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FAA-99-5535-13

**COMMENTS ON NOTICE OF PROPOSED RULE MAKING  
FEDERAL AVIATION ADMINISTRATION  
14 CFR Parts 400,401,405,406,413,415,431,433, and 435  
[Docket No. FAA-1999-5535; Notice No. 99.04]**

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DEPT OF TRANSPORTATION

**§401.5 Definitions - Launch**

This definition serves to define the extent of activities associated with a definable segment of operations at a launch site. The last moment in time included in the definition is “after the licensee’s last exercise of control over its launch vehicle.” For RLVs, that span of activities should include post-flight ground operations and remediations, if any, dealing with and as a direct consequence of having launched a vehicle on a particular mission and then having brought it back to earth in either a controlled or an uncontrolled manner. Including this specification in the “Launch” definition is consistent with the stated policy of integrating launch and reentry licenses. Alternately, it may be included in the “Reentry” definition.

**§401.5 Definitions – Operation of a launch site and Operation of a reentry site**

These definitions are presently limited to “safety operations” at launch or reentry sites. This limitation is vague since no definition is given for safety operations. Further, it seems logical that these definitions should extend beyond those specifically classed as “safety operations” to include all activities authorized by the site operation license. While all such activities would fall under the safety purview, in that they would have to be conducted in a safe manner, there seems to be a logical distinction between those that are directly associated with ensuring and implementing safety measures and other activities whose primary purpose is in other directions. Therefore, we propose that the word “safety” be stricken from the definitions and suggest that it be replaced with the word “licensed”.

**§401.5 Definitions - Payload**

As it stands, the definition limits payloads to objects intended for placement in “outer space”. Because subsequent definitions (see for instance §43 1.35 or the definition of “Reenter” in this section) make reference to orbital insertions in ways distinct from being in outer space, we suggest striking the word “outer” and simply referring to objects in space.

**9401.5 Definitions – Reentry site**

Because the standard deviation of a reentry vehicle depends on atmospheric conditions, which may change markedly with the time of year, we think it is important to include in the definition either that the standard deviation should be an upper bound based on year-round atmospheric conditions or that a site which qualifies under some conditions may not be useable if the conditions assumed in site determination are not met.

**9405.1 Monitoring of licensed and other activities.**

It seems inconsistent with economy, fairness, and privacy that the FAA should have inspection authority or jurisdiction over “payloads for which no Federal license, authorization, or permit is required” once the payload determination has been made. Therefore, we believe reference to such should be removed, or specific identification should be provided justifying why such observation or inspection authority is to be granted.

### **§431.3 Types of reusable launch vehicle mission licenses, (b) Operator license**

While we have no objection to the two-year period for renewal of an operator license, we believe that procedures for renewal could be modified from those for initial acceptance in order to take advantage of existing documentation, experience gained in the previous two years' activities, and so forth, and thus save costs and effort by both the FAA and the site operator. We think a paragraph addressing the process for license renewal and the factors that will be considered in that process should be included.

### **9431.11 Additional license terms and conditions**

This provision opens the door for harassment and capricious intervention with a launch or reentry operator's activities. We acknowledge the responsibility of FAA to ensure safety and compliance with applicable regulations. However, there is significant financial and programmatic risk associated with the possibility that at any time, an operator's license may be changed in ways that would prevent him from continuing based on what may be rather arbitrary and subjective interpretation of the law. Therefore, we believe that some controls should be applied to FAA's license modification authority. This is not adequately covered in §404.3 Filing of petitions to the Associate Administrator. We believe that a license, once issued, should be in force for the period it was issued for. Should a serious error be discovered in the granting of the license, the FAA should notify the licensee of the situation, suggesting and justifying proposed changes to the license. Then, if an agreement for license modification cannot be reached, the license may be revoked.

### **§431.25 Application requirements for policy review, d(3) [typographic]**

Remove the capitalization from the word "For" in the second line.

### **§431.33 Safety organization (c) Safety official**

In the prefatory material (see p. 68) it is stated that the FAA recommends "the safety official report directly to the person responsible for the conduct of licensed activity. . ." In this paragraph the requirement is made mandatory: "The safety official shall report directly to the person responsible for an applicant's licensed RLV mission activities. . ." While we agree that it is a logical and useful configuration for communications and effective operations, we do not believe it is the prerogative of FAA to dictate the internal organizational structure of an entity external to itself. We, therefore, recommend changing the second sentence in this paragraph to begin: "It is recommended that the safety official report. . ."

### **§431.35 Acceptable reusable launch vehicle mission risk. (a)**

The last sentence of this paragraph indicates that the mission concludes "upon landing on Earth of the RLV." We believe this would be more specific and complete if it read: ". . . upon coming to rest on Earth of the RLV." Not all landings (for instance those performed for private pilot certification) include cessation of motion on the ground after touch down.

### **(b) Acceptable risk. . .**

A fundamental concept, espoused in the prefatory material and reflected in much of the proposed rule change, is that a mission begins with preflight activities and continues to the end of operations associated with the vehicle and payload that are committed to when flight begins. That means that when the RLV mission flight is initiated, either it is intended that the payload

and possibly parts of the launch vehicle remain indefinitely in space or that they return to the earth. While it is possible on an RLV launch to make the decision not to return items in orbit to the earth, by virtue of its being classed an RLV launch the operator declares his intent to return at least part of the launch vehicle to the earth, making the reentry part of the mission. Therefore, it seems inconsistent and illogical to separately identify risk for the reentry phase from that during the launch phase. The entire mission should share in the risk allocation of  $E_c = 30 \times 10^{-6}$  per mission declared to be the bounding value for public risk. Even though return to the earth is unpowered, it is by no means clear that it would only involve 1/30 the risk to the public of the launch phase. We believe that it should be the prerogative of the operator to distribute the public risk between launch and reentry phases and that there should not be a separate requirement or risk budget for the reentry phase.

**§431.37 Mission readiness, (a)(1) and (a)(2) [grammar]**

Grammatical structures of leading sentences/phrases in the two subparagraphs do not correspond.

**§431.41 Communications plan**

Either in this section of safety documentation or elsewhere, there should be a discussion of communications system reliability and procedures for implementing backup systems if needed. System functionality will be included in the assurance of safety-critical system readiness [ §43 1.37 (a)( 1)(i-iii)].

**§431.43 Reusable launch vehicle mission operational requirements and restrictions. (c)(2)**

References to “substantial dwell time” and “densely populated areas” are indefinite, and should be removed. There is obvious concern for increased risk if the IIP spends a long time in an area that is densely populated (both relative terms), but without having a specific level of risk associated with such a provision, it will be impossible to enforce. Requiring that the vehicle not have substantial dwell time over densely populated areas during any segment of mission flight is complicated by the potential axial and lateral dispersion of debris or of the vehicle itself should an accident or incident take place. How far away from such an area must the vehicle remain before there is acceptable risk to that area? Further, to make such a requirement in contradiction of the stated maximum  $E_c$  value of  $3 \times 10^{-6}$  per mission is a declaration that the stated number is not really the requirement. There are few inland launch sites or reentry sites, deemed important for RLV operations, where there are no densely populated areas that would be overflowed at some stage of the launch or reentry. This requirement will place an undue restriction upon an otherwise successful operation.

**(d)(2)**

The same arguments apply to the requirement in this subparagraph that an unproven vehicle shall not operate over a populated area if the estimated  $E_c$  will exceed  $30 \times 10^{-6}$  assuming the probability of failure over that area is unity. First, there is no defined basis on which to determine that a vehicle is proven or unproven. Next, what constitutes being “over” the populated area? Finally, this requirement again implies that the acceptable risk criterion is not the stated  $30 \times 10^{-6}$  per mission. This is not a rejection of the concept that it is unwise to fly vehicles with a high probability of failure near areas where they may cause serious injury, but without specifics, it will be impossible to enforce. If the decision on admissibility is to be a subjective one by the FAA, so state and say who will be making the call.

**\$431.45 Mishap investigation plan and emergency response plan. (b)(1)**

The requirement for “immediate” notification is vague in that it is not clear what constitutes immediacy. It would be better to give a time interval such as “within one hour of discovery”.

**\$431.55 Payload reentry review. (e) and \$431.59 Issuance of payload reentry determination.**

There should be a time interval set for response by the FAA to a request for determination. Program planners and managers will be unable to effectively manage program resources without an assurance of the time in which they can expect a reply.

**\$431.57 Information requirements for payload reentry review.**

There should be an assurance of confidentiality and protection of proprietary information provided to the FAA for review.

**5431.61 Incorporation of payload reentry determination in license application.**

The paragraph does not sufficiently reflect the stated desire by the FAA that the license for a mission is for the complete mission including reentry, if any. Therefore, we suggest that the first sentence of this paragraph read: “If the mission plan calls for payload reentry, a favorable payload reentry determination issued for a payload or class of payload will be included. . .”

**\$431.79 Reusable launch vehicle mission reporting requirements. (c)**

See comment on \$431.45 Mishap investigation plan and emergency response plan. (b)(1), above regarding definition of “immediately”.

**§435.7 Payload reentry determinations, and 9435.9 Issuance of a reentry license.**

Statements should be made regarding the time required/guaranteed for response by the FAA after a request for determination or license has been made. This is needed by operators for appropriate planning of resources and program milestones.

**§435.11 Additional license terms and conditions.**

See comment on §43 1.11 Additional license terms and conditions, above.