National Research and Development Institute for Gas Turbines COMOTI
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Established in 1985 as the Scientific Research and Engineering Center for Aircraft Engines, within the former INCREST, COMOTI becomes the "National Research and Development Institute for Gas Turbines, COMOTI", as a result of its assessment and certification.

The National Research & Development Institute for Gas Turbines is the only specialized company that integrates such activities as scientific research, design, manufacturing, testing, experimental activities, technologic transfer and innovation in the field of aircraft and industrial gas turbines and high speed bladed machinery.

Its scientifics departments are:

- Research and development for gas turbines and aerospace propulsion components direction;
- Research and development for gas turbines and environment direction;
- Technological Research direction;

Main areas of activity :

Aircraft gas turbines

National Programmes since 2000 to the present,

by means of contracted activities in the INVENT, RELANSIN, MENER, AEROSPATIAL, MATNANTECH, NUCLEU Programs;

International cooperation and technical and scientific cooperation with famous European companies, such as: SNECMA, ROLLS – ROYCE, TURBOMECA, etc – within the frame Program (PC)V as well SILENCE(R) – 2001, METHOD 2001, Jean 2001, ABRANEW – 2003 and Frame Program (PC)V, CoJeN – 2003, VITAL – 2004, dealing with the most advanced research applied to aeronautics;

EU financed programmes

European projects are for high end research, on international level, in applied aeronautics and turbine based machines in aviation and industry. In the last years, INCDT-COMOTI has been partner in many European research projects, such as:

1. **Within the 5th Framework Programme**,
   - SILENCER - 2001 (Snecma, Fr) - Significantly lower community exposure to aircraft noise
   - METHOD -2001,
   - JEAN – 2001 (Jet Exhaust Aerodynamics & Noise),
   - ABRANEW – 2003 (GE Nuovo Pignone, It) - Innovative abradable/abrasive materials for improved energy efficiency in gas turbines
2. **Within the 6th Framework Programme**,
   - CoJeN -2003 (Computation of Coaxial jets noise)
   - VITAL – 2004 (Snecma, Fr) - Environmentally friendly aero engine
   - XNOISE 2 – 2006, X3-NOISE (Aviation Noise Research Network and Coordination)
3. **Within the 7th Framework Programme**
   - TEENI-2008 (Turbomeca, Fr) - Turbo shaft engine exhaust noise identification
   - OPENAIR-2009 (Snecma, Fr) - Optimisation for low environmental noise impact aircraft
   - NINHA-2010 (Noise impact of aircraft with Novel engine configuration in mid to high altitude operations)
   - TEAM_Play-2010 (Total suite for environmental and economic aviation modeling for policy analysis)

- ESPOSA-2011 (Efficient Systems and Propulsion for Aircraft)
- ELTHESYS (Electrically Driven Test Bench for Testing of Aircraft Electrical Equipment)
- TIDE-2013 (Tangential Impulse Detonation Engine)

4. **Within Clean Sky Programme**
   - ANCORA-2011 (COMOTI Rotorcraft Acoustic Initiative for preliminary acoustic flight tests for the tuning of simplified rotorcraft noise)
   - HEXENOR-2011 (Development of Helicopter Exhaust Engine Noise Reduction technology)
   - SARTGENSYS-2011 (Adaptation kit design and manufacturing: APU driving system)
   - OPA-2012 (Optimization of Air JET Pump)

CHP (Combined heat and Power plant)

by the implementation of the first co–generation power plants in the country (for example the plants located in SC TERMICA SA – BOTOSANI and SNP PETROM – Suplacu de Barcau, Romania).

They are opening the perspective of supplying the consumers with thermal power at much lower cost than at present

Equipments for oil and gas industry

such as oil and gas, by using special equipment – turbo compressors and electrical compressors necessary to the compression, pumping stations belonging to SNP PETROM and Distrigaz, such as: SP TICLENI, SP VINTU, SP TURBUREA, SP SUPLACU DE BARCAU.

Before COMOTI's equipment was available, such special units were imported. By developing a partnership with GHH Rand, COMOTI deliver on oil and gas market screw compressor and screw compressor packages in a wide range of pressures and flow rates.

For its products, COMOTI, provides technical assistance to commissioning, spare parts, training, etc.

It also made various repairs for turbine engines, respectively imported components type SOLAR, DEMAG, CENTAC, VRK, etc.

Environment

by developing a family of centrifugal electrical air blowing performance comparable to similar equipment products worldwide for waist treatment plants. Equipment have achieved a high reliability, which ensure uninterrupted reliability for the entire period of work.

CLEANDANUBE, Romanian-Bulgarian project – common strategy to prevent the Danube's pollution technological risk with oil and oil products

Production for small Series and Aviation Gas Turbines manufacturing and assembly

Advanced technologies and mechanical processing for aircraft and industrial gas turbines.

Scientific research, design and manufacturing for parts with complex configuration and low rigidity.

Reengineering and repairing different bladed parts as rotors and stators, thrust bearings, heat-exchangers etc).

Various processing of materials like stainless steel, dural, titanium and nickel alloys

Main Equipment:

- DAH LIH Vertical Milling Center 5 axes
- DOOSAN DB130 CX ream and milling center
- Vertical processing center with simultaneous interpolation in 3+2 axes DMU70
- Vertical processing center with 5 axes simultaneous interpolation DMU70 eVO linear
- 5 axis milling machine LINE VEGA MILL 215 T F NU
- 3 axes milling machine FOREST V 500 SA
- 2 1/2 axes milling machine FNF 40 N
- SC14 CNC vertical lathe

- horizontal lathe SD 610
- horizontal lathe GILDEMAISTER CTX 620 linear
- horizontal lathe EEN 320 – CNC
- 3 D measuring machine DEA DELTA 34.04
- roundness measuring machine TALYROND 73

ACOUSTIC and VIBRATIONS Laboratory

The Acoustic and Vibration Laboratory is certified by The Accreditation Organization from Romania RENAR according with SR EN ISO/CEI 17025/2005.

With an endowment of exception in this field, the laboratory is able to perform complex studies identifying and implementing solutions for noise and vibration control.

The laboratory can perform studies in the following specialized chambers:

- **The Anechoic Chamber** realized according with ISO 3745
- **The Reverberation Chamber** realized according with ISO 3741- Annex D ISO 354
- **The Transmissibility Chambers** according with ISO 140/1, /7, /8, STAS 6161/4, STAS 6691.

MSC Software Tools used at COMOTI

- Aerospace industry gas turbines parts - MD.NASTRAN SOL. 400 Nonlinear Static and Prestressed Dynamic Simulation
- Energy Industrial applications - MD.NASTRAN SOL.108 Direct Frequency Response Simulation
- Oil and Natural Gas industry Screw Compressors - MD.NASTRAN SOL.101 Linear Static Simulation
- New Technology composite parts development - MD.NASTRAN COMPOSITE SIMULATION Classical Shell and New Solid Laminate Theory

3D MODELING using CATIA V4 & V5, UNIGRAPHICS and SOLID EDGE V20
OPTIMIZATION and CFD ANALYSIS using Concepts NREC & ANSYS - CFX 11 software
CFD THERMAL ANALYSIS using ANSYS - CFX 11 software

Gas Turbine testing facility

Four testing cells:

- 2 cells for turbojet, turboshaft
- 1 cell for microturbines
- 1 cell for turboprop

Fuel type: liquid, gas (biogas also)

Other testing facilities

- Centrifugal compressor test facility
- Screw compressor test facility

Quality Assurance

QA System certified in accordance with AEROQ SR EN ISO 9001, ISO 14001, ISO 18001, ISO 27001, which operates on the Total Quality Management and provides environment friendly products at the required quality, reability and operational safety. Also, is a member of:

- AIAA (The American Institute for Aeronautics and Astronautics);
- AGIR (The General Association of Romanian Engineers);
- S.R. ACUSTICA (The Romanian Acoustic Society)