Paper ID: 43372
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IAF SYMPOSIUM ON COMMERCIAL SPACEFLIGHT SAFETY ISSUES (D6)
Enabling safe commercial spaceflight: vehicles and spaceports (3)

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# FROM AVIATION TOURISM TO SUBORBITAL SPACE TOURISM: THE ISSUE ON SPACEPORT REQUIREMENTS

**Abstract**

Most recent development in suborbital space tourism (SST) includes: (1) On 26 October 2017, the Public Investment Fund (PIF) of Saudi Arabia and Virgin Group have signed a non-binding Memorandum of Understanding for a partnership under which PIF intends to invest approximately USD 1 billion into Virgin Galactic; (2) On 18 December 2017, the Virgin Galactic and Italian Space Agency (ASI) announced that they had signed a Letter of Intent under which ASI would secure a full suborbital flight on Virgin Galactic's SpaceShipTwo (SS2) for scientific research in 2019 at Spaceport America in New Mexico; (3) On 12 December 2017, Blue Origin's New Shepard flew again for the seventh time from its West Texas Launch Site with 12 commercial, research and education payloads onboard, featured the next-generation booster and the first flight of Crew Capsule 2.0; and so on. However, there are still many issues for the enhancement from aviation tourism to SST: safety of reusable suborbital launch vehicles (RSLV), requirements on spaceport facilities, study in consumer attitude, facilities for screening and training of tourists, training of pilots, settlement of laws and regulations, promotion of marketing, insurance system, spacelines operations, etc. The major purposes of this paper are to study the requirements of spaceports for SST, to investigate the current status of existing spaceports, and to make suggestions for the spaceports to be developed worldwide in the future. Basically, for the horizontal-take-horizontal-landing (HTHL) RSLV such as SS2, requirements on the spaceport are not too far away from the current aviation airport. But Blue Origin's New Shepard belongs to the vertical-take-vertical-landing (VTVL) RSLV, which needs extra considerations. Therefore, for a spaceport to accommodate both the HTHL and VTVL RSLVs, it might need an independent and safe location for the launch of the VTVL RSLV. Noise level could be high and proper isolation facility might be needed. Also, two dedicated areas are required, one for the recovery of used rocket and one for the landing of crew capsule, respectively.