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PROPOSAL FOR A MODERN INDUSTRY-GOVERNMENT PARTNERSHIP TO ADVANCE
COMMERCIAL SPACEFLIGHT SAFETY: THE SPACE SAFETY INSTITUTE

Abstract

Within a decade human spaceflight operation in Low Earth Orbit (LEO) may become predominantly commercial and also significant elements of private participation in institutional Moon and Mars exploration missions, besides international partnership, could be envisioned in consideration of the associated high costs. As a consequence, there is a strong need to establish harmonized safety requirements and a system of recognition of safety certification to better fit commercial space programs into a mixed private-institutional environment. The purpose of the paper is to provide the rationale for the establishment of a Space Safety Institute (SSI) as “regulated self-policing” entity. It would be an open consortium of industry, space agencies and regulators to efficiently perform standardization and certification activities, conduct joint research and provide both educational and professional training opportunities within a broad framework of mandated policies and rules. The need of such an organization is both practical and strategic. Government as responsible for public welfare and, sometimes, as customer needs assurance that space industry can deliver on promises. However, system safety is multidisciplinary and there is a relatively limited number of individuals with the required expertise and updated experience in writing performance requirements and supporting safety peer-reviews, making it hard for regulators to be able to rely solely on their own personnel. In addition, all the parties involved need assurance that commercial competition takes place on a level playing field and that safety is not compromised by cost cutting efforts. Sharing data, transparent communication and independent risk assessment can provide such assurance. Industry’s acknowledgement of the strategic business value of improving on the safety records of space programs, fully supported by leadership commitment, is fundamental. Traditionally, aviation safety standards consist in detailed prescriptive requirements built over a period of more than a century on a large number of lessons learned from mishap and close calls and aimed at specific types of vehicles. Instead, since the 80’s, space programs have been using a risk-based approach to system development, so called “performance standards”, consisting in identifying the potential conditions for mishaps starting in the early phases of design and implementing risk mitigation and control measures consistent with broad safety goals. The transition from the old-fashioned “prescriptive standards” to modern “performance Standards” is growing faster and faster. The Space Safety Institute would support a regulatory model that can react quickly and efficiently to technological advancements, whilst exercising effective controls on commercial space systems developments.