The TECHNOLOGY PARTNERS Foundation

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Strategic and Targeted Support for Europe-Ukraine Collaboration in Aviation Research

AERO.UA Project

Kiev, April 19-20, 2017

The TECHNOLOGY PARTNERS Foundation

- **Research and Technology Organisation, Advanced Technology Centre**
- **Specialising in RTD and Innovation Management**
- **Focus on performance of large, interdisciplinary projects**
- **Private, Non-for-Profit**
- **Coordinator of the *TECHNOLOGY PARTNERS Consortium*, composed of leading Polish RTOs:**
  - **Air Force Institute of Technology**
  - **Institute of Advanced Manufacturing Technology**
  - **Institute of Non-Ferrous Metals**
  - **Institute of Applied Optics**
  - **Road and Bridge Research Institute**
  - **Automotive Industry Institute**
- **Extensive cooperation with Warsaw University of Technology**

Selected areas of special interest in materials engineering for aerospace

- **CNT-doped thermoplastic veils for improving electrical and mechanical performance of composites (H2020 PLATFORM)**
  - **Suitable for Antistatic or EMI Shielding applications.**
  - **Produced by the use of melt-blown technology.**
  - **Inserted into GFRP or CFRP during manufacturing of composites using infusion or pressing methods, as well as an autoclave.**

- **Development of technologies and predictive simulation tools for avoiding or mitigating accretion of ice (H2020 PHOBIC2ICE)**
  - **Collection of fundamental knowledge of phenomena associated with icephobicity issues.**
  - **Design and fabrication of icephobic surfaces with improved functionalities by applying innovative simulation and modelling.**
  - **Development of several types of polymeric, metallic and hybrid coatings using different deposition methods.**
  - **Preparation of laser treated and anodized surfaces.**

Participation in the AERO.UA project

- **Leader of two Work Packages:**
  - **Pilot Project 3.1b: Aerospace composite structural health monitoring system**
  - **Project 3.2a: Engine health management system**
- **Participation in three other:**
  - **Pilot Project 3.1a: Advanced design of aerospace composite structures**
  - **Pilot Project 3.2a: Engine health management system**
  - **Pilot Project 3.3b: Manufacturing aerospace composite structures**

Air Force Institute of Technology

AFIT History Dates back to 1918, when the Scientific & Technological Division for Polish aviation was established. In 1958 the name was changed to Air Force Institute of Technology, which remains in force since then.

Supervising The supervisor of AFIT is the Polish Minister of National Defence.

Employment 594 workers (including 23 soldiers and 410 researchers)

Laboratories In the Institute there are laboratories accredited by the Polish Centre for Accreditation and laboratories accredited by the Ministry of National Defence

LABORATORIES

Aircraft Engines Division

Airworthiness Division

IT Logistics Support Systems Division

Aeroplanes & Helicopters Division

Air Armament Division

Support of operational use of Air Force technology in the scope of research and development
10 R&D Entities
410 Engineers (594 employees)
Laboratories accredited by PCA and MOD
scope of research and development

Avionics Division

10 R&D Entities
410 Engineers (594 employees)
Laboratories accredited by PCA and MOD

Command, Control and Training Systems Division

Propellants and Lubricants Division

C4ISR Systems Intergration Division

Airfield Systems Division

ADAPTATION FOR BATTLEFIELD REQUIREMENTS

Extension of technical life time
up to 45 years

- **1**

0 Military Aviation Works No 1

&

Air Force Institute of Technology (ITWL)

are specializing in an extension life time of Mil helicopters

Mi-8 up to 45 years
Mi-17 up to 42 years
Mi-14 up to 36 years
Mi-24 up to 45 years

MATERIAL DIAGNOSTICS & MONITORING

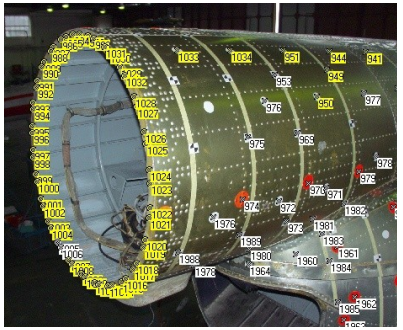
Non-destructive testing

Monitoring of operational loads

Materials testings

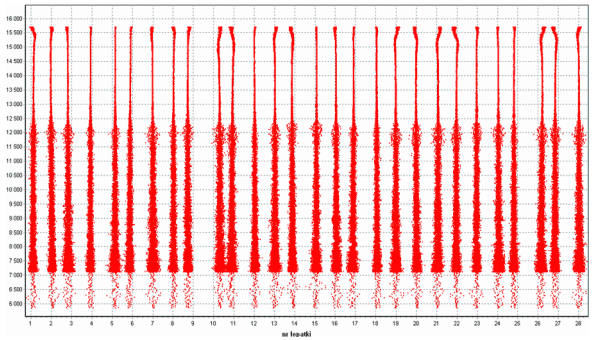
Fatigue assessment of structures

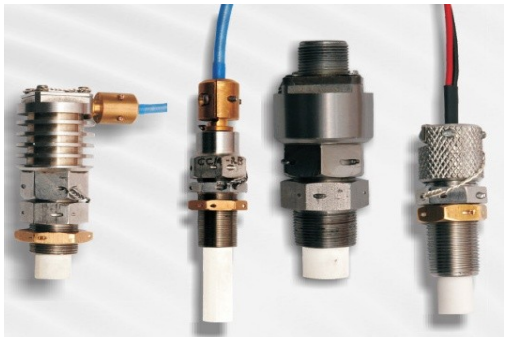
Corrosion monitoring

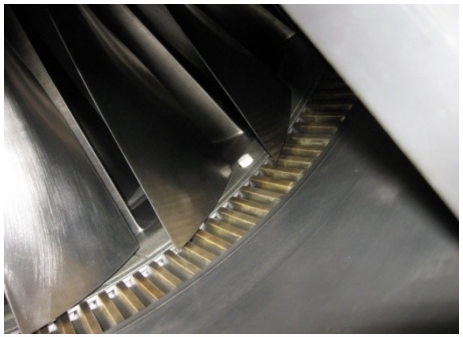


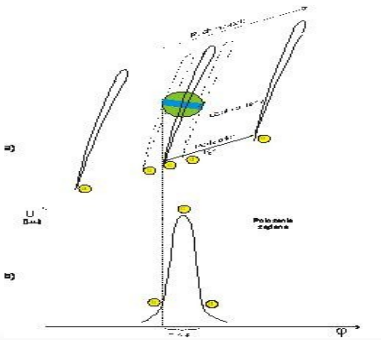
DIAGNOSTICS AND MONITORING OF AIRCRAFT PROPULSION SYSTEMS

The development of new research techniques
Monitoring and diagnostics of all kinds of aircraft engines types





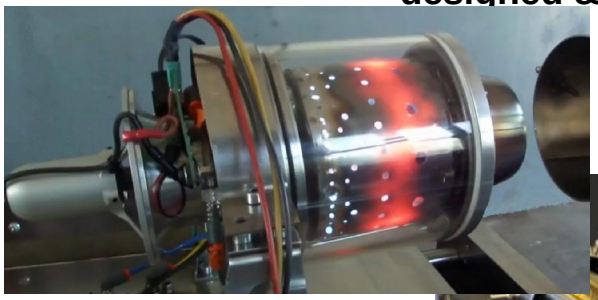


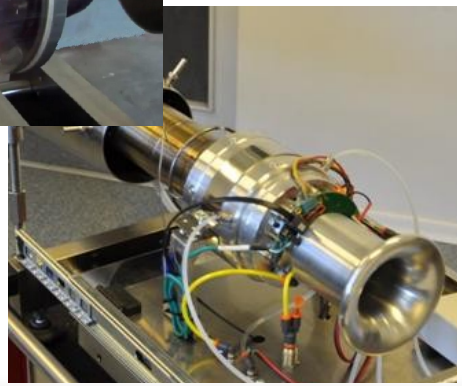


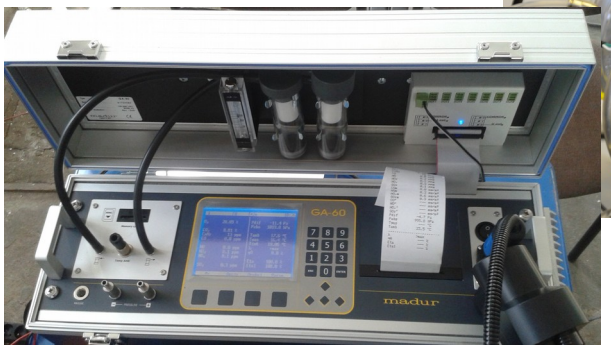
TEST BEDS FOR COMBUSTION PROCESS IN JET ENGINEES

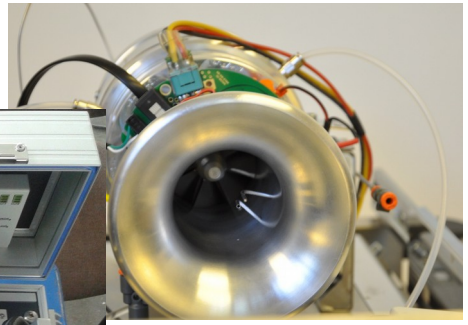
Testing of:

- ✓ **new fuel, including ones from renewable sources of energy**
- ✓ **innovation material technologies**
- ✓ **novel structure solutions**
- ✓ **designed & developed test beds dedicated for individual client's needs.**







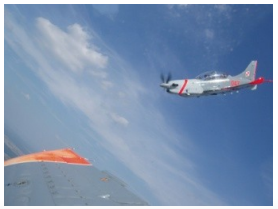


AIRCRAFT MODERNIZATION

- ✓ **Digitalization of Avionic Systems (open architecture)**
- ✓ **Adaptation to a modern network-centric battlefield**
- ✓ **Integrated Communication Systems**
- ✓ **Helmet Mounted Display systems**







UNMANNED AERIAL VEHICLES

SUMMARY

- Unmanned aerial vehicles (UAVs)
- IT support systems
- Tests and assessment preparing to the extension of service life
- Modernization and tests of aircrafts
- Training systems, i.a. simulators, e-learning
- Propellants and lubricants
- Non-destructive materials testings
- Manufacturing of Composites
- Airfield pavements and systems
- Communication and data transmission systems
- Testing of aircraft systems – Airborne Laboratory

Thank you for attention