Federal Aviation Administration

Memorandum

Date: July 23, 2018

To: Kelvin B. Coleman, Acting Associate Administrator for Commercial Space Transportation

CC: Charles M. Trippe, Jr., Chief Counsel

From: Lorelei Peter, Assistant Chief Counsel for Regulations

Prepared by: Anne Moore, Supervisory Attorney, Regulations Division

Subject: Request for Legal Interpretation Regarding Scope of Virgin Galactic's WhiteKnightTwo Flight Activity Allowed Under Launch License

This memorandum responds to your request for a legal interpretation dated June 20, 2018, regarding whether Virgin Galactic, LLC (VG) may conduct certain secondary mission operations as licensed activity under Title 51 of the United States Code. VG is currently authorized to conduct flights using the SpaceShipTwo (SS2) rocket-powered reusable launch vehicle (RLV) in combination with the WhiteKnightTwo (WK2) jet-powered carrier aircraft to conduct launches in a suborbital trajectory.

On May 11, 2018, VG requested a modification of its launch license to allow WK2 to conduct additional flight activity. As proposed by VG, after SS2 has landed, been returned to a safe condition, and repositioned or towed off the runway, WK2 would continue to conduct additional flight activity that would include "but not be limited to WK2 performing SS2 approaches, touch and goes, and additional landings and take-offs." AST has indicated that it has no safety concerns with the additional operations that VG would like to perform.

Background

The Commercial Space Launch Act of 1984 (CSLA) states that "[e]xcept as provided in this chapter, a person is not required to obtain from an executive agency a license, approval, waiver or exemption, to launch a launch vehicle or operate a launch site or reentry site, or to reenter a reentry vehicle."[1] Notwithstanding this language, AVS and AST initially provided dual

[1] 51 U.S.C. § 50919(a).

authorizations for operations involving SpaceShipOne and its carrier aircraft.[2] Subsequently, Congress enacted a new provision:

> SINGLE LICENSE OR PERMIT.—The Secretary of Transportation shall ensure that only 1 license or permit is required from the Department of Transportation to conduct activities involving crew or space flight participants, including launch and reentry, for which a license or permit is required *under this chapter*. The Secretary shall ensure that all Department of Transportation regulations relevant to the licensed or permitted activity are satisfied.[3]

A license or permit is required under this chapter for a launch, which the CSLA defines, in relevant part, as "to place or try to place a launch vehicle . . . from Earth . . . in a suborbital trajectory."[4]

In a 2012 legal memorandum, the FAA concluded that, when a carrier aircraft is taking a rocket to a required altitude to drop it so that the rocket engines may fire and a suborbital launch take place, a space license or permit is all that is required.[5] In such operations, the carrier aircraft is operating as the first stage during launch rather than as an aircraft. In the same memorandum, the FAA responded to VG's argument that AST should license certain operations by its carrier aircraft under § 50904(d) even when a launch is not taking place including operations like captive carriage for ferrying, maintenance flights, and flights for crewmember training. The FAA concluded that, because AST may only license or permit launch and reentry, VG's argument was unpersuasive. In a subsequent letter to VG, the FAA affirmatively stated that non-launch operations of SS2 and WK2 must be conducted as aircraft under the aviation rules promulgated under Title 49 of the United States Code.[6]

Current Legal Issue

The issue raised in the request for legal interpretation is whether the additional flight activities that VG seeks to conduct under its license can be construed as launch activities subject to Title 51 or are non-launch activities subject to Title 49. If the activities do not constitute launch activities, the FAA could be viewed as acting outside its Title 51 authority by including non-launch activity in a license.[7]

As stated earlier, under 51 U.S.C. § 50902(4), launch includes the act of placing or trying to place a launch vehicle in a suborbital trajectory. For a suborbital RLV, launch ends after reaching apogee if the flight includes a reentry, or otherwise after vehicle landing or impact on

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[2] When SpaceShipOne operated as a suborbital rocket it operated under both a space license and an experimental airworthiness certificate.
[3] 51 U.S.C. § 50904(d) (Emphasis added).
[4] 51 U.S.C. § 50902(4).
[5] Internal AGC Memorandum: "AST Legislative Proposal to Acquire Jurisdiction over Space Related Aircraft Flight," Jan. 10, 2012.
[6] Letter from Pam Melroy, Director of Field Operations, to Mack Reiley, Regulatory Compliance Officer for Virgin Galactic, Sept. 12, 2012.
[7] See Food and Drug Administration v. Brown & Williamson Tobacco Corp., 529 U.S. 120, 161 (2000) (stating "an administrative agency's power to regulate in the public interest must always be grounded in a valid grant of authority from Congress.")

Earth, and after activities necessary to return the vehicle to a safe condition on the ground."[8] VG has asked in essence to include activities under its license that would take place after WK2's first opportunity to land and be returned to a safe condition.

It is well-settled that, when no launch is taking place, WK2 and SS2 activities like ferrying flights or crewmember training flights must be conducted under the FAA's aviation rules governing experimental aircraft. It is an open question whether these activities when added on to the end of launch activity can be included in a license issued under Title 51 as secondary mission activity.

The FAA has historically noted the importance of determining what activity is properly included under a license issued under Title 51. The importance of this determination is underscored when viewed under the financial responsibility obligations and waiver provisions that exist for commercial space activity. In the 2000 final rule establishing operational requirements for launches of RLVs, the FAA noted:

> Delimiting the extent of licensed activity is particularly important because activities that are not licensed by the FAA would not be covered by the statutory financial responsibility and risk allocation regime and liability risks resulting from those activities must be managed privately as a matter of business judgment rather than Federal regulation.[9]

Likewise, in a companion final rule, the FAA addressed the importance in determining when launch ends and when reentry begins when a commercial space operation involves on orbit activity. The FAA stated that "[a]bsent a clear casual nexus to a licensed launch or reentry, risk allocation under the CSLA does not apply and indemnification would not be available to cover liability of launch or reentry participants to third parties for on orbit damage."[10]

Under 51 U.S.C. § 50914(a), a licensee must obtain liability insurance or demonstrate financial responsibility in amounts that compensate for the maximum probable loss (MPL) from claims by: (1) a third party for death, bodily injury, or property damage or loss resulting *from an activity carried out under the license*; and (2) the United States Government against a person for damage or loss to Government property resulting from and *activity carried out under the license*." Likewise, under 51 U.S.C. § 50914(b), the licensee must make a reciprocal waiver of claims with applicable parties involved in launch services or reentry services under which each party to the waiver agrees to be responsible for personal injury to, death of, or property damage or loss sustained by it or its own employees resulting from *an activity carried out under the applicable license*." As noted, determining what activity is appropriately carried out under a license is critical to ensure that financial responsibility and waivers of claims are properly executed.

In the request to modify its license, VG noted three activities that WK2 would perform: (1) an SS2 steep approach; (2) touch and goes; and (3) additional landings and takeoffs. To the extent that VG is seeking to include WK2's performance of an SS2 approach on its return to land, such

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[8] 14 C.F.R. § 401.5.
[9] 65 FR 56618, 56621 (Sept. 19, 2000).
[10] 65 FR 56670,

activity seems appropriately licensed activity under Title 51. The approach would occur prior to WK2's first opportunity to land. The regulations do not dictate the type of return that must be conducted but rather VG must demonstrate that the return satisfies the regulations governing the protection of public health and safety, safety of property, and national security and foreign policy interests of the United States.[11]

The more challenging legal questions involve VG's request to conduct touch and goes and additional landings and takeoffs after WK2 could have landed and been returned to a safe condition. While AST has indicated that the additional activity can be conducted safely and is not a driver for maximum probable loss calculations, those conclusions are not a sufficient basis to include non-licensed activity under a Title 51 license. The Supreme Court has noted that regardless the seriousness of the problem an administrative agency seeks to address, "it may not exercise its authority 'in a manner that is inconsistent with the administrative structure that Congress enacted into law.'"[12] Undoubtedly, the exclusion of this activity from VG's launch license will result in an inconvenience to VG as WK2 will have to land and be returned to a safe condition before conducting the activity under Title 49 unless the FAA identifies an acceptable means through which the Title 51 activity and the Title 49 activity can be conducted seamlessly. This obstacle to VG's operation appears to conflict with Congress' apparent intent that commercial space laws and regulations not create unnecessary impediments to the development and success of the commercial space industry in the United States.

Based on the definitions in Title 51 and the FAA's statutory obligation to ensure that non-launch activity is not included in a license issued under Title 51, it difficult to conclude that the touch and goes and the additional landings and takeoffs would constitute appropriate licensable activity. Expanding the FAA's authority under Title 51 to permit operators to add activities to the end of a launch that do not have a causal nexus to launch would set a precedent and could create additional requests to include more expansive activity in launch and reentry licenses. AST has expressed that such concerns are unwarranted as the ability for an RLV to conduct lengthy operations after completing suborbital flight is limited. However, that position understates the fact that the FAA cannot speak definitively about the capacity and capability of future space vehicles. AGC notes this interpretation applies to the specific facts presented by VG in seeking modification of its license. Determining whether a particular activity may be included in a license issued under Title 51 is subject to an individualized review of the timing and nature of the activity.

The space industry with the support of the FAA has continued to seek a legislative solution that would permit space support flights to be conducted under Title 51. In fact, the Senate and the House have draft language that would address this issue in some degree. Rather than stretching the FAA's interpretation of its authority, it would be more appropriate if Congress provided a complete solution to this ongoing problem.

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[11] 51 U.S.C. § 50901(b)(3).

[12] Food and Drug Administration v. Brown & Williamson Tobacco Corp., 529 U.S. 120, 125, 120 S.Ct 1291, 1297 (2000) (quoting ETSI Pipeline Project v. Missouri, 484 U.S. 495, 517, 108 S.Ct. 805 (1988)).

Federal Aviation Administration

Memorandum

Date: June 20, 2018

To: Charles M. Trippe, Jr., Chief Counsel, x73222

From: Kelvin B. Coleman, Acting Associate Administrator for Commercial Space Transportation, x77793

Prepared by: Kenneth Wong, Manager, Licensing and Evaluation Division, x78465

Subject: Request for Legal Interpretation Regarding Scope of Virgin Galactic's WhiteKnightTwo Flight Activity Allowed Under Launch License

Legal Interpretation Requested

Virgin Galactic (VG) has requested a modification of its current launch license to conduct secondary safety-related mission operations using a component of its hybrid launch system; specifically, to allow its WhiteKnightTwo (WK2) carrier aircraft to conduct simulated SpaceShipTwo (SS2) approaches, and touch and goes, for the purpose of safety training for its piloted launch system.

Prior to approving VG's requested modification, AST seeks AGC review of whether these secondary mission operations can be approved in accordance with the regulatory authority granted to the Secretary of Transportation in Title 51.

AST's review of VG's modification request has yielded no significant public safety issues or concerns.

Background

VG holds a launch license (License No. LRLO 16-092) from AST that authorizes VG to conduct launches using the WK2/SS2 hybrid launch vehicle. WK2 is a jet-powered vehicle used to carry SS2 to a release altitude. SS2 is an air-launched, winged, piloted, hybrid rocket-powered, and horizontal-landing vehicle. Launch under the launch license includes WK2/SS2 captive carry, SS2 rocket-powered boost, SS2 coast to apogee, SS2 reentry, SS2

glide, and WK2 and SS2 landings. For WK2 and SS2, flight under the launch license ends upon wheels stopping after landing at the site where flight began.

During launches, AST prescribes operational requirements as license terms and conditions. These terms and conditions include the following:

> VG is authorized to conduct flights using SS2, in combination with the WK2 carrier aircraft that must hold a valid FAA experimental airworthiness certificate and must operate in accordance with the operating limitations of that certificate and the applicable sections of 14 CFR part 91.

Although the launch license requires a valid experimental airworthiness certificate, the experimental airworthiness certificate is held in abeyance during the launch. During non-launch operations, WK2 and SS2 operate under experimental airworthiness certificates.

Launch License Modification Request

On May 11, 2018, VG requested a modification of its launch license to include additional flight activities that the WK2 may perform once SS2 is clear of the runway. Specifically, VG proposed the following:

> After SS2 has landed, been safed and repositioned or towed off the runway, WK2 may continue to conduct additional flight activity that could include but not be limited to SS2 approaches, touch and goes, and additional landings and take-offs. Licensed activity is complete once WK2 has exited the active runways/taxiways, returned to blocks, and engines have been shut down. The additional WK2 flight activities are to provide pilot training and proficiency that enhances the safety of operations and provides mission readiness for future missions. WK2 lands using the same runway as SS2.

For its next rocket-powered flight scheduled for July 10, 2018, VG would like to conduct one simulated SS2 approach and several touch and goes in WK2 under its launch license. Although AST does not have any concerns regarding the safety of these requested operations, the launch license does not currently authorize VG to use WK2 to conduct the proposed flight activity above. To operate within the scope of the launch license, the WK2 must land using the same runway as SS2 and come to a complete stop once SS2 is cleared from the runway, except for off-nominal or abort situations.

Public Safety and Past Precedent

If the simulated SS2 approach by WK2, and WK2 touch and goes, were covered under the launch license, they would neither increase the Maximum Probable Loss (MPL) value nor would they cause the operation to exceed the collective and individual flight risk

criteria. Furthermore, the requested pilot training enhances safety for future missions and supports the continuous improvement of the safety of launch systems designed to carry humans.

Additionally, other operators have conducted secondary mission objectives, e.g., experimental landing of boosters after stage separation, under launch licenses with no impact on public safety. AST believes this approach of allowing secondary mission objectives to be achieved under a launch license can be adopted for VG's requested pilot training.