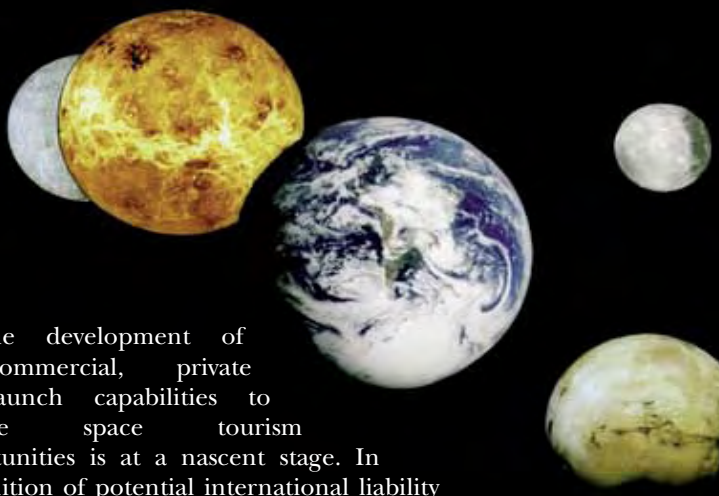
Keeping pace with space tourism

Rachel A Yates

Recent developments in private space travel have led to a 'light touch' in the regulation of such flights by the US Federal Aviation Administration.



The development of commercial, private launch capabilities to provide space tourism opportunities is at a nascent stage. In recognition of potential international liability under existing treaties, governments are trying to keep pace with industry and to regulate space tourism activities. Until the design and engineering of launch, orbital and re-entry vehicles are validated, however, regulation of the industry must be flexible, liberal, and practical. The US Federal Aviation Administration (FAA) has recently followed this approach in the promulgation of regulations on human space flight. After weighing several competing interests and policies to avoid artificial or rigid barriers that might stifle innovation unnecessarily, the regulations intentionally impose the least restrictive requirements that encourage safety. The development of the regulations reflects a model for cooperation between industry and its regulating agency.

Journey to space	Provider	Cost (subject to change)
Lunar flyby	Space Adventures under agreement with the Russian Federal Space Agency	US$100 million
Flights to the International Space Station (ISS)	Space Adventures under agreement with the Russian Federal Space Agency	US$20 million
90-minute spacewalk from ISS	Space Adventures under agreement with the Russian Federal Space Agency	US$15 million
Four-week stay at fully-habitable module on orbit	Bigelow Aerospace	US$14 million
Suborbital flight	The Spaceship Co	US$200,000
90-minute parabolic flight	Zero Gravity Corp	US$3,500

Recent developments in private space travel spur legal changes

Space travel has long been the fodder for futuristic science fiction. A scan of top news stories, however, reveals that the future is at hand. Wealthy entrepreneurs now have, or will have in the next five years, the opportunity to travel and stay in space:

Given this increased activity by a well-funded, non-governmental venture, the US Congress recognised the need for additional oversight and regulation. Under the 1972 Convention on International Liability for Damage Caused by Space Objects (Liability Convention), the US Government could face liability as a launching state for activities conducted on its territory or by its citizens that launch or procure a launch. In 1995, the Commercial Space Launch Activities Act 49 USC § 70101 et seq (1994) (CLSA), comprehensively legislated launch and re-entry activities. By delegation, it authorised the Federal Aviation Administration to regulate launches, re-entries and the operation of sites. Until 2004, the FAA had licensed only operators of expendable launch vehicles, but in that year, it issued two reusable launch vehicle (RLV) licences for missions involving an onboard pilot. Congress thereafter adopted amendments to the CSLA to address human space transport for hire, mandating that the FAA promulgate regulations for human space flight. The FAA issued a formal Notice of Proposed Rule-making for human space flight requirements, setting out proposed regulations to address these areas – Human Space Flight Requirements for Crew and Space Flight Participants 70 Fed Reg 77262 (2005) (notice of proposed rulemaking) (proposed 29 December 2005) (the 'Proposed Rule'). The final rule issued on 15 December 2006. Simultaneously, the FAA received comments on its proposed regulations for experimental permits for reusable suborbital launch vehicles, which were finalised on 6 April 2007.

Human space flight laws balance competing interests and policies to encourage human space flight

Both the US statute and the administrative regulations admirably balance protection of the affected public and government controls. At the statutory level, the FAA was required to 'encourage, facilitate and promote the continuous improvement of the safety of launch vehicles designed to carry humans, and…promulgate regulations to carry out this subsection' – Commercial Space Launch Amendments Act of 2004, 118 Stat 3974 at § 2 (23 December 2004). But Congress limited the means by which this could be accomplished.

Specificity v flexibility in design and operational requirements

One competing tension in the regulation of human space flight is the desire to impose specific requirements to improve safety, while allowing the operators flexibility in the design and operation of their spacecraft. The US Congress resolved this tension in favour of

'A scan of top news stories…reveals that the future is at hand'

giving operators flexibility to creatively design and operate their spacecraft, subject only to narrow requirements for protection of the crew and space flight participants. Until 2012, the FAA may only restrict or prohibit design features that have resulted in a serious or fatal injury to crew or space flight participants during a licensed or commercial human space flight or contributed to an unplanned event that posed a high risk of causing a serious or fatal injury. As the FAA stated in its comments on the final rule, 'For the next six years, the FAA has to wait for harm to occur or almost occur before it can improve restrictions'. Human Space Flight Requirements for Crew and Space Flight Participants 71 Fed Reg 75616 (15 December 2006) ('Final Rule').

The regulations also balance these competing interests by imposing only limited controls on cabin conditions, including environmental and life support systems, smoke detection, fire suppression and security. 14 CFR §§ 460.11, 460.13, 460.53. They allow the operator to choose the best method for achieving these general safety requirements, employing active or passive systems, on board or remote operations, or open-loop or closed-loop systems. The process for obtaining an experimental permit is designed to quickly enable the spacecraft engineer to validate the technology, without all of the hurdles otherwise needed to verify the craft's safety and worthiness.

Duty of government to protect space flight participants and crew v duty of government to respect individual right to choose

As pertains to space flight participants, the statute limited the FAA's control almost exclusively to regulating the disclosure of information. Under the CSLA, to obtain a licence or permit, the operator must certify that it has informed the space flight participants of the risks of launch and re-entry, including the safety record of the vehicle type; that the US Government has not certified the launch vehicle as safe for carrying humans; that the space flight participant has provided written, informed consent to participate; and that the operator has complied with FAA regulations.

In turn, the FAA balanced competing views of the role of government to protect the space flight participant. Weighing in favour of personal responsibility, the regulations require that the space flight participant be trained to respond to emergency situations and to avoid jeopardising the safety of the flight crew or the public (14 CFR §§ 460.51, 460.53). However, the rider need not take any medical examinations and will not receive the same training as the crew.

Apart from training, the regulations ensure the crew and space flight participants are adequately informed of the mission risks, but are not overwhelmed with data. The operator must present information in a manner that is understandable to the space flight participant. For instance, the regulations require the operator to disclose the safety record of all crewed vehicles, including statistics about death or injury to people on the flights; the number of catastrophic failures, vehicle flights, and safety-related anomalies or failure; and any corrective actions taken to resolve them. Because failing to satisfy these disclosure obligations might nullify an informed consent, the agency evaluated whether it should maintain the data necessary for that disclosure. In the Final Rule, the FAA agreed to investigate the feasibility of maintaining a safety record database.

The space flight participant must sign a waiver and an informed consent acknowledging that the participant understands the risks and that his or her presence on board the vehicle is voluntary. The waiver required in the Final Rule protects only the government, not the operator. For protection of the operator, a separate contractual waiver and release should accompany any informed consent. In some states, however, waivers violate public policy and have no legal effect. To avoid a conflict of law, the Final Rule specifies that the governmental waiver is governed by federal law, not by state law, and is therefore enforceable despite these public policy concerns. The contractual waiver will also need a choice of law provision.

Summary

At this stage of industry development, the FAA appropriately minimised the regulatory burdens. The regulations offer flexibility to operators in the design and operation of the spacecraft, without sacrificing safety unnecessarily. In recognition of the inherent risks of human space flight, the regulations give space flight participants sufficient information to make informed decisions about whether to take part in a mission. This approach balances competing interests while stimulating the development of the next-generation launch and re-entry vehicles necessary to encourage our human space flight programme.

Rachel A Yates is an attorney at Holland & Hart LLP, Denver Tech Center office. She can be contacted at **ryates@hollandhart.com**.

'…the regulations ensure the crew and space flight participants are adequately informed of the mission risks'