



June 2007

## About INCAS



INCAS has carried out its activity under different names and structures for about 55 years (since 1950) when the

Applied Mechanics Institute of the Romanian Academy was established.

In 1965, the Institute of Fluid Mechanics has separated as a company specialized in aeronautical and space R&D.

Starting with 1968 IMFCA (ICSITAv in 1985) assumed control of all the Romanian aeronautical research

In 1990 ICSITAv became the Aviation Institute, as the unique company for research and design in Romania

In 1991 National Institute of Aerospace Research "ELIE CARAFOLI" - INCAS was established as a state own company with 150 employees. This is the leading research establishment for aeronautics in Romania.

## INCAS expertise in aeronautics

- Main design authority and system integrator
- Aerodynamic design
- Experimental wind tunnel validation
- Global performance analysis
- Structural design and analysis
- New materials and technologies in aeronautics.



## INCAS at Le Bourget 2007

### EREA Stand : Hall 2B - F12

As part of the program of conferences by EREA members, please attend the following INCAS presentations:

### Tuesday 19 June 2007

**16h00 Research capabilities and infrastructures at INCAS Romania, Catalin Nae.** This presentation will provide updated information on current state of the art experimental facilities at INCAS, together with our plans for advanced simulation capabilities. Details on current projects and expected results in international cooperation will be provided.

### Friday 22 June 2007

**11h00 Aeronautical Projects at INCAS, Catalin Nae.** This presentation will give an overview of major project in aeronautics where INCAS has an important contribution. Projects financed by Romanian National R&D Program and also participations in EU FP6 projects are to be presented together with relevant information on current plans for joint activities with international partners.

## INCAS research infrastructure

The National Institute of Aerospace Research "ELIE CARAFOLI" is the only company in Romania with dedicated research infrastructure for basic research in applied aerodynamics and associated technologies.

### INCAS Supersonic Wind Tunnel



The supersonic wind tunnel at INCAS is a blowdown wind tunnel with a 1.2m x 1.2m test section, capable of a Mach range numbers from as low as 0.1 up to Mach 3.5, with a unity Reynolds number up to 100 millions. This facility has an interchangeable porous transonic

test section with variable porosity from 0.01% up to 9% and 800 mm schlieren windows. State of the art data acquisition system and new investigation capabilities (CTS system and PIV) are under constant development. In this facility several important Romanian aeronautical projects have been performed, from military IAR-93 combat and IAR-99 trainer, air-to-air missiles and UAV systems, to civil aviation programs IAR-705 and ROMBAC.

### INCAS Subsonic Wind Tunnel

The subsonic wind tunnel is an atmospheric pressure continuous type facility with a maximum speed of 110 m/s and usual Reynolds number up to 1.5 million. This traditional type facility is very well equipped with a 6 component pyramidal type balance and state of the art data acquisition systems. It is the ideal facility for all major projects in aeronautics, from basic tests for configuration assessment to the validation of high lift low noise concepts in greening the air transport of the future.



## ■ Participation in EU projects



INCAS participation in EU projects started in FP5 with relative limited involvement. From FP6, INCAS has increased his international visibility and currently is involved in several STREPs and one IP as follows:

- **CESAR** - *Cost Effective Small Aircraft*, IP
- **UFAST** - *Unsteady Effects in Shock Wave Induced Separation*, STREP
- **AVERT** - *Aerodynamic Validation of Emission Reducing Technologies*, STREP

At the same time, INCAS is participating to several important IT projects at EU level:

- **EGEE** - *Enabling Grids for e-Science*, IP
- **See-GRID** - *South - Eastern European Grid-enabled e-Infrastructure Development*, STREP

INCAS is also participating in other activities supported by EU instruments. We are **SCRATCH** members and active participants to **AirTN** and **ERA-NET**, together with ROSA - Romanian Space Agency.

## ■ Participation to the JTI "Clean Sky"



Following the process of selection of Associate Partners to the JTI "Clean Sky", INCAS

Consortium (**INCAS**, **STRAERO**, **AVIOANE** Craiova and **ROMAERO** Bucharest) are in the negotiation phases for the following platforms:

- **SFWA** - Smart Fixed Wing Aircraft
- **GRA** - Green Regional Aircraft (in cooperation in a CIRA lead consortium)

This possible participation to the JTI is highly supported by Romanian authorities and is considered as a major step towards integrating R&D and industrial capabilities at EU level in aeronautics.

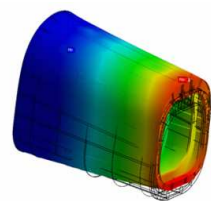
## ■ Major National Projects

### ■ INCAS is leading AeroTAXI project



AeroTAXI is a project for a 12 pax subcommuter scale twin engine aircraft (CS-23) as main vector for a next generation of air transportation system at regional scale. This project, founded by national R&D program, is a cooperation with Romanian major establishments INAv, AVIOANE Craiova and University Politehnica Bucharest and is now in the phase of delivering a specimen for fatigue test.

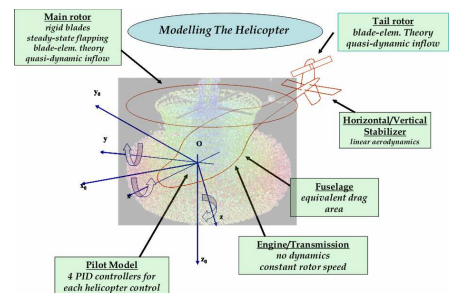
### ■ Advanced techniques for structural analysis



INCAS, as main design authority for IAR-99 Soim Romanian trainer is continuing the development of

advanced tools for structural analysis using parametric geometrical modeling. This project is a partnership INAS Craiova addressing advanced CAD/FEM and CAM techniques applicable to military products under INCAS design authority

### ■ Dynamics and control for helicopters in maritime environment



This is a multibody dynamics type modeling relative to noninertial frames with unsteady modeling for strong coupling phenomena. It also deals with the simulation environment for heliship evolutions and associated control schemes for special problems of flight

## ■ INCAS News

### ■ INCAS is EREA associate member



Starting from year 2006 INCAS has become EREA

associated member. EREA is a major contributor to European aeronautical research (higher annual budget than the budget in the Framework Programme). As part of this important association, INCAS will try to achieve higher international visibility and to extend international partnerships. INCAS participation to EREA is currently orientated towards ARG group.

### ■ INCAS participation to ACARE

Starting from year 2007 Romania has nominated as ACARE member an representant of INCAS. This nominalisation is a recognition of the role and influence INCAS has inside Romanian aerospace community and is a chance for higher visibility of existing national capabilities and stronger representation of national aeronautical interests at EU level.

### ■ INCAS expert in PC7 - Transport

A specialist from INCAS has been nominated as national expert in PC7 - Transport in order to represent current integration of Romanian interests in transport sector (including aeronautics) with respect to R&D policy. Harmonization of Romanian national R&D program with the major strategic objectives of EU research and innovation policy is a key element of national strategy for EU integration.

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