

Tusaş Engine Industries, Inc.



TEI Capabilities & Collaboration Opportunities

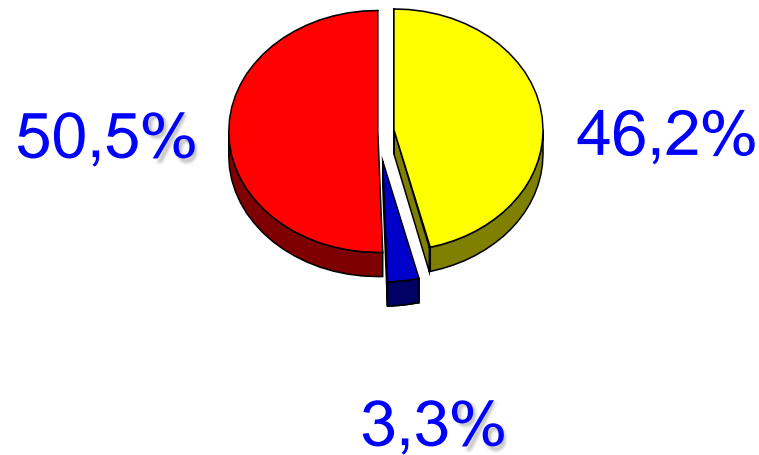
05 October 2010

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Share Holders

TEI is a Joint Venture between the Turkish Aerospace Industries-TAI and the General Electric of USA.

■ TAI ■ TSKGV & THK ■ GE

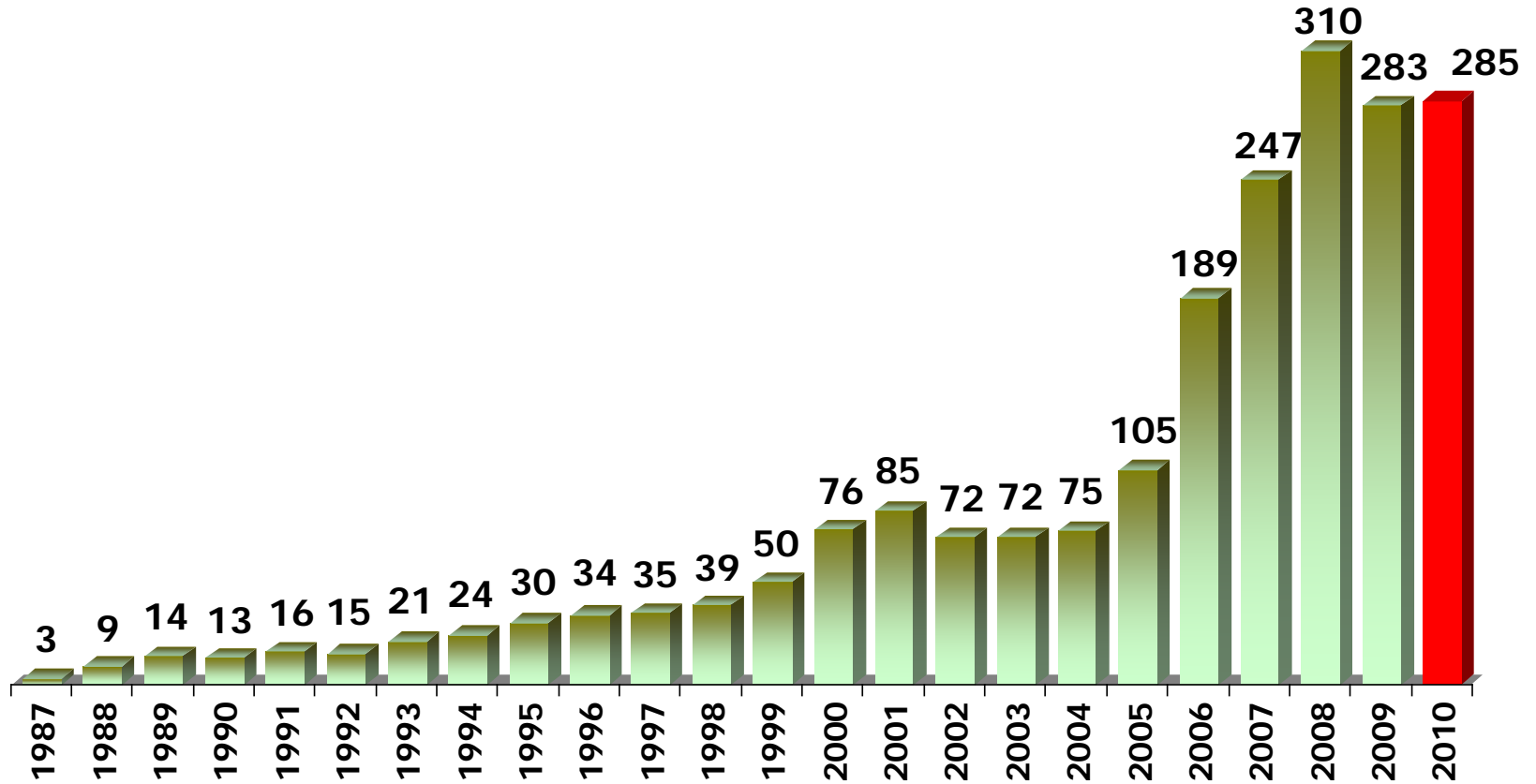


TEI Activities

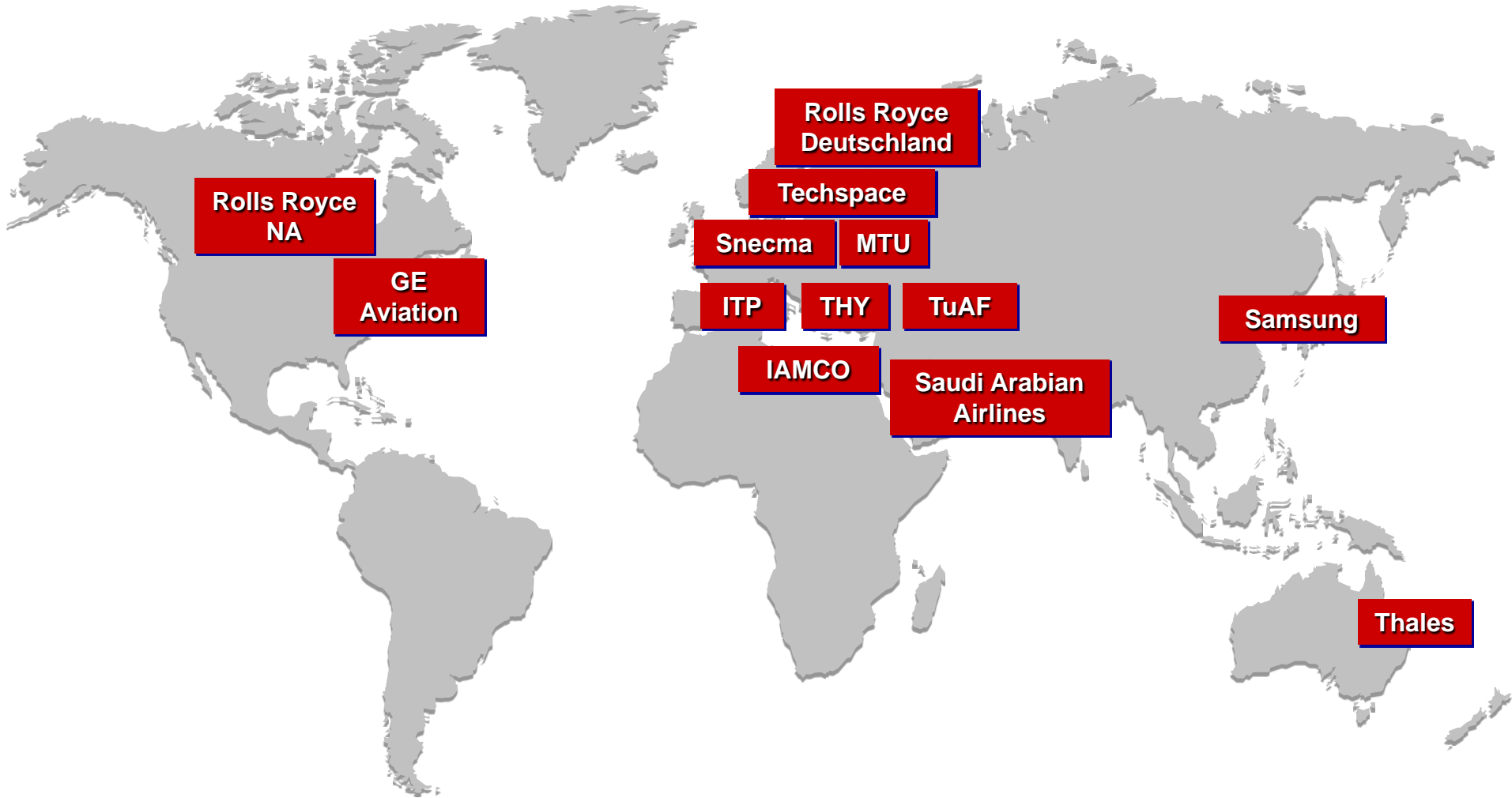
- **Engine Module and Parts Production**
 - More than 600 different parts for 33 engine programs
 - Rotating Parts Center of Excellence
- **Engine Assembly & Test**
 - F16 Aircraft - F110 Engine
 - Cougar Helicopter - Makila 1A1 Engine
- **Maintenance Repair & Overhaul**
 - NATO Awacs Aircraft - TF33 Engine
 - Cougar Helicopter - Makila 1A1 Engine
 - F-16 Aircraft - F110 Engine
 - CN235 Aircraft - CT7/T700 Engine
- **Services**
 - Field Service Representatives in all bases
 - Spare Parts Supply & Logistics Support
- **Design Engineering**
 - T38-J85 Ejector Design
 - A400M-TP400 Engine Program
 - Joint Strike Fighter (JSF) Engine Program
 - Unmanned Air Vehicles Engine Program

Total Sales

Million \$



Customers



Commercial Engine Programs



- B787
- B747

GE Enx

53,000-70,000 lbs.



- B777

GE90

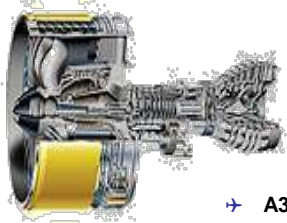
74,000-115,000 lbs.



- A319/A320/A321/A340
- DC8
- B737
- KC135
- E-3/E-6/KE-3A

CFM56

22,000-27,000 lbs.



- A380

GP7200

83,000 lbs.



- A300
- A310
- A330
- B747
- B767

CF6

40,000-73,000 lbs.



- Comac C919

LEAP X

18,000-35,000 lbs.



- CRJ700
- CRJ900
- 604
- 170/175
- 190/195

CF34

9,220-20,000 lbs.



- SUKHOI Superjet

SaM146

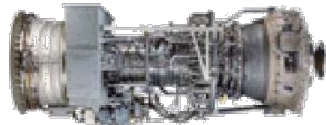
14,000-17,300 lbs.



- HondaJet
- Spectrum Freedom

HF120

2,630 lbs.



LM Series

Marine & Industrial Engines



- B727
- B737
- MD-80
- DC9

JT8D

14,000-17,400 lbs



- CN235
- 214ST
- EH101
- S70/S80/S92

CT7

1,700-2,145 lbs.



TUSAŞ MOTOR SANAYİ A.Ş.
TUSAŞ ENGINE INDUSTRIES, INC.



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Military Engine Programs



F110

100/129/132/400/SLEP
27,000-32,000 lbs.

- F-14
- F-15
- F-16



F136

40,000 lbs.

- F35 Joint Strike Fighter



F404

10,300-18,100 lbs.

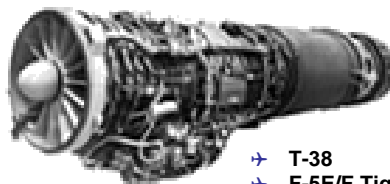
- T-50
- F/A-18
- F-117A
- Gripen



J79

17,820-18,730 lbs.

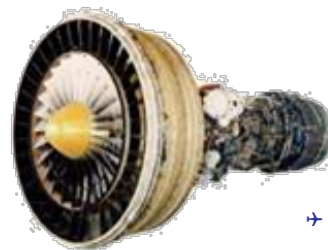
- B-58
- F-4
- F-104
- Kfir
- A3J Vigilante
- F-16/79



J85

2,850-5,000 lbs.

- T-38
- F-5E/F Tiger II



TF39

22,000-26,320 lbs.

- C-5



CT58

1,250-1,870 hp

- CH-46D/E
- HH-3E/F
- HH-46D
- S-61
- SH-3A/G/H
- SH-3D/H
- UH-3H



CTS800

1,360 shp.

- AW A129



F118

17,000-19,000 lbs.

- B-2
- U-2



TP400

10,000 shp.

- A400M



T700

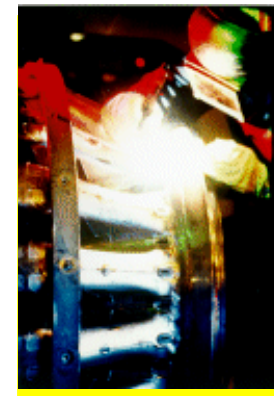
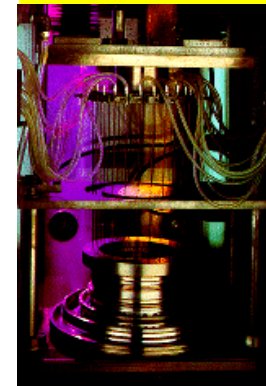
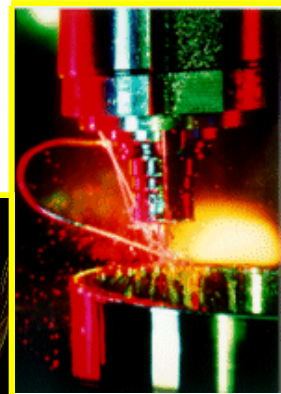
3,000 shp.

- H-60
- 214ST
- AH-1W



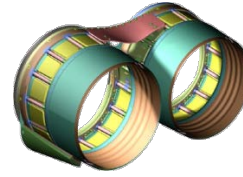
Manufacturing Capabilities

- CNC Machining/Grinding
- Disc Broaching
- Jig Grinding
- Fabrication (forming, punching, honeycomb applications, etc.)
- CNC Shot Peening
- CNC Plasma Spraying
- Electro-Chemical Milling, EDM, ECG
- Laser Machining
- STEM Drilling
- Vacuum Heat Treatment, Brazing
- TIG/Resistance Welding
- Gas shielded arc Welding
- Hard Chrome & Nickel Plating
- Macro Etching, Blue Etching
- Black Oxide
- Sermetal Painting
- Alkaline & Titanium Cleaning
- F.P.I. / M.P.I. / Ultrasonic Inspection
- Eddy Current Inspection / X-ray Inspection
- C.M.M. / Stack Projection



Design Engineering Projects

→ Development of J85 Ejector System (1997)



→ A400M / TP400 Project (RRSP) (2003)



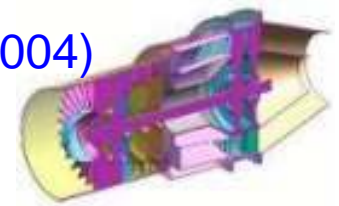
→ F136 Component Design (2005)



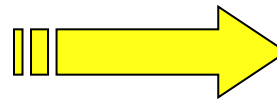
→ Türkiye Technology Center (TTC) (2007)



→ UAV Turboprop / Turbojet Engine Projects (2004)



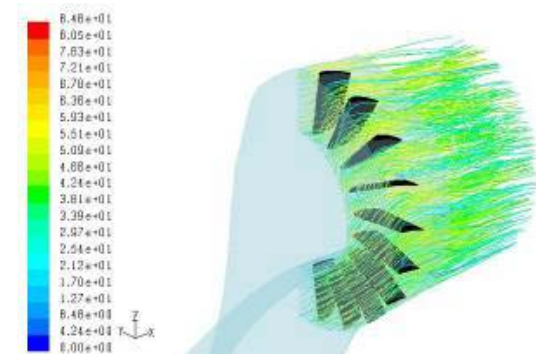
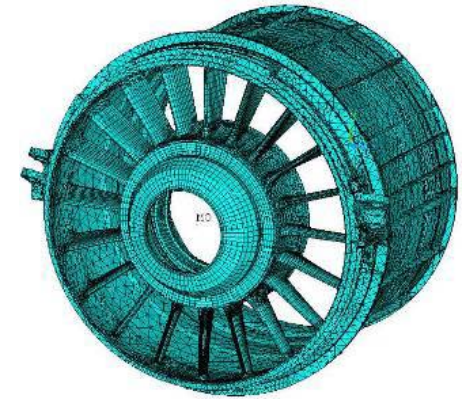
RRSP / RSP Partnerships



Indigenous Design

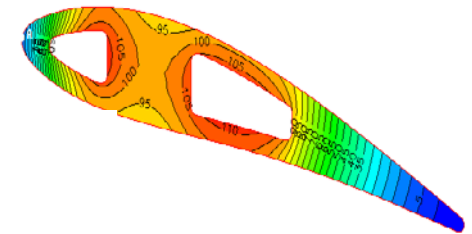
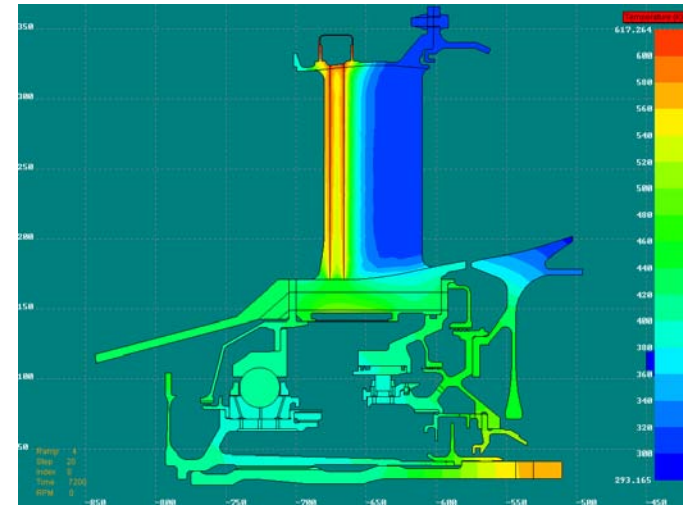
TEI Design Capabilities

- Mechanical Design and Detailing, (Unigraphics)
- Structural analyses (Stress, modal, harmonic, spectrum, buckling, HCF, LCF) (ANSYS, FeSAFE, SA16) and simulations,
- CFD analysis of rotating and non-rotating modules, (Fluent, Numeca, Axstream, NREC)



TEI Design Capabilities

- Thermal analysis and simulation, (SC03, ANSYS)
- Flow network analysis and simulation for secondary air systems, (EcoSimPro, FlowMaster)
- Thermodynamic cycle analysis, (GasTurb, in-house codes)
- Validation Engineering
- Configuration Management
- Procurement and Cost analysis
- Test Instrumentation design and application
- Reliability and Maintability



Projects



- A400M Transportation Aircraft Project (TP400 Engine, RRSP with ITP)
- F35 JSF F136 Project (Production & Design)
- Turkish Utility Helicopter Project (Licensed Eng. Production incl. AIT)
- Attack Helicopter Project (Modular Production)
- POIV F16 Aircraft Procurement Program (F110-GE-129B Engine AIT)
- Target Aircraft & UAV Projects (TEI-TP-1X Turboprop Engine)
- Blisk Spool Production (F136, GEnx, CF6, LMS Engines)

Collaboration Opportunities with Ukrainian Companies

- TEI is open to any collaboration proposals for the below items:
 - FP7 Projects (Esposa etc.)
 - Domestic engine development projects
 - Partnership in multinational engine projects
 - Others

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Quarter Century in the Sky...

Thank You!