management Systems – Requirements for Aviation, Space and Defence Organisation.

The file that forms the basis of this certificate: 349269

Date of Initial Certification : 23 July, 2024
Date of Current Revision : 23 July, 2024
Certification Expiry Date : 22 July, 2027

K. G. Garg

K.G. Garg
Chairman & Chief Executive

NVT QC ANAB ACCREDITED MANAGEMENT SYSTEMS CERTIFICATION BODY iaqg

Accredited Office: NVT Quality Certification International LLP, Bangalore, India
Marketing Office : NVT Quality Certification International, Milpitas, CA, USA

NVT Quality Certification International LLP is accredited by ANAB under ICOP scheme and recognized by IAQG.

Note: Please verify current validity of certificate from NVT Quality Certification International LLP at nvt@nvtquality.com

NVT:FORM/4/014-3 Issue F 05 Oct 2023

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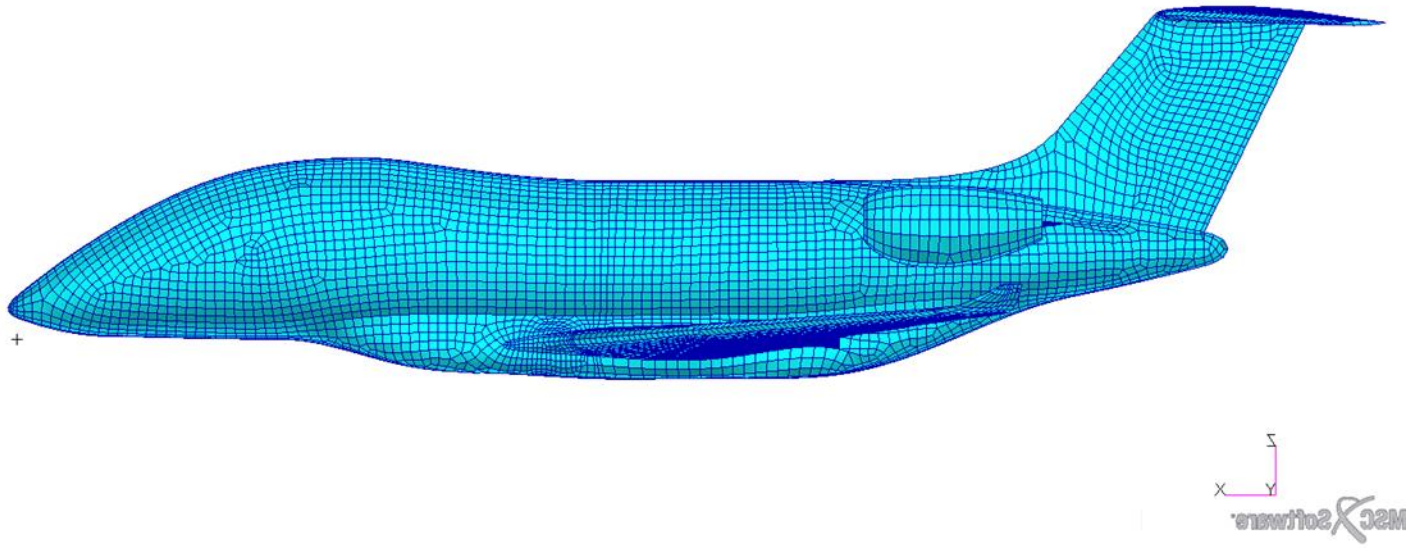
Investment Ready Project Example

A Business Jet

Architecting Indigenous Development of a Light Business Jet



Streamlined beauty & performance

PROJECT EXCERPTS

genser

MISSION aerofi
AEROSPACE FOUNDATION OF INDIA

Architecting Indigenous Development of a Light Business Jet

angas
अङ्गस् ऐरोनॉटिक्स इंडिया प्राईवेट लिमिटेड
ANGAS AERONAUTICS INDIA PRIVATE LIMITED

ON PATH TO ATMANIRBHARATA IN CIVIL AIRCRAFT

PROJECT EXCERPTS

The Business Case

1. Product : A contemporary transcontinental business jet for the global market
2. Market :1200 aircraft in 20 years; @$4-5 m/aircraft (2023 level); + customisation + Defence Version + MRO; derivative businesses: FBOs (Fixed Base Operations) across India; APP based operations by Consolidators
3. Investment:≈ $ 390m ; $10m per month over 39 months ; then self sustaining
4. Positive cash flow in 4 years; Self sustaining business in 6 years
5. Manpower: 3200 ;equal number in derivative employment for hi-Tech eco system
6. Product Realisation:
   a. Best Brains in Aeronautics; Indian global experts
   b. HAL MoU to support Prototype Integration, testing & Certification
   c. Power Plant & Systems Partners of global acclaim
7. Project Milestones & Progress:
   a. First Flight End 2025;Certification:2026;EIS(Entry Into Service) :2026
   b. Preliminary design Done; detailed design, manufacturing drawings progressing
   c. Wind Tunnel Test (IISc) completed
   d. Full scale Mock up done; Prototype Manufacturing progressing
   e. Applications for DoA (Design Organisation Approval) and Type certifications made to DGCA; Review in progress

PROJECT EXCERPTS

genser

MISSION aerofi
AEROSPACE FOUNDATION OF INDIA

1.The product & usp

2 Pilot+7 seat

Twin engine delivering 17.8KN

2250 NM in less than 5 hours at 0.79 Mach

MTOW: 11,000 lb (5000 Kg)

Signature shape (aerodynamic rise)

Signature comfort & connectivity

Signature ease of flying

High reliability through proven technologies (TRL7,8 & 9 ; TRL: Technology Readiness Level) , innovatively implemented

More digital, more electric, internet on board

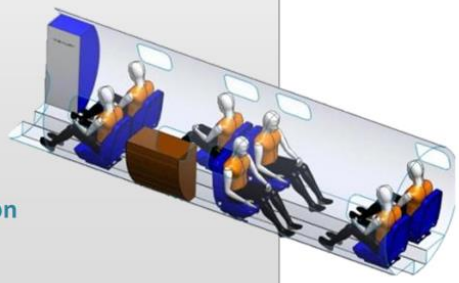
(Power by Wire, Partial Fly-by-Wire)

Very Low Cost of Ownership & Operations

Target price (Standard aircraft): <$3.99 m plus customization

Cost of operation: <$0.2 per seat KM

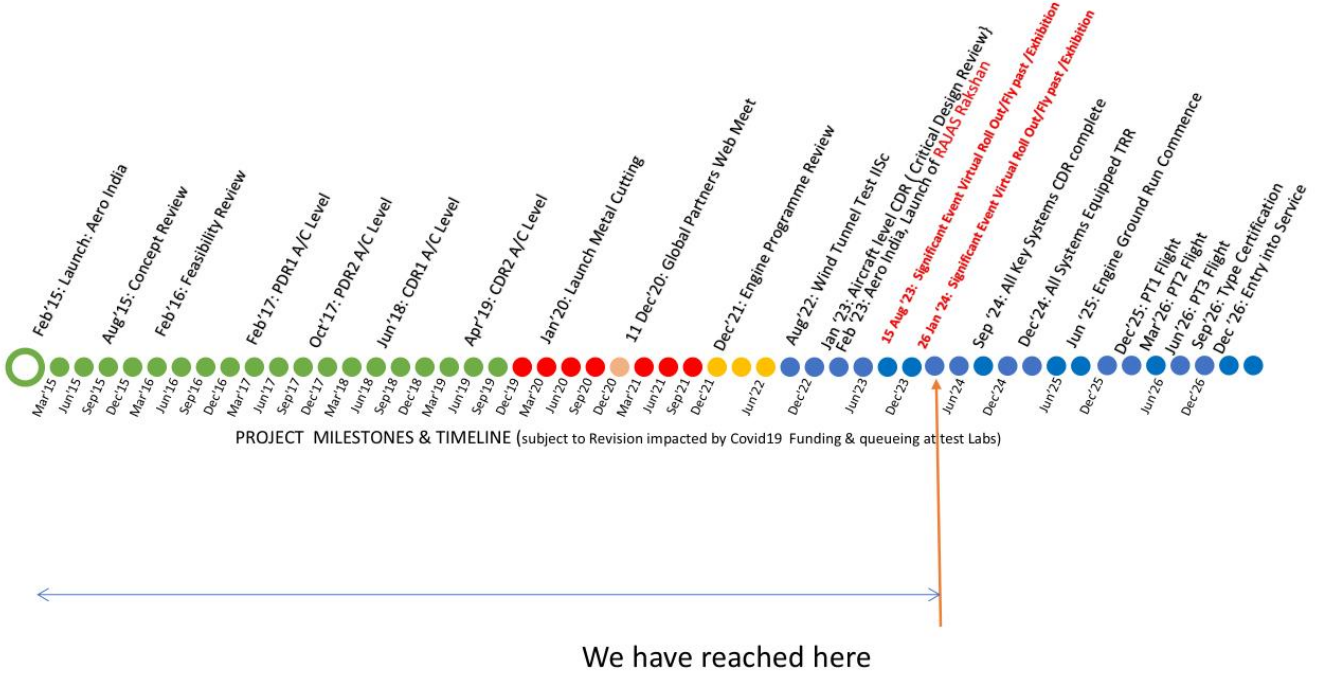
Point to Point travel ,requiring very short runway allowing to operate from smaller airports



angas
अंगस एरोनॉटिक्स इंडिया प्राईवेट लिमिटेड
ANGAS AERONAUTICS INDIA PRIVATE LIMITED

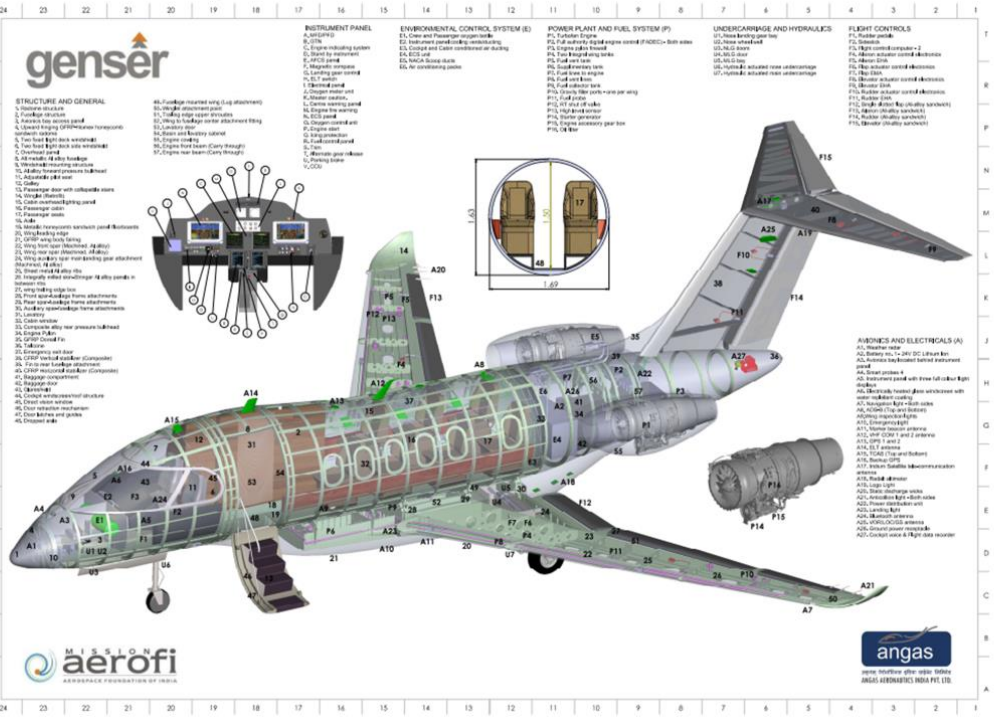
PROJECT EXCERPTS

Journey So far



PROJECT EXCERPTS

7b.Preliminary Design Done



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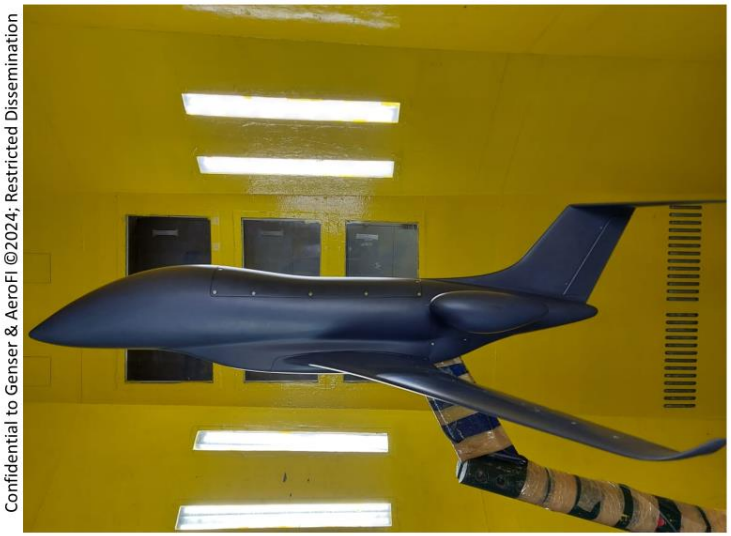
7c. Wind tunnel Testing done;



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Wind Tunnel Tests at IISc

PROJECT EXCERPTS

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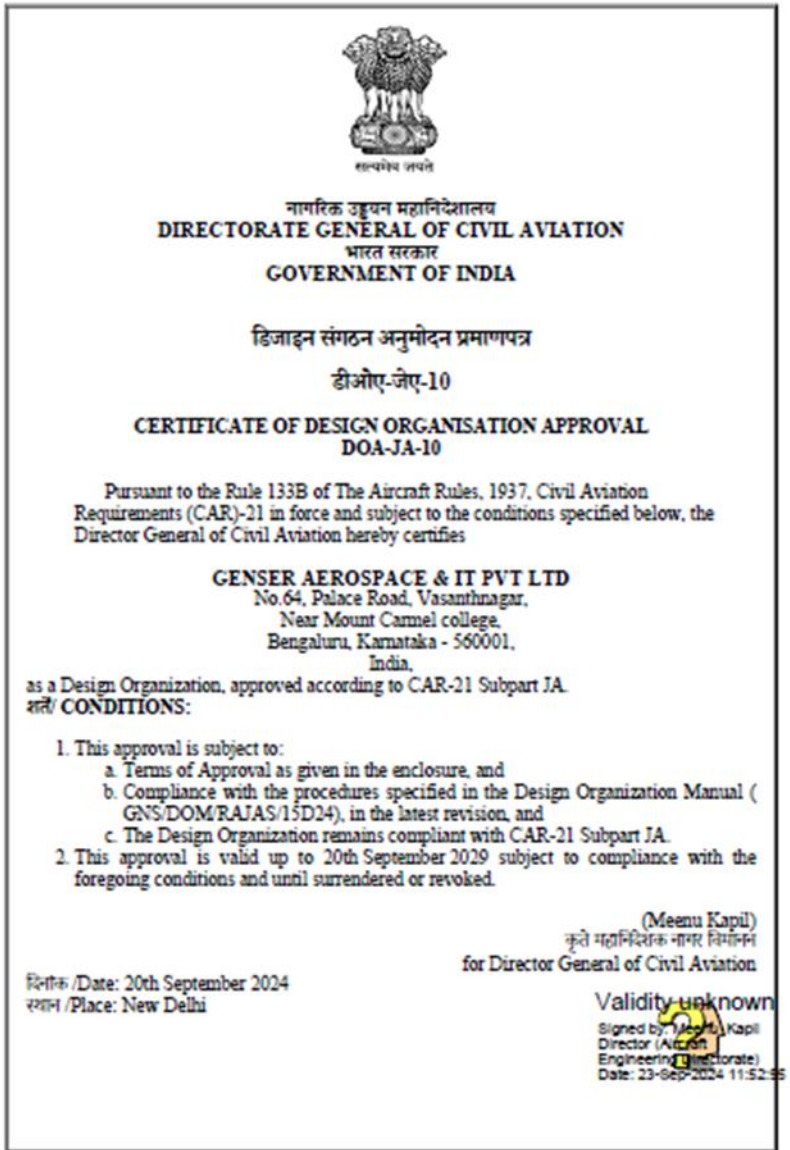
FULL SCALE MOCK UP AT JAKKUR FLYING SCHOOL HANGAR

DOA(Design Organisation Approval)



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GOVERNMENT OF INDIA

डिजाइन संगठन अनुमोदन प्रमाणपत्र

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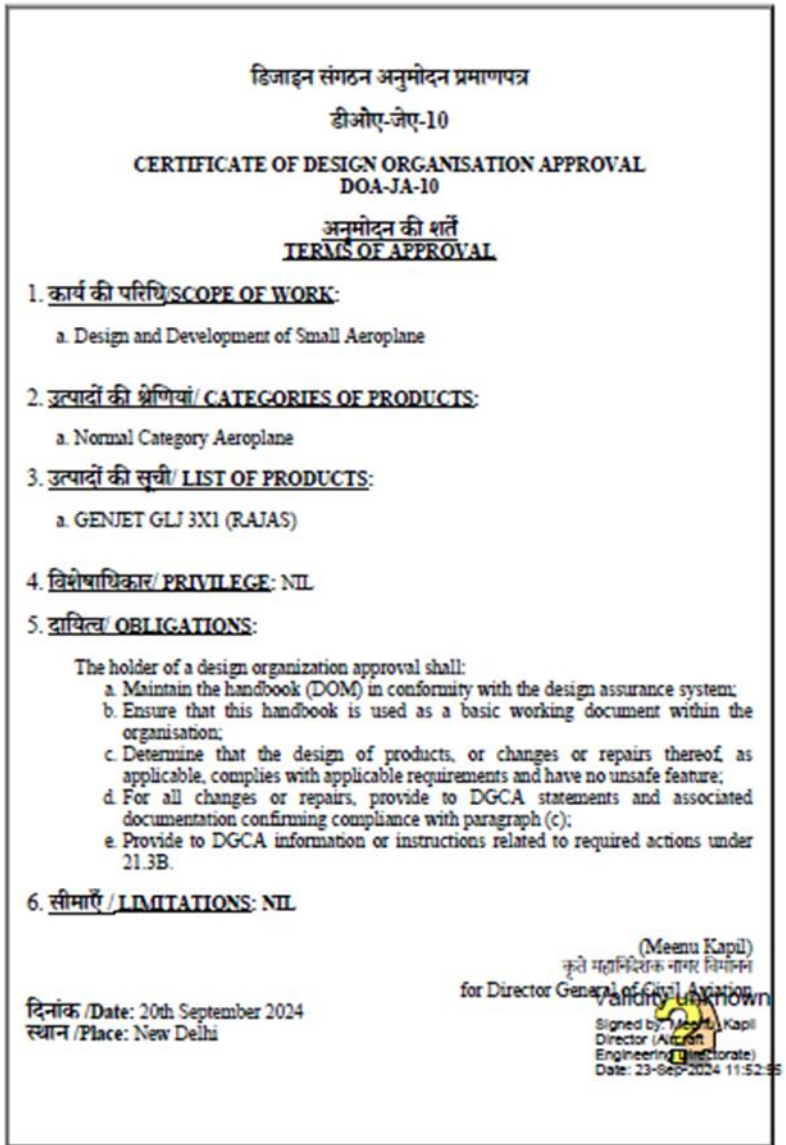
Validity unknown
Signed by: Meenu Kapil
Director (Aircraft Engineering Directorate)
Date: 23-Sep-2024 11:52:35



डिजाइन संगठन अनुमोदन प्रमाणपत्र

डीओए-जेए-10

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DOA-JA-10

अनुमोदन की शर्तें
TERMS OF APPROVAL

1. **कार्य की परिधि/SCOPE OF WORK:**
   a. Design and Development of Small Aeroplane
2. **उत्पादों की श्रेणियां/ CATEGORIES OF PRODUCTS:**
   a. Normal Category Aeroplane
3. **उत्पादों की सूची/ LIST OF PRODUCTS:**
   a. GENJET GLJ 3X1 (RAJAS)
4. **विशेषाधिकार/ PRIVILEGE:** NIL
5. **दायित्व/ OBLIGATIONS:**

   The holder of a design organization approval shall:
   a. Maintain the handbook (DOM) in conformity with the design assurance system;
   b. Ensure that this handbook is used as a basic working document within the organisation;
   c. Determine that the design of products, or changes or repairs thereof, as applicable, complies with applicable requirements and have no unsafe feature;
   d. For all changes or repairs, provide to DGCA statements and associated documentation confirming compliance with paragraph (c);
   e. Provide to DGCA information or instructions related to required actions under 21.3B.
6. **सीमाएँ / LIMITATIONS: NIL**

(Meenu Kapil)
कृते महानिदेशक नागर विमानन
for Director General of Civil Aviation

दिनांक /Date: 20th September 2024
स्थान /Place: New Delhi

Validity unknown
Signed by: Meenu Kapil
Director (Aircraft Engineering Directorate)
Date: 23-Sep-2024 11:52:35

Message to potential Private Investors & Participants

We invite you to Invest

if

- building Indigenous business Jet for India and for the world would enhance your **prestige, brand and value**
- this project brings **synergies** with what your business does
- this aircraft can be a **platform to launch your own aerospace activities**
- you desire to contribute to **ATMANIRBHARATA** through this "**never before in India & the only programme in Asia**"
- you want to be **part of the passionate team** who have embarked on a long haul journey of "**business of business jets**"

If answers to all the above are "**YES**",
we would wish to talk to you as to how we will assure reasonable ROI

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Investment and Technology Promotion Office (ITPO), Tokyo

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Thank you

Arunakar MISHRA
Honorary Vice President,SIATI
MD & CEO,Genser Aerospace
arunakar.mishra@genser.com