Federal Aviation Administration

Memorandum

Date: July 24, 2013

To: Stewart W. Jackson, Manager, Regulations & Analysis Division, AST-300

From: Mark Bury, Acting Assistant Chief Counsel for International Law, Legislation and Regulations, Office of the Chief Counsel, AGC-200

Subject: Legal Interpretation of Questions Associated with 14 CFR part 420

This responds to your March 26, 2013, memorandum requesting a legal interpretation of 14 C.F.R. §§ 420.63 through 420.70 regarding the Office of Commercial Space Transportation's (AST's) explosive siting requirements. Specifically, you ask five questions regarding what constitutes an explosive hazard facility and what activities part 420 addresses.

With a focus on public safety and the safety of property, §§ 420.63 through 420.70 establish criteria for siting facilities at a launch site where solid propellants, energetic liquids, or other explosives are located to prepare launch vehicles and payloads for flight. A launch site operator must provide the FAA with an explosive site plan that includes an explosive site map showing the location of explosive hazard facilities. 14 C.F.R. § 420.63(a)(1) (2013). Explosive hazardous activities conducted at explosive hazard facilities may include storage, handling, assembly, checkout, ordnance installation, propellant loading, and final launch preparation. Part 420 establishes criteria for siting facilities at a launch site where solid propellants, energetic liquids, or other explosives are located to prepare launch vehicles and payloads for flight. These separation distances are necessary to protect the public from explosive hazards. *Explosive Siting Requirements*, Final Rule, 77 FR 55108 (Sept. 7, 2012).

I have addressed each of your specific questions below.

1) Is a reusable launch vehicle considered an "explosive hazard facility" under part 420?

No, a reusable launch vehicle is not an explosive hazard facility because it is neither a location nor a facility. An explosive hazard facility is defined as "a facility or location at

a launch site where solid propellants, energetic liquids, or other explosives are stored or handled." 14 C.F.R. § 420.5.

The 2012 Explosive Siting Requirements rule clarified that the definition of explosive hazard facility includes not only facilities but also locations. The FAA added "location" to the definition of explosive hazard facility in order to avoid misinterpretations that explosive hazard facilities are only buildings or storage sites. *Explosive Siting Requirements*, NPRM, 76 FR 8923, 8924-25 (Feb. 16, 2011). This clarification was made in order to more clearly include as explosive hazard facilities hazardous areas such as launch pads and static firing areas with explosives or propellant present. *Id.* at 8924-25. Explosive hazard facilities may include storage sites, buildings, launch pads, and static firing areas with explosives or propellant present. *Id.* at 8925.

Even though a reusable launch vehicle is not an explosive hazard facility under part 420, safe separation distance requirements may apply. If a reusable launch vehicle contains propellants with explosive potential, experimental permit regulations require a safety clear zone that will contain the adverse effects of each operation involving a hazard. For example, under the permit regulations, the public must remain outside of the safety clear zone before and during any hazardous operation. 14 C.F.R. § 437.53. Likewise, under the licensing regulations for expendable launch vehicles, section 417.411(a)(1) requires a launch operator to establish a safety clear zone that accounts for the potential blast, fragment, fire or heat, toxic and other hazardous energy or material potential of the associated systems and operations. 14 C.F.R. § 417.411(a)(1). Under part 431 for reusable launch vehicles, a licensee is responsible for ensuring the safe conduct of an RLV mission and for protecting public health and safety and the safety of property during the conduct of the mission. 14 C.F.R. § 431.71(a).

While the vehicle itself is not an explosive hazard facility, its location may be if, for example, liquid propellant is being loaded onto or unloaded off of the vehicle. If liquid propellants are located in a launch or reentry vehicle tank or other vessel on the vehicle, a launch site operator must comply with the separation distance requirements of § 420.67. These separation distance requirements may apply to stationary vehicles on a launch pad or runway if an explosive hazardous event is taking place. *Explosive Siting Requirements*, NPRM, at 8929-30.

2) Is mobile support equipment that meets various Department of Transportation and OSHA rules and regulations considered an "explosive hazard facility" under part 420?

As stated above, an explosive hazard facility is "a facility or location at a launch site where solid propellants, energetic liquids, or other explosives are stored or handled." 14 C.F.R. § 420.5. Mobile support equipment is not a facility or location. If mobile support equipment is a liquid fuel or oxidizer truck, part 420 dictates where mobile support equipment should be stored, or where it should be located for transfer of its contents to and from a launch vehicle when the fuel transfer occurs on a commercial launch site. 14 C.F.R. §§ 420.63-69.

3) Does part 420 address the loading and unloading of fuel on a reusable launch vehicle on airport or spaceport property by mobile support equipment that meets various Department of Transportation and OSHA rules and regulations?

Part 420 may affect the location of propellant loading. The loading or unloading of liquid propellant must be conducted at the propellant loading area designated on the launch site explosive site map. 14 C.F.R. 420.63(a)(1); *see also Explosive Siting Requirements*, Final Rule, at 55110.

A launch site operator must designate explosive hazard facilities on an explosive site map. 14 C.F.R. § 420.63(a)(1). Additionally, the launch site operator must ensure that the launch operator performs the loading and unloading of co-located incompatible energetic liquids at an explosive hazard facility that is separated from other explosive hazard facilities, each public area, and each public traffic route in accordance with the minimum separation distances of section 420.67 because fueling constitutes handling under part 420. *See Licensing and Safety Requirements for Operation of a Launch Site*, NPRM, 64 FR 34316, 34321 (June 25, 1999).

The loading and unloading of liquid propellant onto or off of a reusable launch vehicle falls under a launch operator's license or experimental permit because it is part of launch.[1] The launch operator is responsible for the safe execution of any fueling operations for its launch vehicle. *See* 14 C.F.R. 417.109(b) (requiring a launch operator to protect the public from adverse effects of hazardous operations associated with preparing a launch vehicle for flight at a launch site); *see also* 431.71(a) (requiring a launch operator to ensure the safe conduct of an RLV mission and protect public health and safety and the safety of property during the conduct of the mission).

The FAA strongly encourages launch site operators to anticipate where explosive hazardous activities may take place in order to avoid having to revise their explosive site plans. Thorough advanced planning during pre-consultation may save the site operator from having to revise and update his or her explosive site plan to accommodate an additional fueling site, for example. The FAA is aware of at least one launch site operator that chose to designate its entire runway as an explosive hazard facility in order to avoid later revisions to its explosive site plan.

---

[1] Launch includes preparing a launch vehicle for flight at a launch site in the United States. Under a license, launch begins with the arrival of a launch vehicle or payload at a U.S. launch site. 14 C.F.R. § 401.5. Under a permit, launch begins when any preflight ground operation at a U.S. launch site meets all the following criteria: (1) is closely proximate in time to flight, (2) entails critical steps preparatory to initiating flight, (3) is unique to space launch, and (4) is inherently so hazardous as to warrant the FAA's regulatory oversight. *Id.*

4) Is part 420 applicable to horizontal reusable launch vehicles when rolling down the runway at a commercial launch site?

As addressed in question one, part 420 does not apply to a horizontal reusable launch vehicle itself. Part 420 may apply to the location of a horizontal reusable launch vehicle, however, if, for example, the launch operator is loading or unloading liquid propellant. 14 C.F.R. § 420.67(a).

5) Under part 420, what are the respective responsibilities of the commercial launch operator and the commercial site operator?

Under part 420, the launch site operator has specific responsibilities with respect to ground safety, such as preventing unauthorized public access to the site, informing customers of limitations of use of the site, and scheduling and coordinating hazardous activities conducted by customers. *Licensing and Safety Requirements for Operation of a Launch Site*, Final Rule With Request For Comments, 65 FR 62812, 62816 (Oct. 19, 2000). The launch site operator is also responsible for developing and maintaining the explosive site plan to include the location of all explosive hazard facilities within the boundaries of the commercial launch site. 14 C.F.R. § 420.63(a)(1). The commercial launch operator is not directly regulated under part 420, but rather under the appropriate part that regulates its launch operations.

A site operator must be able to provide appropriately sited facilities that permit a launch operator to comply with its requirements. *Explosive Siting Requirements*, Final Rule, at 55110. The launch license governs launch under parts 417 and 431; however, the launch operator will have to operate with separation distances in effect. *See, e.g.*, 14 C.F.R. 417.411(a)(1) (requiring launch operator to establish safety clear zone able to confine an adverse explosive event). Part 420 addresses a different issue than a launch operator's safety clear zone. While parts 417 and 437 require launch operators to establish a safety clear zone during pre- and post-flight operations, and part 431 requires launch operators to protect the public during the conduct of the mission, part 420 requires that there be room for such safety clear zones in the first place. *Explosive Siting Requirements*, Final Rule, at 55110. As explained in the preamble to the final Explosive Siting Requirements rule:

> For example, if a launch operator performs its hazard assessment and it, or the FAA, determines that it needs a great deal of room to encompass its hazards, the launch site operator's preliminary explosive siting should already have made sure that the necessary separation distances are in place at the launch site. Different launch vehicles may have different levels of quality, safety, and reliability, depending on the maturity of the technology and the organization, which means that the site operator's separation distances must account for a worst-case launch vehicle.

Id.

Ultimately, under each respective part, the launch site operator and the launch operator are both responsible for the safety of hazardous ground operations when conducted as a part of a launch operation at an explosive hazard facility when located on a commercial launch site. "The philosophy underlying the necessity for separation distance requirements is that there must be room for hazardous operations, even those covered by other licenses." *Id.*