

SYMPOSIUM ON COMMERCIAL SPACEFLIGHT SAFETY ISSUES (D6)
Commercial Space Flight Safety and Emerging Issues (1)

Author: Mr. Christophe Chavagnac
Airbus Defence & Space, France, christophe.chavagnac@astrium.eads.net

Mr. Thierry Pichard
EADS Astrium, France, thierry.pichard@airbus.com
Mr. Jean Philippe DUTHEIL
Airbus Defence and Space, France, jean-philippe.dutheil@astrium.eads.net

SAFETY FACTORS FOR AEROSTRUCTURES & LARGE SCALE PRESSURIZED STRUCTURES

Abstract

Designing aerostructures and large scale pressurized structures is basically a matter of Design for Minimum Risk (DMR). When comparing aeronautic and space businesses, the computation method for safety factors is close to each other. Concentrating on level of safety factors themselves, there are some differences. These differences stem from (1) the nature of differing missions and (2) possibly their architecture and related design drivers. On top, requirements in terms of safety are not the same in between rockets and airplanes. In aeronautic business and for getting a certification granted, the set of factors of safety is stated by independent airworthiness authorities as the European Aviation Safety Agency (EASA) or the US Federal Aviation Administration (FAA). In space business this data is expressed by (national) space agencies (and may slightly differ with each other). The safety factor magnitude is not the same in between the two craft categories (space launch systems vs. aircraft) according to (1) the life cycle of products, (2) operational limitations, (3) the energy at stake and (4) mission class for space launch systems (manned vs. not). As soon as transport of paying passengers to the edge of space is at stake, the safety margins embedded in the vehicle items have to be given different and specific attention. Purpose of this paper is to detail the approach promoted by Airbus Defence Space (Space Systems unit) for safety factors applied to aerostructures large scale pressurized structures of SpacePlane class of vehicles.