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HUMAN SPACE FLIGHT MISSION SUCCESS AND CREW SAFETY RISK MANAGEMENT

Abstract

Over the 55 years of human space flight history, mission's objectives have evolved from being just putting a human in space to broader scientific and technological goals for which the crew on board has since been seen more as a mean to help achieve these goals rather than the goal themselves. However, it is understood that bringing home the crew safely remains a priority criteria for any decision making concerning the mission. These 2 goals – mission success and crew safety – can sometimes appear antagonist. In off-nominal situations, one might jeopardize the other and vice-versa. This paper describes, from the astronaut perspective, the current strategy aiming at maximizing both. The selection process, the training concept, the spaceship design, the mission operations, are currently organized by all human space flight programs across the world in order to satisfy both constraints. For example, the crew involvement in the program development, the intensive high fidelity Joint Integrated Simulation, the FOFS criteria (Fail Operational Fail Safe) or the "Likelihood-Consequences" risk analysis for any possible event during a mission are implemented in current programs management. This strategy is several decades old. With the coming of more intricate missions such as for the moon village concept or for missions to Mars with no more ground control support, human resources strategies will have to take priority upstream of the classic technical approach to maximize mission success and crew safety. This latter point will be presented in another article.