

IAF SYMPOSIUM ON COMMERCIAL SPACEFLIGHT SAFETY ISSUES (D6)
Commercial Spaceflight Safety and Emerging Issues (1)

Author: Dr. Sara Langston
Embry-Riddle Aeronautical University, United States

Prof. Anthony Brickhouse
Embry-Riddle Aeronautical University, United States

CHARTING THE COURSE: DEFINING PARAMETERS FOR COMMERCIAL SPACEFLIGHT
SAFETY INVESTIGATIONS

Abstract

Spaceflight has long been recognized as an inherently risky activity, raising safety concerns for commercial launch operators, regulators and safety professionals. Consequently, safety constitutes both an element of national space law and a driver for developing legislation and regulation in tandem with spaceflight activities. Last year, the U.S. Federal Aviation Administration (FAA) issued an updated streamlined licensing regime reinforcing safety standards while providing industry with flexibility and alternative means for demonstrating safety requirements in regards to protecting public health, safety and property from the ultra-hazardous nature of spaceflight. In 2021, 54 commercial launches were conducted in the U.S. alone, a thirteen-fold increase from ten years ago. This surge in commercial spaceflight activities underlines inherent concerns involving safety awareness, risk assessment and investigation procedures for risk, probability of harm, and potential scope of accidents, incidents, and mishaps. Moreover, in November 2021 the National Transportation Safety Board (NTSB) proposed a new rule to solidify basic parameters for space accident investigation. Pursuant to general statutory authority and stipulated agreements with the FAA, the NTSB has investigated commercial spaceflight accidents since 1993. However, the space industry is still within a statutory learning period, and the FAA has specific authority in regulating commercial spaceflight, raising questions for clarification on inter-agency jurisdiction, industry development, and appropriate space safety investigation procedures and protocols to address the needs of a surging space transportation industry.

In practice, the nature of spaceflight technologies, operations, mission architectures (rocket launch vs air-launch) and flight trajectories (suborbital vs orbital) differ from prior transportation modalities. So what are the practical implications facing the professional safety and accident investigation community? This paper provides an interdisciplinary perspective in law, policy and safety to identify and address crucial aspects for commercial spaceflight safety and accident investigation. Specifically, this presentation will provide an overview of safety requirements for spaceflight, to include: a brief historical safety review, highlighting the role and scope of authority for pertinent governmental entities (e.g. FAA, NASA, NTSB), outlining the safety requirements for commercial launch operators, and addressing key issues and challenges for commercial spaceflight safety going forward. In particular, this analytical research and presentation aims to inform and contribute to the discussion on commercial spaceflight safety for identifying the parameters and requirements for spacecraft accident investigation and response.