Vela Technology Development, INC.

BUILDING A SPACEFARING CIVILIZATION

ORIGINAL

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U.S. Department of Transportation Dockets
Docket No. FAA-l 999-6265 -2
Room Plaza 401
400 Seventh Street SW
Washington DC 20590

October 15, 1999

Greetings,

The attached comments are submitted to Docket No. FAA-19996525, Notice No. 99-17, against DoT, FAA 14 CFR Part 450 et al., '*Financial Responsibility Requirements for Licensed Reentry".

All comments will be referenced to page number, major section heading, paragraph number on page and then line from the top of paragraph as appropriate.

It is noted with confusion and regret by this reviewer that the authors are still trapped by a notion that RLVs are just re-usable ELVs and that an orbiting RLV is just a reusable RV. Therefore they have seen fit to load all the baggage from ELV launches and their RV reentry's onto RLV licensing. It is a mystery to us why the inherent, aircraft-like nature of RLVs (winged or not) is not more apparent to the authors. That RLVs transit space in addition to the air does not change how and when they present a risk to the public (i.e., take-off and landing). RLV licensing regulation should be completely rewritten, separate from ELV and RV regulations as appropriate, to recognize this heretofore ignored fact of life.

Sincerely,

Robert H. Ballard
Program Manager

1 Atch
Comments (4 pages)

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Comments to Docket No. FAA-19996265.

As usual, absent any identifying marks on the NPRM, it is very difficult to reference a comment to the pertinent part of the NPRM. These comments are to be applied to the "n99-17.doc" version from the web site.

Page/Section/Paragraph on page/Line within para on page: Comment

15/"RLV Launch and Reentry Financial Responsibility; Mission approach"/last para/7("Accordingly, it is necessary.. ."): For an RLV, it is no more "necessary to define the scope of licensed launch activities, as distinct from licensed reentry activities, involved in an RLV mission in order to allocate risk and assign financial responsibility requirements to the appropriate phase of licensed flight" than it would be to define the scope of take-off, as distinct from landing, of an aircraft, While ELV, or even RLV, payloads which later reenter might benefit from such a distinction, RLV's themselves are not even remotely conceived of in this manner.

16/same as above/last/entire para: Same comment as above. These notions are entirely left over from, and a poor legacy of, ELV activities. Aircraft too are in a different and irrelevant fuel load configuration at launch verses "reentry" (which for both aircraft and RLVs are more properly thought of as landings rather than reentry's). (In fact the whole notion of a reentry "site' for an RLV is largely non sequitar. RLVs reenter "controlled air space" and land-many on normal runways--apart from any location directly connected to any so called reentry site. The notion that the event called "reentry" is itself a risk to the public in the case of RLVs is a mistaken holdover from ELVs and warhead-like RVs (a class in which COMET/METEOR clearly belongs). In fact, the whole notion that "landing" should be licensed separately from "take-off' for RLVs is a misconstruction of the properties of the launch vehicle. RLVs are not ELVs: in this regard they are more like aircraft. When you are talking about "reentry" for RLVs, you are really talking about "landing' (planned or unplanned) as far as risk to the public is concerned. Therefore you must consider the "fully loaded landing" that will follow a flight which "aborts' just a validly as an "empty' flight returning from a lengthy stay on-orbit. And, RLVs will address IIP in the same fashion as aircraft: nobody is planning on either restricting operational RLVs to unpopulated flight paths or destroying them intentionally during takeoff (or any other time for that matter) any more than you would destroy or restrict a fully loaded B-747.

17/same as above/last/last sentence on page: While such distinctions may be beneficial for returning, separated payloads, it is wholly inappropriate for RLVs just as it would be for aircraft.

18/ "RLV Launch and Reentry Financial Responsibility; Scope of RLV Launch Authorization"/2/definition of launch discussion: Wording of the CSA not withstanding, the definition of Launch for an RLV is herein defined totally inappropriately. It was fallacious when presented in the RLV licensing NPRM; it is fallacious here. It is without substance or value to define launch of an RLV in a manner consistent only with the activities associated with some ELV missions. RLVs are distinctly different from ELVs. Many, if not most, RLVs will be intact, *major* components present, at all times after their initial construction. To pretend that they are in the midst of "launch" when in this configuration is to imply they are always in "launch". Further, this could also, somehow, require them to be subject to licensing even when they are sitting idle on the tarmac awaiting a future mission. Abandon ELV definitions for RLV activities and define terms appropriate to RLV activity.

20/ "RLV Launch and Reentry Financial Responsibility; Scope of RLV Launch Authorization"/1/definition of launch end point discussion: Payload deploy is an inadequate definition of end of launch. It may or may (probably) not be useful when dealing with ELVs; after all, deploy or not, the launch will end even if it's with raining debris. It is without meaning, however, on an RLV mission, especially one that carries and/or deploys no payload (can't think of examples?-- microgravity experiments, passenger excursions, earth/stellar observation missions, failed deployments or unready payloads, changed my mind, etc.-curious to see how you handle even this definition for an ELV which has an integral upper stage/payload going into orbit-bad definitions are bad no matter where they are applied). This need to define the end of launch arises artificially in the first place because of some perceived need to allocate risk to different phases of the same flight. This is partly the result of not realizing that RLVs are different than ELVs and assuming that all RLVs are simply an ELV that plans to reenter. It now seems like we need to add something new to cover the rest of the flight even though (or maybe especially because) we've always ignored ELV reentry. I can assure you, my passengers don't plan on being deployed at this time; and don't care about phases beyond a general expectation to be reasonably safe for the entire flight. [Needless to say, we agree that the proposed changes in other documentation to a time of "last vehicle control (or safing)(or whatever)" is equally bogus for RLV's under any circumstances!]

21/ "RLV Launch and Reentry Financial Responsibility; Scope of RLV Launch Authorization"/1/definition of launch end point discussion: The NPRM makes the following request: "In other circumstances, such as delayed reentry by design, the FAA has requested comments in the RLV Licensing Regulations on the appropriate commencement point of reentry licensing authority from a safety perspective and now solicits public comment from a financial responsibility and risk management perspective." It is suggested here that no distinction be made between "launch" and "reentry" for RLVs: they are all part of the same mission and they should be treated as continuous/overlapping/mutually-required activities with no discernable boundary. What goes up, must come down. RLVs are certainly intended to do both. To license take-off and then treat

landing as if it were some independent unrelated event is hard to comprehend. Even a long-delayed reentry is not conceptually different from a long flight leg between checkpoints, or between takeoff and landing. Many paragraphs are spent in this document struggling with the ramifications and inconsistencies brought about in the attempt to create this unneeded distinction. An RLV (or ELV for that matter) (excluding perhaps any deployed orbiting objects-which should have their own coverage) should be responsible for the consequences of its flight regardless of when during that flight something becomes amiss. And, as charged by Congress, the U.S. Government should indemnify the launch industry (RLVs included) against catastrophic loss liability on the ground; period. Look to the aircraft model, if you must, to salve the need for this otherwise totally unnecessary and artificial distinction. The FAA should be licensing the flight (launch, landing, whatever-the issue is risk on the ground!) and the insurance/indemnification should cover all of the consequences on the ground of that licensed activity.

The whole idea that anything that happens "after the launch" could somehow NOT be "causal nexus" is misleading at best. Vehicle operators in any other transportation industry do not seem to have these kinds of language problems. Even in the unlikely event that some other contractor is landing the RLV, he owns part of the risk pool shared by the launching contractor. It is irrelevant to those at risk on the ground, and often impossible even for the participants to determine, whether the problems are caused during launch, while on orbit, or for no reason at all-they are still at risk. Over all, somebody is sponsoring this flight activity-somebody is responsible-it all stems from the existence of the flight in the first place and the transportation methods chosen. If you authorized the launch and something happens during orbital operations that causes a liability on the ground, it matters not one whit what these definitions say: reentry will have taken place, the damage will have been done, and it would not have happened if you had not authorized the launch. There is no condition that can separate any RLV "reentry", planned or unplanned, from licensed activity. The fact that the operator was authorized to place the object in space in the first place must come with the realization that the object will return! There can exist no condition under which reentry (no matter the cause) can be left unprotected from the possibility of catastrophic liability. These so called "bright line reference points" are not; and are even detrimental to the good order of the industry. License the flight and indemnify the risk on the ground. To do otherwise is to risk the entire industry and indeed the nation's future in space.

31-32/ "RLV Launch and Reentry Financial Responsibility; Scope of RLV Launch Authorization"/last paragraph/definition of reentry discussion: See comment immediately previous for why this paragraph should be deleted and the concepts contained therein have no basis in supporting this industry or following the mandate of Congress.

32-33/"RLV Launch and Reentry Financial Responsibility; Suborbital RLV Financial Responsibility"/last paragraph/proposed distinction between suborbital RLVs and suborbital RLVs: "The FAA requests public comment on this proposed distinction in financial responsibility requirements." Even absent a definition of when an RLV "enters outer space" it is impossible to envision why an particular altitude determines whether or not the last "half" of the suborbital trajectory is to be licensed or not. Recommendation is to license the entire suborbital flight regardless of altitude reached on the first "half" of the flight. The "distinction" proposed is a difference without distinction.

40/Section 450.3 – Definitions/last paragraph; "For example, should passengers be regarded as any other customers who are expected to waive claims against other participants for injury, damage or loss as a result of launch or reentry? Should the Government play a role in establishing limits on liability for injury to space vehicle passengers? Should indemnification be extended to cover risks of liability to passengers?": Look to the rest of the adventure tour industry to see examples of how this is handled. Look to "sky-divers" for how they are handled. Look to deep-sea submarine riders as to how they are handled. How do airline passengers get covered under their carrier's liability? This is a second party contract freely entered into; not a third party liability issue in any case.

78/ "§ 450.3 Definitions; Hazardous operations": Definition is weak; implies everything is a hazardous operation. What is there that cannot potentially cause "bodily injury or property damage"?