8th. World Congress on Computational Mechanics (WCCM8)
5th. European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS 2008)
June 30 – July 5, 2008
Venice, Italy

ON THE USE OF SOFTWARE ANALYSES FOR THE SUBSTANTIATION OF FALCON F7X UPPER COCKPIT CONCERNING BIRDSTRIKE.

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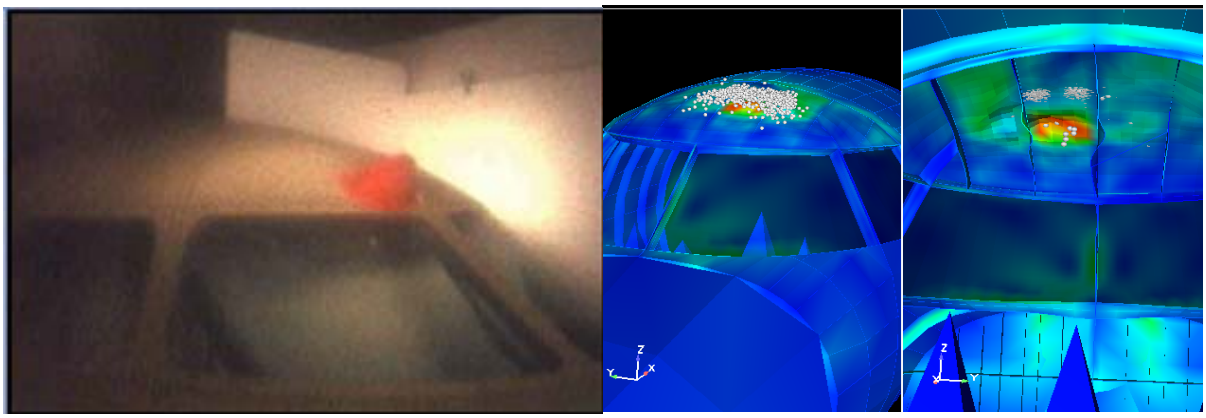
Key Words: *Bird strike, Substantiation, Cockpit, Nonlinearities, Dynamics, Impact, Finite Elements.*

ABSTRACT

Thanks to previous works, carried out mainly last decades, Dassault Aviation has been able to perform almost the whole bird strike substantiation of the new bizjet F7X in an exemplary way, which is a complete revolution in the development aircraft process. In its own integrator role, Dassault Aviation provided the substantiation of its own structural parts, whereas the subcontractors provided the equivalent ones from their own. And so was the process for the bird strike substantiation aspects. We first recall the basic principles of the software used (the dynamic nonlinear module of F. E. ELFINI software), in conjunction with tests. These principles are an implicit time marching scheme loop, imbedding an explicit one when integrating the bird strike itself, and the bird being simulated as a "pack of marbles" ([1]). Then we illustrate these works with the help of the bird strike substantiation of the upper cockpit. Comparisons between experimental results and theoretical ones are given. Thanks to this, we have managed to provide the substantiation according to the whole rules considered by airworthiness authorities (EASA and FAA♦).



♣ This paper is dedicated to Christophe Picard, who used to work at Dassault Aviation on this subject too, before his premature decease.

♦ European and US certification Authorities, respectively.

Abridged Bibliography:

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