

evektor



SESRA

Single Engine Spin Resistant Aircraft

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3rd Call FP7

7.1.3. ENSURING CUSTOMER SATISFACTION AND SAFETY

AREA 7.1.3.3. - Aircraft safety

AAT.2010.3.3.1. Aerostructures

Project Objectives: Increasing safety of the aircraft itself by improving passive safety to minimize impact of human error.

Advanced modelling tools and design techniques will be used for developing methodology of spin-resistant airplane, which can provide substantial improvement of protection against crash or dangerous situations caused by human error or casual effect occurrence.

Experimental validation of the methodology will be part of the SESRA project.

Single Engine Airplane Usability

Typical role of single engine airplane and required qualities:

- ❖ trainer - flight characteristics
(non-experienced pilots)
- ❖ aerobatic - controllability
(experienced pilots)
- ❖ transport - performances
- ❖ recreation & hobby - safety,
flight characteristics
(pilots of different skills)



Stall and spin problems

- ❖ abrupt stall, unsymmetrical stall
- ❖ dirty leading edge degradation
- ❖ spin entry
- ❖ spin recovery





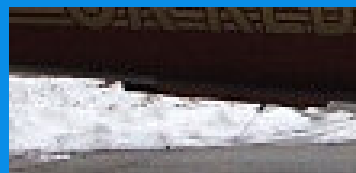
Anti-spin aerodynamic modifications *evektor*

Modifications applicable during early design:

- ❖ wing twist
- ❖ wing geometry (taper and aspect ratio, sweep angle, ...)
- ❖ tail unit geometry and conception

Modifications applicable during design and flight test:

- ❖ drooped leading edge
- ❖ fin



Modifications applicable during flight tests (cure)

- ❖ vortex generators
- ❖ turbulators
- ❖ ribbons
- ❖ stall strips



Ways to achieve the goals

- * analysis of suitable aerodynamic modifications and their efficiency
- * creation a methodology, how to design spin-resistant airplane
- * manufacturing selected modifications for wind-tunnel and flight tests
- * preparation and performing flight tests:
 - test program
 - instrumentation of the test plane
 - adaptation of the airplane for carrying specimens
- * evaluation of developed methodology

Supposed benefits of the project

- **Significant increasing the safety of operation**

Spin resistant airplane is much safer than that one of poor stall behavior.

- **Creation of methodology of designing the airplane as spin resistant straight from the beginning of the design process**

Time and costs reduction during early design phase is much more efficient, than curing problems afterwards.

- **Possibility to use methodology to cure possible problems**

Known ways how to cure problems can save lot of effort than testing dead end variants.

Project Consortium and budget

Consortium:

Project coordinator: EVEKTOR, Spol.s r.o. (Czech Republic)

- * Institute of Aviation – (Instytut lotnictwa - Poland)*
- * Delft University of Technology – (TUD, The Netherlands)*
- * National Institute for Aerospace Research - (INCAS - Romania)*
- * DAHER SOCATA - (France)*
- * IBK Technology - (Germany)*
- * Paragon Ltd. - (Greece)*
- * JMJ Composites - (Czech Republic)*

Budget:

Targeted budget : 3.2 - 3.5 M€ (under development)

Proposal status

- Consortium closed
- Work packages defined
- Milestones and deliverables partly defined
- Task leaders partly defined
- Work distribution and responsibilities under development
- Budget re-distribution under development

Thank you

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