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United Space Alliance

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In Reply Refer To: 99USA0447

Mr. Stewart Jackson
AST-100, Space Systems Development Office
Mr. Randall Repchek
AST-200, Licensing and Safety Division
Office of the Associate Administrator for
Commercial Space Transportation
Federal Aviation Administration
800 Independence Ave. SW.
Washington, DC 20591

Subject: Comments to 14 CFR Parts 401 et al.

Dear Messrs. Jackson and Repchek:

The United Space Alliance (USA) is pleased to provide proposed modifications to the referenced Part II Final Rule dated April 21, 1999. In addition, we are providing requested comments to the proposed advisory circulars (Part III) from the same date:

A. Proposed Modifications to Part II, 14 CFR 401 et al, Commercial Space Transportation Licensing Regulations; Final Rule.

1. **Section 401.5 Definitions.** The definition of launch is overly broad and would impact seriously both flight operations and the economic viability of any commercial space launch operator. These negative effects would not be offset by corresponding increases in the safety of the public or of property. Using the "gate-to-gate" approach discussed by the FAA, virtually any activity conducted at a launch site becomes part of the launch itself, even when the activity is unrelated to a launch or the vehicle in question never would launch from this particular facility.

Launch vehicle operations may be divided into two steps, processing and launch, where the majority of activities take place during processing.

This step includes any required vehicle maintenance, reconfiguration to install the payload for the mission, and any system testing necessary to verify nominal operations. These activities should be excluded from the FAA definition of launch. First, all of these activities are essentially industrial activities that are well regulated by OSHA and other federal, state, and local agencies. New FAA regulation would be redundant, possibly causing conflicts with existing requirements, and place an unnecessary burden on the launch operator to document and demonstrate compliance.

Second, the FAA definition would create an inconsistent enforcement of proposed regulations. As these regulations would cover only activities taking place "inside the gate," any operator who chose to perform its processing activities at a different location would not be subject to them. The resulting scenario could have one operator processing a vehicle just inside a launch facility with a second operator conducting identical operations within a few hundred yards outside the fence. Subjecting the first, but not the second, operator to the FAA regulations would skew the operating plans of launch operators, having a negative economic impact on the launch industry. For example, an operator might not conduct vehicle processing in available facilities located on a launch site because of increased regulatory burden. Moving the processing out of the site could increase the overall cost of flight with no increase in public safety.

USA recommends that the term launch be redefined to exclude the processing activities and only apply to those situations where an operator places a vehicle at the launch pad *with* the *intent* to launch *the* vehicle. This intent is significant as this definition would exclude launch pad tests, such as countdown tests, where no launch is planned. Also, the term would no longer cover activities at launch facilities where clearly there is no intention to launch a particular vehicle. For example, an operator could conduct selected activities at the White Sands Test Facility prior to moving the vehicle to the Kennedy Space Center for launch. Because White Sands conducts launches, and would be a launch site under the current FAA definition, all operator activities would be subject to launch regulations.

In contrast, the proposed definition would meet the FAA responsibility to regulate unique activities surrounding launch preparations and the launch itself. It would include specifically those events that placed the public at risk from the presence of a propulsive launch vehicle at the site. It is important to note that this revised definition does not reduce the responsibility of the launch operator to protect the safety of the public or of property.

Instead, it provides a more uniform regulatory atmosphere for operators, eliminating the burden created by duplicate regulation of operations and eliminates the economic impact from inconsistent application of regulation to operators caused by the "gate to gate" approach.

1. Section 413.5 Pre-application consultation. Although USA agrees that such a consultation has great value, the section should be expanded to provide more guidance to the launch operator. USA recommends that the definition also discuss what data the launch operator should have available when consulting with the FAA and the specific products that will result from these consultations.

2. Section 415.3 Types of launch licenses. The two types of licenses included in this section do not cover launch operators who may operate a variety of launch vehicles from a single launch site. In these cases, the launch operator could be required to obtain multiple licenses to operate out of a single launch site. USA recommends that a third type of license be created allowing the operator to obtain a single license for the complete range of its launch site operations. Amendments could be added to this basic license to cover launch vehicles from each family of vehicles employed by the operator. These amendments would discuss only activities specific to those vehicles or any required waivers or deviations from approved launch site operations. Using this approach, the fundamental data on each launch site's operations would not have to be reviewed and approved multiple times by the FAA.

3. Section 415.55 Classes of Payloads. This section appears to be in conflict with the requirements contained in Section 413.15 Review Period and Section 415.7 Payload Determination. These latter sections contained a launch licensing requirement that payload data be supplied as part of the 180-day FAA review process. Section 415.55 sets a minimum 60-day FAA review period for payloads. USA recommends eliminating the 180-day requirement. As launches become more frequent, the 60-day requirement would provide ample time to identify any safety issues, but would allow flexibility in manifesting payloads. Economic benefits also would be increased in two ways. Launch vehicles could be use more efficiently and payload launch delays reduced. For example, in situations where the payload provides commercial services, the impact of a delay could have considerable impact on the viability of any enterprise.

4. Section 415.85 Compliance Monitoring. USA suggests that this section be modified to include the confidentiality requirements contained in Section 413.9 Confidentialitv. Individuals monitoring launch operator activities might be exposed to or require access to proprietary data.

   Similarly, these monitors may observe proprietary methods or operations requiring commitments of non-disclosure.

5. Section 415.91 General. This section places undue burden on the launch site operator. USA recommends that specific guidance be provided on how the launch operator can meet the requirement that the launch "demonstrates an equivalent level of safety to that provided by a launch from a federal launch range." As the section is written currently, the launch operator is being required to pass a subjective test containing largely undefined standards. For example, AC 431-02, Section 431.75, subsection (b) requires agreements for notices to mariners and airmen, but similar requirements are not specified here. USA recommends that the FAA develop a set of required standards that must be met at non-federal launch ranges or that the agency specify which federal launch range rules and regulations must be satisfied for operations.

B. Comments to Proposed AC 431-01, Reusable Launch System Safety Process, and AC 431-02, Expected Casualty Calculations for Commercial Space Launch and Reentry Missions

1. **Section 405.1 Monitoring of licensed and other activities.** USA suggests that this section be modified to include the confidentiality requirements contained in Section 413.9 Confidentialitv. Individuals monitoring manufacturing, testing, and operations activities might be exposed to or require access to proprietary data. Similarly, these monitors may observe proprietary methods or operations requiring commitments of non-disclosure.

2. **Section 413.3 Who must obtain a license.** This section is silent on the question of reentry vehicles owned or controlled by United States citizens, but which are launched on vehicles owned or controlled by foreign entities. For example, a United States citizen-owned reentry vehicle could be launched on a Russian launch vehicle, but reenter to a United States landing site. Also, this reentry vehicle may or may not be a reusable vehicle. USA suggests that in both these cases, the reentry vehicle should be regulated under the terms of Part 435 – REENTRY OF A REENTRY VEHICLE OTHER THAN REUSABLE LAUNCH VEHICLE.

3. **Section 431.11 Additional license terms and conditions.** Although USA recognizes the FAA's responsibility to ensure compliance with 49 U.S.C. subtitle IX, chapter 701, and applicable regulations, this section provides little guidance to licensees who may find themselves in violation due to statutes being modified. USA recommends that the FAA establish a review procedure in this section for implementing such modifications.

   This procedure would permit all concerned parties to discuss implementation alternatives, assess the impacts of these alternatives, and continue operations while modifications were being put in place.

4. **Section 431.3 Types of reusable launch vehicle mission licenses.** In subsection (a) Mission-specific license, the requirements state that a licensee may receive authority to launch multiple missions with each mission separately enumerated. For each launch, the proposed reentry site must be included as part of the licensing process. This requirement implies that, for this type of license, all missions must return to the same landing site. USA recommends that the regulation be clarified to state that a different site may be specified for each mission. Similarly, USA recognizes that multiple possible landing sites might be required for a single mission. For example, USA anticipates missions where weather constraints or mission requirements would make it advantageous to land at one of multiple sites without the actual site being known prelaunch. USA suggests that a single license be issued to cover the mission, with any landing site-specific requirements included in the license.

5. Subsection (b) Operator license requires an operator of RLV missions to renew its license every two years. Although this period may be appropriate for a new operator, a proven experienced operator, such as USA, should be able to secure licenses for a five year term. USA recommends a two-tiered system allowing operators to "graduate" to longer-term licenses similar to those specified in Section 415.3 (b).

6. **Section 431.7 Payload and payload reentry determinations.** Subsections (b) through (d) address only those payloads returned using RLVs. USA can foresee operating payloads using a carrier that is reusable and may or may not be launched on an RLV, but is returned by an RLV. In these cases, USA recommends that the RLV operator payload responsibilities be limited to the requirements in Section 431, Subpart D – Payload Reentry Review and Determination.

7. **Section 431.11 Additional license terms and conditions.** Although USA recognizes the FAA's responsibility to ensure compliance with 49 U.S.C. subtitle IX, chapter 701, and applicable regulations, this section provides little guidance to licensees who may find themselves in violation due to statutes being modified. USA recommends that the FAA establish a review procedure in this section for implementing such modifications. This procedure would permit all concerned parties to discuss implementation alternatives, assess the impacts of these alternatives, and continue operations while modifications were being put in place.

8. **Section 431.23 Policy review.** This section includes the phrase ". . .would jeopardize public health and safety or the safety of property..." This phrase is not found in its counterpart, Section 415.23 Policy review. However, the phrase is repeated in Section 431.31 General.

   This would indicate a duplication of effort and paperwork by the license applicant for two separate reviews. USA recommends that the requirement be satisfied by the safety review only, and that the requirement be deleted from this section.

9. **Section 431.25 Application requirements for policy review.** Subsection (d)(l) requires the license applicant to specify launch and reentry sites, including contingency abort locations. For vehicles possessing an extensive cross range capability, this subsection could encompass both standard and "emergency" abort sites. USA proposes that these two types of sites have different reporting requirements. The standard site would be subject to the licensing requirements of this section. For emergency sites, the approach would follow that of aircraft operations. When an emergency is declared, the vehicle could land at any site within a prescribed range of safety parameters. As with aircraft, the reentry vehicle could land at such a large number of sites that it would be impractical to identify or prepare for landings at each one.

10. **Section 431.35 Acceptable reusable launch vehicle mission risk.** Subsection (b)(l) establishes **a** limit of 0.00003 casualties per mission. This figure **was** derived using launch criteria only and the extension of this requirement to an entire mission is not appropriate. USA recommends that these casualty risk numbers should consider launch and reentry as distinct events, with individual calculations of risk, when the events are separated by an extended period of time. These individual components of risk can then be included in an integrated risk calculation for the mission as a whole.

11. Subsection (b)(2) specifies a IOO-mile distance from the border of a scheduled or contingency landing site for an RLV. Vehicles with extended cross range might land at one of hundreds of sites should a contingency arise. It is not feasible to calculate the required probability of 0.000001 casualties per mission for each site or to guarantee that this standard can be attained. In addition, the current requirement introduces a significant population with little or no probability of being impacted. USA recommends that the requirement for contingency sites be removed from this section.

12. Subsection (d)(7) requires the applicant to provide data that validates systems safety analyses. The standards and methods for such validations should be defined.

13. **Section 431.39 Mission rules, procedures, contingency plans, and checklists.** Subsection (a) requires the applicant to submit these items as part of the application procedure. Given the lead time associated with license review and approval, it is impractical to assume that these documents will be developed in their final form upon application submittal. Also, the FAA should describe requirements for what constitutes material changes to these documents that would require reporting the changes to the FAA.

14. **Section 431.43 Reusable launch vehicle mission operational requirements and restrictions.** Subsection (c)(l) requires an RLV operator to perform a collision avoidance analysis prior to any launch or reentry. This requirement could be very difficult to meet in circumstances where the exact launch time or reentry time is not known in advance. USA suggests that these analyses be provided in advance for scheduled events, and that the RLV operator perform such analyses for off-nominal launch/reentry events prior to their initiation.

15. Subsection (c)(2) and (d)(l) employ the phrase “substantial dwell time over densely populated areas.” The terms “substantial” and “densely populated” should be defined.

16. **Section 433.5 Operational restrictions on a reentry site.** This requirement is inconsistent with the Section 431.35 Acceptable reusable launch vehicle mission risk, subsections (b)(l) and (2) requirements for expected casualties per mission. USA recommends that the contents of Section 433.5 reflect the requirements in Section 431.35.

17. **Section 435.3 Types of reentry licenses.** In subsection (a) Reentry-specific license, the requirements state that a licensee may receive authority to reenter one model or type of reentry vehicles. For each launch, the proposed reentry site must be included as part of the licensing process. This requirement implies that, for this type of license, all missions must return to the same landing site. USA recommends that the regulation be clarified to state that a different site may be specified for each mission. Similarly, USA recognizes the multiple possible landing sites might be required for a single mission. For example, USA anticipates missions where weather constraints or mission requirements would make it advantageous to land at one of multiple sites without the actual site being known prelaunch. USA suggests that a single license be issued to cover the mission, with any landing site-specific requirements included in the license.

Subsection (b) Reentry operator license requires a non-RLV reentry operator of reentry missions to renew its license every two years.

USA recommends a two-tiered system that allows operators, as experience is gained and operational procedures are proven, to "graduate" to longer-term licenses similar to those specified in Section 415.3 (b).

18. **Section 435.11 Additional license terms and conditions.** Although USA recognizes the FAA's responsibility to ensure compliance with 49 U.S.C. subtitle IX, chapter 701, and applicable regulations, this section provides little guidance to licensees who may find themselves in violation due to statutes being modified. USA recommends that the FAA establish a review procedure in this section for implementing such modifications.

This procedure would permit all concerned parties to discuss implementation alternatives, assess the impacts of these alternatives, and continue operations while modifications were being put in place.

19. **Section 435.23 Policy review requirements and procedures.** This section references Section 431.23 Policy review that includes the phrase ". . .would jeopardize public health and safety or the safety of property.. ." This phrase is not found in its counterpart, Section 415.23 Policy review. However, the phrase is repeated in Section 431.31 General. This would indicate a duplication of effort and paperwork by the license applicant for two separate reviews. USA recommends that the requirement be satisfied by the safety review only, and that the requirement be deleted from this section.

20. Section 435.23 Policy review requirements and procedures. The observations that are noted in Section 431, subpart B of this subchapter also are applicable in this situation.

21. Section 435.33 Safety review requirements and procedures. The observations that are noted in Section 431, subpart C of this subchapter also are applicable in this situation.

22. Section 435.35 Acceptable reentry risk for reentry of a reentry vehicle. The observations that are noted in paragraphs (a) and (b) of Section 431.35 of this subchapter also are applicable in this situation.

23. Section 435.43 Payload reentry review requirements and procedures. The observations that are noted in part 431, subpart B of this subchapter also are applicable in this situation.

USA stands ready to discuss any comments or to provide more data that leads to our positions on these issues. Please contact me at (281) 212-6120 or Dr. William Vantine at (281) 212-6143 with any questions you may have about these topics.

Sincerely,

Jim C. Adamson
Chief Operating Officer