

SYMPOSIUM ON COMMERCIAL SPACEFLIGHT SAFETY ISSUES (D6)  
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CERTIFICATION VERSUS LICENSING FOR HUMAN SPACE FLIGHT IN COMMERCIAL SPACE  
TRANSPORTATION

**Abstract**

Safety oversight of commercial space transportation by government can come in two forms: a certification regime or a licensing regime. Certification addresses design characteristics of a vehicle and is common in aviation. In the realm of aviation, certification is also a familiar process to governments and is typically based on decades of extensive flight experience and data. While aviation certification can be expensive, there is a large and mature market to offset initial investment. However, certification may not be the best approach for a new industry such as commercial human space flight. Although there is a history of government funded orbital spaceflight, most commercial companies will not have the same resources as a national government program. In addition, new suborbital vehicles have less in common with historical government suborbital test aircraft and to date only a few commercial flights have been carried out. The market for carrying people into space shows great potential but is unproven for both orbital and suborbital vehicles. In 1984, the Department of Transportation (DOT), as the regulator of U.S. commercial space transportation, established a regime to license the safety of launch events instead of certifying launch vehicles. The Federal Aviation Administration's Office of Commercial Space Transportation (AST) has this authority within DOT today. Instead of imposing a prescriptive and limited set of design criteria, AST has performance-based requirements to demonstrate compliance to safety. Thus far, results indicate greater innovation by industry at a much lower cost to test designs and methods before entering the market. This paper will examine some of the key differences between certification and licensing in commercial space transportation and evaluate the U.S. approach to grow a new industry while maintaining safety. The paper may be useful to countries that are considering safety oversight during the development of new spaceports and vehicles that can carry people.