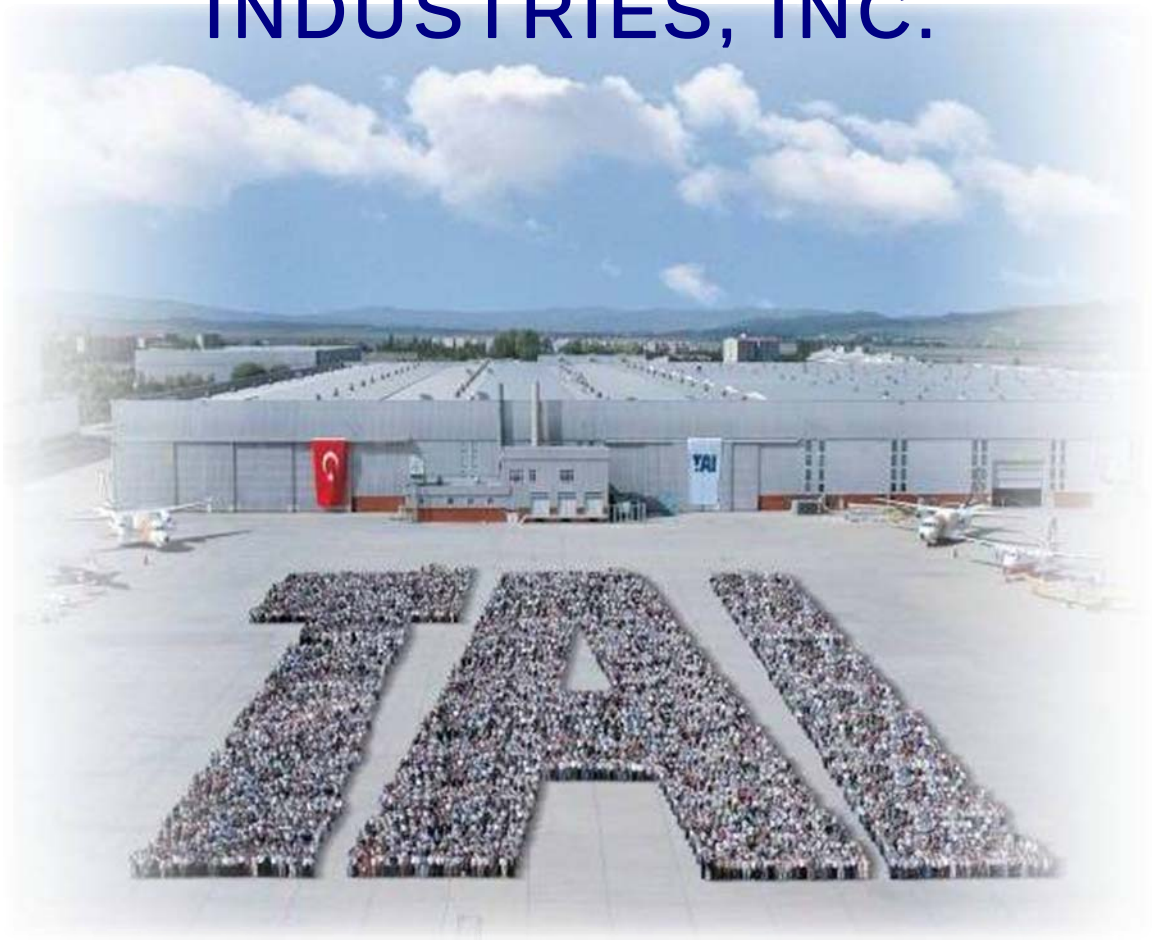
TURKISH AEROSPACE INDUSTRIES, INC.



ESTABLISHMENT

May 1984 **Established in 1984 as a joint venture company for co-production of F-16 a/c in Turkey**

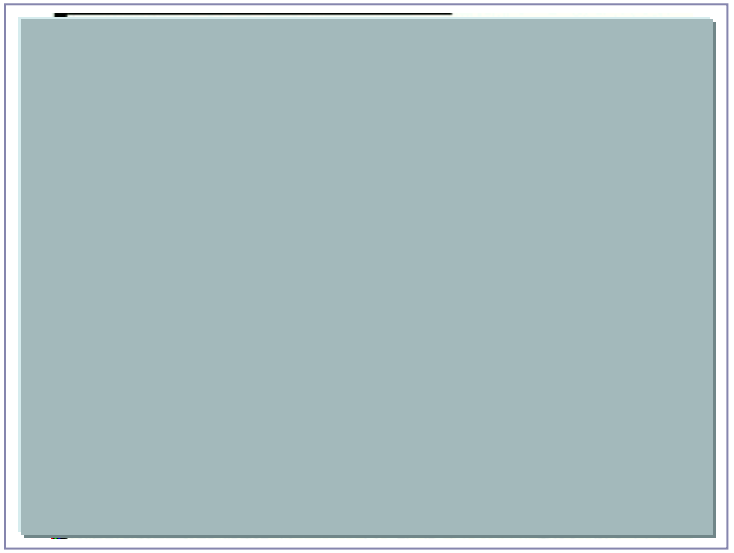
Jan 2005 **Lockheed Martin and General Electric shares were bought by TUSAS**

Apr 2005 **TAI and TUSAS merged in the name of TAI**

- **Total Area : 5 million sqm**

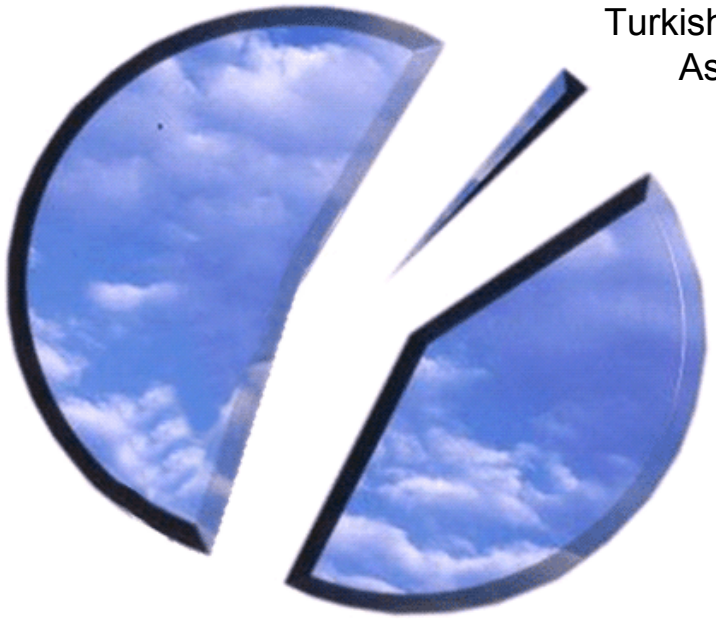
  Akıncı* : *205.000 sqm under roof
  Technopolis* : *4.000 sqm

- design and engineering
- manufacturing and final assembly
- chemical process
- composite / metal bonding
- aircraft painting
- flight operations
- satellite integration & test center



SHAREHOLDERS

Turkish Armed Forces Foundation
54.49%



Turkish Aeronautical Association
0.06%

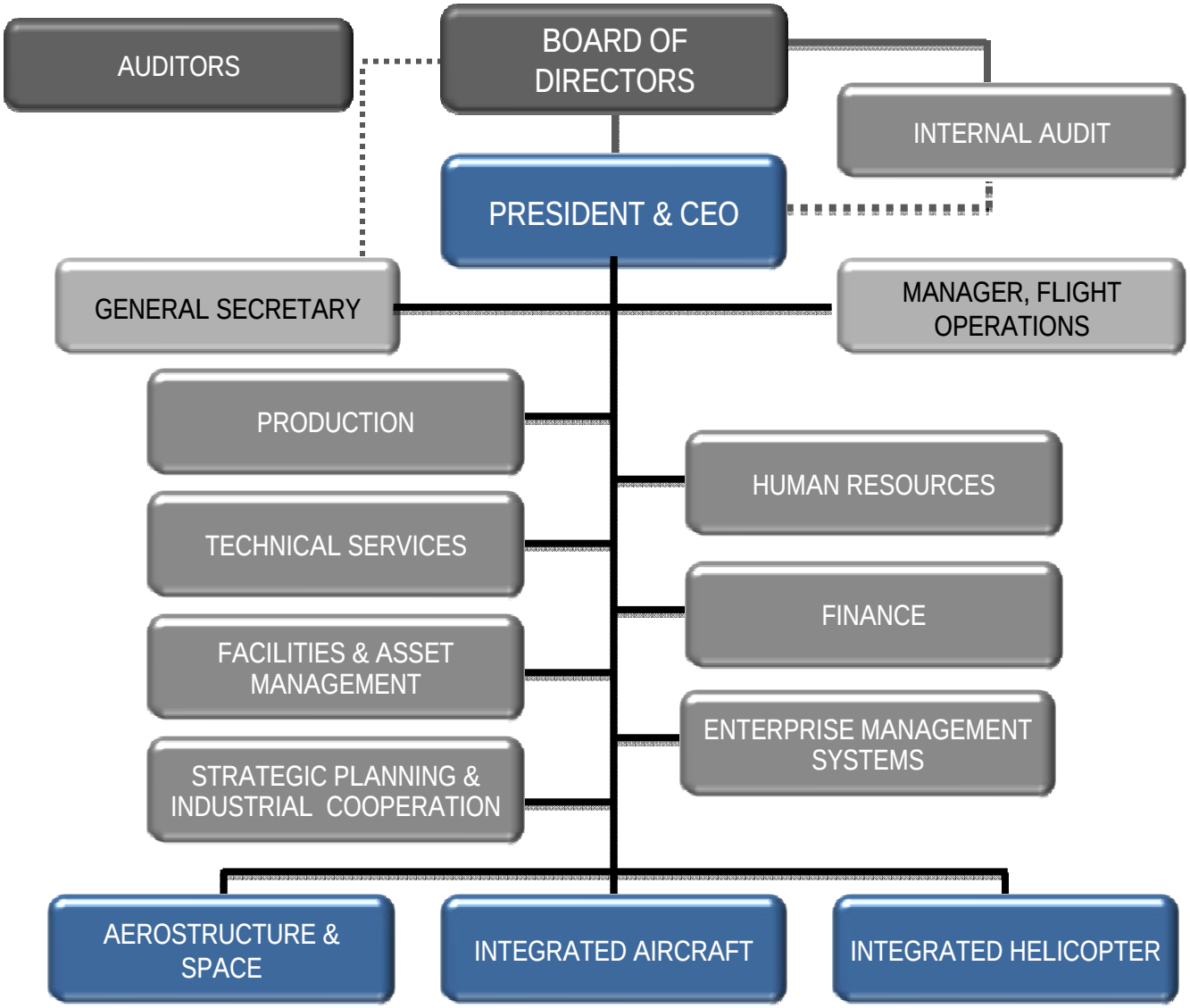
Undersecretariat for Defense Industries
45.45%

MAJOR SUBSIDIARIES

TEI

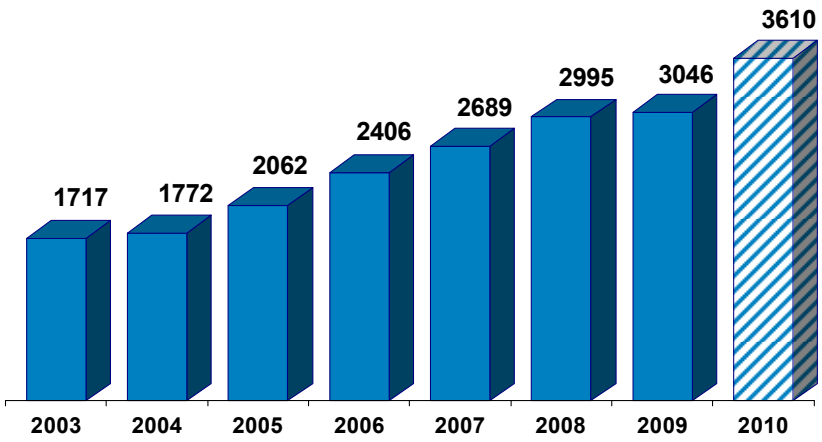
AIRBUS MILITARY

ORGANIZATION

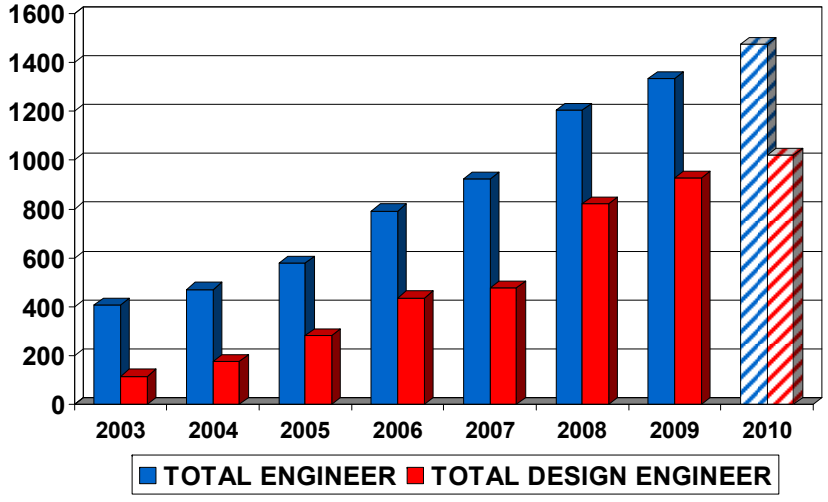


PERSONNEL STATISTICS

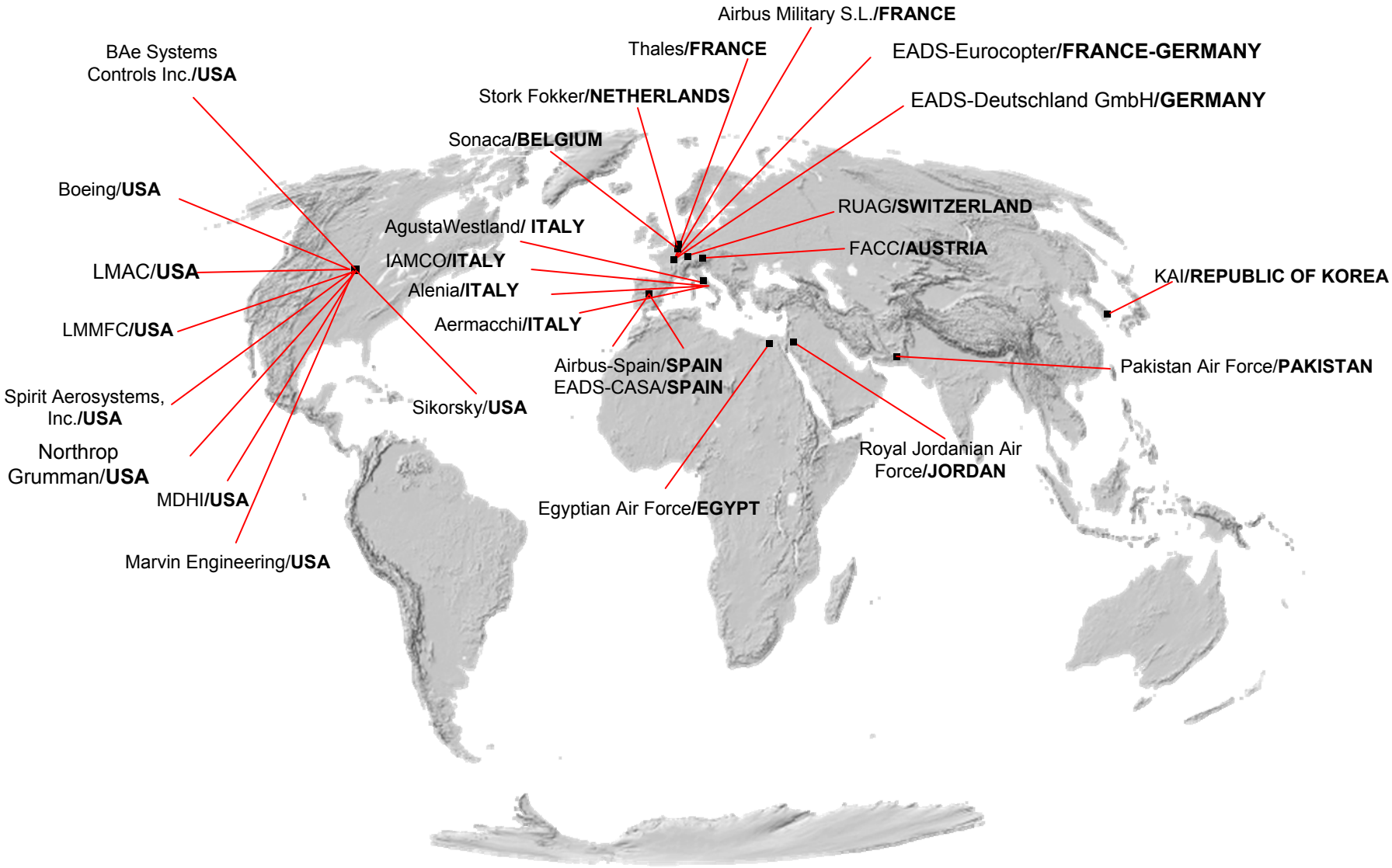
MANPOWER HISTOGRAPH



TOTAL ENGINEER/DESIGN ENGINEER



CUSTOMERS

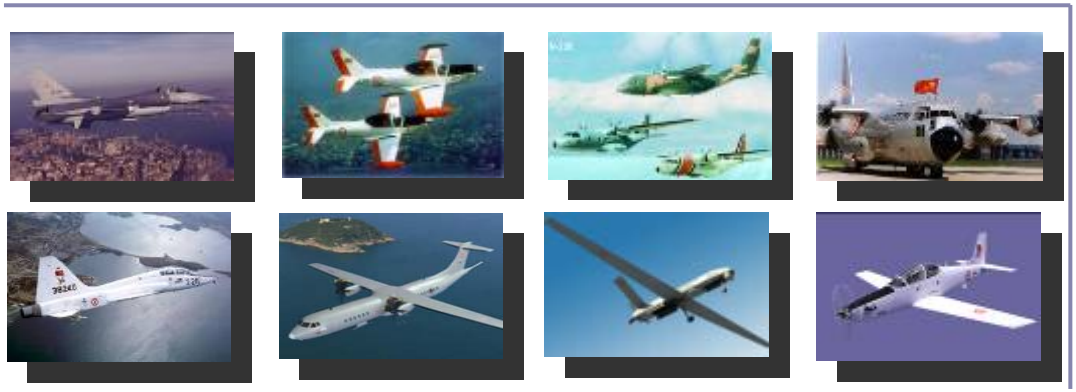

Airbus Military S.L./FRANCE
Thales/FRANCE
EADS-Eurocopter/FRANCE-GERMANY
BAe Systems Controls Inc./USA
Stork Fokker/NETHERLANDS
EADS-Deutschland GmbH/GERMANY
Sonaca/BELGIUM
Boeing/USA
RUAG/SWITZERLAND
AgustaWestland/ ITALY
FACC/AUSTRIA
LMAC/USA
IAMCO/ITALY
KAI/REPUBLIC OF KOREA
Alenia/ITALY
LMMFC/USA
Aermacchi/ITALY
Airbus-Spain/SPAIN
EADS-CASA/SPAIN
Pakistan Air Force/PAKISTAN
Spirit Aerosystems, Inc./USA
Sikorsky/USA
Royal Jordanian Air Force/JORDAN
Northrop Grumman/USA
MDHI/USA
Egyptian Air Force/EGYPT
Marvin Engineering/USA

QUALITY

Certifications

- **TAI meets the stringest quality standards in the world satisfying :**
  - *AQAP-2110*
  - *ISO-9001 : 2000*
  - *AS EN 9100*
  - *AECMA-EASE*
  - *NADCAP*
  - *DOA (under Airbus)*
  - *POA*
- **CMMI-Maturity Level 3 Certificate**
- **ISO/IEC 27001:2005**
- **OHSAS 18001:2007**

MAIN ACTIVITIES

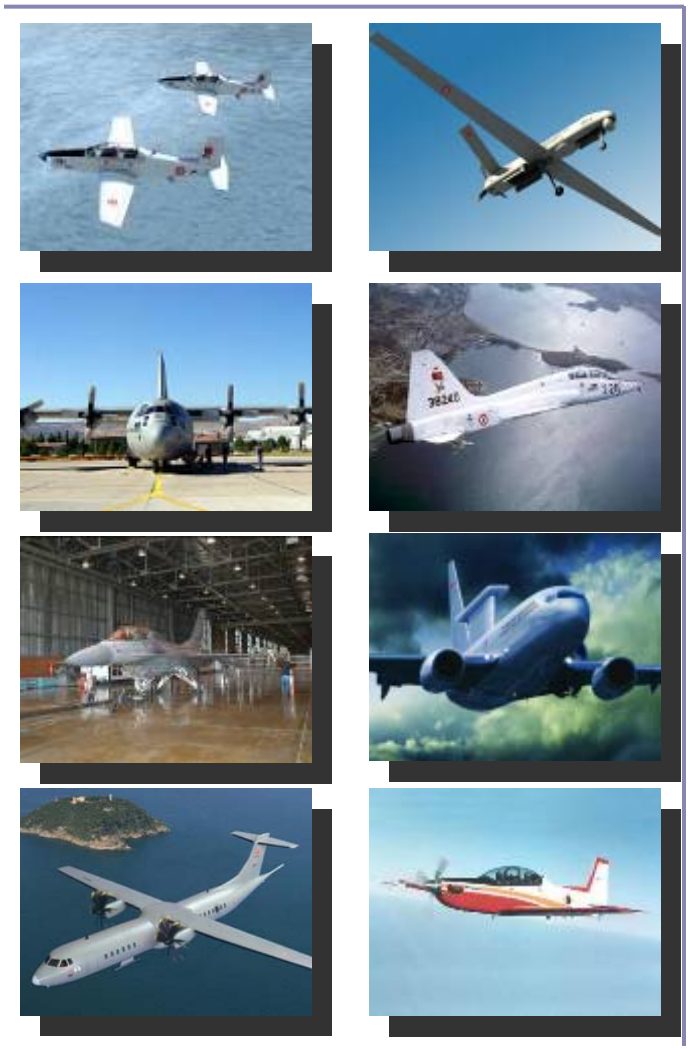


- **Integrated Aircraft**

- **Integrated Helicopter**

- **Aerostructure & Space**

INTEGRATED AIRCRAFT

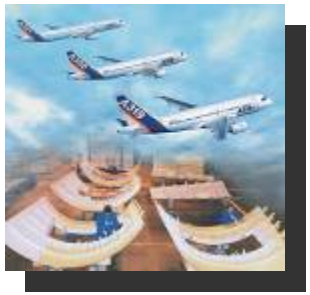


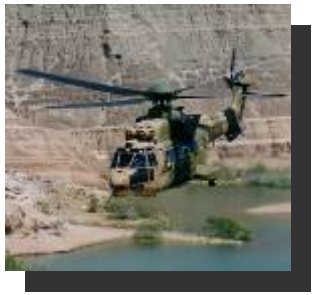
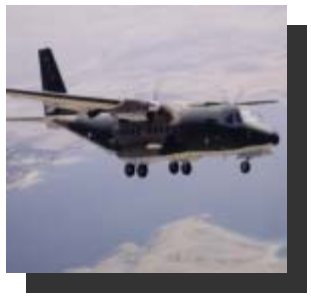
- **Indigenous Development**
  - Turkish Basic Trainer Aircraft (HÜRKUŞ)
  - UAV Development
- **Modernization & Systems Integration**
  - C-130 Avionics Modernization
  - T-38 Avionics Modernization
  - F-16 Mod. - Turkish Air Force
  - F-16 Mod. - Royal Jordanian Air Force
  - F-16 Mod. - Pakistan Air Force
  - AEW&C (B737)
  - MPA / MSA (CN-235)
  - MPA (ATR-72)
- **Co-production**
  - KT-1 Basic Trainer Aircraft
  - F-16 Program (Turkish Air Force)

INTEGRATED HELICOPTER

- **S-70 Blackhawk Systems Integration (Yarasa)**
- **Attack Helicopter Program**
- **Indigenous Light Utility Helicopter Development**
- **TLFC-Utility Helicopter**

AEROSTRUCTURE & SPACE



- **AgustaWestland**
  - AW-139 Fuselage
- **Airbus Commercial**
  - A350 Ailerons Design to Build RSP
  - A319/320/321 Fuselage Panel
  - A380 D-Nose Panel Stretching Shells
- **Boeing Commercial**
  - B787 Elevator, Fuselage Skin Plating & Cargo Compartment Separation Panel
  - B737, B747, B777 Aerostructures
- **Eurocopter**
  - EC-135 Rear Doors & Engine Cowlings
  - AS-532 Components
- **CASA**
  - CN-235 Center Fuselage
  - CN-235 MLG Fairing & Engine Mount
- **Sikorsky**
  - S-70, S-70/MH-60, S-70/UH-60, S-76 Components
- **Stork Fokker**
  - Gulf Stream G650 Fuselage Skins

AEROSTRUCTURE & SPACE

A400M

Order
180+12

7 50 60 1 27 10 25 8 4

TAI's workshare in Design, Manufacture & Logistic Support :

Structural

- forward-center fuselage
- paratroop doors & hatch doors
- tail cone and upper shell on rear fuselage
- ailerons / spoilers
- emergency exit door

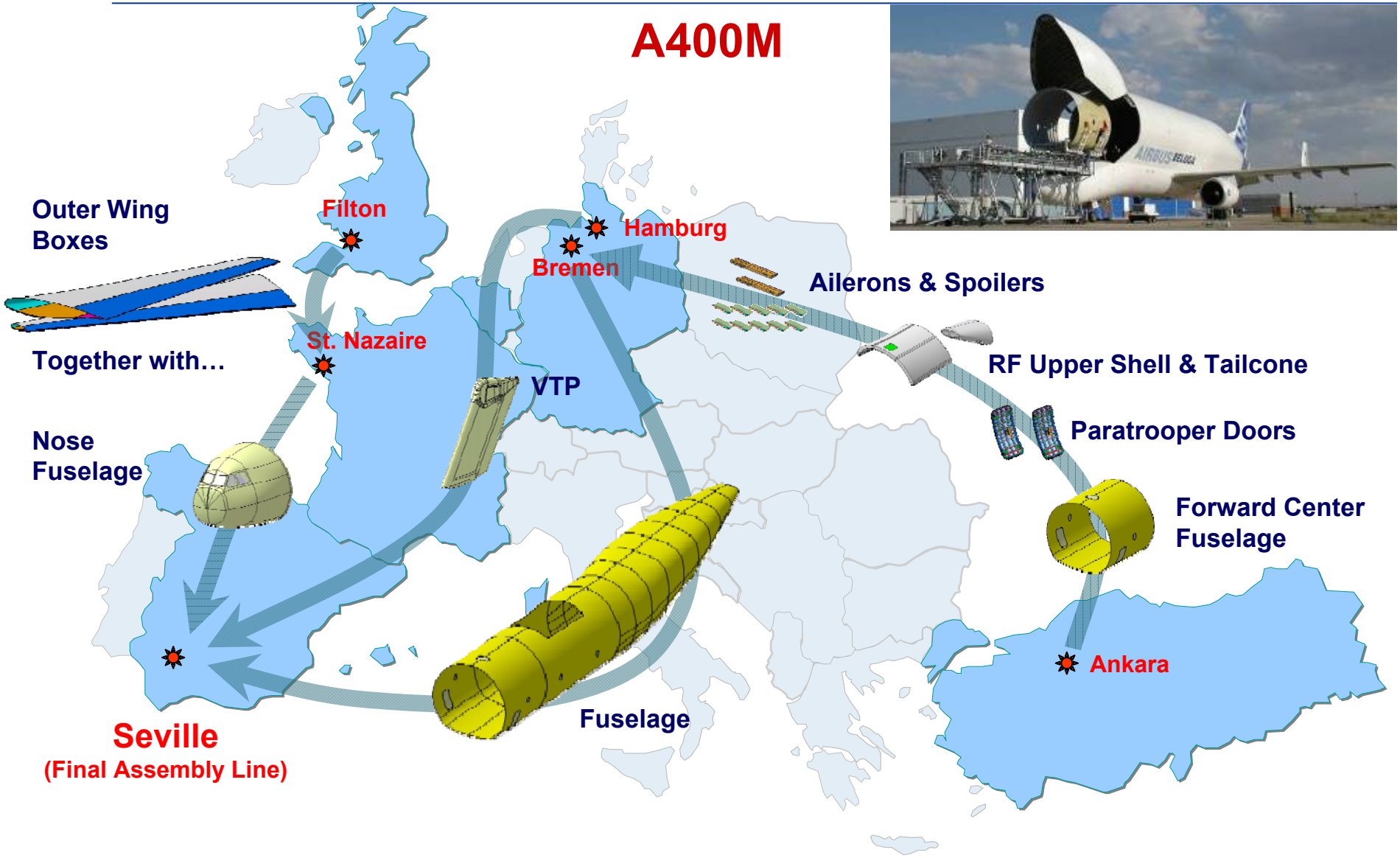
Systems

- lighting and water / waste systems

Other

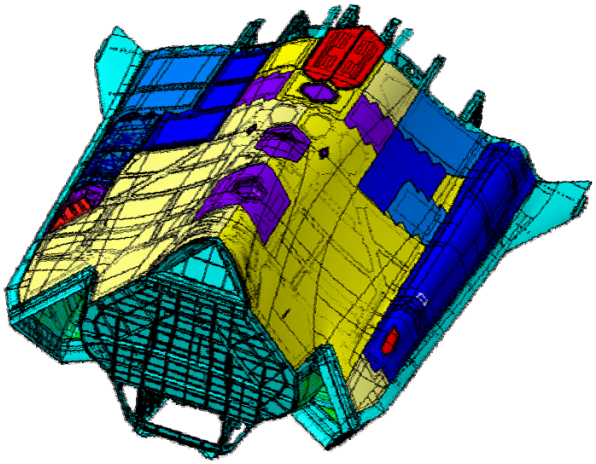
- fuselage harness (manufacturing)

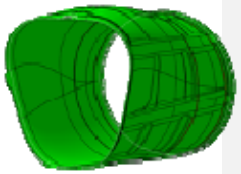
AEROSTRUCTURE & SPACE

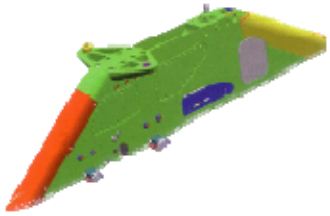


AEROSTRUCTURE & SPACE

F-35 JOINT STRIKE FIGHTER







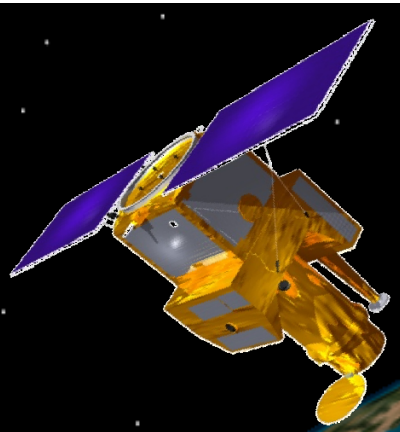
NORTHROP GRUMMAN

- F-35 (JSF) Center Fuselage
- F-35 (JSF) Composite Components

MARVIN ENGINEERING

- F-35 (JSF) Air-to-Ground Pylon

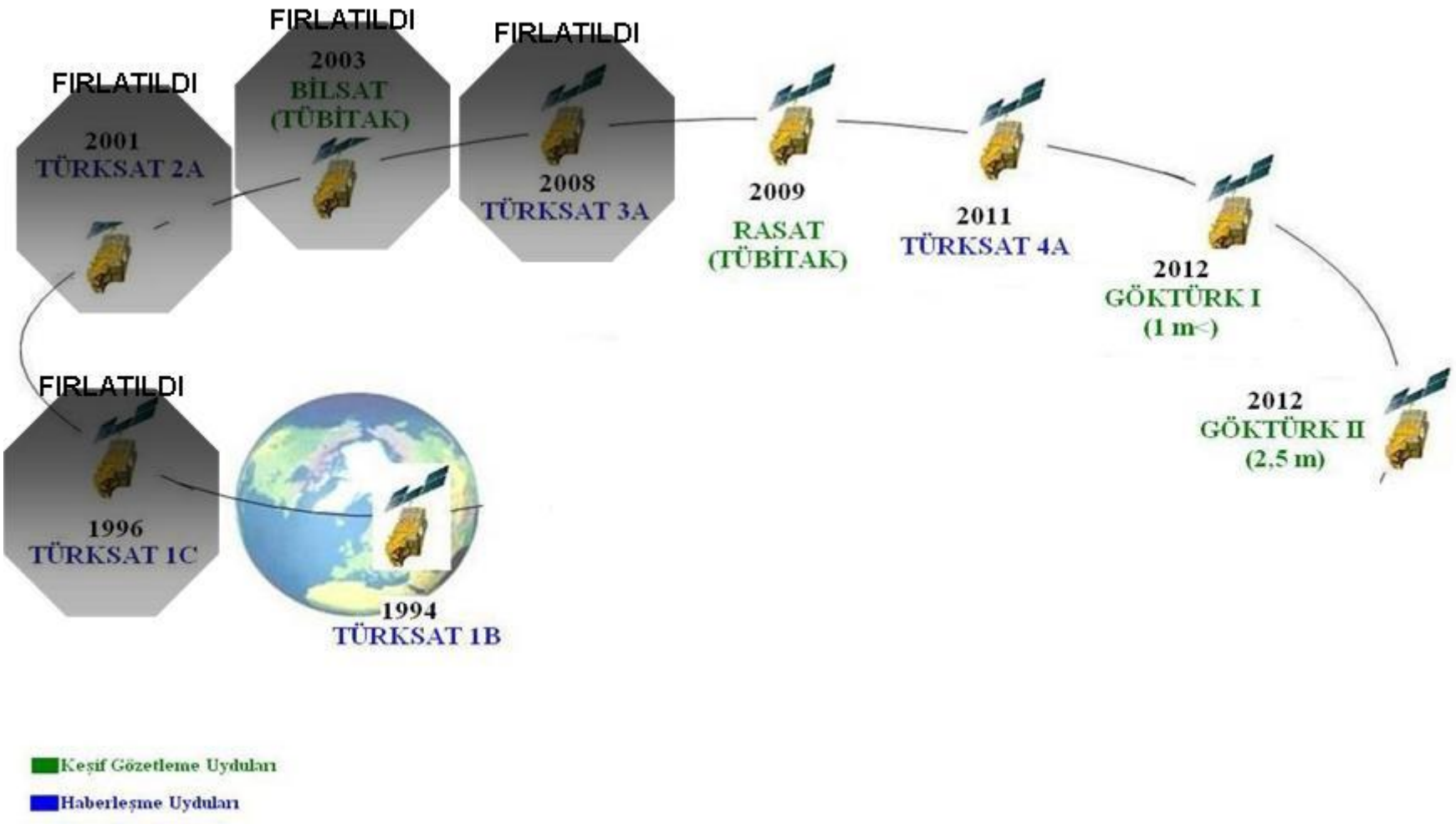
GÖKTÜRK Satellite Programs



AEROSTRUCTURE & SPACE

- **Observation Satellite with a 1 meter resolution (co-production)(GÖKTÜRK 1)**
- **Observation Satellite with a 2.5 meter resolution (development) (GÖKTÜRK 2)**
- **Gyroscope Development**

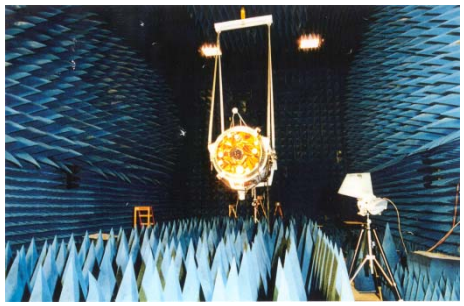
NATIONAL SPACE ROADMAP



NATIONAL SPACE ROADMAP AND TAI 1

In accordance with the resolution taken at the Defense Industry Executive Committee meeting in June 2005,

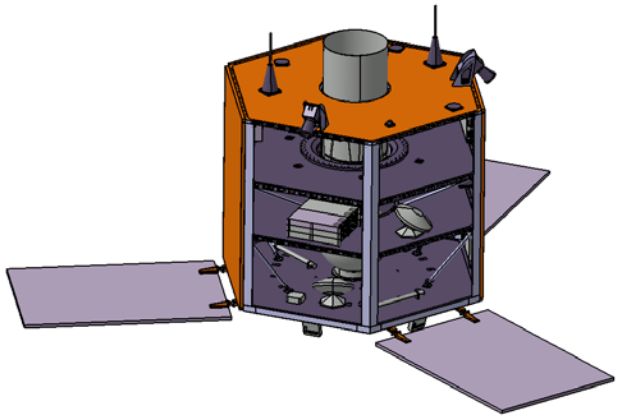
- **TAI is the main local contractor in GÖKTÜRK Programs and prime contractor in military satellite projects,**
  - **GK (Contract has been signed)- Telespazio**
  - **GK-2 (partnership with TÜBİTAK SPACE)-National Program**
  - **ADCS subsystem and other subsystems R&D project**
- **National Satellite Assembly, Integration and Testing (AI&T) Facility shall be established in 2012 at TAI.**



NATIONAL SPACE ROADMAP AND TAI 2

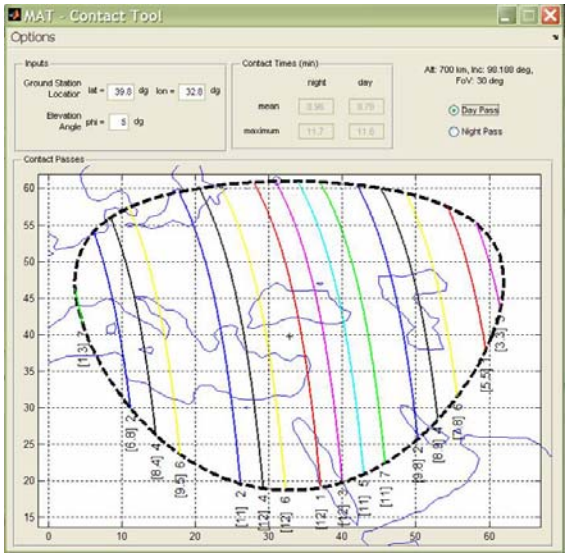
- **GÖKTÜRK Program:** **Remote Sensing LEO satellite procurement and development program.**
  - **GK: As a result of an international tender, SSM (Procurement agency) signed the contract with TELESPAZIO for Göktürk satellite system. TAI's role: Main local partner. System level design, structure, thermal, AODCS, OBDH, etc. In addition, AIT activities will be done in TAI.**
  - **GK-2: National tender, MoD, TAI established a partnership with TUBİTAK Space Technologies Research Institute. In addition to subsystem level roles, TAI- TUBİTAK Space Technologies Research Institute partnership is working together to conduct system level activities.**
- **Subsystem R&D Projects**
  - **Capability, infrastructure development activities, know-how improvement tasks.**

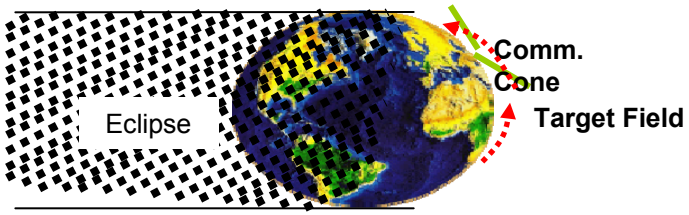
SATELLITE DEVELOPMENT ACTIVITIES 3



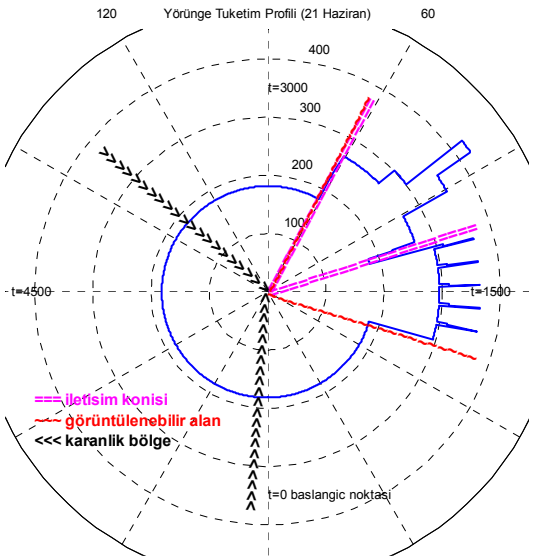
Systems Engineering;

- ***Requirement Management***
- ***Mission and Operation Analysis***
- ***Reliability, Safety***
- ***Accomodation Design***
- ***Harness Routing etc.***

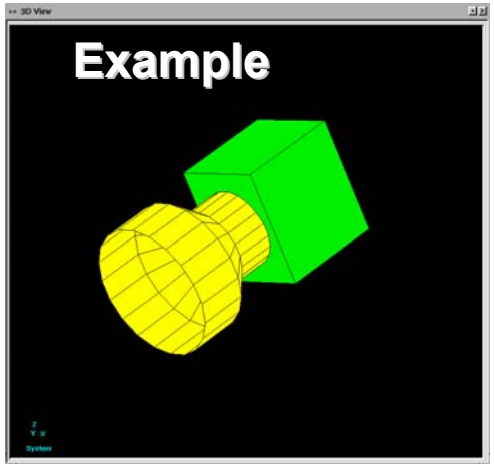




Mission & Operation Design Tools

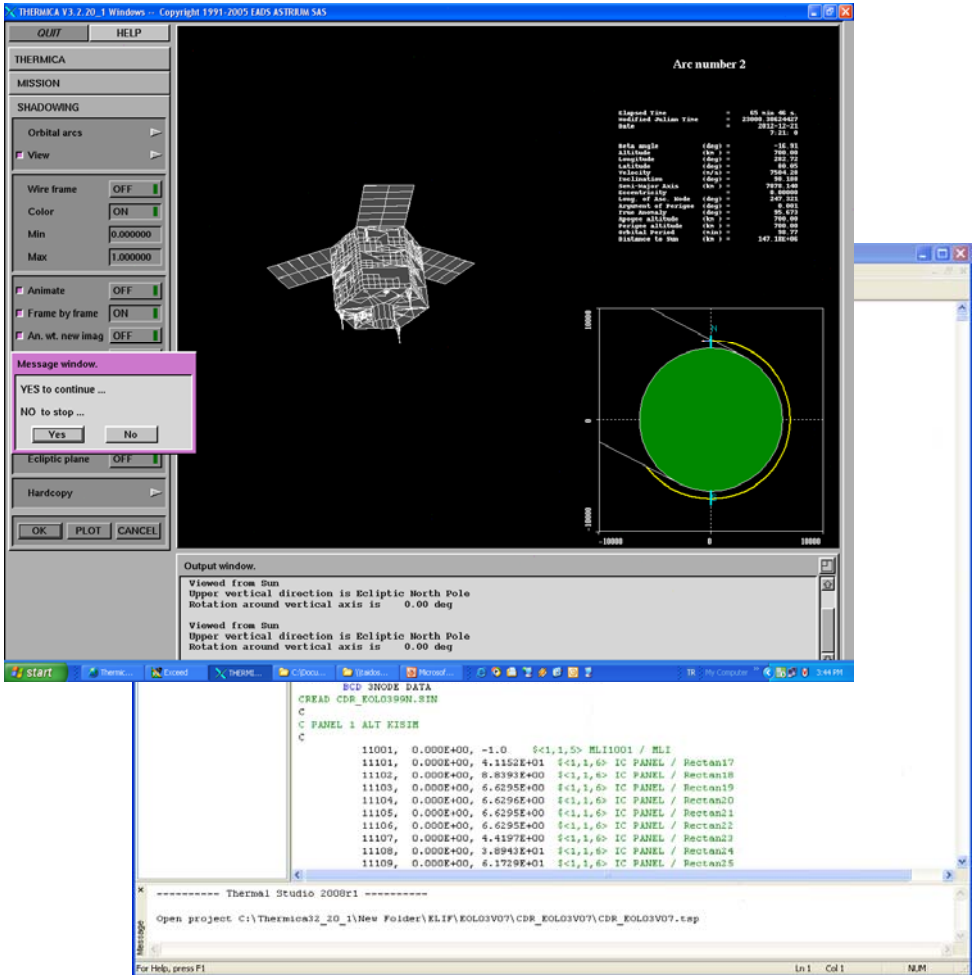


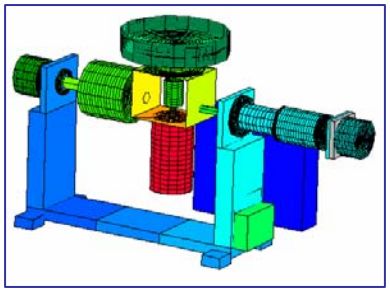
SATELLITE DEVELOPMENT ACTIVITIES 4

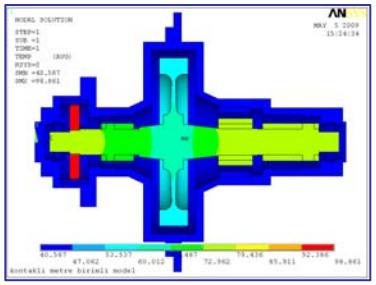


Thermal Geometric Modelling

Thermal Design Engineering



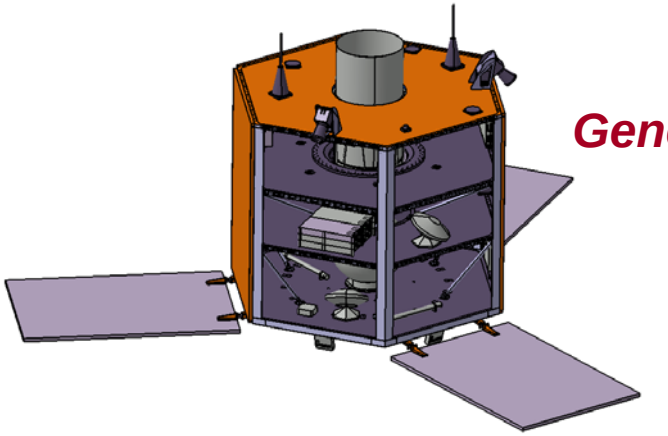




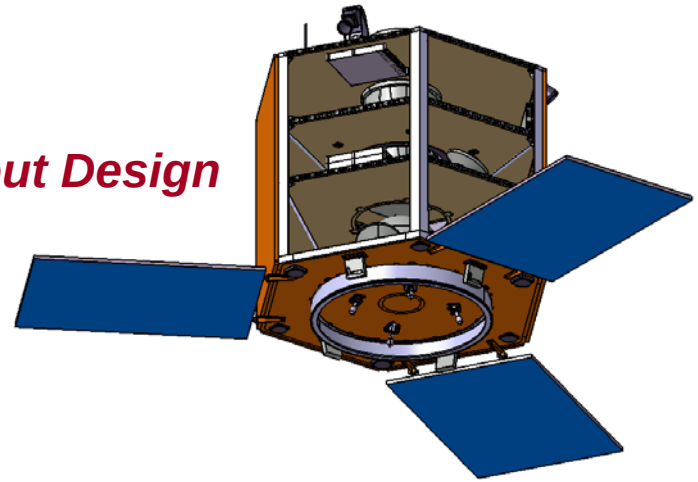
Thermica / SindaG

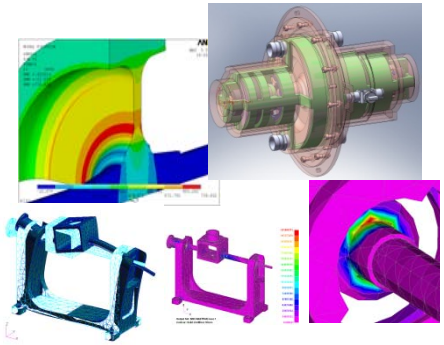
SATELLITE DEVELOPMENT ACTIVITIES 5

Structural Engineering

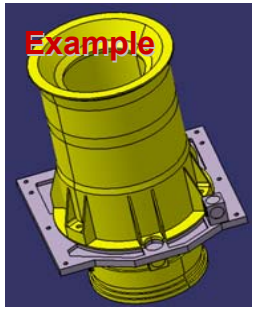


General Lay-out Design





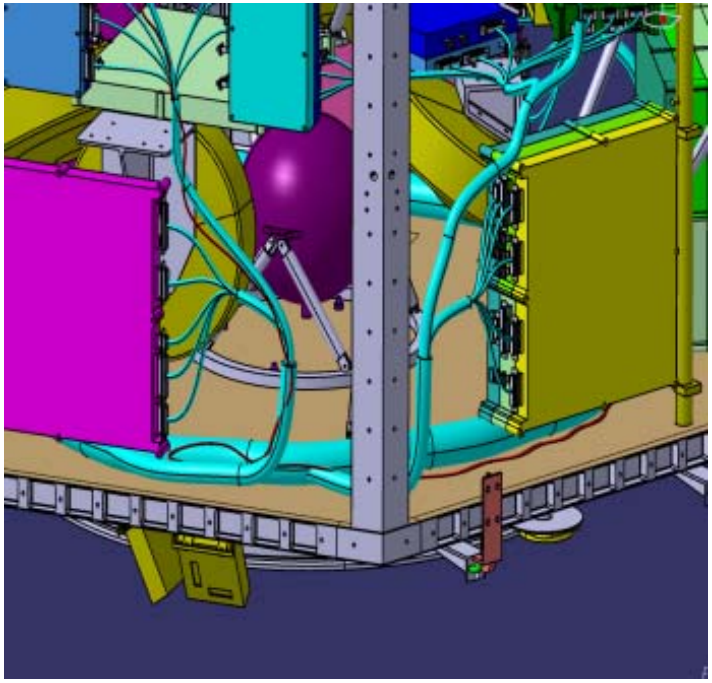
Component Design



- **Structrual 3D Modelling and General Layout (CATIA – UG)**
- **Structural Analysis (Nastran - Patran)**

SATELLITE DEVELOPMENT ACTIVITIES 6

Harness Design by LCable/Zuken
Harness Routing by Catia



Harness Routing

Harness Workshop

SATELLITE DEVELOPMENT ACTIVITIES 7

Satellite Mechancial Ground Support Equipments

Multi Purpose Trolley

Satellite Container

Satellite Lifting Device

SATELLITE DEVELOPMENT ACTIVITIES 8

Examples for Development Activities

- **Establishment of satellite specific processes and methodologies;**
  - ✓ **Design and testing processes in accordance with ECSS standarts,**
  - ✓ **Validation & verification processes for internally developed design – analysis tools,**

- **Subsystem development;**
  - ✓ **AODCS development; hardware, software, validation & verification through HIL tests,**
  - ✓ **Satellite command & control tasking, software algorithms, validation & verification,**

OUR MISSION

Leading the development of Turkey's aerospace industry.

OUR VISION

Becoming a "World Brand Aerospace Company" with indigeneous products and global competitive power.

Contact Point:
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fboran@tai.com.tr
Tel:+90 312 811 18 00 / 3650

www.tai.com.tr

TURKISH AEROSPACE
INDUSTRIES, INC.