

SYMPOSIUM ON COMMERCIAL SPACEFLIGHT SAFETY ISSUES (D6)
Commercial Space Flight Safety and Emerging Issues (1)Author: Ms. Therese Jones
RAND, United StatesIS FAILURE AN OPTION? DIFFERENCES IN RISK PERCEPTION ACROSS REGULATORY
AGENCIES, INDUSTRY, AND THE PUBLIC IN HIGH-RISK EVENTS, AND APPLICATIONS TO
HUMAN SPACEFLIGHT.**Abstract**

As Commercial Human Spaceflight (CHS) shifts from the public to private sector, the question remains: is the spaceflight industry capable of largely self-regulating, and if not, what is the role of the Federal Aviation Administration Office of Commercial Space Transportation (FAA AST) in ensuring the safety of both CHS participants and those on the ground? Historically, NASA has been the arbiter of acceptable risk in CHS; its role will almost certainly lessen with the market entrance of new commercial companies, though it may be able to influence industry standards through its Commercial Crew Program (CCP). While one of NASA's prime goals is to ensure the safe return of its astronauts, AST is charged with promoting the spaceflight industry, and thus the solvency of commercial companies, suggesting that it will have to evaluate which safety measures are an undue burden on industry. In order to determine the role of both the AST and NASA in mitigating risk for spaceflight participants on commercial vehicles, we look to historical examples for the calculation of maximum acceptable risk related to industries with low frequency but high impact/visibility accidents. Regulation of emerging industries in the U.S. has largely been reactionary, with calls for stricter enforcement coming from regulatory agencies long before Congressional authorization of such regulations occur (often post-accident). This suggests that industry and regulatory agency standards of maximum acceptable risk differ greatly, and public/Congressional perception has a major impact on regulatory oversight. We look to both the theory of High Reliability Organizations and Normal Accident Theory to identify industries of similar technical complexity to CHS, including nuclear energy, aviation, petrochemical plants, and utility grids, and assess how in each industry, the industry, regulators, and the public/Congress perceived risk both pre- and post-accidents. We use this information, alongside interviews with AST, NASA, and CHS industry employees to determine the alignment/lack thereof of CHS risk perception, and how economic incentives may or may not decrease overall risk. We also discuss how public perception/Congressional reaction is likely to differ based on whether accident casualties are NASA astronauts, innocent bystanders, or CHS participants who have waived liability.