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

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AERONAUTIC VS. SPACE-LIKE SAFETY OF FLIGHT: WHAT REALLY MATTERS

Abstract

At first glance, management of safety for aircraft may look very different from spacecraft. Such straightforward statement deserves to be analyzed further. When considering safety oriented guidelines for designing a vehicle, either aircraft or spacecraft, basic rules are the same : - Design to tolerate failures ; - Design to minimum risk ; - Design to contain ; - Emergency, caution and warning items and procedures.

In case of Spaceraft missions, another area of design is to be paid attention to : crew escape / safe haven dedicated systems and/or procedures. This set of safety oriented design rules is obviously tailored according to different aspects : vehicle architecture, flight envelope, set of missions and related management (concept of operations), class of crew on board e.g. Concentrating on these two last categories, there are main differences which may heavily impact designto- safety level of the operational vehicles and then their operation limitations, if any. In case of commercial aeronautics, general public pays for a service, point-to-point transportation. For human spaceflight missions, only professional staff (paid for completing a mission) and highly trained as well, fly to space up to now but some very few exceptions. Another example is the fact that an airline company is interested in having a fleet with as few operations limitations as possible in overflying territories and taking-off / landing in highly populated areas. For Space launch systems, it is a matter of defining a safety range and making the launch system disabled in case of off-nominal trajectory beyond safety range boundaries. This approach for launching satellites to orbit makes definitely sense when considering flight rate of Space Launch Systems, their life cycle (expendable vehicles) and then their highly design-to-performance driven architecture. This paper will detail the main differences between legacy aeronautics and space in terms of safety. Then Astrium Spaceplane will be presented as a showcase of blending properly aeronautic and space best practices from Safety perspective.
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