

evektor



SESRA

Single Engine Spin Resistant Aircraft

July 2009
Warszawa

Ing. Pavel Růžička, PhD

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 problems

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





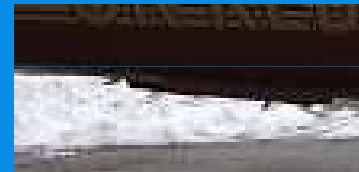
Anti-spin aerodynamic modifications *evektor*

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:

- ❖ dropped 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
- * creation the methodology, how to design spin-resistant airplane
- * manufacturing selected specimens for flight tests
- * preparation of flight tests:
 - test program
 - instrumentation of the test plane
 - adaptation of the airplane for carrying specimens
- * performing the flight tests
- * evaluation of individual modifications impact on stall and spin behavior

Supposed benefits of the project

- Significant increasing the safety of operation

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

- 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.

- Creation of proved methodology to cure possible problems

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

Supposed members of consortium:

EVEKTOR, Spol.s r.o. - proposal coordinator

More partners are welcomed:

- * *University (CFD)*
- * *Small Airplane producer*
- * *Research center*
- * *Aircraft composite parts manufacturer*

Thank you

Ing. Pavel Růžička, PhD

E- mail: pruzicka@evektor.cz

Tel: +420 572 537 841

Fax: +420 572 537 901



EVEKTOR spol. s r.o.

Letecká 1008

686 01 Kunovice

Czech Republic

July 2009, Warszawa
Ing. Pavel Růžička, PhD

Single Engine Spin Resistant Airplane