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Part III

Department of Transportation

Federal Aviation Administration

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14 CFR Part 450

Financial Responsibility Requirements for Licensed Reentry Activities; Final Rule

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 450

[Docket No. FAA 1999-6265; Amendment No. 450-1]
RIN 2120-AG76

Financial Responsibility Requirements for Licensed Reentry Activities

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final Rule.

SUMMARY: Under its licensing authority, the Associate Administrator for Commercial Space Transportation of the Federal Aviation Administration (FAA) determines financial responsibility requirements for licensees authorized to launch and reenter a reusable launch vehicle or to reenter a reentry vehicle. The FAA will determine, on an individual basis, the amount of required insurance or other form of financial responsibility after examining the risks associated with a particular reentry vehicle, its operational capabilities and designated reentry site. In this rulemaking, the FAA provides procedures for demonstrating compliance with requirements for reentry financial responsibility and for implementing risk allocation provisions of 49 U.S.C. Subtitle IX, chapter 701.

DATES: Effective November 20, 2000.

FOR FURTHER INFORMATION CONTACT: Ms. Esta M. Rosenberg, Attorney-Advisor, Regulations Division, Office of the Chief Counsel, Federal Aviation Administration, U.S. Department of Transportation (202) 366-9320.

SUPPLEMENTARY INFORMATION:

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Small Business Regulatory Enforcement Fairness Act

The Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996 requires FAA to comply with small entity requests for information or advice about compliance with statutes and regulations within its jurisdiction. Therefore, any small entity that has a question regarding this document may contact their local FAA official, or the person listed under FOR FURTHER INFORMATION CONTACT. You can find out more about SBRFA on the Internet at our site, http://frwebgate.access.gpo.gov/cgi-bin/leaving.cgi?from=leavingFR.html&log=linklog&to=http://www.gov/avr/arm/sbrefa.htm. For more information on SBREFA, e-mail us 9-AWA-SBREF@faa.gov.

Background

The Commercial Space Act of 1998 (CSA), Public Law 105-303, extends to the Secretary of Transportation licensing authority over reentry operations and the operation of reentry sites, within the United States or when conducted by U.S. citizens abroad. The Secretary is authorized to license reentry activities consistent with public health and safety and the safety of property, as well as U.S. national security and foreign policy interests. Prior to enactment of the CSA, the Secretary's licensing authority under 49 U.S.C. Subtitle IX, chapter 701, popularly known as the Commercial Space Launch Act or CSLA, was limited to the launch of a launch vehicle and non-federal operation of a launch site. By delegation of authority, the Secretary's statutory responsibility for regulation and oversight of commercial space transportation is assigned to the Administrator of the Federal Aviation Administration (FAA), who in turn has delegated those functions to the Associate Administrator for Commercial Space Transportation (AST).

The additional grant of authority over reentry operations enables the FAA to fashion and implement a licensing and safety regulatory program for emerging reusable launch vehicle (RLV) technologies, facilitating their further development. Because the absence of an established licensing program could impede prospective RLV operation, the FAA has worked closely with industry and the interested public in crafting regulations that form the foundation of the safety program applicable to RLVs. The FAA's regulatory program is designed to be stable, but not static, in order to respond to advancements in technology and vehicle performance capabilities.

The authority granted by the CSA over reentry and reentry site licensing generally operates in a manner parallel to that granted to the agency over launch and launch site operations. Accordingly, it is necessary to establish, in regulations, a financial responsibility and risk allocation program applicable to licensed reentry activities, as was done in 1998 for licensed launch activities. (See 14 CFR part 440, referred to in this final rule as part 440). Although no formal request has been made for an RLV mission or reentry license, prospective operators and their customers and contractors will benefit from understanding, in advance of operation, how certain risks will be allocated by regulation and covered by insurance or otherwise addressed through statutorily-directed financial responsibility.

This final rule implements a financial responsibility program applicable to reentry operations of an RLV or other reentry vehicle, similar in nature to that contained in part 440. A companion rulemaking, referred to in this rule as the Final RLV and Reentry Licensing Regulations, covers licensing requirements for RLV missions and other reentries within the FAA's regulatory authority. Taken together, issuance by the agency of the comprehensive safety and risk management regulations just described removes potential regulatory barriers and impediments to RLV technology development and operation.

Enactment of the CSA in 1998 extends to a licensed reentry, including reentry of an RLV, the financial responsibility and risk allocation scheme that has proven critical to the success of the U.S. commercial space industry. Most significantly, it affirms the government's commitment to share with industry in the potentially catastrophic risks associated with launch and reentry of an RLV, thereby enabling liability risk of all participants to be maintained at a manageable level. Absent further amendment of the CSLA, however, that commitment may be short-lived. A critical component of the statutory risk sharing scheme, known as ``indemnification,'' will sunset at the end of the year 2000 for both launch and reentry.\1\ Unless extended, catastrophic

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risk protection will only be available to those launch and reentry vehicle operators that have submitted a substantially complete application for a license by December 31, 2000.

\1\ A one year extension of the sunset provision from December 31, 1999 to December 31, 2000, was enacted by Section 433 of H.R. 2684, the Departments of Veterans Affairs and Housing and Urban Development, and Independent Agencies Appropriations Act, 2000.

The indemnification provisions of the CSLA are one facet of a comprehensive financial responsibility and risk allocation program added to the CSLA in 1988 in response to, among other things, industry concern over potentially unlimited liability that may result from launch vehicle failure. As expressed in testimony delivered at a hearing before the House Subcommittee on Space and Aeronautics on April 21, 1999, the commercial space industry continues to require relief from open-ended liability, particularly in light of government-backed support afforded to international competitors of U.S. entities. Hearings Before the Subcommittee on Space and Aeronautics of the Committee on Science, 106th Cong., 1st Sess., Serial No. 106-13. RLV operators share similar concerns over the prospect of potentially unlimited liability that may result from a catastrophic event associated with reentry and are expected to benefit from the statutory program in a manner comparable to that realized by the commercial launch industry in launching expendable launch vehicles (ELVs).

CSLA Financial Responsibility and Risk Allocation

Financial responsibility and risk allocation for launch and reentry

under the CSLA consists of several components, including a three-tiered approach to addressing claims for damage or loss suffered by third parties as a result of licensed activity, requirements for financial coverage for damage or loss to government property involved in the licensed activity, and contractual assumption among participants in the activity of certain risks that result from their participation.

Under the CSLA, a launch or reentry licensee is required to obtain two forms of insurance, in amounts determined by the FAA using a risk-based methodology known as maximum probable loss (MPL), up to statutorily specified ceilings. Insurance coverage (or other demonstration of financial responsibility) provided by the licensee would cover the first tier of liability risk, that is, the maximum probable loss due to third-party claims that result from licensed activity. Insurance obtained by the licensee in accordance with CSLA requirements must cover third-party claims against participants in that activity, thereby relieving each of them of the cost of separately insuring their liability risk. In addition to the licensee (vehicle operator), participants in a licensed launch or reentry that benefit from required insurance include the licensee's customer(s), and the contractors and subcontractors of the licensee and customer, as defined by the FAA in financial responsibility regulations, as well as the U.S. Government, its agencies and its contractors and subcontractors involved in the licensed activity. By statute, the FAA may not require more than $500 million of liability insurance for a licensed launch or reentry.

Insurance is also required in the event of damage or loss to U.S. Government range assets at a launch or reentry site as well as property belonging to government contractors supporting the licensed activity. Government property insurance requirements may not exceed $100 million for a licensed launch or reentry.

The CSLA provides a procedure whereby the U.S. Government agrees to be responsible for the payment of successful third-party claims against a participant in a licensed launch or reentry in the event liability exceeds risk-based insurance requirements set by the FAA. The payment of excess claims procedure, commonly referred to as indemnification, addresses the second tier of liability risk and is subject to congressional appropriation of funds. The government's responsibility for payment of claims under this procedure is limited to an additional $1.5 billion, as adjusted for post-January 1, 1989 inflation, above the required amount of insurance. Although it has never been invoked, the statutory indemnification procedure has been a crucial factor in enhancing the international competitiveness of the U.S. space industry and represents the government's agreement, albeit conditioned upon congressional action, to share in the risks that are associated with commercial launch and reentry operations. The third tier of risk, that is, liability for third-party claims in excess of required insurance plus the appropriated $1.5 billion, as adjusted for inflation, is the responsibility of the legally liable party. Consistent with part 440 and as explained in the notice of proposed rulemaking for licensed reentry activities (64 FR 54448-54472, October 6, 1999) (referred to in this final rule as the NPRM), the FAA, by this final rule, assigns financial responsibility for the third tier of risk to the licensee unless it has no liability whatsoever for the claims.

Both the commercial space industry and the U.S. Government benefit from the statutory risk sharing arrangement. Under the quid pro quo

arrangement described above, the aerospace industry is relieved, in part, of the consequences of catastrophic liability which would be financially burdensome, if not impossible, to cover through private insurance. And, the government benefits by having its liability risk covered at no cost to the government, thereby insulating it financially, up to the prescribed amount. The government's liability exposure arises by virtue of its involvement in licensed activities through use of its property, personnel, facilities, equipment and services to support operations, and as a result of treaty obligations under which the government accepts absolute liability for damage on the ground or to aircraft in flight, outside of the United States, when the United States is deemed a launching State under the terms of the Outer Space Treaties, specifically the Convention on International Liability Caused by Space Objects (Liability Convention, entered into force September 1972). Liability for damage caused elsewhere, such as on orbit damage, is also accepted by the government as a launching State under the Liability Convention but only if the damage is the fault of persons for whom the launching State is responsible. Under Article VI of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (Outer Space Treaty, entered into force October 1967), the United States bears international responsibility for national activities in outer space, including those carried on by non-governmental entities.

Under the Liability Convention, the definition of a launching State includes a State from whose territory or facility a space object is launched. Liability Convention, Article I(c)(ii). A ``space object'' includes component parts of a space object as well as its launch vehicle and parts thereof. Liability Convention, Article I(d). The latter definition appears sufficiently broad as to encompass within its terms a reusable launch vehicle or one of its stages. With the introduction of commercial reentry technology and capability, the prospect of government liability arising out of the errant performance of an RLV makes the benefits of statutory financial responsibility and allocation of risk all the more significant and valuable for the government.

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Risk allocation under the CSLA includes means, in addition to insurance and the statutory indemnification procedure described above, of assigning and covering certain risks to launch and reentry participants and the government.

Under the CSLA, reciprocal waivers of claims are required among launch participants and reentry participants, respectively, in order to relieve each of them of the threat and cost of inter-party litigation, and the associated need to obtain liability insurance covering their potential liability to other participants in a launch or reentry, for property damage or loss for which each might otherwise be legally responsible. As in a licensed launch, the CSLA directs a reentry licensee, its customer and the contractors and subcontractors of each, involved in the licensed activity, to enter into reciprocal agreements whereby each participant waives certain claims it may have for damage or loss against each of the other participants and accepts financial responsibility for losses suffered by its personnel. (Consistent with

the FAA's approach in establishing final rules under part 440 for launch financial responsibility, these entities are referred to in this rulemaking as private party reentry participants, or PPRPs. Entities involved in licensed launch activities other than the government and its contractors and subcontractors are referred to in this supplementary information as private party launch participants, or PPLPs.) As explained in the supplementary information accompanying issuance of part 440, an entity's agreement to be responsible for losses suffered by its employees may be termed a legislatively-mandated contractual indemnification obligation under which each party agrees to hold harmless and indemnify other participants in the licensed activity against whom one's employee has made a claim. Under FAA financial responsibility regulations, potential claims of employees of PPLPs and PPRPs are not intended to be addressed by, or considered by the FAA in determining the required amount of, liability insurance that a licensee must obtain to satisfy the CLSA. The principles explained in the part 440 rulemaking regarding the reciprocal waiver of claims agreement required for a licensed launch apply, in equivalent fashion, to licensed reentry. (See 63 FR 45592, August 26, 1998).

The CSLA further directs the government to waive claims for itself and for its contractors and subcontractors involved in a licensed launch or reentry and assume certain financial responsibility. However, the government's waiver of claims for property damage is limited to claims in excess of insurance required to cover government property and property belonging to government contractors and subcontractors involved in supporting the licensed activity, at a Federal range. (The government and its contractors and subcontractors involved in licensed activity are referred to in this document as government launch or reentry participants, GLPs or GRPs, as the case may be.) As explained in supplementary information accompanying issuance of part 440 final rules at 63 FR 45601-06, because of limitations on the government's ability to assume an unfunded contingent liability, the government does not accept financial responsibility for covering losses sustained by employees of the government or its contractors and subcontractors, referred to in the final rule as ``Government personnel,'' except to the extent claims for Government personnel losses exceed required insurance. Rather, claims of Government personnel are intended to be covered under the licensee's liability insurance policy as third party claims and are considered by the FAA in establishing liability insurance requirements for the licensed activity.

A more detailed explanation of risk allocation principles and how they are implemented through FAA regulations appears in the supplementary information accompanying issuance of part 440, a copy of which may be accessed from the AST web site at http://frwebgate.access.gpo.gov/cgi-bin/leaving.cgi?from=leavingFR.html&log=linklog&to=http://ast.faa.gov.

This final rule focuses on those aspects of financial responsibility and allocation of risk that are unique to reentry activities authorized by the FAA. Reentry vehicles requiring a license to return to Earth include, but are not limited, to RLVs. Without exception, however, each of the reentry concepts described to the FAA in pre-application consultation involves wholly or partially reusable launch vehicles. For most of these vehicle concepts, authorized flight would consist of launch and reentry of an RLV. Part 440 requirements apply to licensed launch of an RLV; however, because reentry licensing

authority did not reside within the FAA at the time part 440 was issued, risk management issues unique to an RLV mission, as opposed to an ELV launch, were not specifically addressed in the part 440 rulemaking. Accordingly, also highlighted in the discussion below is the FAA's approach to financial responsibility and allocation of risk for authorized flight of an RLV.

Between launch and reentry of an RLV, activities may be conducted on orbit that do not require FAA licensing and would not be subject to the CSLA financial responsibility and risk allocation regime. In this rulemaking, the FAA clarifies the scope of authorized RLV launch activities subject to part 440 requirements and authorized RLV reentry activities subject to this final rule. Doing so will enable licensees and participants in RLV missions to make informed business decisions governing risk and liability for unlicensed activity that is not intended to be covered by the CSLA financial responsibility and risk allocation regime.

In issuing this final rule, the FAA intends to ensure that the universe of participants in licensed RLV activity and reentry activity generally are identified, and that claims against them from all potential sources are addressed by FAA rules governing financial responsibility for licensed vehicle flight.

Claims for injury, damage or loss may come from entities and individuals involved in licensed activity and from those that are not involved in licensed activity. Financial responsibility for claims of participants involved in licensed RLV flight and their employees would be addressed through the comprehensive reciprocal waiver of claims agreement presented in Appendix B of this final rule. For an RLV mission that is suborbital in nature in that the vehicle does not enter a closed orbital path but rather returns to Earth through ballistic flight or other physical forces, the same entities would necessarily be involved in all licensed flight. However, reentry of an RLV from Earth orbit may involve participants that are different, in part, from those involved in its launch. Even so, entities and their employees involved in either flight phase are deemed by the FAA to be sufficiently involved in a licensed RLV mission as to warrant their participation in and the protections afforded by a reciprocal waiver of claims agreement covering all licensed mission flight of an RLV. Participants in a licensed reentry may suffer property damage or loss and their employees may suffer losses through their involvement in the licensed launch required to place the vehicle or payload in Earth orbit. Including all participants in licensed flight is therefore necessary to accomplish the intended objective of the reciprocal waiver scheme of limiting the risk of inter-party litigation. Accordingly, although this rulemaking is directed at reentry financial responsibility, the NPRM (64 FR 54448, Oct. 6, 1999) proposed, and this final rule codifies, a comprehensive from of reciprocal waiver of claims agreement

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that would include all participants, government and private, involved in licensed RLV flight, including launch and reentry of an RLV, in order to address the vast proportion of proposed reentries for the foreseeable future. The FAA will address on an individual basis those circumstances in which licensed reentry occurs sufficiently independent of the launch that placed the reentry vehicle in space making it

practical and reasonable to separate launch participants from reentry participants for purposes of implementing the reciprocal waiver agreement.

Claims resulting from licensed activity of entities and individuals who are not Government personnel under FAA financial responsibility regulations and that are not involved in licensed RLV activity would be addressed through liability insurance obtained by the license to respond to covered claims by a third party, as defined in part 440 and this final rule, against any participant, public or private, involved in licensed activity. Because a participant in either flight phase is sufficiently involved in vehicle operations such that it may be a potential defendant in litigation arising out of loss or damage to third parties, liability insurance required as a condition of a reentry license (and an RLV mission license authorizing launch and reentry of an RLV) must cover participants involved in associated launch activities. Simarily, launch liability insurance under part 440 would cover entities involved in associated reentry activities, either as a customer or contractor or subcontractor of the licensee. Claims arising out of launch or reentry of an RLV, or flight of a suborbital RLV, in excess of the required amount of liability insurance become the responsibility of the government, subject to appropriation of funds, up to $1.5 billion (as adjusted for inflation occurring after January 1, 1989) above the amount of insurance that the agency requires. Addressed as part of this supplementary information is the FAA's approach to establishing liability and property insurance requirements for licensed reentry, as distinct from licensed launch, of an RLV that does not operate as a kind of suborbital rocket, and eligibility for indemnification as a result of catastrophic claims arising out of RLV launch and reentry.

Notice of Proposed Rulemaking

Proposed rules governing reentry financial responsibility and risk allocation appear in a notice of proposed rulemaking or NPRM, published in the Federal Register on October 6, 1999. See 64 FR 54448-54472. The 60-day comment period initially provided was reopened for an additional 30 days at the request of several launch providers.

The NPRM was intended as a companion document to another notice of proposed rulemaking, referred to in this supplementary information as Proposed RLV and Reentry Licensing Regulations, issued April 21, 1999, describing the FAA's technical approach to licensing an RLV mission and other reentries. 64 FR 19626-19666. The Proposed RLV and Reentry Licensing Regulations describe the scope of activities comprehended by FAA launch and reentry licensing authority, respectively, in order to ensure those operations do not jeopardize public health and safety or the safety of property. However, more detailed discussion and consideration of the appropriate commencement and termination point for RLV launch and reentry authorizations, particularly from a risk management perspective, was deferred to the October 6, 1999 NPRM (64 FR 54448).

The reentry financial responsibility regulations proposed in the NPRM resemble closely those applicable to licensed launch activities under part 440 and would effect risk allocation among participants in a licensed reentry in a manner comparable to that currently utilized for commercial launches. Instead of reciting the FAA's approach to

implementing the various principles underlying CSLA-based requirements for financial responsibility and risk allocation, the NPRM referred the interested public to the part 440 rulemaking, and stated that the principles governing relationships among launch participants and coverage for third party claims for damage or loss under part 440 would apply to reentry as they currently do for launch.\2\ Documents associated with the part 440 rulemaking can be accessed from the AST web site at http://frwebgate.access.gpo.gov/cgi-bin/leaving.cgi?from=leavingFR.html&log=linklog&to=http://ast.faa.gov.

\2\ For a more detailed explanation and analysis of the FAA's approach to implementing financial responsibility and risk allocation requirements of the CSLA, the interested public is referred to part 440 and the accompanying supplementary information found at 63 FR 45592-45625. It identifies the universe of third parties whose claims are intended to be addressed or covered through statutorily required insurance or other form of financial responsibility. The notice of proposed rulemaking associated with the part 440 rulemaking, issued July 25, 1996, describes the FAA's methodology for setting insurance requirements on the basis of its determination of the maximum probable loss from covered third party claims and for government property damage resulting from licensed activity. (See 61 FR 39004-39007.)

Except for a request for clarification of the relationship between a licensed launch site, commonly known as a spaceport, and its customer when its customer is a licensed launch or reentry vehicle operator, the FAA received no comments on financial responsibility and risk allocation principles established through the part 440 rulemaking and incorporated in this rulemaking. The majority of comments focused on the scope of licensed activity comprehended by FAA launch and reentry licensing authority when the launch vehicle is reusable. The FAA responds to comments regarding the scope of its licensing authority in this final rule; however, regulatory definitions of the terms ``launch'' and ``reentry,'' as applied to an RLV, appear in the Final RLV and Reentry Licensing Regulations.

Scope of RLV Launch and Reentry Licensing Authority and Associated Financial Responsibility

Proposed Definitions of ``Launch'' and ``Reentry'' of an RLV

By law, the transportation events of launch of an RLV and its reentry require licensing by the FAA; however, the two authorizations may be combined in a single license document consistent with the FAA's longstanding practice of authorizing multiple flights or launch missions in a single license.

In the Final RLV and Reentry Licensing Regulations, the FAA establishes a mission approach to RLV licensing through use of a single collective risk criterion that may not be exceeded for proposed RLV flight, comprised of launch and reentry flight, to be authorized by an FAA license. The risk criterion selected is consistent with that applied to ELV launches at Air Force ranges. The agency's objective in

utilizing a single collective risk threshold against which to measure public risk is to ensure that round-trip flight for the purpose of achieving Earth orbit or outer space and returning a vehicle to Earth does not pose greater jeopardy to public health and safety than would launch of an ELV, the more conventional means of accessing space.

Notwithstanding use of a mission-based approach to assessing public safety risk, the FAA concludes that its licensing authority over RLV flight does not encompass on orbit operation of an RLV that is unrelated to its launch or reentry.

Although the FAA does not license on orbit operation of an RLV, the authority granted to an RLV operator to reenter its vehicle may be conditioned upon satisfaction of certain criteria before a reentry may be commenced under an FAA license. In this manner, FAA

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licensing authority may affect or limit on orbit operations, without subjecting them to licensing requirements of the FAA. For example, a reentry license or authorization may be conditioned upon verification of a vehicle operating limits while on orbit, assuming those limits were identified in an application and determined by the FAA as adequate to preserve intact, or at least not degrade, the integrity of vehicle safety systems necessary for safe reentry. If vehicle operations while on orbit exceed those limits there may be no assurance, absent additional data from the operator, that vehicle reentry can be accomplished in a manner consistent with the application and supporting analyses. Hence, reentry authorization may be withdrawn or contingency plans invoked to address the non-conforming vehicle. To this extent, FAA licensing procedures and approvals may influence planned on orbit operations involved in an RLV mission, including those that do not require FAA licensing because they are neither launch nor reentry.

Liability risk that may be associated with activities not subject to FAA licensing must be addressed through private insurance and relationships among participants in the activity are not directed by CSLA risk allocation requires, such as reciprocal waivers of claims. Hence, from a financial responsibility and risk management perspective, absence of FAA licensing authority over on orbit operations unrelated to RLV launch or reentry may influence business decisions and mission design.

The FAA understands the importance to launch and reentry vehicle operators of ensuring comprehensive coverage of liability risk for all vehicle operations and the need for certainty and predictability in understanding when the CSLA applies and when it does not. For this reason, the NPRM presented detailed analysis and rationale concerning the scope of licensed launch and reentry activities associated with an RLV mission to which CSLA-based financial responsibility and risk allocation requirements would apply in a certain and predictable fashion. Financial responsibility requirements imposed by the FAA are co-extensive with activities authorized by a license. Certain consequences of licensed activity are also addressed through CSLA-based allocation of risk, particularly government indemnification. However, a sufficient causal relationship must be demonstrated between licensed activity and third party claims in order for such claims to be considered as ``resulting from'' licensed activity and to be eligible for consideration under the indemnification provisions of the CSLA. 49

U.S.C. 70113(a). Not every event following a launch bears a sufficient causal nexus to that launch to qualify for indemnification. Nor would every event causing damage to third parties on orbit or on the ground bear a sufficient nexus to a licensed reentry as to be deemed to result from licensed activity. Based upon guidance issued by the House Committee on Science and discussed further in the section-by-section analysis of the final rule, the FAA cannot agree with those commenters that suggested that anything that happens once a reusable launch vehicle has been launched necessarily and sufficiently results from the licensed activity of ``launch'' and would therefore be eligible for indemnification. Absent a sufficient relationship to licensed activity, launch and reentry vehicle operators must be prepared to address third party liability entirely through private insurance or other form of financial responsibility. Consistent with the part 440 rulemaking, the FAA considers that determining eligibility for payment of excess third party claims is a fact-based inquiry that depends upon unique circumstances giving rise to a claim. Accordingly, the FAA declines to issue rules of general applicability to determine eligibility requirements.

The NPRM explained that financial responsibility requirements applicable to licensed launch of an RLV are provided under part 440 and that losses resulting from performance of the launch vehicle during its ascent are intended to be addressed through risk-based insurance and eligible for government indemnification under the CSLA. Unlike an ELV, however, the end of RLV launch authorization ought not be defined by the last action of control over the launch vehicle exercised by the licensee after payload separation, according to the NPRM, because an operator could retain control over the vehicle throughout its orbital life in order to accomplish a reentry. If a control test were applied, all events, including on-orbit operations and reentry, would be comprehended by the term ``launch,'' and this is an illogical result in the FAA's view.

The FAA proposed in the NPRM to define the end of an RLV launch for purposes of its licensing authority by using an event test dictated by the purpose of the mission. The supplementary information accompanying the NPRM indicated that accomplishment of the launch phase of the mission would provide an appropriate point of demarcation between the end of licensed launch activities and non-launch-related events, when the launch vehicle is an RLV. At the time the NPRM was issued, market analysis indicated launch and replenishment of low Earth orbit (LEO) satellite constellations would be a primary factor behind RLV development and launch demand, leading the FAA to identify payload deployment or attempted deployment, as a typical RLV mission endpoint for purposes of licensing an RLV launch. For pre-flight operations, the FAA identified no basis, from a public safety perspective, for defining the commencement of licensed ``launch'' of an RLV differently from that of an ELV launch. FAA licensing authority over pre-flight operations at a launch site in the United States is directed by the CSLA and, under 14 CFR 401.5, begins upon arrival of the launch vehicle (or its major components) at a U.S. launch site for purposes of fulfilling the FAA's safety mandate.

Public safety considerations underlie the FAA's proposal to license reentry of a reentry vehicle commencing upon initiation of reentry readiness procedures, as reflected in the Proposal RLV and Reentry Licensing Regulations. (See 64 FR 19626-19666, issued April 21, 1999.)

Under that proposal, ``reentry'' would include ``activities conducted in Earth orbit or outer space to determine reentry readiness and [that] are therefore unique to reentry and critical to ensuring public health and safety and the safety of property during reentry.'' (64 FR at 19656). For most RLVs under consideration, that is, those that will deploy a payload as their mission objective, the FAA considered that operators would endeavor to spend minimal time on orbit in order to minimize cost and risk to their vehicle. Accordingly, for those operators, the FAA suggested that reentry readiness activities would begin immediately following payload deployment. Hence, there would be no (or extremely minimal) activity between launch and reentry that would not be covered by an FAA license for an RLV whose mission purpose is dedicated to payload deployment and prompt return to Earth. The FAA reiterates that at the time the Proposed RLV and Reentry Licensing Regulations and the NPRM were issued, satellite constellation deployment and servicing were identified as the primary forces driving demand for RLV launch services.

Under the NPRM, reentry readiness activities performed on orbit would be those requiring regulatory oversight in order to accomplish the agency's public

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safety objectives. Safety-related procedures intended to prepare the vehicle for its reentry would consist of, among other things, those operations necessary to assure proper attitude and orientation of the vehicle and operability of safety-related systems (both software and hardware). Reentry readiness procedures and check-outs may begin days, perhaps weeks in some unique instances, in advance of the vehicle's actual descent to Earth. As part of its license application, a prospective licensee would identify those reentry readiness procedures and operations it intended to rely upon for safe reentry and that would become part of the licensing record. Under this approach, the FAA would apply reentry readiness and public safety criteria to make an individualized determination, on the basis of a particular reentry proposal, as to commencement of licensed reentry. The license would identify clearly the point at which a licensed reentry commences.

In support of its proposal to license public safety-related reentry readiness procedures and preparatory activities, but to exclude from license coverage events in space wholly unrelated to launch or reentry, such as maneuvers between orbits, the FAA cited report language issued by the House Committee on Science (the Committee) accompanying H.R. 1702, the bill ultimately enacted as the CSA. H. Rep. 105-347, 105th Cong., 1st Sess. (Committee Report). Specifically, the Committee indicated that ``reentry'' is ``intended to cover a wide range of activities, including the act of returning a reusable launch vehicle to Earth. In establishing the legal framework for reentry, the Committee's approach is to treat reentry of a reentry vehicle the same as launch of a launch vehicle.'' H. Rep. 105-347, 105th Cong., 1st Sess., at 21. The FAA finds in this non-binding guidance Committee intent that the FAA address public safety considerations surrounding reentry activities in a manner comparable to that utilized for launch regulation. Therefore, despite the Committee's suggestion that it would expect reentry to begin, typically, when vehicle attitude is oriented for propulsion firing to place the vehicle on its reentry trajectory, the FAA

concludes that its public safety mandate compels application of a regulatory program sufficient to address public safety considerations that arise as a result of planned reentry of a reentry vehicle, including an RLV. As in launch licensing, certain pre-flight events, that is, those preceding descent of a reentry vehicle, may be regarded as so hazardous to public safety or property, or to have such direct impacts on reentry risk and public safety, as to warrant regulatory oversight through FAA licensing, as explained in the NPRM. (See 64 FR at 54453.)

Under the FAA's safety mandate, a vehicle operating on orbit in a steady state condition such that there is no change in its condition or position ought not require regulatory oversight by the FAA. Risks to public safety change upon initiation of reentry readiness procedures or operations that, by virtue of their performance, may affect the condition or stability of the vehicle making reentry unsafe. Exercise of reentry licensing authority so as to cover such procedures or operations should facilitate accomplishment of the agency's public safety objectives by ensuring that the risk of a non-nominal reentry resulting from the conduct of those activities is addressed as part of FAA licensing to ensure such risks are sufficiently mitigated. Similarly, the FAA ensures that CSLA-directed financial responsibility and risk allocation covers such risks. The FAA would consider non-nominal reentry scenarios as part of its reentry licensing and regulatory program and may rely upon contingency planning by a licensee, such as plans for reentry to an alternative or contingency abort location, before issuing a license. Reasonably foreseeable risks of non-nominal operation would likewise be addressed by the FAA as part of its risk-based approach to determining insurance requirements.

Whether an RLV mission involves seamless licensing, as in the case of an RLV launch for purposes of payload deployment and immediate return to Earth, or licensed launch and reentry with intervening unlicensed activity, both authorizations (launch and reentry) may be combined in a single license document. As reflected in the NPRM, the FAA proposed that all licensed vehicle flight must be covered by a licensee's demonstration of financial responsibility and subject to risk allocation under the CSLA. Because flight risks are different for launch and reentry, and either or both events may pose potentially catastrophic risk, financial responsibility up to required amounts must be available throughout licensed flight. In the NPRM, the FAA proposed to reserve discretion, depending upon the results of its risk analysis, to require either a consistent measure of financial responsibility applicable to all licensed flight, or different amounts covering launch and reentry consequences. In either case, financial responsibility would be required to respond to claims arising during either or both licensed flight phases. Except for certain suborbitally operated RLVs, imposition by the FAA of a uniform or single insurance requirement throughout licensed flight would not relieve the licensee of financial responsibility for third-party claims up to the established ceiling during each licensed flight phase. For a suborbital RLV that enters outer space, the FAA suggested that it could apply separate financial responsibility requirements for launch and reentry, but would reserve discretion to impose a uniform requirement throughout licensed flight. The NPRM solicited public comment on the proposed distinction between suborbital RLVs that technically satisfy the definition of a reentry vehicle and those that do not and must necessarily be licensed under

the agency's statutory authority for launch of a suborbital rocket.

Overview of Comments on Proposed Scope of RLV Mission Licensing

The agency received comments from ten entities representing a cross-section of the affected industry. Among the commenters were seven developers of reusable launch vehicle technology and one prospective launch site, or spaceport, targeting the RLV market. Three of those entities, The Boeing Company, Lockheed Martin Corporation, and Orbital Sciences Corporation, are currently licensed to launch ELVs and as a condition of their licenses must comply with part 440 requirements. In addition, comments were submitted by a U.S. insurance broker, Marsh Inc. (Marsh), and on behalf of the International Underwriting Association of London. Nearly all of the comments addressed the issue of FAA licensing authority over on orbit operation of an RLV but expressed divergent views. For example, Vela Technology Development, Inc. (Vela) and Space Access urged seamless regulation of all RLV flight while others, including Kistler Aerospace Corporation (Kistler), supported a narrow view of FAA licensing authority and regulatory oversight. The Boeing Company (Boeing), Lockheed Martin Corporation (Lockheed Martin) and Marsh noted with interest the gap in FAA licensing authority over RLV operations, as identified in the NPRM. Lockheed Martin observed that it is premature to judge whether the FAA's current licensing authority is adequate from a risk management and business perspective while Boeing objected to issuance of final regulations that would leave a gap in licensing coverage and associated indemnification benefits for

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on orbit activities of RLVs, notwithstanding limitations on FAA authority under the CSLA.

A number of comments stressed that regulations affecting RLV operations should enhance, not inhibit, the international competitiveness of the U.S. space industry. However, some commenters believe competitiveness is aided by licensing of, and application of CSLA financial responsibility and risk allocation to, all RLV activities including those on orbit not specifically related to ascent or descent flight of a vehicle. Others urged less regulation through narrow application of FAA licensing authority over launch and reentry to aid competitiveness. Kistler, in particular, stressed that if made final, the regulations as proposed would make the United States the only nation to regulate activities in space and to require insurance of launch operators for on orbit activities. Doing so would be contrary to promoting the competitiveness of the U.S. launch industry, according to Kistler. The FAA notes that Kistler is not entirely correct in its broad statement inasmuch as the United Kingdom may require insurance of satellite owners and operators who are British nationals under its Outer Space Act 1986. Also, to some extent, commercial launch operators currently licensed to launch ELVs are required to maintain insurance for vehicle operations on orbit where they are part of a licensed launch, for example, maneuvers and operations necessary for payload delivery or to render an orbital stage inert.

To further enhance competitiveness of the emerging RLV industry, some comments endorsed treating RLVs in a manner, comparable to ELVs.

By way of contrast, Vela was critical of the FAA for applying an ELV-based regulatory philosophy to RLV flight instead of applying a new paradigm to RLV missions.

Summary of Comments on Proposed Scope of RLV Mission Licensing

The NPRM solicited public comment on the FAA's proposed approach to licensing RLV flight to and from orbit from the perspective of ensuring meaningful application of the statutory financial responsibility and allocation of risk regime. Most of the comments addressed the relative merits of licensing all aspects of RLV operation, that is, to, from and on orbit, and implications for insurance and risk coverage. A number of comments focused upon and took issue with proposed definitions of ``launch'' or ascent flight of an RLV and ``reentry'' or descent flight of an RLV, as defined by the FAA in proposed regulations, and suggested alternative views regarding the appropriate breadth of launch and reentry activities that would require authorization by an FAA license and are therefore subject to CSLA financial responsibility requirements.

The following summary of the comments addressing the FAA's authority for launch and reentry licensing authority express divergent views with respect to on orbit operations in terms of whether they are licensable as part of launch or reentry as those terms are defined by the CSLA and implemented by the FAA in regulations governing RLV operations. For the most part, comments on the NPRM expressed sensitivity to the limits of FAA licensing authority under existing law, whether or not the commenter found the regulatory result sufficient or satisfactory from a business and operational perspective. Responses to the comments follow under the heading, ``Response to comments on proposed scope of RLV mission licensing.''

Space Access, Boeing and Vela urged that all vehicle operations involving an RLV should be subject to a seamless regulatory program and associated financial responsibility and risk allocation regime. In support of its position, Space Access suggested that all on orbit operation of a vehicle that ultimately is intended to reenter to Earth may affect reentry safety and reliability and therefore should be subject to FAA oversight and licensing. According to Space Access, planned reentry provides the following litmus test of what should and should not be subject to FAA regulation: If a vehicle is intended to be recovered for reuse its operations should be covered by an FAA license. If it is not so intended then it would not be subject to FAA regulatory oversight. Hence, the only on orbit operations that would not be subject to FAA authority would be those involving vehicles never intended for recovery and reuse, according to Space Access. Space Access recommended use of a control test in defining the breadth of licensed activities such that all vehicle operations, wherever conducted, would be licensed through the point (after payload separation if that is the mission) when the last action occurs over which a licensee has direct or indirect control over the launch vehicle. Space Access's proposed definition of launch would include reentry of an RLV, at least through landing at a reentry site. Consistent with seamless licensing, Space Access endorses a seamless approach to financial responsibility covering all aspects of RLV operation. A single, seamless financial responsibility requirement covering the entire RLV mission, including on orbit operations, would

have the added benefit of reducing compliance burdens for licensees and minimizing possible overlaps between launch and reentry insurance coverage.

Boeing also endorsed application of a control test in defining the scope of RLV activities requiring FAA licensing and compliance with statutory financial responsibility and risk allocation requirements. While understanding legislative limits on FAA regulatory authority, Boeing nevertheless questioned, if not objected to, a licensing regime which fails to address the full mission range of RLVs, does not account for causal connections between on orbit activities and non-nominal reentry, and overlooks the ``relevance and applicability of FAA commercial aircraft `flightworthienss' standards to RLV's.'' Boeing proposed an alternative definition of the term ``payload,'' as explained in clarifying remarks, as a means of suggesting that a launch is not concluded as far as the payload is concerned where the payload is not simply deposited in Earth orbit or outer space but performs on orbit operations so that vehicle operations would be subject to continued licensing and regulatory oversight by the FAA. Boeing also pointed to a perceived regulatory shortfall in terms of fulfilling international obligations of the United States under the terms of the Outer Space Treaties to supervise activities of non-governmental entities in outer space. Due to the ``critically low predictability'' of RLV risks and the inability to spread risk among a large fleet of vehicles, among other things, Boeing believes that licensing and indemnification coverage throughout an RLV mission, including on orbit operations, is critical for the RLV industry, particularly in the absence of specific flightworthiness standards similar in nature to airworthiness certification requirements for aircraft. From the perspective of financial responsibility, Boeing expressed concern that the FAA's proposed licensing approach and having separate insurance requirements fore each flight phase, would create the potential for uncertainty and inconsistency in claims adjudication as well as an unpredictable indemnification gap, or gray zone, for unlicensed on orbit activities. This is undesirable from Boeing's perspective as well as ``conceptually artificial in the context of RLV technology,'' despite potential eligibility for indemnification during each licensed flight phase.

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Absent comprehensive licensing and seamless financial responsibility requirements for all aspects of an RLV mission, Boeing predicts the RLV industry will face increased insurance costs, litigation and customer anxiety. Boeing argued that these issues would be resolved under a control test that would subject all on orbit activity of an RLV and FAA licensing.

Vela plans a passenger-bearing RLV in furtherance of space tourism. Vela criticized the FAA's proposed approach to separating flight phases for licensing and financial responsibility and risk allocation purposes and attributes it to a failure to realize that RLVs are not ELVs that plan to reenter. According to Vela, RLVs are more like aircraft that take-off and land, whether planned or unplanned, because what goes up will come down and also in terms of their instantaneous impact point \3\ (IIP) over populated areas. Vela urged the FAA to apply its authority in a manner that covers an RLV mission in its entirety

because the risks intended to be addressed by FAA licensing regulations are those to people and property on the ground regardless of when landing or impact occurs, that is, regardless of whether landing occurs nominally as planned or non-nominally before initiation of intentional reentry. Vela argued that the need to find a causal nexus between incensed activity and damage that results on the ground is misleading inasmuch as a vehicle should be responsible for the consequences of its flight regardless of when something goes awry and ``the U.S. Government should indemnify the launch industry (RLVs included) against catastrophic loss liability on the ground; period.'' According to Vela, if the FAA authorizes the launch of a vehicle and something happens on orbit that causes a liability on the ground, it results from the authorized launch. Therefore, definitions of launch and reentry and the need to allocate risk between the two events are not meaningful to RLV operations, in Vela's opinion, just as the FAA does not distinguish between the scope of take-off and landing of aircraft. According to Vela, because resulting liability stems from the fact that an RLV launch was authorized, indemnification must be available as a safeguard against catastrophic liability for damage or casualties on the ground any time it results from RLV operation.

\3\ The IIP of a vehicle reflects a projected impact point on the surface of the Earth where the vehicle or vehicle debris in the event of failure and break-up would land. A vehicle on orbit does not possess an IIP.

By way of contrast, comments submitted by Kistler and Lockheed Martin acknowledge that the FAA was not granted authority under the CSA to license on orbit operation of RLVs.

Kistler objected to the FAA's proposed definition of ``reentry'' as exceeding the scope of FAA legal authority and creating ambiguity. Kistler suggested that the proposed definition will result in inappropriate regulation of on orbit activity and, to the extent the FAA proposes to do so in order to extend indemnification benefits to RLV operators, it is not necessary because of the law risk of survivability and damage from a non-nominal or otherwise unplanned reentry. Moreover, Kistler does not believe that the CSLA directs indemnification for an inadvertent reentry.

Lockheed Martin's comments were submitted with its stated understanding that ``[n]either the CSA nor the CSLA extends the Office's licensing authority to on-orbit activities (i.e., those activities that fall within neither the definition of ``launch'' nor the definition of ``reentry'').'' Therefore, according to Lockheed Martin, the questions that will require time and experience to answer are whether liability insurance will be available to cover unlicensed activities on orbit (i.e., whether the risks are considered by the underwriting community as insurable or uninsurable) and, if not available, whether U.S. companies can operate without that protection of government indemnification. The answer to both questions may depend upon the level of risk associated with those activities, a matter than remains to be seen. Absent insurance and indemnification, Lockheed Martin suggested that it would be appropriate for industry and the government to address the matter of claims compensation for innocent

third parties in the event industry concludes it can operate in that environment. However, if industry finds it cannot so operate then, in Lockheed Martin's opinion, it may be appropriate to consider further statutory amendment to allow the FAA to ensure provision of seamless financial responsibility by RLV licensees.

Lockheed Martin further noted that the absence of seamless FAA licensing authority over an RLV mission involving on orbit activities along with the ability to establish seamless financial responsibility requirements could make claims processing arising from a single RLV mission a difficult, time consuming and contentious matter. That is because arguments may arise as to when the occurrence giving rise to a claim took place, that is, whether a claim arises out of licensed or unlicensed activity and, if licensed, whether it arises out of launch or reentry where the FAA requires different amounts of insurance for the two flight phases that comprise a licensed RLV mission. Absent greater understanding of the nature of on orbit activities that would be unlicensed under the FAA's current authority, and their attendant risks, Lockheed Martin believes that it is premature to conclude that a legislative solution to extend CSLA licensing and risk allocation provisions to those activities is necessary.

Comments submitted by Marsh, a liability and space insurance broker, also expressed concern over the potential for dispute between insurer and insured as to when a loss occurs and applicable liability limits when gaps exist between indemnified and non-indemnified activities. Marsh further observed that absence of seamless CSLA financial responsibility and risk allocation coverage will drive industry to insure against maximum possible, rather than probable, loss when it is yet unknown whether and the extent to which the insurance market will be willing and able to respond to non-indemnified risk. Moreover, the benefits currently derived under the CSLA of a single liability policy covering all participants and of minimizing costs and risk of inter-participation litigation would not extend to unlicensed activities on orbit. As a consequence, RLV participants would face increased insurance costs inasmuch as each would need to cover its resultant liability to third parties and to each other that arise out of on orbit operations. Marsh noted that its purpose in registering concern is to alert the launch industry to risk management issues in analyzing risk during on orbit activities; however, Marsh takes no position on the FAA's proposed approach to addressing reentry and RLV financial responsibility. The FAA acknowledges and appreciates the insights and observations contributed to this rulemaking by Marsh in its role as professional risk and insurance consultant to the aerospace industry.

The FAA's careful consideration of comments to the reentry financial responsibility NPRM regarding appropriate definitions of ``launch'' and ``reentry'' and on the appropriate scope of RLV mission licenses for purposes of implementing statutory financial responsibility and risk management tools is reflected below.

Response to Comments on Proposed Scope of RLV Mission Licensing

The FAA concludes that this final rule as well as the Final RLV Licensing

and Reentry Regulations reflect the limits of FAA authority over RLV mission launch and reentry licensing granted to the FAA. The FAA remains mindful of the charter granted to it for RLV and reentry operations under the recent amendment of the CSLA and is wary of exceeding it at the risk of providing to licensees a false sense that all activities in space involving an RLV or other reentry vehicle, in essence, indemnified by the U.S. Government. FAA statutory licensing authority is limited to those transportation events having Earth orbit or outer space, and purposeful return to the surface of the Earth, as their intended destinations, as well as a suborbital rocket launch. The nature and extent of on orbit activity, including appropriate risk management for that activity, remains a business and operational decision of the vehicle operator, alone or in combination with its customers and insurers, and not a matter subject to FAA regulatory oversight. Stated another way, the conduct of commercial business in space, other than transportation to and from space, remains outside the sphere of FAA regulatory control.

An argument along the lines suggested by Boeing could be constructed that by defining launch to include ``to place or try to place a launch vehicle or reentry vehicle and any payload'' otherwise in outer space, Congress intended to grant to the agency continuing licensing jurisdiction over vehicle and payload operations; however, the FAA believes that such a broad reading of the statute would ignore the plain meaning and use of the term ``place'' in the definition and require substituting it with the term ``operate.'' Boeing's view is therefore not supported by a plain reading of the statute and is not adopted by the FAA. 49 U.S.C. 70102(3).

The control test over RLV operations suggested by Space Access and Boeing in order to assure licensing and indemnification coverage throughout an RLV mission, as well as the aircraft analogy reflected in comments submitted by Boeing and Vela, are also interesting but overlook statutory limits on FAA authority. As previously mentioned, reentry licensing restrictions will, to some extent, affect on orbit operation of RLVs and other reentry vehicles but a comparison of the Federal Aviation Act and CSLA reveals fundamental differences. For one thing, the FAA issues airworthiness and operating certificates as a requirement for operating aircraft whereas the CSLA specifically limits FAA licensing authority to the events of launch and reentry, to and from space, and operation of launch and reentry sites. It does not authorize the FAA to license all vehicle operations, wherever conducted.

Accordingly, the Final RLV and Reentry Licensing Regulations and associated financial responsibility requirements established in the final rule reflect the limits of FAA ``launch'' and ``reentry'' licensing authority. The two companion rules are intended to provide some level of predictability and certainty to prospective RLV and other reentry vehicle operators so that they may make appropriate business and risk management decisions as their business plans and technology develop. In some instances, the FAA will need to address the unique circumstances presented by a vehicle proposed for launch or reentry on an individual basis, sometimes referred to as a case-by-case determination, and will provide mission-specific precision through license terms and conditions; however, the two companion rules establish the principles upon which such determinations will be based.

Definitions of ``launch'' and ``reentry,'' when applied to an RLV, and the scope of FAA licenses for both launch and reentry activities are presented as part of the Final RLV and Reentry Licensing Regulations. In that companion rulemaking, the FAA resolves that licensed launch of an RLV begins with arrival of the launch vehicle or its major components at a U.S. launch site, consistent with the FAA's public safety mandate, and concludes upon completion of the launch phase of the mission. Where payload deployment is a purpose of the mission, that event marks the end of licensed launch of an RLV. For other orbital RLV missions, that is, where payload deployment is not a mission objective, as discussed in greater detail below, the FAA defines the end of an authorized RLV launch as occurring at the completion of the first sustained or steady-state orbit of the vehicle in its intended orbit, consistent with the FAA's safety mandate over launch operations. The Final RLV and Reentry Licensing Regulations also define ``reentry'' to include the conduct of activities directed at determining reentry readiness and that are therefore critical to ensuring public health and safety and the safety of property during reentry.

The FAA reaches its conclusions in the face of concern expressed by Boeing that the United States retains certain obligations arising out the Outer Space Treaties that will not be fully addressed or discharged through RLV mission licensing regulations, such as responsibility for continuing supervision of activities of non-governmental entities in outer space. (Outer Space Treaty, Article VI). Limits on FAA licensing authority originate in the CSLA and are observed in this rulemaking and the companion Final RLV and Reentry Licensing Regulations. While on orbit, RLVs and other reentry vehicles are not unlike other satellites that are operated and maneuvered and, in so doing, may interfere with or cause damage to the other assets in space. This is no different than the situation that exists today regarding many satellites, generally without problem or objection. In any event, the FAA does not have the power to change that result through rulemaking or an inappropriate assumption of authority over payloads or vehicle operations on orbit that are not properly deemed part of a launch or reentry, as Boeing suggested.

Cost and availability of insurance for unlicensed activities on orbit remains to be seen and the FAA will look to industry to advise the agency when, and if, unavailability of insurance for such activities creates an impediment to RLV technology development. As a practical matter, cost and availability of third party liability insurance for an RLV that remains on orbit for an extended time after launch and before initiating reentry should be comparable to that obtained under current business practices for other satellites on orbit. To the extent commenters are concerned about damage caused by an RLV to another vehicle or object on orbit with which it is intended to dock or otherwise make contact, the FAA believes that such concerns are best addressed contractually between the owners and operators of those vehicles or objects such as through voluntary reciprocal waivers of claims agreements or insurance, and that it is not a matter implicating third party liability insurance under the CSLA. For other on orbit operations, the FAA believes that it is premature to assess the risk of such activities and determine whether they are insurable or not.

Specific comments to the NPRM on the proposed scope of RLV mission licensing from the perspective of financial responsibility and risk

management are addressed below.

1. Definition of ``Launch'' of an RLV

Notwithstanding the jurisdictional issue concerning RLV on orbit operations, many comments suggested alternative commencement and endpoints of an RLV launch to that presented in the Proposed RLV and Reentry Licensing Regulations for purposes of defining the activities authorized by an RLV mission license

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and the risks intended to be addressed through FAA licensing and CSLA financial responsibility and risk allocation.

a. Commencement of RLV ``launch.'' The Proposed RLV and Reentry Licensing Regulations defined the commencement of an RLV launch in a manner consistent with that appearing in 14 CFR 401.5, and currently applicable to ELV launches. Launch would therefore include pre-flight ground operations commencing upon arrival of a launch vehicle (or its major components) or payload at a U.S. launch site.\4\

\4\ Reference to payload arrival in 14 CFR 401.5 in the definition of ``launch'' was included on the presumption that a payload would arrive at about the same time, or after, arrival of a launch vehicle and was not intended to suggest that payload processing activities require FAA licensing. Activities involving a payload for which an FAA license is required would be those associated with the launch vehicle, such as integration of a payload with the vehicle.

Kistler, Vela and the New Mexico Office of Space Commercialization (New Mexico) which plans to operate an inland launch and reentry site for RLVs objected to including pre-flight operations as part of launch. Kistler and New Mexico protested that in the absence of valuable U.S. Government range facilities, there is no need for CSLA-driven insurance and indemnification for pre-flight activities at a commercial launch complex. In fact, they argued that the lack of any need for government indemnification at such sites provides them a competitive advantage over more crowded, Federal launch ranges. New Mexico further believes that licensing pre-flight activities and thereby subjecting them to CSLA-based financial responsibility requirements limits flexibility in commercial arrangements between a launch site operator and its customer (the launch operator). Accordingly, launch should begin at engine ignition, according to New Mexico. Kistler acknowledged recent amendment of the CLSA to include preparatory activities within the statutory definition of ``launch,'' but suggested that it is sufficient to limit licensing and associated financial responsibility requirements to steps that are critical to initiating flight, unique to space launch and so hazardous as to warrant regulatory oversight by the FAA.

The FAA retains arrival of the launch vehicle at a U.S. launch site as the point at which launch begins and licensing is required for an RLV in the Final RLV and Reentry Licensing Regulations, and therefore licenses certain preflight activities. The FAA bases its determination on the statutory definition of ``launch,'' and on risks to third parties posed by vehicle-related operations at a U.S. launch site upon

arrival of the vehicle. (See Final Rule, Commercial Space Transportation Licensing Regulations, 64 FR at 19591-93, issued April 21, 1999.) The FAA believes that a consistent definition of the commencement of launch is appropriate and necessary for both ELVs and RLVs because of the nature of hazardous pre-flight operations that are undertaken upon vehicle arrival at a U.S. launch site. Risks to third parties and third-party property as a result of pre-flight processing hazards appear comparable, based upon the FAA's current understanding of proposed vehicle operations, regardless of the reusability of the launch vehicle. Moreover, the statutory definition of launch does not differentiate on the basis of type of launch vehicle. From a financial responsibility and risk management perspective, the FAA does not agree with comments that suggest imposition of such requirements is driven by the need for indemnification, or that it will hinder the competitiveness of non-federal launch sites. If, as some comments suggested, there is little risk to third parties and third-party property at non-federal sites, reduced risk will be reflected in lower MPL determinations and associated insurance requirements that are lower than those currently imposed for pre-flight ELV operations at Federal launch ranges.

The FAA notes that some commenters confuse the U.S. Government's statutorily-directed contractual waiver of property damage claims in excess of required insurance with the catastrophic third-party claims protection afforded participants in licensed launch activity, known as indemnification. The interested public is referred to the Final Rule; Financial Responsibility Requirements for Licensed Launch Activities (63 FR 45592-45626, issued August 26, 1998), for a comprehensive discussion of risk allocation principles under the CSLA when launches take place at a Federal range facility and expose valuable national range assets to risk of damage or loss.

Kistler's comments pointed out that an RLV also arrives at a launch site at the end of flight when it reenters from Earth orbit and therefore must be covered immediately by a launch license for the next flight of that vehicle, and that this is an illogical result of applying the definition of an ELV launch to an RLV. Similarly, Space Access stated that under the proposed definitions of launch and reentry, it is unclear when one mission ends and another begins for an RLV that will land, or arrive, at the launch site. Vela pointed out that RLVs will be substantially intact, with major components present at the launch site, once their initial construction is completed, unlike ELVs. As a result, an idle RLV awaiting its next mission would be subject to launch licensing, and that this, too, is an illogical result of the definition in Vela's opinion.

The FAA makes no change to the commencement point of ``launch'' in the Final RLV and Reentry Licensing Regulations on the basis of the comments. FAA licensing is necessary when presence of a launch vehicle in anticipation of a launch presents risks to public safety at a launch site in the United States. The detailed analysis presented in the supplementary information accompanying the Commercial Space Transportation Licensing Regulations, issued April 21, 1999 (64 FR 19586), explains at great length that arrival of a launch vehicle at a U.S. launch site occurs when it passes the gate, or entry point, to the site. Although reentry includes return flight of a reentry vehicle from Earth orbit or from outer space to (and including) Earth, landing at a reentry site ought not be confused with the vehicle's initial arrival

at the entrance to a launch site. As explained in the Final RLV and Reentry Licensing Regulations, the FAA understands that a vehicle will, in all likelihood, undergo operations following its reentry to secure the vehicle and mitigate the risks associated with any remaining on-board hazardous materials. These events are part of the reentry, as opposed to subsequent launch, of the vehicle and associated risks and third party loss or damage, if any, would be assessed in determining MPL for that reentry. A vehicle that is inert, passive and presents no risk to third parties, such as an RLV that is effectively in storage, may not require a license to remain at the launch site; however, a fueled and armed vehicle at the facility that is idle because it is awaiting a payload must be covered by FAA licensing and would remain subject to FAA regulatory oversight, including financial responsibility requirements under 14 CFR part 440.

Maintenance and refurbishment activities will also be required to prepare a vehicle for its next mission and these events may impact public safety and risk to third parties, much like pre-flight preparatory processing of any launch vehicle. The FAA reserves to future rulemaking the matter of regulations governing maintenance and refurbishment of a vehicle between RLV missions; however, the FAA anticipates

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that when such activity poses risk to uninvolved persons and property it may require regulatory oversight, possibly under an FAA license, and insurance (or other form of financial responsibility) in the event of damage or loss to third parties. Given that such activities are preparatory and necessary to ensure safe vehicle flight from Earth, in addition to being hazardous, the FAA may determine that such activities are properly regulated under the FAA's authority over launch of a launch vehicle and subject to financial responsibility requirements in accordance with 14 CFR part 440.

b. End of RLV Launch. The Proposed RLV and Reentry Licensing Regulations erroneously failed to specify in the regulatory text that launch of an RLV would end upon accomplishment of the launch phase of the mission, specifically, payload deployment for those orbital RLVs having that as their mission objective. A more elaborate discussion of the scope and endpoint of RLV launch authorization appears in the NPRM at 64 FR 54452, in order to identify that phase of RLV launch operations covered by CSLA-based financial responsibility and risk allocation and differentiate them from on-orbit operations not intended to be covered by the CSLA risk management regime. The FAA proposed payload deployment in order to provide a bright line demarcation between authorized launch and other RLV-related operations.

Eight of the ten comments submitted to the docket addressed the appropriate endpoint of RLV launch authorization. Once again, putting aside the issue of on orbit jurisdiction over RLV operations, the comments did not disagree with the FAA that the event of payload deployment proves an appropriate point at which to deem launch activities concluded for those RLVs whose mission and design is directed at deployment of a payload. However, the comments pointed out that many RLVs will have other mission objectives, such as servicing the International Space Station or space tourism, and the proposed definition is therefore insufficient for those RLVs. Lockheed Martin's

comments noted that because launch and reentry, but not on orbit operations, are events requiring a license and therefore subject to CSLA requirements including financial responsibility and allocation of risk, it is critical that definitions of launch and reentry be tailored to the needs to RLVs and other reentry vehicles.

In the NPRM, the FAA explained the scope of activities that would be comprehended by a launch and reentry license for an RLV mission for precisely the reasons indicated by Lockheed Martin. At the time the NPRM was issued, the FAA understood that the RLV market would be comprised mostly of payload deployment missions conducted to loft and replenish low Earth orbit satellite constellations. Accordingly, the FAA attempted to define the end of launch for the majority of RLV missions forecast in the near term. In light of recent changes in market projections and the surge in other aspects of space commercialization, it is appropriate to define the endpoint of RLV launches that do not involve deployment of a payload. The FAA does so in the Final RLV and Reentry Licensing Regulations based upon the FAA's public safety concerns and concludes that launch ends upon accomplishment of the launch phase of the mission, as discussed in the NPRM, 64 FR at 54452. In an effort to provide clarity, the Final RLV and Reentry Licensing Regulations provide that the launch phase of the mission is accomplished upon payload deployment for those RLVs having payload deployment as a mission objective. For other orbital RLV missions, the launch phase is accomplished upon completion of the first sustained orbit of an RLV in a steady state condition at its intended orbit. In the Final RLV and Reentry Licensing Regulations, the FAA explains that once an orbit in such condition has been completed, the risk of an unplanned event, such as unintentional reentry or collision, is sufficiently small that FAA regulatory oversight is no longer required to fulfill its public safety mandate.

The FAA's definition of the appropriate endpoint of an RLV launch in which no payload is intended to be deployed is similar in nature to suggested alternative endpoints offered in a number of comments. For example, Kistler proposed that launch would end for any RLV whether or not its mission is payload deployment at the first full cessation of thrust after the extinction of the instantaneous impact point (IIP) of the vehicle but in no event later than payload deployment. By suggesting extinction of the IIP as the appropriate launch endpoint, Kistler takes into account risk to the public and property on the ground, that is, the point at which vehicle debris would not impact the surface of the Earth, should break-up occur. Kistler's suggestions avoids a launch scenario in which RLV reentry occurs before payload deployment is concluded where the RLV uses an expendable upper stage to deploy its payload. The FAA declines to adopt Kistler's proposal because it does not address on orbit collision risks that may also be a direct result of an RLV launch and therefore does not adequately fulfill the FAA's safety mandate.

Space Access took issue with defining the end of the RLV launch differently from the end of an RLV launch and proposed instead that launch continues ``through the point after payload separation when the last action occurs over which a licensee has direct or indirect control over the launch vehicle.'' The FAA does not agree that a control test, or an event test that signals the last act of control, is appropriate for RLVs given the FAA's understanding that most operators plan to retain some form of control over their vehicle while on orbit until it

reenters. Defining an RLV launch in such a manner would lead to the result that launch is not concluded until the mission, inclusive of reentry to Earth, has been completed. Under that interpretation, the only reentry requiring FAA licensing would be that of a reentry vehicle launched initially as a payload that subsequently reenters, as in the COMET or METOR situation described in the NPRM or other vehicle meeting the definition of rentry vehicle that was not launched as an RLV. The FAA concludes that the result of this interpretation runs contrary to the statutory definition of reentry inasmuch as a reentry requiring FAA licensing under the CLSA specifically includes reentry of an RLV.

Other suggested endpoints of an RLV launch include the following comments.

The Experimental Rocket Propulsion Society (ERPS), a developer of rocket engine technology for use by commercial entities, suggested a 3-phase approach to RLV regulations as follows: launch, on orbit and reentry. In order to accommodate a broader range of RLV missions, ERPS proposes that the launch phase would end when an RLVs main engine stops and the desired trajectory or orbit is achieved. Doing so is necessary, according to ERPS, to avoid the ``regulatory surrealism'' of perpetual launch that would otherwise result for those RLVs that will not deploy a payload. ERPS noted that its proposed definition of launch could be interpreted to include a circularizing burn as part of launch, even though it occurs after main engine cut-off, because the vehicle is not yet in attainment of its intended orbit.

Orbital Sciences Corporation (Orbital Sciences) suggested an expanded definition of launch to mean activities through ``payload deployment, insertion into a stable orbit, or

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preparation for reentry, whichever comes first.''

Boeing recommended a broad definition of RLV launch to include accomplishment of the launch phase of any RLV mission. The FAA used those words in the supplementary information accompanying the NPRM in defining the end of the launch phase as the point of payload deployment for RLVs having that as their mission. The FAA agrees with Boeing to the extent that the launch phase of the mission is construed to mean achieving and securing the intended orbital destination of an RLV before other operations are performed. The FAA would not agree with Boeing if, by accomplishment of the launch phase of the mission, Boeing means to include the conduct of operations on orbit uniquely associated with a particular mission, such as International Space Station and satellite servicing or on orbit research, as Boeing's comment suggested.

Vela, consistent with its mission approach to RLV flight, dismissed the need to define and distinguish among launch and reentry for risk allocation purposes as the result of a lack of understanding of RLVs in general. In Vela's view, launch will end, even if it is with a shower of debris, and must be covered by CSLA financial responsibility and allocation of risk.

The FAA remains mindful of the limits of the statutory grant of licensing authority recently extended to it, that is, licensing the launch of a launch vehicle and the reentry of a reentry vehicle, and restrictions on FAA authority over on orbit operations envisioned by

the Committee. In the revised definition of launch that appears in the Final RLV and Reentry Licensing Regulations, as applied to an RLV, the FAA establishes the endpoint of an RLV launch in terms of accomplishing the launch phase of a mission and provides bright line clarity in the following manner. RLV launch ends upon payload deployment for orbital RLVs having that event as a mission objective. For those RLVs, deployment of the payload properly identifies the end of the transportation service offered by a launch vehicle and for which FAA regulatory safety oversight is necessary. Mitigation of collision risks, and the associated potential for debris generation, that attend payload deployment would also be subject to FAA regulatory controls. For those orbitals RLVs that do not have payload deployment as a mission objective, launch ends upon completion of the first sustained, steady-state orbit of an RLV at its intended destination. This definition offers the benefit of avoiding the need for individual determinations of the end of an RLV launch on a case-by-case basis using other, more particularized mission objectives as the measuring yardstick. The FAA includes attainment of the intended orbital destination of the vehicle as part of the definition because an RLV may fail to reach the orbit for which it was intended. Where that occurs, and assuming the vehicle remains in the licensee's control, a licensee would typically employ risk mitigation measures and perform maneuvers necessary to accomplish an orbital correction rather than risk its vehicle and success of the mission. The FAA would view corrective maneuvering as part of the launch. The FAA's rationale including such corrections as part of the launch is that the intended orbit was approved as part of the FAA's launch safety approval and assessment process, and anything short of that creates uncertainty and risk from a public safety perspective. The FAA would have reviewed hazard analyses and risk mitigation measures, such as maneuvering for orbital correction, as part of the licensee's application. Thus, it is necessary from a regulatory perspective that licensed launch activities include adjustments and corrections necessary (and planned and evaluated as part of a license application) to achieve vehicle stability in the intended orbit. Whereas corrections and adjustments performed to achieve the first intended orbital destination are part of the launch, the same is not true for on orbit maneuvers performed after launch, as defined by the FAA, in the conduct of further RLV business in space, such as satellite servicing or docking.

2. Definition of ``Reentry'' of an RLV

a. Commencement of ``reentry.'' Under the CSLA, as recently amended, ``reenter'' and ``reentry'' are defined to mean ``to return or attempt to return, purposefully, a reentry vehicle and its payload, if any, from Earth orbit or from outer space to Earth.'' 49 U.S.C. 70102(10). A ``reentry vehicle'' includes an RLV under the CSLA. 49 U.S.C. 70102(13). The Proposed RLV and Reentry Licensing Regulations define ``reentry'' to include ``activities conducted in Earth orbit or outer space to determine reentry readiness and that are therefore unique to reentry and critical to ensuring public health and safety and the safety of property during reentry. 64 FR at 19656.

In an effort to add clarity and precision to the FAA's implementation of reentry licensing authority, the NPRM elaborated upon the regulatory definition of ``reentry'' included as part of the Proposed RLV Licensing and Reentry Regulations, and amplified upon the underlying justification for the agency's proposed approach.

The NPRM explained, in detail, the FAA's rationale for licensing the conduct of reentry readiness activities. Just as risks to public safety and to property resulting from launch activities become sufficiently heightened to warrant FAA safety regulation upon arrival of a launch vehicle at a U.S. launch site, risks to public safety and property change upon commencement of certain activities conducted in anticipation of reentry flight and likewise rise to a level at which safety oversight and approval by the FAA is appropriate. A vehicle must be properly positioned and oriented to achieve its intended reentry trajectory. Safety systems, hardware, software, and structures must be verified to be in reentry-ready condition and configuration to assure public safety is not jeopardized as a result of a reentry attempt. Except where reentry will occur as a result of ballistic forces, adjustments in safety systems and vehicle positioning may be required for a licensee to conduct planned reentry as contemplated by its license application and in compliance with authority granted by the license. Where reentry readiness cannot be verified or achieved, a license may be required to employ contingency plans, such as abort to orbit or reentry to an alternative, approved location.

Including those preparatory activities conducted to determine reentry readiness as part of licensed reentry does not contravene guidance offered by the House Committee on Science (the Committee) in a report accompanying passage of H.R. 1702, the predecessor to the CSA, on the scope of FAA reentry licensing authority. H. Rep. 105-347, 105th Cong., 1st Sess. (Committee Report). Although the Committee Report is not binding as law, it provides instructive guidance to the FAA in delimiting regulated reentry activity. In it, the Committee specifically notes that the legal framework applicable to launch applies to reentry. In amending 49 U.S.C. Subtitle IX, chapter 701, the CSA grants to the Secretary of Transportation ``the same authority and responsibility with respect to the licensing and regulation of the reentry of reentry vehicles as existing law provides to the Secretary with respect to the launch of vehicles.'' Id. at 21. Under longstanding authority, FAA launch licenses authorize preparatory activities involving a launch vehicle at a launch site in order to fulfill the FAA's safety

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mandate. Licensing is necessary because such activities expose third parties to safety risk and therefore require FAA regulatory oversight.\5\ Final licensing regulations issued by the FAA on April 21, 1999, clarify that licensed activity is deemed to begin upon arrival of a launch vehicle at a U.S. launch site. The amended CSLA imposes on the agency safety responsibility over reentry comparable to that applicable to a launch. Because the conduct of reentry readiness activities directly affects risk to public safety and to property, fulfillment of the agency's safety mandate would best be achieved by assuring that such activities are conducted under FAA approval, oversight and authority. Accordingly, the Proposed RLV and Reentry Licensing Regulations included such activities within the scope of a reentry license.

\5\ Recent amendment by the CSA of the statutory definition of

the term ``launch'' is intended to make clear that preparatory activities requiring licensing are those conducted at a launch site in the United States. The amendment resulted from concern that increasingly mobile launch systems utilizing multiple launch sites in preparation for a single mission were not adequately covered by FAA licenses.

The Committee Report contemplates flight phases, consistent with the FAA's approach to RLV licensing. It provides that ``[t]he Committee intends that for purposes of the license requirement, reentry begins when the vehicle is prepared specifically for reentry. By way of definition, the Committee intends the term to apply to that phase of the overall space mission during which the reentry is intentionally initiated.'' Id. Additional guidance reflects the Committee's general sense that reentry begins when the vehicle's attitude is oriented for propulsion firing to place the vehicle on its reentry trajectory, but acknowledges that the reentry phase will vary based upon the particulars of different vehicle systems.

In proposing to include preparatory activities as part of the FAA's reentry licensing authority, the FAA remained mindful of Committee Report language noting that procedures and activities preceding initiation of reentry are not intended to be encompassed within the agency's licensing authority. Id. at 22. At the same, the Committee acknowledged the FAA's need to assure itself of a licensee's capability to carry out safe reentry without jeopardizing critical national interests.

Reentry licensing authority, as proposed by the FAA in Proposed RLV and Reentry Licensing Regulations, would also be consistent with this aspect of the Committee Report guidance. Reentry licensing would be confined to those activities that would have direct impacts upon public safety and the safety of property if not performed in accordance with FAA approvals. The conduct of such activities may trigger or proximately result in occurrence of an anomalous event causing damage or loss to persons or property not involved in the reentry. Moreover, the FAA's safety review and approval is premised upon the adequacy from a public safety perspective of the conduct of such activities which, if not done properly, could invalidate the basis upon which the FAA determined that reentry could be performed safely. Hence, only those activities that are unique to reentry and critical to carrying out safe reentry, as opposed to those that are merely indicative of an operator's capabilities, would require an FAA license.

Consequences of a non-nominal reentry would therefore be addressed through CSLA risk allocation measures if reentry occurs in the course of licensed activity or is determined to result from activity carried out under the license, that is, if a fact-based inquiry indicates a sufficient casual nexus exists between the claim and licensed activity. Non-nominal reentry resulting from unlicensed activity, on orbit, after a nominal launch would not qualify for indemnification, nor would claims resulting from collision with another orbiting space object during unlicensed on orbit activity.

The NPRM further pointed out the benefits of licensing reentry readiness activities under the FAA's reentry authority. By including within the regulatory definition of ``reentry'' those activities conducted to determine reentry readiness, such as verification of

safety systems and performance of reentry system status checks, the Proposed RLV and Reentry Licensing Regulations would include certain preparatory activities within the scope of a reentry license. The proposed definition would implement effectively the FAA's safety responsibilities and, from a financial responsibility perspective, enable and enhance meaningful risk allocation under the CSLA. Thus, operators would be relieved of the need to privately manage the risks that would otherwise attend such activities. Because risk to public safety and the safety of property change upon commencement of reentry readiness activities, and because such activities are directly related to protecting public safety and the safety of property, including preparatory activities as part of licensed activity ensures meaningful risk management and allocation for reentry operations in accordance with CSLA objectives. In determining insurance requirements for a licensed reentry, the FAA would identify sufficiently probable risks and outcomes that would result from reentry readiness activities under a license and set financial responsibility requirements accordingly.

Where vehicle operations are not licensed, the FAA noted in the NPRM that reentry vehicle operators must manage resultant risks as a private business decision. As stated in the NPRM, the United States accepts fault-based liability as a launching State under the Liability Convention, Article III, for damage to another launching State's on orbit space object if damage is the fault of the government or persons for whom the United States is responsible. Absent 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. Where the statute does not apply, the government may fulfill its treaty obligations and seek contribution or compensation from entities at fault for the damage.

At the time the NPRM was issued the FAA understood that most of the RLVs under contemplation and development were intended to spend minimal time on orbit in order to reduce costs and risks to the vehicle. Additional time spent on orbit would entail additional cost and expose the vehicle to risk from other orbiting objects. Once returned to Earth, an RLV could be secured intact and refurbished for its next mission. It therefore seemed likely that most EPA operators would seek swift return of their valuable asset and would not leave a vehicle exposed to the risks of the space environment except as necessary to engage in activities and check outs designed to ensure the vehicle could return safely and intact, in accordance with the approval for reentry granted by an FAA license. Accordingly, the FAA forecast that payload deployment would be followed immediately by preparation for reentry and therefore seamless financial responsibility coverage under the CSLA would result. For those RLVs, a non-nominal reentry would generally occur as a result of licensed reentry and would be covered by CSLA-directed financial responsibility. In this context, the FAA requested comment on the scope of proposed reentry licensing authority from a financial responsibility and risk management perspective. The FAA also sought comments from a financial responsibility and risk management perspective on the

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appropriate commencement of reentry licensing authority for other RLV

missions, such as those with delayed reentry or that are intended to perform on orbit activities not deemed ``launch'' or ``reentry.''

Boeing expressed dissatisfaction with the proposed definition of reentry because of the potential for interpretive conflicts over qualifying activities. For consistency, Boeing suggested that reentry begins, for regulatory purposes, with planning activities, followed by ignition of RLV retrograde propulsion systems and subsequent first movement toward the atmospheric entry interface (EI). The FAA does not agree that Boeing's suggestion adds clarity to the proposed definition. Although reference to ignition and subsequent events is clear, the FAA does not believe that reference to ``planning activities avoids the potential for debate Boeing believes will result from the FAA's proposed definition and, as discussed in the companion Final RLV and Reentry Licensing Regulations does not make any change to the definition on the basis of Boeing's comment.

Kistler also regarded as imprecise the FAA's proposed definition of reentry inasmuch as it may be impossible to attribute an on orbit activity exclusively to reentry or in furtherance of reentry readiness. More importantly, Kistler suggested that in applying this definition, the FAA has attempted to regulate on orbit operations that Congress did not intend the FAA to license. According to Kistler, to the extent the FAA has done so in an effort to extend to an anomalous reentry the benefits of the CSLA financial responsibility and risk allocation regime, specifically indemnification, Kistler does not believe such regulatory oversight is necessary or within the agency's authority. In support of its position, Kistler noted that the NASA Space Shuttle, the only operational RLV, has never experienced an unplanned reentry. Moreover, should a vehicle experience a non-nominal reentry, it would in all likelihood break up and/or burn up upon entry into Earth atmosphere and there would be no need for indemnification, according to Kistler. The FAA acknowledges that although this statement may be correct for certain vehicles, the Final RLV and Reentry Licensing Regulations address the agency's regulatory approach to evaluating the hazards that attend random reentry.

Kistler further noted that a non-nominal reentry that is accidental, inadvertent, unplanned, unintentional or unexpected would not satisfy the statutory definition of a reentry inasmuch as it cannot be termed ``purposeful.'' Kistler cited congressional report language stating the ``[b]y way of definition, the Committee intends the term to apply to that phase of the overall space mission during which reentry is intentionally initiated.'' (Emphasis supplied.) Therefore, reentry readiness activities conducted on orbit are outside the scope of FAA licensing jurisdiction, according to Kistler, and indemnification to cover inadvertent reentries is not required by the CSLA.

In place of the FAA's definition, Kistler suggested that, for purposes of FAA licensing, reentry should not be deemed to begin before an IIP is created and in no event should it exceed the expectation reflected in the Committee Report that reentry begins when the vehicle's attitude is oriented for propulsion firing to place the vehicle on its reentry trajectory. Kistler argued that by limiting reentry to vehicle orientation for propulsion firing, the Committee intended to extend indemnification to ``what it perceived as an operation (reentry) that posed a threat to people and assets on the ground.'' According to Kistler, a misplaced desire to extend to an unplanned reentry the benefits of indemnification by licensing on orbit

activities would burden industry by requiring additional analyses and insurance without any needed benefit.

ERPS similarly suggested that the FAA proposed to define reentry too broadly by including on orbit operations commencing immediately upon payload deployment in an effort to extend to a non-nominal reentry the benefits of statutory indemnification. ERPS agreed with including within the scope of a reentry license activities conducted on orbit in preparation for reentry, as defined by the FAA, but disagreed that such activities would necessarily commence immediately upon deployment of a payload. According to ERPS, a non-nominal reentry is a purposeful intentional event subject to FAA reentry licensing; however, a premature reentry would be an unintentional event. Nevertheless, ERPS suggested that having obtained an FAA license and having the intent to reenter, together, would be sufficient to satisfy the CSLA and extend statutory indemnification to the consequences of a non-nominal reentry event, whenever it occurs. In ERPS's opinion, this interpretation of the CSLA is preferable to regulation of an orbit activities following payload deployment in order to conclude that indemnification would be available in the event of a premature, errant or otherwise non-nominal reentry. ERPS expressed its views in the face of extensive discussion in the NPRM of non-nominal reentry from a financial responsibility and risk allocation perspective. (See NPRM, 64 FR at 54453-54455).

The FAA has not suggested that the term ``purposefully'' that appears in the statutory definition of ``reenter'' and ``reentry'' is intended to necessarily exclude premature or other non-nominal reentries from the risks intended to be addressed through CSLA-directed financial responsibility and risk allocation. Rather, it was included, the FAA believes, to distinguish planned intentional reentry of a reentry vehicle from entry into Earth atmosphere of debris and other objects that are not reentry vehicles, that is, that are not designed to reenter substantially intact, and that deorbit naturally as a result of the space environment and orbital mechanics, such as orbital decay. The FAA considers unplanned events that occur during licensed activity, such as premature or non-nominal reentry, to result from licensed activity and would require financial responsibility to cover the consequences of such events. Similarly, an unplanned or premature launch of an ELV has occurred. For example, ELV launches have occurred at a Federal range facility as a result of electrical charges supplied through static electricity. Had such an event occurred during a licensed launch, CSLA financial responsibility and risk allocation would address the consequences.

The basis for including reentry readiness activities as part of FAA licensing authority over reentry is not to maximize indemnification benefits for RLV and reentry vehicle operators. Rather, licensing is appropriate because of the safety risks presented by such activities and the need for FAA regulatory oversight in fulfilling the agency's statutory safety mandate. Covering activities that present public safety risks through the CSLA financial responsibility and allocation or risk regime assures that risks that have the greatest likelihood of occurrence and for which insurance is warranted are, in fact, covered up to the agency's determination of maximum probable loss and makes risk management under the CSLA a meaningful program.

ERPS agreed with the FAA's proposed definition of reentry to include reentry readiness activities that are unique to reentry and critical to ensuring safety, but finds no rationale in congressional

report language or the NPRM to conclude that reentry would therefore begin immediately following payload deployment. ERPS suggested that

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reentry begins at preparation for retrofire for orbital vehicles, and for suborbital vehicles at preparation for atmospheric interface. ERPS's concerns reflect its tentative conclusion that the FAA essentially requires reentry to begin immediately following payload deployment, thereby forbidding on orbit operations. ERPS is incorrect in its reading of the NPRM. The FAA would neither require immediate reentry, nor forbid on orbit operations. In using payload deployment as the point of demarcation between the end of an RLV launch followed promptly by reentry, the FAA was attempting to address the majority of missions envisioned for RLVs at the time the NPRM was issued. Under the Final RLV and Reentry Licensing Regulations, commencement of licensed reentry would be defined under the terms of an RLV mission license based upon application of the principles established in that companion rulemaking.

Lockheed Martin noted in its comments that definitions of launch and reentry must be tailored to the needs of RLVs and other rentry vehicles and that identifying a uniform point at which reentry begins for all RLVs may not be appropriate.

The FAA appreciates the concern expressed by Lockheed Martin but believes it vital for RLV operators to understand early in RLV and mission design and planning the point at which an RLV would covered by a license and the CSLA financial responsibility and risk allocation regime. Doing so is necessary to enable RLV developers and operators to make informed business and risk management, as well as mission design, decisions regarding unlicensed operations. Accordingly, in the Final RLV and Reentry Licensing Regulations, the FAA defines the commencement of reentry as occurring upon the conduct of reentry readiness activities that are critical to ensuring public health and safety and the safety of property during reentry. Reentry readiness activities include those necessary to accomplish and verify proper vehicle orientation, as well as other safety-critical checks that may be identified or defined in a license term addressing the unique capabilities of a particular vehicle. Activities would not need to be unique to reentry for FAA licensing authority to apply, as discussed in the companion Final RLV and Reentry Licensing Regulations. The point at which licensed activity is deemed to commence for a specific RLV mission would depend upon the unique characteristics and systems of an RLV proposed for flight and would be identified in the license. Concerns of Lockheed Martin should be alleviated, as differences in vehicle systems are addressed through the licensing process.

b. End of Reentry. Licensed reentry includes landing or other impact on Earth, as indicated in the Proposed RLV and Reentry Licensing Regulations, and financial responsibility would be required to cover injury, damage or loss to third parties and U.S. Government property resulting from reentry. For ground operations at a reentry site, the NPRM proposed that financial responsibility for reentry remain in effect until completion of licensed reentry activities at the site. The term ``licensed reentry activities'' would be defined in licensing regulations or by a license. To address other liability considerations that attend licensed reentry, including an attempted reentry, the NPRM

proposed that financial responsibility remain in place thirty days from initiation of reentry flight, unless a reentry were aborted on orbit. Under those circumstances, the FAA would determine in advance of rentry and based upon its hazard analysis and risk assessment, when risk to third parties and government property resulting from a licensed reentry \6\ were sufficiently small as to eliminate the need for insurance provided by the licensee.

\6\ Reentry includes attempted reentry by stature; hence, an abort while in orbit would be covered by a reentry license and considered in determining MPL for a mission.

As previously indicated, in pointing out deficiencies in the proposed definition of ``launch'' as it applies to an RLV, a number of comments equated reentry on Earth with arrival of a launch vehicle at a launch site. ERPS observed that definitions of launch and reentry for an RLV should be tied to ground operations, rather than specific marker events such as arrival of a lunch vehicle at a U.S. launch site, to avoid illogical results such as launch beginning upon reentry impact at a reentry site (assuming the reentry site is also a U.S. launch site). ERPS suggested that the reentry phase of RLV operations ends when vehicle engines stop and upon completion of post-flight ground operations that hazardous and unique to space transportation. Similarly, Space Access suggested, as the reentry endpoint, the last action performed after landing to safe the RLV for ground servicing in order to separate reentry activities from subsequent launch activities.

For ground operations, which seemed to generate the most concern among commenters, the end of reentry is defined in the Final RLV and Reentry Licensing Regulations to include post-flight ground operations conducted to ensure a reentry vehicle does not pose a threat to public health and safety or the safety of property. Doing so ensures that hazardous ground operations are covered by an FAA license, consistent with ERP's comment.

The FAA agrees with an observation offered by ERPS that where an RLV uses a single site as it launch and reentry site, a revised definition of the commencement of licensed launch activities would be appropriate for a follow-on RLV mission from the same site because the vehicle does not arrive at the gate. The FAA understands that additional regulations addressing maintenance and refurbishment operations between RLV missions may be appropriate and has a research program under way for purposes of identifying operations and maintenance procedures that will be associated with RLV operations. The FAA has presented its research plan to the RLV Working Group of the Commercial Space Transportation Advisory Committee (COMSTAC) in an effort to gain understanding of the kinds of operations and maintenance issues that may require a regulatory solution. As a result of its research, the FAA hopes to benefit from enhanced understanding of when such activities may be deemed to commence when a launch site is also the reentry site for that vehicle.

Comments on Financial Responsibility Aspects of RLV Mission Licensing

Launch and reentry authorizations may be combined in a single

license for administrative convenience to the FAA and its regulated entities. However, combining the authorizations to launch and reenter an RLV does not remove or relieve a licensee's responsibility for complying with financial responsibility requirements for both flight phases. Under the CSLA, as amended, insurance requirements attach to a launch license and a reentry license and, for each phase, statutory ceilings on such requirements would apply separately. That is, up to $500 million of liability insurance based upon maximum probable loss from third-party claims may be required for launch, and up to $500 million of liability insurance may also be required for reentry. Unlike an ELV launch for which a catastrophic event generally signals the end of vehicle flight, it is possible to suffer a catastrophic event during either, or both, flight phases of launch and reentry, particularly where the launch vehicle is a multi-stage RLV, and financial responsibility must be available to respond to claims arising

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out of either flight phase. By corollary, in the remarkable event that catastrophic claims result from both flight phases, indemnification up to the statutory ceiling would be available to respond to excess claims arising out of both licensed launch and licensed reentry.

The FAA proposed to reserve authority to establish differentiated insurance requirements as opposed to a uniform amount that must be satisfied for both flight phases. Risk-based methodology, known as maximum probable loss or MPL, would be applied to RLV mission proposals to assess launch and reentry risks associated with the mission and establish insurance requirements for launch and reentry flight. Where the monetary value attributed to such risk are comparable for launch and reentry, a uniform level of insurance would be appropriate and the FAA would impose parallel requirements for launch and reentry. However, where the value, in terms of a dollar amount, of launch risk is measurably different from reentry risk, the FAA would consider it appropriate to differentiate requirements for RLV launch and reentry. For example, an RLV may possess greater blast capability and explosive potential during launch when it is fully fueled than during reentry when it would have exhausted or expelled all or most of its hazardous propellants, justifying a higher amount of financial responsibility for launch than would be necessary for reentry. Under another example, a fully fueled launch vehicle lifting off from an inland launch site may pose greater risk to third parties in terms of the FAA's maximum probable loss analysis than would reentry to a coastal reentry site of a vehicle whose fuel supply has been depleted and that contains no hazardous materials.

Where risks are comparable in magnitude such that uniform requirements are established for both licensed flight phases of the mission, it is still the case that financial responsibility must be available to respond to claims arising during either or both flight phases. Imposition by the FAA of uniform requirements for launch and reentry flight phases of an RLV mission does not relieve or limit the responsibility of a licensee to cover the liability that may result from an RLV mission. In the NPRM, the FAA stressed that financial responsibility requirements would apply to both the launch of an RLV and its entry, up to statutory ceilings. Events resulting in third party liability could occur during either or both flight phases (launch

and reentry) of an RLV, and financial responsibility must be available to respond to claims arising out of either flight phase. A licensee would not be relieved of financial responsibility for reentry in the event that its RLV launch results in claims up to or exceeding the launch liability policy limits established by the FAA.

Whether or not uniform requirements would be imposed on all segments of licensed RLV flight, as opposed to differentiated requirements covering launch risk as distinct from reentry risk, the licensee would be responsible for covering the liability that results from licensed activity up to prescribed ceilings. The FAA proposed to reserve authority to make its determination on a case-by-case basis, based upon the results of its risk-based maximumprobable loss analysis. Given that the FAA proposes to authorize RLV missions using a single license to cover launch and reentry flight, the FAA sought public comment on the practicalities of differentiating launch or ascent risk from reentry or descent risk from a risk management and insurance perspective.

A number of comments expressed reservations about the practical effects of distinguishing launch from reentry financial responsibility for an RLV mission.

Lockheed Martin, in consultation with its insurance providers, indicated that claims processing for a single mission could be hampered, particularly where disputes could arise as to whether a claim arose out of licensed or unlicensed (e.g., on orbit) activity. Seamless financial responsibility requirements avoid such difficulties; however, Lockheed Martin acknowledges that the FAA would have to have the statutory authority currently lacking to license on orbit activities, thereby extending financial responsibility burdens and benefits to the conduct of such activities. Nevertheless, Lockheed Martin did not advocate extending CSLA financial responsibility and risk allocation measures to on orbit operation of RLVs. Rather, Lockhead Martin noted that it is premature to conclude that it would be necessary or desirable to do so in light of the early stage of RLV development and lack of appreciation as yet for the scope of on orbit activities to be performed by RLVs and their attendant risks.

Marsh observed that seams in financial responsibility, both in terms of licensed as opposed to unlicensed activity, and in terms of differentiated requirements for launch as opposed to entry, may lead to disputes cover (e.g., whether a claim results from a covered occurrence) and limits (e.g., the occurrence is a covered event but up to what limit of insurance).

Orbital Sciences noted that differentiating launch from reentry insurance requirements could be done at the election of the licensee, where for example, there may be cost benefits for the licensee.

The FAA appreciates these observations and considered, as an alternative, whether certain disputes may best be avoided by requiring a for uniform demonstration of insurance all licensed flight in the higher amount where MPL analysis for launch and reentry yields measurably different results. This alternative has the benefit of removing disputes as to whether an occurrence arose during launch or reentry because the available limits of coverage would be constant regardless of when the event occurred, or if both launch reentry events contributed to the damage, as long as the damage is not claimed to occur during, or result from unlicensed activity. Even so, certain underwriters might be willing to accept launch-related risks, but not

those having to do with reentry, or vice versa. However, notwithstanding the benefits of uniform and consistent insurance requirements for all licensed flight, the FAA concludes that it is bound to abide by the plain direction of the statute to set insurance requirements based upon risk, and not for administrative convenience. Absent practical experience in administering combinations of launch and reentry MPL-based requirements in an RLV mission license, the FAA believes it is premature to change its longstanding approach to setting risk-based insurance requirements based upon actual assessment of risk. Accordingly, the FAA reserves discretion to issue differentiated insurance requirements for the conduct of an RLV mission to cover launch and reentry risks. The FAA also understands that variations in liability policies regarding coverage for an occurrence, as the term is defined in the policy, may also result in disputes between insurer and insured and licensees are reminded that, by statute, insurance coverage must be available to respond to claims that result from an activity carried out under the license.

Space Access urged a single, seamless financial responsibility requirement for all RLVs, from a technical and practical perspective. As a technical matter, Space Access believes that all RLV activity will affect long-term safety of launch and reentry and should be subject to CSLA requirements throughout an RLV mission. From the practical perspective of paperwork

burdens on the licensee, it expressed concern that differentiated requirements for launch and reentry will complicate the paperwork necessary to demonstrate compliance with financial responsibility requirements.

The FAA does not agree that differentiating the amount of financial responsibility required for launch as distinct from reentry adds measurably to a licensee's compliance burden. Compliance may be demonstrated through a single policy evidencing coverage for all licensed activity. Similarly, a single opinion letter from the insurance broker issuing the certificate of insurance and corporate certification of compliance may suffice if the documents address all licensed activity. No change is made in the FAA's approach to requiring insurance for launch and reentry on the basis of the Space Access comment.

Vela found no more basis for differentiating launch from reentry in terms of setting financial responsibility requirements than it did for licensing launch separately from reentry.\7\ According to Vela, it may be appropriate to differentiate requirements when the vehicle's payload will return separately from the RLV, as would be the case for a COMET/ METEOR type of reentry vehicle. The FAA agrees that financial responsibility requirements apply to reentry of a payload that is itself a reentry vehicle. An operator of such a reentry vehicle is required to satisfy part 450.

\7\ Vela pointed out that an aborted RLV launch will land fully fueled. However, that contingency would be evaluated as part of the safety review for the mission and the associated risk, measured in terms of the probable value of loss to third parties and Government

property, associated with an aborted launch would be assessed in establishing launch MPL.

Comments on Financial Responsibility for Suborbital RLV Missions

An RLV that operates as a suborbital rocket inasmuch as it does not enter Earth orbit may be licensed under the FAA's longstanding launch licensing authority over suborbital rockets and subject to a single insurance requirement, issued under part 440, for all flight. However, the Proposed RLV and Reentry Licensing Regulations pointed out that the return to Earth of certain suborbital RLVs may also be licensable as a reentry. As the Proposed RLV and Reentry Licensing Regulations also noted, until passage of the CSA it was not clear whether Congress intended to extend to intact landing of such vehicles on Earth the financial responsibility and risk allocation requirements and benefits of the CSLA, and particularly indemnification, because of the unique risks posed by intact landing. In that proposal, the FAA suggested that the better approach to licensing suborbital RLV missions would be to regard them as launch and reentry, rather than a suborbital launch of a launch vehicle to ensure consistency in the measure of risk to which the public would be exposed from RLV operations. Accordingly, the FAA would apply to RLVs the same mission risk criteria calculated in terms of expected casualties, or Ec, whether an RLV reenters from Earth orbit or returns as part of a suborbital mission. From a safety and risk standpoint, no distinction is made in the Final RLV and Reentry Licensing Regulations between launch and reentry of an orbital RLV and a suborbital RLV. Any RLV mission would be licensed using the safety requirements set forth in that final rule. However, where the return to Earth of a suborbital RLV qualifies as a reentry, the FAA sought public comment on whether to impose financial responsibility requirements upon its launch as distinct from its reentry.

The FAA's request for comments on the proposed distinction between suborbital RLVs that are also reentry vehicles and those that are not, yielded several requests for a definition of where outer space begins. Under its mission approach to licensing suborbitally operated RLVs, there is no need to delimit outer space for purposes of assuring financial responsibility for the mission, as all RLV flight would be covered by FAA requirements.

Vela misconstrued the request for comments from a financial responsibility standpoint on distinctions between a suborbitally operated RLV and those that are not in arguing that the entire flight is subject to licensing, whether or not it reaches a certain altitude. There is no issues as to licensing. The issue posed by the FAA was whether certain RLVs should be subject to a single insurance requirement for the life of the mission or subject to differentiated requirements because they launch and reenter without entering Earth orbit. Comments submitted by Space Access advocated a single, seamless determination of financial responsibility for all RLVs, whether or not they satisfy the definition of a reentry vehicle.

The FAA clarifies its intent with regard to suborbitally operated RLVs in this final rule. The FAA has determined that, consistent with launch and reentry licensing and associated risk management requirements under the CSLA, separate MPL determinations and insurance requirements are appropriate for those RLVs that enter Earth orbit. The

requirement for human intervention before commencing reentry, including positive enabling of reentry under the Final RLV and Reentry Licensing Regulations, along with the potential conduct of other intervening activity between launch and reentry, warrant separate MPL analyses and financial responsibility requirements to address the risks that attend launch and reentry of RLVs that enter Earth orbit. However, for those RLVs that operate in a suborbital manner, that is, vehicles that do not enter a closed path and for which return to Earth is a matter of physics rather than human intervention, a single determination of financial responsibility covering all flight risk is deemed appropriate. For such vehicles, satisfaction of part 440 insurance requirements would be necessary to address the risks that attend operation of a suborbital RLV. Use of the reciprocal wavier of claims agreement contained in part 440, Appendix B, would be sufficient to encompass all participants in the mission; however, the FAA would not object to use of the form of agreement that appears in Appendix B of this final rule.

Financial Responsibility for Reentry of a Reentry Vehicle Other Than an RLV

The NPRM focuses upon risk management issues that attend RLV operation but queried when licensed activities should be deemed to commence for other licensed reentries in order to ensure meaningful implementation of statutory financial responsibility and risk allocation requirements.

The Final RLV and Reentry Licensing Regulations apply consistent criteria in defining reentry of an RLV and a reentry vehicle. The same public safety considerations that support FAA licensing authority over reentry activities conducted to determine reentry readiness are also presented by reentry of reentry vehicles that are not RLVs.

Few comments were directed specifically at reentry of a reentry vehicle other than an RLV; however, as previously noted, Vela commented that for such reentries it may be appropriate to differentiate reentry from launch financial responsibility requirements, and the FAA agrees.

Requirements contained in this final rule also to reentry of a reentry vehicle other than an RLV. Prospective operators of such vehicles will not have the benefit of seamless financial responsibility that RLV operators may enjoy in certain circumstances and must

manage liability risk associated with vehicle operations on orbit before commencing reentry entirely through private insurance. In managing those risks, reentry licensees, their customers and contractors and subcontractors must bear in mind that absent a clear causal nexus to a licensed launch or reentry, statutory risk allocation provisions, including indemnification, would not apply to cover their liability to third parties, including liability for damage to other space objects on orbit. Where the statute does not apply and the U.S. Government bears fault-based liability as a launching State under the Liability Convention because of on orbit damage caused by persons for whom the United States is responsible, the government may fulfill its treaty obligations and seek contribution or compensation from entities at fault for the damage.

Other General Comments

A number of comments to the docket remarked generally and favorably upon various aspects of the rulemaking. Kistler, in a particular, noted the positive benefits of rulemaking in eliminating regulatory uncertainty. A number of entities submitting comments to the docket have years of practical experience in demonstrating compliance with financial responsibility requirements for licensed launches. Others have no comparable experience because they have never been licensed by the FAA to operate a launch vehicle. However, none of the entities submitting comments has experience with regulatory requirements for reentry financial responsibility because commercial, or non-federal, reentry capability has yet to be presented to the FAA for formal licensing.

Accordingly, comments submitted included the following general observations for agency consideration and requests for guidance and clarification from the FAA.

Space Access requested clarification as to whether FAA licensing and insurance requirements, along with indemnification benefits of the CSLA, would apply to a developmental flight test short of an orbital or suborbital profile. Space Access noted the importance of understanding the regulatory and financial responsibility framework applicable to flight test activity because it is more hazards than launch and reentry of a proven vehicle.

For purposes of implementing its licensing authority under the CSLA, the FAA does not distinguish between a flight test for technology development purposes and commercial use of a proven, operational vehicle as long as the activity qualifies as launch of a launch vehicle or reentry of a reentry vehicle subject to licensing under the CSLA. However, operational restrictions would vary depending upon whether a vehicle is deemed proven or unproven. Experimental activities may be performed that would not qualify as launch or reentry of a launch or reentry vehicle, respectively, under the statute and FAA implementing regulations, and persons interested in performing such activities should consult the FAA to determine whether they must obtain a license. Financial responsibility requirements and allocation of risk under the CSLA would attach to any licensed launch or reentry, whether it is a flight test or operation of a proven vehicle, but would not apply to unlicensed vehicle operations.

ERPS asked whether the FAA plans to specify the conditions under which a licensee would be forced to accept a random reentry, such as that resulting from an abort while on orbit followed by natural reentry, and how the presence of crew or passengers would affect the determination. As a general matter, the FAA does not necessarily require random reentry in the event nominal reentry criteria cannot be accomplished or verified by the licensee. The FAA envisions that a non-nominal reentry may, depending upon the circumstances, pose less jeopardy to public safety than would a random reentry. For example, an applicant may demonstrate as part of its hazard identification and risk assessment that a non-nominal reentry would have a 500-mile footprint but that the footprint can accurately be targeted within the Pacific Ocean, thereby avoiding population. These variables would be evaluated and assessed as part of the licensing process in advance of an RLV mission or launch involving a reentry vehicle. Whether or not an

aborted reentry that leaves an RLV in orbit or an otherwise random reentry would be required would depend upon the safety demonstration and risk mitigation measures developed by a licensee as part of its application. The FAA envisions that a designer or operator of a manned vehicle would provide procedures for safe return of crew and passengers under non-nominal conditions as part of its application, and demonstrate the adequacy of such procedures from a public safety and risk perspective, thereby eliminating random reentry as an option.

New Mexico requested that final rules governing reentry financial responsibility differentiate between ballistic reentry vehicles and RLVs. New Mexico pointed out that RLVs would be aerodynamically controllable and are therefore inherently more reliable and pose less risk of liability than would a ballistic type of reentry vehicle, such as COMET.

The NPRM relies upon the statutory definition of a reentry vehicle which includes certain RLVs, although the NPRM solicited comments on the appropriate commencement point of licensed activity for those reentry vehicles that are not RLVs. Vehicle reliability does not alter rules governing implementation of the CSLA financial responsibility and allocation of risk regime. It is a factor that would enter into the FAA's risk-based determination of the value of the maximum probable loss that may result to third parties and government property from licensed activities.

New Mexico further pointed out that the MPL methodology deemed by the FAA appropriate and adequate for a ballistic reentry vehicle, such as COMET, is outmoded and inadequate for controllable RLVs that can target a landing footprint comparable to a runway.

The FAA is charged by law with establishing liability and government property insurance requirements based upon an assessment of the probability of loss. The FAA intends to continue use of existing MPL methodology in order to address the risks posed by the full range of RLVs and other reentry vehicles that may be under development, as it currently does for innovative space launch concepts, such as airborne and platform-based launch systems. Ability of an operator to control an RLV during reentry is an additional factor that could affect an MPL determination.

Additional information on risk-based methodology for establishing insurance requirements is found in the supplementary information accompanying proposed rules governing financial responsibility for licensed launch activities, issued July 25, 1996 (61 FR 38992-39021), and issuance of final part 440 rules, issued August 26, 1998 (63 FR 45592-45625). Both documents are available from the FAA web site at http://frwebgate.access.gpo.gov/cgi-bin/leaving.cgi?from=leavingFR.html&log=linklog&to=http://ast.faa.gov.

Boeing requested that the FAA reconcile how it would implement financial responsibility requirements for reentry into a foreign jurisdiction with requirements imposed by that jurisdiction, and what rights and obligations the licensee may have in the process, if any.

Under the CSLA, a license is required for a U.S. citizen to launch a launch vehicle or reenter a reentry vehicle

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outside the United States.\8\ It directs the Department of Transportation (and by delegation the FAA) to establish financial

responsibility requirements for each launch and reentry license issued by the agency. The CSLA addresses circumstances under which a U.S. entity seeks authorization to conduct its space transportation activity at a location that is outside U.S. territory, as Orbital Sciences did when it conducted its successful launch of the Pegasus XL vehicle system from Spain. Although a license issued by the FAA is required for a U.S. entity to conduct such activities abroad, a license does not convey the right to that entity to enter another sovereignty and conduct operations. For this reason, the FAA does not license, nor does the CSLA define ``launch'' to include, preparatory activities conducted at a launch site outside of the United States. The laws of a foreign sovereignty would apply to activities conducted within that territory. It is possible that overlapping or duplicative requirements would result where the United States and the foreign government providing a launch or reentry site share concurrent jurisdiction, as may be the case where a foreign government also requires insurance for space activities conducted from or directed at its territory, and the licensee would need to satisfy both governments' requirements. Where the requirement in question is to obtain liability insurance, satisfaction of differing requirements may best be accomplished by insuring to the highest required limit and naming both governments as additional insureds under the policy. More problematic would be the circumstance where technical safety requirements are inconsistent as a result of concurrent jurisdiction. Under those circumstances, liability of the two governments to reconcile requirements may impede a favorable licensing determination and foreclose the ability of the U.S. entity to use the foreign site. The FAA has not yet encountered this situation.

\8\ A U.S. citizen-controlled foreign entity requires a license under particular circumstances. See Final RLV and Reentry Licensing Regulations, 14 CFR 413.3(c).

Boeing asked how the Outer Space Treaties enter the regulatory process for licensing and requiring financial responsibility for reentry. Though its licensing and regulatory program, the FAA implements national law, specifically the CSLA, which in turn was enacted with congressional recognition of certain treaty responsibilities undertaken by the United States. The regulatory process for implementing financial responsibility and risk allocation under the CSLA exists independently of the Outer Space Treaties, however.

In enacting the CSLA in 1984, Congress found that the United States should encourage private sector launches and associated services and, only to the extent necessary, ``regulate such launches and services in order to ensure compliance with international obligations of the United States and to protect the public health and safety, safety of property and national security interests and foreign policy interests of the United States.'' Pub. L. 98-575, 49 U.S.C. App. 2601. The accompanying Report of the Senate Committee on Commerce, Science, and Transportation (Report) reveals that Congress was aware of responsibilities accepted by the United States as a State Party to the Outer Space Treaty and, in particular, the Liability Convention and intended to fulfill certain of those responsibilities through domestic law. The Report explains that

``licensing requirements, as prescribed in section 6(a) [of Pub. L. No. 98-575] with respect to any activities outside the United States, provide, to the greatest extent possible, licensing coverage that is consistent with international law and the international convention on liability. In establishing these requirements, the Committee gave serious consideration to the extent of U.S. jurisdiction and the extent of U.S. liability for launch-related activities pursuant to international law and international obligations. Section 6(a), therefore, is intended to ensure comprehensive coverage of the licensing regime to the fullest extent permitted.'' S. Rep. No. 98-656, 9th Cong., 2d Sess. 9. Report language accompanying the 1988 amendments to the CSLA, which added the comprehensive financial responsibility risk allocation regime implemented under part 440 rules, further evidences commitments undertaken by the United States under the Outer Space Treaty and when the United States is a ``launching State'' under the terms of the Liability Convention. Report of the Committee on Science, Space, and Technology, H. Rep. No. 100-639, 100th Cong., 2d Sess. 12. Most recently, the 1998 amendments to the CSLA enacted by the Commercial Space Act of 1998, added reentry licensing authority to the CSLA along with associated financial responsibility and allocation of risk requirements. Although it does not refer specifically to U.S. obligations under the Outer Space Treaties, the associated Committee Report notes that amendments to chapter 701 of 49 U.S.C. Subtitle IX grants to the Secretary ``the authority and responsibility with respect to the licensing and regulation of the reentry of reentry vehicles as existing law provides to the Secretary with respect to the launch of vehicles.'' Committee Report at 21.

Boeing stated that the NPRM raises issues with respect to U.S. international commitments regarding on orbit activity. Boeing suggested that the definitions of ``launch,'' ``reentry'' and ``non-nominal reentry'' need to be expanded to include on orbit operations so that they are fully consistent with the liability provisions of the Outer Space Treaties. As previously mentioned, Boeing asked for clarification as to how the proposed reentry licensing regime, which excludes on orbit activities, fully satisfies international obligations of the United States under the Outer Space Treaties which, according to Boeing, ``appear to require supervision by the launching state of all activities conducted by non-governmental entities in outer space.''

The United States implements its treaty obligations through national law, including the CSLA. However, the FAA was not directed by Congress to license and regulate all on orbit activities of spacecraft. Rather, the CSLA, as recently amended, directs the Secretary to issue regulations carrying out the agency's licensing and safety mandate under the statute and to include licensing procedures for the conduct of a reentry. The FAA cannot, and does not, presume authority beyond that granted by Congress on the basis of treaty obligations. Accordingly, the Final RLV and reentry Licensing Regulations implement the agency's mandate under the CSLA to license and regulate launches of RLVs and reentry activities consistent with public health and safety and safety of property, as well as U.S. national security and foreign policy interests. The FAA further notes tht Boeing erroneously merges State Party responsibility under the Outer Space Treaty (Outer Space Treaty, Article VI) with liability assumed by a launching State under the Liability Convention.

Under the CSLA and FAA financial responsibility requirements,

claims resulting from unlicensed activity on orbit remain the responsibility of the operator and participants in those activities. RLV operators, as well as other spacecraft owners and operators need to be aware of their responsibility and make informed business decisions regarding risk management. As noted in the NPRM and already stated in this supplementary information, the United States accepts fault-based liability as a launching State under the terms of the

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Liability Convention for damage to another launching State's on orbit space object if the damage is due to the fault of the United States or the fault of persons for whom the United States is responsible. Liability Convention, Article III. However, where on orbit damage does not result from a licensed launch or reentry rendering the CSLA risk allocation regime inapplicable to cover third-party damage claims, the government may fulfill its treaty obligations and is not foreclosed from seeking compensation from those entities at fault for the damage.

The advent of RLVs means shared airspace between launch vehicles and aircraft and under the terms of the Liability Convention the United States also accepts absolute liability as a launching State for damage caused by its space object to aircraft in flight. Liability Convention, Article II. Accordingly, Boeing suggested that the FAA consider the potential impacts of its Concept of Operations in the National Airspace System in Year 2005 (CONOPS) on RLV financial responsibility and address collision avoidance in the final rule. Boeing identifies traffic, workload, environment, vehicle and mission profile, and airspace requirements as specific areas in the CONOPS affecting the NPRM.

The FAA is developing an integrated air and space traffic management concept designed to accommodate projected RLV, as well as ELV, traffic and safe use of shared airspace. For safety purposes, RLV mission and reentry licenses would require issuance of notices to airmen prior to initiating launch and reentry flight. The Final RLV and Reentry Licensing Regulations provide additonal detail concerning air and ocean traffic management requirements. From a risk management perspective, the probability of collison between a launch or reentry vehicle with aircraft would be extremely remote due to required notices to airmen and air traffic coordination. In all likelihood, the consequences of such a remote event would not affect directly the value of the FAA's MPL determination; however, if such events are found to be sufficiently probable as to warrant financial responsibility coverage they would be considered and assess under the methodology employed by the FAA.

Boeing also requested comment from the FAA as to how this rulemaking is intended to address financial responsibility for future space activities, such as commercial docking with the International Space Station, satellite refueling and servicing, and space tourism and debris management. Activities in space that are part of a licensed launch or reentry would be covered by FAA financial responsbility regulations. Financial responsbility and allocation of risk for activities that are not licensed by the FAA would be addressed by participants in those activities. The FAA acknowledges Boeing's forward thinking concerns and vision regarding an expanded commercial role in space transportation and utilization, and the important role risk

management will play in fostering the viability of commercial on orbit services. For smiliar reasons, the FAA sought public comment on passenger liability and related matters.

Passenger Liability and Risk Management Considerations

Although risk management for space tourism is beyond the scope of this rulemaking the FAA has identified the need for passenger safety and liability regulations as part of a comprehensive regulatory program for RLVs. To assist FAA in thinking about and developing an appropriate regulatory framework for passenger-bearing space vehicles, the FAA solicited public comment on the following questions: 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?

Thoughful comments were submitted to the docket by three entities. Space Access's concern over safety of the traveling public is reflected in its observation that passengers should be afforded the same protection in space flight that the public has come to expect from air travel and other forms of transportation. Consistent with its philosophy that airworthiness standards of the FAA may be appropriately and benefically applied to space vehicles, Space Accesss recommended using airworthiness standards for commercial transport category aircraft as the safety regulatory starting point for space flight involving carriage of passengers for hire. Space Access opposed treating passengers in a manner comparable to that of a satellite customer that can independently assess vehicle safety and reliability. Unlike a satellite customer, the traveling public relies upon government standards and regulation in selecting their preferred mode of transport.

In is response, Vela suggested using the adventure tour industry and air carrier liability as models, noting that passengers contract for travel services and therefore liability for their losses should not be regarded as a third party liability matter. Vela's observations are interesting but suggest an internally inconsistent approach inasmuch as certain air carriers are required by Department regulations to have a certain amount of insurance covering liability to passengers.

ERPS observed that its initial reaction was to treat passenger liability in space travel the same as air travel by relying upon such means as the Warsaw Convention, FAA regulations and other applicable laws and regulation. However, upon further reflection and consideration of the FAA's questions, ERPS recommended treating space vehicle passengers like other customers of launch and reentry vehicles by requiring that passengers carry their own insurance to cover their personal injuries, damage or loss. According to ERPS, applying principles of risk allocation whereby passengers travel essentially at their own risk, much like hold harmless arrangements subscribed to by participants in adventure tourism, reduces the threat of litigation and is more appropriate to an emerging, or ``embryonic'' industry. ERPS also suggested that unlike satellite customers of launch or reentry vehicles, passengers on a space vehicle should be required to purchase a minimum amount of personal insurance so that they are assured some amount of financial recovery in the event of a mishap. ERPS recommends

using the cost of a human life utilized by the FAA in its MPL analysis, that is, $3 million. The cost of insurance would reflect the reliability of a space vehicle and therefore should be reduced with increased flight rates and experience. It would therefore appear from ERPS's comments that claims of passengers should not be covered by government indemnification.

The FAA will utilize this input and engage in further consideration of passenger safety and liability issues before proposing a regulatory program applicable to passenger travel, for hire, in space.

Section-by-Section Analysis and Discussion of Comments

Summarized below are specific comments addressing particular provisions of the proposed rule and the agency's response to comments. Changes to the regulatory text, other than those that may be considered nonsubstantive, are identified as well.

Section 450.1--Scope of part; Basis

Section 450.1 provides that the financial responsibility and allocation of

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risk requirements of this rulemaking apply to licensed reentry activities. Licensees authorized to conduct orbital RLV missions must comply with part 440 requirements applicable to licensed launch activities and also part 450 requirements for licensed reentry. Because reentry activities described to the FAA in pre-application consultation involve vehicles still in conceptual stages or under development, the FAA considers it preferable to add reentry financial responsibility requirements in a new part 450, rather than combine them with existing requirements of part 440 and possibly complicate matters for other launch licenses. By limiting the scope of part 440 to licensed launch activities and adding a new part 450 covering reentry financial responsibility, the FAA intends to avoid potential confusion that may result from combined launch and reentry financial responsibility requirements. That said, the final rule codifies the proposed form of reciprocal waiver of claims agreement proposed in the NPRM for RLV missions, rather than a reentry vehicle, such as COMET or METEOR, launched as a payload and subsequently reentered, because it appears that reentry activities for the near term will involve RLVs. Also, in part 450, participants in a licensed launch associated with a particular reentry are identified and included in reentry financial responsibility requirements, where appropriate, to ensure that their interests in appropriate risk management are adequately covered.

Section 450.3--Definitions

Definitions of a number of terms appearing in Sec. 440.3 also appear in Sec. 450.3 without change. Although doing so may be duplicative, the FAA considers it desirable and more ``reader friendly'' to group in one part those terms requiring definition for reentry financial responsibility regulatory purposes, rather than cross-referencing another part. Where appropriate, the final rule

incorporates conforming changes to definitions, as proposed in the NPRM, to cover reentry activities instead of launch activities. Comments on proposed definitions are summarized below.

Consistent with Sec. 440.3, the term ``contractors and subcontractors'' is defined in terms of the nature of involvement of an entity in licensed activity, rather than by a description or other classification of the entity. New Mexico recommended specifically adding ``reentry site operator'' to the definition of ``contractors and subcontractors'' to ensure it receives the same treatment as would a Federal launch range. The FAA does not adopt New Mexico's recommendation in the final rule out of concern that listing covered entities in the definition may suggest that any entity not included is therefore excluded. Based on more than ten years of experience in implementing comparable requirements for launch financial responsibility, the FAA considers it preferable to provide a definition that is sufficiently broad as to encompass those entities entitled to coverage under required insurance and that are expected to accede to and reap the benefits of the reciprocal waiver of claims agreements required by the CSLA than to list classes of covered entities.

Vela commented that the definition of ``hazardous operations'' proposed in Sec. 450.3 is overly broad in that anything can potentially cause injury or damage. The term ``hazardous operations'' appears in Appendix A to the final rule and in Appendix A to part 440, both of which list information requirements for obtaining an MPL determination. In using the term, the FAA intends to gain information regarding hazards and risk to third parties, their property and to Government personnel and property in order to make an MPL determination. When read in context, the term ``hazardous operations'' appropriately identifies activities that may cause injury or damage to persons or property and the FAA would then classify persons and property exposed to risk as first party, third party or government. Doing so is necessary element in rendering an MPL determination. Accordingly, the definition of ``hazardous operations'' remains unchanged in the final rule.

New Mexico recommended adding definitions of the terms ``licensed launch activity'' and ``persons.'' The term ``licensed launch activities'' is defined in part 440 and, because it appears in part 450, that definition is added to Sec. 450.3. The definition is the same as that appearing in Sec. 440.3(a)(10), as follows: ``licensed launch activities means the launch of a launch vehicle as defined in a regulation or license issued by the Office and carried out pursuant to a launch license.'' The term ``persons'' need not be separately defined in part 450 because it is defined in Sec. 401.5 of the Commercial Space Transportation Licensing Regulations. Section 450.3 provides that, unless otherwise stated, there is no change to the definitions of terms appearing in part 450 from those appearing in the statute or Sec. 401.5 of the Commercial Space Transportation Licensing Regulations.

Boeing recommended a revised definition of ``payload,'' a term defined in Sec. 401.5 of the Commercial Space Transportation Licensing Regulations, as a means of extending FAA licensing authority to on orbit operation of certain RLVs. The FAA does not accept Boeing's recommendation, as previously explained.

Definitions of other terms appearing in Sec. 450.3 remain unchanged in the final rule.

Section 450.5--General

Section 450.5(a) of the final rule establishes that compliance with part 450 requirements is a prerequisite to the conduct of a licensed reentry. Because compliance with part 450 must be demonstrated to the FAA's satisfaction in advance of a licensed launch involving a reentry under the terms of Sec. 450.15(a)(2)--``Demonstration of compliance,'' Sec. 450.5(a) effectively precludes commencement of licensed launch activities involving a reentry license until compliance with part 440, where applicable, has also been demonstrated.

Under Sec. 450.5(b), the FAA retains its current practice of prescribing required amounts of insurance or other form of financial responsibility in a license order. Required amounts of insurance may be modified by order of the FAA. Where a multi-year operator license has been issued, the agency requires flexibility to modify requirements when it learns of changes in property (amount and value) and numbers of third parties exposed to risk whose claims are intended to be covered by required insurance, or where a license is amended by authorizing new mission profiles. The FAA reaffirms that, as a general matter, changes in requirements would be issued before licensed activity begins. The FAA does not envision changes in reentry insurance requirements after a reentry vehicle has been launched but before it reenters. The agency understands that obtaining additional coverage at that point may be difficult or extremely costly to obtain where, for example, a non-nominal situation occurs. The methodology used by the FAA in determining MPL in advance of licensed activities is intended to evaluate reasonably foreseeable and sufficiently probable non-nominal events and assess their consequences.\9\ Therefore, it is highly unlikely that insurance requirements would be changed by the FAA in the midst of an RLV mission to address

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anomalous circumstances. It is conceivable, however, that requirements would change where a licensee proposes to alter the mission profile authorized by the license after the mission has begun.

\9\ As reflected in Sec. 450.11 of the final rule, the risk analysis used to determine MPL will also dictate the required duration of insurance coverage where reentry is aborted and the reentry vehicle will remain on orbit until its natural entry into Earth atmosphere.

Section 450.5(c) establishes the fundamental principle that a reentry licensee remains responsible for liability, loss or damage sustained by the United States resulting from licensed reentry activities except where: (1) Liability, loss or damage sustained by the United States results from willful misconduct by the United States or its agents; (2) covered third-party claims exceed the amount of required insurance and do not exceed $1.5 billion (as adjusted for post-January 1, 1989 inflation) above that amount and are payable under 49 U.S.C. 70113 and part 450; (3) loss or damage to government property covered by insurance under Sec. 450.9(e) exceeds the required amount of coverage and does not result from willful misconduct of the licensee;

and (4) in the event the licensee has no legal liability for claims that exceed required insurance under Sec. 450.9(c) plus $1.5 billion (as adjusted for post-January 1, 1989 inflation).

The FAA may suspend or revoke a license, and impose civil penalties, where a licensee fails to comply with part 450 requirements, as reflected in Sec. 450.5(d) of the final rule.

Section 450.7--Determination of Maximum Probable Loss

The regulatory approach to establishing required amounts of reentry financial responsibility includes the FAA's risk assessment methodology, known as maximum probable loss or MPL. MPL is a risk-based analysis that yields the greatest potential losses, measured in dollars, for bodily injury and property damage that can reasonably be expected to occur as a result of licensed launch or reentry activities. MPL measures probabilities, not possibilities, against a specified yardstick or threshold point, to identify events that are sufficiently probable as to warrant financial responsibility to cover their consequences. Insurance requirements are established at a level that provides financial protection against the consequences of events that are deemed sufficiently probable under the regulations. (See 14 CFR 450.3--``maximum probable loss'' for the regulatory definition of MPL and associated threshold probabilities of occurrence.) Under the final rule, the FAA uses the same threshold probabilities of occurrence in establishing reentry financial responsibility as it currently does for launch financial responsibility. With a limited exception for claims of Government personnel, for required liability insurance, there is about a one in ten million chance that third party claims will exceed the amount of insurance mandated by the FAA. For government property loss or damage, there is about a one in one hundred thousand chance that damage to covered government property will exceed required insurance. The notice of proposed rulemaking associated with part 440 contains a detailed discussion of MPL methodology as applied to third party liability and government property insurance requirements for licensed launch activities and the NPRM referred the interested public to that discussion. (See 61 FR 38992, at 39004-39007, issued July 25, 1996.) Generally, the same principles would apply in assessing reentry risk and establishing MPL values for the conduct of licensed reentry activities. Section 450.7(a) of the final rule provides that MPL values form the basis for insurance requirements (up to statutory ceilings on those requirements) issued by the FAA in a license order.

Section 450.7(b) reflects the statutory 90-day requirement for issuance of an MPL but makes provision for possible delay due to required interagency coordination. The FAA will keep the licensee informed of delays in issuing an MPL determination. The 90-day period is measured from the point at which all information required of the licensee to make a determination has been submitted. Space Access commented that 90 days is too long a time to wait for an MPL determination for a quick turnaround mission using a previously flown vehicle and payload. The concerns registered by Space Access resemble those of Kistler in response to a comparable 90-day requirement in part 440. As in the part 440 rulemaking, the FAA reiterates that it will retain its longstanding practice of applying an established MPL value to missions falling within specified parameters, rather than performing a new MPL determination for each flight. This practice would

accommodate quick turnaround missions performed on short notice as long as mission parameters were previously considered under the FAA's MPL methodology. A change in mission profile, such as use of a reentry site, hazardous material, changed trajectory and payload, if any, to one not assessed as part of the MPL determination process may affect required amounts of financial responsibility. Under those circumstances, a reentry licensee should allow time for reconsideration of the MPL value in scheduling a mission.

Section 450.7(c) provides that information required for obtaining an MPL determination for licensed reentry activities are located in Appendix A to part 450. Information previously submitted to the FAA in support of a prior MPL determination may be identified and certified by a licensee as accurate and applicable to its current MPL request.

Space Access requested additional guidance in understanding certain information requirements, such as identification of the impact dispersion area, and methodology for measuring debris casualty areas. In the Final RLV and Reentry Licensing Regulations, the FAA provides greater clarity regarding the three-sigma landing or impact dispersion area that must be identified by a reentry license applicant. The FAA continues to develop additional guidance materials regarding MPL methodology, and will make them available to the public upon their completion.

Section 450.7(d) reflects the discretion, reserved by the FAA, to amend an MPL determination before licensed reentry activities have been completed. As noted above, the FAA requires discretion to revise insurance requirements under appropriate circumstances, such as when changes in property and persons exposed to risk warrant a change. The FAA would not alter requirements mid-flight but might do so at some point during the term of an operator license or before all missions authorized by a license have been accomplished. Changed financial responsibility requirements due to a revised MPL determination are issued in a license order further amending a license.

Consistent with current practice for launch MPL, anyone may request an advisory reentry MPL determination and the FAA will endeavor to accommodate such requests. However, where a requested MPL determination is not associated with a particular license or license application and is therefore advisory in nature, the FAA is not limited to the 90-day timeframe dictated by the CSLA and reflected in Sec. 450.7(b). Section 450.7(e) of this final rule addresses the timing of advisory MPL determinations.

Section 450.9--Insurance Requirements for Licensed Reentry Activities

Section 450.9 of the final rule identifies the two types of insurance a reentry licensee may be required to obtain as a condition of a reentry license. They are liability insurance for

covered loss or damage claims of third parties and property insurance in the event Federal range property or assets are exposed to risk as a result of an authorized reentry.\10\ A licensee that does not obtain insurance must otherwise demonstrate financial responsibility.

\10\ An RLV mission licensee would also be required to comply with part 440 and must obtain liability and government property insurance for licensed launch activities as well as licensed reentry activities.

Section 450.9(b) identifies those entities and persons that must be protected by required liability insurance as additional insureds. The CSLA financial responsibility regime is intended, in part, to relieve all of the various participants in a licensed launch or reentry from the burden and expense of obtaining separate liability insurance and the drain on insurance capacity that would result if each such entity had to provide for its own coverage. The FAA envisions that a reentry accident resulting in third party liability could involve participants in the launch preceding reentry activity and that they, too, require protection from third party liability associated with licensed reentry activities. Accordingly, to ensure comprehensive coverage as intended by statutory requirements, Sec. 450.9(b) also identifies the various entities, and the employees of each, involved in licensed launch activities associated with a particular reentry as persons who must be additional insureds under the liability policy.

Section 450.9(c) provides that the FAA prescribes the amount of liability insurance a reentry licensee must obtain to respond to covered third-party claims. Covered third-party claims include claims for damage or loss to property belonging to the United States, its agencies and its contractors and subcontractors that is not covered by required government property insurance. This requirement clarifies that government assets, as well as government contractor assets, located off a Federal launch range are treated the same as other third party property for insurance and liability purposes and the government does not waive claims for damage or loss to such property. Covered third-party claims include claims of Government personnel, a defined term under Sec. 450.3 that means employees of the United States, its agencies, and its contractors and subcontractors involved in reentry services for licensed reentry activities or launch services for licensed launch activities associated with a particular reentry.

As dictated by the CSLA, the amount of liability insurance that may be required of a licensee is capped at $500 million or the maximum available on the world market at a reasonable cost. Space Access asked whether the ``reasonable cost'' standard would be applied to all applicants on a uniform basis, an approach favored by Space Access, or on a case-by-case basis. The FAA reserves discretion to assess the latter ceiling on insurance. Case-by-case consideration could, theoretically, include such factors as prevailing market conditions or vehicle reliability (to the extent it may affect insurance premiums). The FAA has yet to address, in a formal way, a circumstance under which a licensee is unable to obtain the required amount of liability insurance because its cost was prohibitively high. However, a person who cannot afford insurance probably cannot afford to cover his or her resultant liability. As a general matter, the FAA believes that use of risk mitigation measures provides an appropriate means of limiting insurance cost to an applicant or licensee, rather than a complete shifting of liability risk to the government. Unusually high MPL values and associated insurance costs may signal that a reentry proposal poses unusually great risk to public safety such that it ought not be

authorized by an FAA license absent additional risk mitigation measures.

Although license requirements may be waived on occasion, the legislative history accompanying the 1988 Amendments to the CSLA notes that the Department of Transportation should ``exercise caution'' in granting licenses where MPL will not be fully compensated by insurance or other financial protections obtained by the licensee. S. Rep. No. 100-593, 100th Cong., 2d Sess. 11 (1988). At a time when insurance capacity was insufficient to satisfy demand, the Committee Report accompanying passage of the 1988 Amendments acknowledged circumstances under which inadequate demonstration of financial responsibility may be tolerated by the Department. Those circumstances were based upon Air Force control over launch operations, including control over flight termination decisions, as well as the absence of third party damage claims from launch operations in the United States. Thus, risk to third parties was managed and controlled by use of proven safety procedures and experienced personnel. It further noted that a license should only be granted in the absence of adequate insurance where all available insurance sources have been exhausted, including a reasonable amount of self-insurance. Id. at 10-11.

The FAA reiterates that MPL, and possibly premium cost, may be reduced through operating plans that limit risk to third parties. For example, use of an inland launch and reentry site for an RLV may expose third party persons and property to risk, whereas launch and reentry at a coastal site may significantly reduce such risks. The FAA understands that cost is relative and that premiums affordable for a large corporation may be daunting to a small, entrepreneurial entity. That said, statutory risk allocation provisions are premised upon the notion of shared risk, such that a person who exposes third parties to injury, damage or loss as a result of launch or reentry activities that by their nature are inherently hazardous is expected to cover resultant liability up to a specified level before the government may be called upon to assume responsibility.

Section 450.9(d) provides that the FAA prescribes the amount of insurance required of a reentry licensee to cover damage or loss to government property as a condition of a reentry license. Property covered by required insurance is that belonging to the government and its agencies, and also property of government contractors and subcontractors that support licensed reentry activities when that property is located on a Federal range facility. Unrelated property of a government contractor that is located off the Federal range would be regarded for insurance purposes the same as third party property because its risk exposure is no different than that of any other third party property and the government assumes no greater risk of its damage or loss than that afforded to other such property.

Comments submitted on behalf of New Mexico expressed general support for risk allocation provisions under the CSLA and proposed in the NPRM but noted that certain provisions of the rule would apply only to Federal government ranges and not to commercial sites that are not located on Federal government reservations. New Mexico requested that the FAA revise the rules to exclude non-federal launch sites from requirements when those requirements would be inapplicable. The FAA agrees that certain requirements contained in part 450 are specific to use of Federal property and involvement of Government personnel in the conduct of licensed reentry activities but does not agree that it is

necessary to exclude non-federal sites from particular sections of the rule.

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Section 450.9(d) provides a useful example of a requirement specific to involvement of Federal range facilities and assets in the conduct of licensed reentry activities. Consistent with current practice for licensed launches, the FAA would not impose requirements under Sec. 450.9(d) where no such property is utilized. The FAA does not find it necessary to revise the final rule text to exclude non-federal sites from inapplicable requirements.

Section 450.9(e) reflects the statutory limit on government property insurance requirements. As for licensed launches, insurance is capped at $100 million and the government waives claims for damage or loss to Federal launch range property to the extent damage or loss exceeds required insurance. Property belonging to government contractors and subcontractors involved in licensed reentry activities is also covered by government property insurance and the government waives excess claims for such property as well. An elaborate discussion of risk allocation affecting government contractors and subcontractors appears in the supplementary information accompanying issuance of part 440. (See 63 FR 45592-45626, August 26, 1998.) The discussion is not repeated in this rulemaking because the same principles apply. The document may be accessed from the following web site: http://frwebgate.access.gpo.gov/cgi-bin/leaving.cgi?from=leavingFR.html&log=linklog&to=http://ast.faa.gov.

Financial responsibility is generally demonstrated through insurance policies obtained by a licensee. Other forms of financial responsibility may be utilized by a licensee, as reflected in Sec. 450.9(f), as long as they satisfy the terms and conditions of coverage required under part 450.

Section 450.11--Duration of Coverage; Modifications

As in licensed launch activities, a different term of required insurance coverage is specified for ground operations than for flight. Under Sec. 450.11(a), insurance coverage attaches upon commencement of licensed reentry activities and for ground operations remains in effect through completion of licensed activities at the reentry site.

Reentry flight insurance must address anomalous situations that result from planned reentries. Anomalous situations may arise during licensed activities that precede descent flight, such as premature reentry flight commencing during the conduct of licensed, or covered, reentry readiness operations. They may also arise after descent flight has been initiated and, depending upon the vehicle, the extent of operator control and vehicle maneuverability, may or may not be addressed through contingency plans and procedures of the licensee, such as reentry to a contingency abort location. They may also result in aborted descent flight of the vehicle, where abort on orbit is indicated. Anomalous reentry scenarios that are reasonably foreseeable are considered by the FAA under its MPL assessment methodology. Where reentry or descent flight is initiated, the FAA has determined that it is appropriate to require insurance to cover claims for a period of 30 days following the reentry attempt. Thirty days was proposed because, as for launch, the FAA believes 30 days provides an appropriate length

of time to require coverage for the consequences of a reentry attempt. However, unlike launch, a reentry abort situation could result in leaving a vehicle on orbit with the understanding that it would eventually reenter through natural forces and possibly cause damage on the surface of the Earth. Where that situation occurs, the FAA proposed, and now makes final, application of an event test under which the FAA would examine the consequences of random reentry due to an abort on orbit and require insurance until such time, determined through MPL analysis, that risk to third parties and Government property as a result of essentially random or natural reentry due to orbital mechanics and drag forces is sufficiently small that financial responsibility for its consequences is no longer necessary. The required duration of insurance, should abort on orbit be necessary under the terms of the license or at the licensee's election, would be established as a license condition issued in advance of the launch of the reentry vehicle. The FAA does not intend to impose indefinite insurance requirements on a licensee after a vehicle has been launched and it is subsequently discovered that a reentry vehicle cannot be reentered to Earth as intended. As explained in the NPRM, the FAA's risk-based approach to insurance duration for licensed reentry is appropriate in light of the liability accepted by the United States for damage on the ground or to aircraft in flight when it is a launching State under the terms of the Liability Convention.

Space Access observed that insurance requirements imposed upon reentry or descent flight may overlap with subsequent launch and reentry financial responsibility where a single vehicle will perform a licensed reentry and is intended to be launched again within 30 days of initiation of reentry flight. Under such circumstances, there should be no difficulty in determining where claims result from the subsequent licensed launch or the prior licensed reentry. Moreover, launch and reentry insurance requirements for ground operations involving a launch vehicle will be distinct and the FAA does not envision either compliance difficulties or conflicts as a result of requirements to maintain insurance in accordance with timeframes proposed in the NPRM.

Section 450.11(b) echoes the restriction on changes to insurance coverage and expiration currently imposed on launch licensees.

Section 450.13--Standard Conditions of Insurance Coverage

Conditions of insurance coverage for licensed reentry activities are the same as those for licensed launch activities; however, the prospect of multiple occurrences and occurrences during launch as well as reentry, particularly where an RLV is involved, raises unique issues for ensuring adequate coverage is maintained by a licensee.

Limits of insurance apply separately to launch and reentry of an RLV. Although limits imposed by the FAA may appear uniform for launch and reentry, policy limits must be available to cover occurrences during both flight phases. The fact that two authorizations or licenses, for launch and reentry, are combined in a single document does not mean that all licensed activities are subject to a single limit of liability coverage. Rather, insurance must be available up to prescribed amounts for launch of a launch vehicle and available up to prescribed amounts for reentry of a reentry vehicle, even where the same vehicle is employed for both launch and reentry. Likewise, an operator of such a vehicle would be eligible for indemnification where

claims exceeding required amounts of liability insurance result from launch and then again from reentry of the vehicle. For some multi-stage vehicles, it is foreseeable that a catastrophic failure or accident involving one stage of the vehicle would not preclude its subsequent reentry. The operation of the vehicle could therefore be eligible for government risk-sharing under the CSLA, including indemnification, twice in one mission. Section 450.13(a)(2) states that policy limits must apply separately to each occurrence and, for each occurrence to the total of claims arising out of licensed reentry activities for a particular reentry. The requirement is stated in this fashion because a license may authorize multiple missions, each of which must be insured up to the required amount.

Section 450.13(a)(8), as proposed, would require that policies of insurance

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be placed with insurers licensed to do business in any State, territory or possession of the United States or the District of Columbia. As indicated in an FAA Advisory Circular relating to a similar requirement in 14 CFR 440.13(a)(8), compliance is demonstrated if policies of insurance contain a service of suit clause in which the insurer agrees to submit to the jurisdiction of a court of competent jurisdiction within the United States and designates an authorized agent in the United States for service of legal process on the insurer. Paragraph (a)(8) of Sec. 450.13 reflects that compliance with the licensing requirement is similarly demonstrated through a service of suit clause. The International Underwriting Association of London (IUA) suggested that paragraph (a)(8) be phrased in the alternative to make it clear that either state licensure or a service of suit clause satisfies the regulatory requirement. The FAA does not object to rephrasing the requirement in the alternative but does not agree that it is necessary given the plain meaning of the section. Nevertheless, the FAA makes the requested change to the regulatory text and may make a comparable change to 14 CFR 440.13(a)(8) to avoid any confusion that different standards of compliance apply.

Section 450.15--Demonstration of Compliance

Under Sec. 450.15, a reentry licensee must demonstrate compliance with part 450 requirements in a manner comparable to that required of licensees under part 440. Licensees need not be concerned with duplicative paperwork burdens by virtue of having to supply and demonstrate launch and reentry financial responsibility for an RLV mission. A single, comprehensive demonstration of compliance with part 440 and 450 will satisfy requirements of both parts. Demonstration of compliance must be completed in advance of the licensed launch involving the reentry vehicle.

In similar fashion to demonstrating launch financial responsibility, a reentry licensee must supply the following to the FAA within the timeframes specified in the rule: the reciprocal waiver of claims agreement(s) required under Sec. 450.17, certificates of insurance of evidence of another form of financial responsibility and renewals of coverage as appropriate, certification by the licensee of compliance, a listing of exclusions from insurance coverage and a

certification that the exclusions may be deemed usual in the event the licensee will seek coverage by the government of the excluded risks, and an opinion of the licensee's insurance broker that the insurance coverage provided complies with FAA requirements. A licensee must make policies of insurance and related documents required under this part available for FAA inspection, as provided in Sec. 450.15(f).

Section 450.17--Reciprocal Waiver of Claims Requirements

Reciprocal waivers of claims are essential to the CSLA risk allocation regime. Participants in licensed reentry activities are required to enter into reciprocal waiver agreements comparable to those used for licensed launch activities. Under the agreement, participants waive claims for damage or loss to their property that result from licensed activity and further agree to be responsible for damage or loss to their property sustained as a result of the activity. Each participant is thereby foreclosed, or estopped, from asserting claims against the other participants and each is relieved of the threat and cost of inter-party litigation. The reciprocal waiver scheme therefore reduces the cost and need for liability insurance to cover certain claims among the participants. The government's property damage waiver is limited by statute to damage or loss in excess of required government property insurance and also covers property damage or loss sustained by government contractors and subcontractors involved in licensed reentry activities at a Federal range facility that is the reentry site.

Except for the U.S. Government, as explained below, each participant in licensed reentry activities also agrees to be responsible for personal injury, property damage or loss suffered by its own employees as a result of licensed reentry activities. Although employees of participants in reentry activities are third parties within the statutory and regulatory definitions of the term, their claims are not intended to be covered by required liability insurance and MPL determinations do not assess risk to those employees. Claims of employees, other than Government personnel, are the responsibility of their employer under the reciprocal agreements required by Sec. 450.17 of the final rule. In essence, the obligation of each participant under the reciprocal waiver of claims agreement to be responsible for its employees losses amounts to a contractual obligation to indemnify and hold harmless the other participants in the event one's employee suffers losses and seeks recovery or damage from another participant. The FAA has made this contractual indemnification and hold harmless undertaking explicit in part 440 with respect to licensed launch activities and now does so for reentry in this final rule.

The U.S. government accepts different responsibilities under the reciprocal waiver of claims agreement from that accepted by PPLPs and PPRPs because of limitations arising out of appropriations laws on its ability to accept an unfunded contingent liability. Claims of Government personnel, defined as employees of the government and of its contractors and subcontractors involved in the licensed reentry activities (or licensed launch activities associated with a particular reentry) would be covered by the licensee's liability policy as third-party claims and become the responsibility of the government to the extent third-party claims exceed required insurance. A detailed discussion of the rights and responsibilities of the various

signatories to a reciprocal waiver of claims agreement under the CSLA appears in the supplementary information accompanying issuance of part 440 (see 63 FR 45592-45626, August 26, 1998), and may be accessed from the following web site: http//ast.faa.gov.

The form of reciprocal waiver of claims agreement codified in this final rule covers claims regardless of fault but does not replace contractual rights and remedies negotiated by the parties in good faith and for consideration, such as re-flight guarantees or replacement missions. Fault-based claims, including gross negligence, are waived under the terms of the agreement. The only exception is a claim for willful misconduct by a participant.

The FAA proposed and now codifies in Appendix B to part 450 a comprehensive reciprocal waiver of claims agreement designed to accommodate reentry activities for the foreseeable future. Based upon industry proposals described to the FAA informally or in pre-application consultation, it appears that all reentry activity currently under design involves an RLV. Accordingly, the FAA developed the form of agreement required by Sec. 450.17(c), and that appears at Appendix B, to address RLV missions involving the U.S. Government, its agencies or personnel.\11\ The agreement refers to claims resulting from unspecified ``Licensed Activities,'' rather than licensed launch or reentry activities. In this manner, participants in either phase of licensed activity for

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an RLV are included within the scope of a single, comprehensive agreement. The FAA believes it desirable to include participants at either end of a mission as signatories to the agreement because any of them may confront claims from other participants that result from activities conducted at the other end of licensed RLV activity. For example, participants in a licensed reentry may suffer damage or loss to their property, and their employees may suffer injury, damage or loss, through involvement in the licensed launch campaign preceding placement of the vehicle and its payload, if any, in Earth orbit or outer space. To achieve the intended result of limiting inter-party litigation, it is desirable to include all such participants in a single agreement. There may be instances under which a licensed reentry occurs sufficiently independent of the launch that placed the reentry vehicle in orbit as to warrant a separate reciprocal waiver of claims agreement among launch participants and another one among reentry participants. The FAA will address those circumstances on an individual basis.

\11\ Where the U.S. Government, its agencies or personnel are not involved, Sec. 450.17(b) directs participants in a licensed reentry to execute reciprocal waivers of claims.

As under part 440, the form of reciprocal waiver of claims agreement required under part 450, Sec. 450.17(d), identifies as signatories to the agreement the licensee, its customer and the FAA on behalf of the U.S. Government. Where multiple customers are involved in licensed activities, each would be required to execute the agreement

and to waive claims as between themselves. Under the agreement, each party agrees to flow down, or pass on, to its contractors and subcontractors the obligations each undertakes to waive claims and assume responsibility for employee losses. In this manner, the FAA intends to ease paperwork burdens and simplify implementation of the waiver requirement. Section 450.17(d) of the final rule provides relief to parties that suffer claims by another party's contractors or subcontractors due to failure by that party to implement properly the flow down obligation. The participants in licensed activities that are required to accede to the reciprocal waiver of claims scheme are those that have their personnel or property at risk in the conduct of licensed activities and those who may make claims against other participants for loss or damage sustained by personnel or to property as a result of licensed activities. Failure to comply may subject a participant in licensed launch or reentry activities to enforcement proceedings by the FAA under the CSLA.

New Mexico, a prospective launch and reentry site operator, submitted comments regarding risk allocation between a site operator and its customers. Under parts 440 and 450, ``customers'' of a site operator would include launch and reentry licensees, such as RLV operators. Customers of a site operator may also be entities providing launch and reentry services to other entities at the site and that utilize facilities offered by the site operator. New Mexico commented that commercial site operators should be treated the same as government (Federal) site operators for purposes of the reciprocal waiver of claims agreement. To assure comparable treatment is afforded to commercial site operators, New Mexico suggested that the term ``contractors and subcontractors'' be defined to specifically include a reentry site operator, as discussed above under the discussion of Sec. 450.3, and that the reciprocal waiver of claims agreement be modified to specifically state that the Licensee waives and releases claims it may have against its Contractors, as well as its Customers and the United States. Although the CSLA directs that parties enter into waiver of claims agreements with their contractors and subcontractors, agency practice has been to allow those entities to carry out the CSLA requirement as a contractual, rather than regulatory, matter. As a regulatory matter, the FAA focuses on entities that are not otherwise in contractual privity with a licensee or customer to ensure they obtain the benefits of the waiver of claims arrangement. Accordingly, the form of agreement currently in use under part 440, Appendix B, does not specifically address a waiver between a licensee and its contractors, or a customer and its contractors, and similarly, the proposed form of agreement in the NPRM did not do so.

It appears from New Mexico's comments that it wishes to be protected by insurance or other means of financial responsibility required of the launch or reentry licensee in the event of third-party claims against the site operator arising out of the licensed launch or reentry. A licensed site operator obtains the benefits of coverage provided by the launch or reentry licensee because it is a contractor to that licensee. However, as a contractor to the launch or reentry licensee, the site operator is also expected to accede to the reciprocal waiver of claims agreement.

New Mexico desires treatment of commercial site operators that is comparable to that afforded the U.S. Government as Federal launch range provider; however, the U.S. Government's waiver of claims is limited to

claims that are in excess of required government property insurance. In other words, the government's waiver is more limited than that of private party launch or reentry participants (PPLPs or PPRPs). Whereas the government obtains the benefits of required insurance up to the statutory ceiling of $100 million, as determined through MPL analysis, PPLPs and PPRPs are expected to waive claims from the first dollar of loss. While New Mexico asserts that it wishes to ensure its participation in the waiver scheme, it further comments that when launch takes place at a commercial, rather than Federal government-owned site, licensed launch activities should commence upon launch vehicle ignition in order to limit CSLA financial responsibility reqirements to vehicle flight. New Mexico understands that commercial ELV operators desire coverage for pre-flight hazardous operations under the CSLA financial responsibility and allocation of risk regime because high value government range assets are at risk and ELV operators have felt the need to share in the risk to such property. However, at a commercial site, the notion of including pre-flight operations within the reach of the CSLA insurance and reciprocal waiver scheme limits flexibility in commercial arrangements between the site operator and the vehicle operator and is not necessary, according to New Mexico. New Mexico offered that flight is the one portion of operations for which CSLA financial responsibility is necessary for all operators. Taken together, it would appear that New Mexico advocates participation by commercial site operators in the insurance and reciprocal waiver of claims requirements of the CSLA during vehicle flight only but would otherwise prefer private insurance and risk arrangements between the site operator and vehicle operator.

Hazards to third parties and risks posed by launch activities, including pre-flight operations, may exist whether launch occurs at a Federal launch site or a commercial site. The FAA has defined launch to include pre-flight operations because of their hazardous nature and not merely because Federal range assets are exposed to risk. For regulatory purposes, the FAA does not utilize a different definition of ``launch'' depending upon whether the launch site is commercially or Federally operated. As long as the launch site is located in the United States, a consistent definition of launch applies. Launches outside of the United States are regulated commencing upon ignition in

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deference to the local sovereignty. Thus, a licensed launch or reentry site operator would be deemed a contractor to the licensee for all financial responsibility and risk allocation purposes and is expected to waive claims for damage or loss it suffers as a result of licensed launch and reentry activities at its site. That said, the FAA does not interfere with the conditions of use imposed by a licensed site operator on its customers through private contractual arrangements.

Boeing raises concerns stemming from uncertainties it perceives in identifying when licensed reentry activities begin and statutory reciprocal waivers of claims apply. Uncertainty would be resolved upon issuance of this final rule and in license orders addressing specific reentry proposals. Boeing believes that on orbit activities of an RLV require licensing and application of the CSLA financial responsibility and risk allocation regime. On orbit operation of RLVs will be inherently hazardous, according to Boeing, and therefore it is

commercially desirable, if not critical, that participants in on orbit activities waive claims for damage or loss against other participants. Absent a legal requirement to do so, Boeing believes it will be difficult at best to convince customers and other participants to enter into a reciprocal waiver scheme and questions whether independent agreements covering unlicensed activities provide an adequate contractual, legal and insurance scheme for participants.

The FAA lacks authority to require insurance and reciprocal waivers of claims for unlicensed activities. This situation exists currently for activities involving expendable launch vehicles and payloads when those activities are not covered by an FAA license. Participants in licensed launches may address unlicensed activities and their attendant risks through private contractual arrangements. The FAA understands that the void, or gap, in licensing coverage must be addressed privately through commercial arrangements and that it may affect the ability of vehicle operators to attract customers and participants in the performance of risky business on orbit. However, the FAA is unable to fill the resultant void or gap absent statutory authority to do so. That said, participants in licensed launch and reentry activities should bear in mind that certain claims that result from licensed activity are intended to be covered by statutory requirements for risk allocation, as discussed earlier in this supplementary information

Section 450.19--United States Payment of Excess Third Party Liability Claims

Section 450.19 reflects the commitment of the U.S. Government to accept responsibility for satisfying successful third party claims against reentry and associated launch participants (PPRPs and PPLPs) to the extent covered claims arising out of a reentry exceed required insurance, up to a statutory ceiling of $1.5 billion (as adjusted for post-January 1, 1989 inflation) above insurance, absent willful misconduct by the entity on whose behalf payment of such claims is sought. It also contains procedures applicable to payment of excess claims. This risk-sharing feature of the CSLA is subject to a statutory sunset provision. Unless further extended, it would be available only for licensed activities conducted under a license for which a substantially complete application was submitted on or before December 31, 2000.

In the NPRM, the FAA further explained how the extent of licensing coverage described in the Proposed RLV and Reentry Licensing Regulations would affect launch and reentry risk management, particularly in light of the relationship that must exist between licensed activity and its consequences for purposes of indemnification eligibility.

CSLA financial responsibility and risk allocation requirements are co-extensive with licensed activity and also address the direct results, or consequences, of licensed activity. Under the CSLA, financial responsibility must compensate the maximum probable loss from claims by a third party and the U.S. Government of injury, damage or loss ``resulting from an activity carried out under the license;* * *'' 49 U.S.C. 70112(a)(1)(A) and (B). Similarly, reciprocal waivers of claims mandated by the CSLA require each party to the waiver to be responsible for damage or loss it sustains and injury, damage or loss sustained by one's employees, resulting from an activity carried out

under the applicable license.'' 49 U.S.C. 70112(b)(1). Likewise, the government payment of excess claims provisions, known as indemnification, apply to successful claims of a third party against a launch participant ``resulting from an activity carried out under the license* * * for death, bodily injury, or property damage or loss resulting from an activity carried out under the license.'' 49 U.S.C. 70113(a)(1). Applying plain language principles of statutory construction, the phrase ``as a result of '' can be read to mean ``caused by.'' See, e.g., Black Hills Aviation, Inc. v. United States, 34 F.3d968(10th Cir. 1994).

In issuing part 440 final rules governing financial responsibility for licensed launch activities, the FAA stated that determining eligibility for payment of excess claims is necessarily a fact-based inquiry and would depend on the particular circumstances giving rise to the claim. 63 FR at 45612. The same is also true for reentry indemnification, particularly in light of Committee Report language stating that the provisions set forth in 49 U.S.C. sections 70112 and 70113 ``apply to losses sustained as a result of licensed activities, (i.e., launches and reentries) not events or activities between launch and reentry; after reentry; or uncovered before launch. Once a launch or a reentry is completed no protection against third party liability is intended to be provided under Chapter 701 (of 49 USC Subtitle IX) unless there is a clear causal nexus between the loss and he behavior of the launch or reentry vehicle.'' (Emphasis added.) Committee Report, at 23. But, does reference in the Committee Report to ``clear causal nexus'' mean something more than that which is reasonably foreseeable? And how would intervening events affect eligibility for indemnification?

Guidance is offered in the Committee Report to illustrate the direct relationship between licensed activity and third party losses envisioned by the Committee in using the phrase ``clear causal nexus'' to describe events occurring after licensed activity s concluded but that could be eligible for indemnification. As an example, the Committee Report states that ``if, subsequent to a launch vehicle's successful deployment of a payload that is not a reentry vehicle, the payload returns to Earth and causes third party loss, the loss is not intended to be covered by (49 U.S.C.) sections 70112 and 70113.'' Id. Another example involves an airborne launch where an aircraft accident occurs after release of a launch vehicle. According tot he Committee Report, the accident is not intended to be covered by CSLA financial responsibility and indemnification provisions if the accident is not attributable to the launch vehicle. Id.

In light of cautionary, albeit non-binding, guidance offered in the Committee Report, the FAA has stressed in this rulemaking that licensees ought not assume that anything that happens as a result of RLV operation after it has been launched, including unlicensed operation on orbit, as qualifying for indemnification.

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Following expiration of the policy period required under the regulations, or where coverage is determined by the FAA to be unavailable because of a ``usual'' exclusion, the government undertakes responsibility for payment of third party claims from the first dollar of loss, as long as the claim results from an activity carried out

under a launch or reentry licenses and is otherwise eligible for indemnification under 49 U.S.C. 70113. The FAA retains its current practice with respect to ``usual'' exclusions from liability and property insurance coverage. For an exclusion to be deemed ``usual'' under Sec. 450.19(c), a licensee must certify, upon demonstrating compliance with financial responsibility requirements under Sec. 450.15(c)(1)(iii), that insurance coverage for the excluded risk is not commercially available at reasonable costs. Acceptance by the FAA of a certificate of insurance or certification by a licensee does not signify an agency finding that an exclusion is, in fact, ``usual.'' A person requesting such a finding in advance of the conduct of licensed activity may submit actual data, including cost and market data in support of its representation that insurance is not available at reasonable cost.

Paperwork Reduction Act

As required by the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)), the FAA has submitted a copy of these sections to the Office of Management and Budget for its review. The collection of information was approved and assigned OMB Control Number 2120-0649. The FAA is establishing financial responsibility requirements to cover risks associated with the licensed reentry of a reentry vehicle. The FAA will determine, on an individual basis, the amount of required insurance or other form of financial responsibility after examining the risks associated with a particular reentry vehicle, its operational capabilities and designated reentry site. This final rule provides general rules for demonstrating compliance with insurance requirements and implementing statutory-based Government/industry risk sharing provisions in a manner comparable to that currently utilized for commercial launches.

The required information will aid the FAA in establishing financial responsibility requirements covering risks associated with the licensed reentry of a reentry vehicle. The information collected helps the FAA determine the amount of required liability insurance for a reentry is similar in nature to information associated with financial responsibility for licensed launch activities. The frequency of required submissions, therefore, will depend upon the number of prospective reentry vehicle operators authorized to conduct licensed reentry operations. The agency received one comment on the reporting requirements associated with this rule and its has been discussed earlier in the preamble. The estimated number of respondents on an annual basis is five. The estimated average annual burden is 1566 hours.

An agency may not conduct or sponsor and a person is not required to respond to a collection of information unless it displays a currently valid Office of Management and Budget (OMB) control number.

Regulatory Evaluation Summary

This final rule is not considered a significant regulatory action under section 3(f) of Executive Order 12866 and, therefore, is not subject to review by the Office of Management and Budget. This final rule is not considered significant under the regulatory policies and procedures of the Department of Transportation (44 FR 11034; February

26, 1979).

Proposed and final rule changes to Federal regulations must undergo several economic analyses. First, Executive Order 12866 directs that each Federal agency shall purpose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs. Second, the Regulatory Flexibility Act of 1980, as amended May 1996, requires agencies to analyze the economic effect of regulatory changes on small entities. Third, the Office of Management and Budget directs agencies to assess the effect of regulatory changes on international trade. In conducting these analyses, the FAA has determined that the final rule will generate benefits that justify its costs and is not ``a significant regulatory action as defined in the Executive Order and the Department of Transportation Regulatory Policies and Procedures. The final rule will not have a significant impact on a substantial number of small entities and will not constitute a barrier to international trade. In addition, this final rule does not contain Federal intergovernmental or private sector mandates. Therefore, the requirements of Title II of the Unfunded Mandates Reform Act of 1995 do not apply. These analyses, available in the docket, are summarized below.

Baseline for Analysis

For the purpose of this evaluation, the baseline is defined as industry practice that existed prior to the Commercial Space Act of October 1998 (CSA). The CSA authorizes the Secretary of the U.S. Department of Transportation to require reentry licenses to meet financial responsibility requirements; generally these requirements will be satisfied by acquiring liability insurance to cover those risks imposed by their intended reentry activities. Such requirements will be implemented in the form of this final rule. The baseline should represent routine industry practice in the absence of any final rulemaking requirements by FAA and prior to statutory authority received from Congress.

Costs

Commercial space reentry operators are likely to also be launch operators, given that RLVs will, for the foreseeable future, constitute the bulk of reentry vehicle activity. Since reentry operators will repeat much of the compliance process for the final rule for launch financial responsibility, cost-saving knowledge will be gained that will be helpful in meeting similar requirements for reentry financial responsibility. Even though reentry activities take place at different times than launch activities, still the personnel involved in both activities are expected to have a acquired a high level of proficiency and cost-saving practices. The potential cost of the final reentry financial responsibility requirements are expected to be lower than they otherwise would be, as the result of knowledge gained from launch activities by such operators.

The final rule should result in a stronger, more stable, commercial space transportation industry by implementing the statute in regulations. Limiting liability insurance requirements based on maximum probable loss (MPL) should result in greater certainty of the potential liability costs (and resulting lower business risk) to commercial space

transportation firms. The Federal Aviation Administration defines MPL as the tool that establishes the dollar value of the maximum magnitude of loss associated with probable events causing casualties or property damage; the accidental event in question must be sufficiently probable to warrant financial responsibility protection.

The final rule will potentially impose costs on U.S. commercial space reentry operators and the U.S. government cast he result of these two requirements:

Insurance Requirements for Licensed Reentry Activities. In accordance with the statute, the final rule will require U.S. licensed reentry commercial space operators to acquire insurance to cover possible damage to or

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loss of government property. The licensee will also be required to obtain insurance to cover potential liability to third parties that result from reentry activities in the event of death, injury, damage, or loss to such third parties (including Government personnel). Final requirements also specify the duration of insurance.

Provisions Requiring Private Party Participants In Licensed Activities to Reciprocally Waive Claims Against One Another. The final rule will require that participants in reentry operations enter into cross-waiver agreements with each other. Specifically, the private parties in licensed activities sign waivers by which the parties agree to forfeit the right to sue each other for damages or injuries associated with the activities. The participants not only assume responsibility for their own losses, but assume responsibility for claims of their contractors and subcontractors against other private party participants in the event the cross-waiver requirement has not been properly applied by them to those parties.

The requirement for 30-day duration of insurance coverage following a planned reentry may impose additional costs on reentry operators. Such costs are not expected to be significant since potential 30-day costs for reentry insurance will be nearly the same as en existing requirement for launch activity, and reentry insurance coverage falls within the typical period of coverage routinely used by the commercial space industry. The shifting of potential costs above MPL of damage and loss claims or of injury claims from private participants to the government will also aid the commercial space transportation industry,. The shifting of these costs onto the government will relieve the licensees of the need to insure for these claims and will also demonstrate U.S. Government support for the commercial space transportation industry. The cross-waiver provisions of the final rule should lower any costs of litigation among private party participants in licensed activities. The final requirement for cross-waivers limits the risk of liability to other participants in licensed activities and results in a more certain business environment (or lower business risk) for all involved parties.

The FAA estimates that the final rule will result in the reallocation of expected liability insurance costs from licensees to the Federal government of about $4,200 ($3,700, discounted) over a five-year period. This estimate is based in part upon work by Princeton Synergetics Inc. (PSI), under contract with the FAA, which analyzed the consequence of the U.S. Government's assumption of risk exposure of up

to $1.5 billion (as adjusted for inflation occurring after January 1, 1989), for covered third-party claims. The additional administrative (or paperwork cost) to the Federal government associated with FAA's responsibilities under the final rule is estimated at $7,600 ($5,700, discounted) over five years. Thus, the total cost to the FAA will be about $11,800 ($4,200 + $7,600) over the next 5 years, as the result of the final rule. This cost estimate represents the amount that will be incurred by the FAA for financial responsibility aspects of the licensing process (which take into account those final provisions to protect private party participants against claims by third parties and provisions of cross-waivers).

Benefits

The primary benefit of the final rule is that it will support and promote U.S. commercial space reentry activity within the United States and by U.S. firms. It is clearly in the interest of the United States to remain in a worldwide position of leadership in commercial space flight. Specifically, the final rule will ensure that U.S. reentry operators are not subject to a competitive trade disadvantage by their rivals abroad as a result of their uncertainty in acquiring adequate liability insurance to cover risks associated with their intended reentry activities.

This final rule will also generate other potential qualitative benefits in two forms. First, in terms of third parties, this final rule will provide added assurance that damage to property or casualty losses (e.g., fatalities or serious injuries) resulting from reentry activities will be adequately covered either by commercial liability insurance purchased by reentry operators or by the U.S. Government. This potential benefit will be generated by the final requirement that all reentry operators have liability insurance coverage up to the MPL amount covering certain risks of liability resulting from reentry activities and statutory risk sharing provisions whereby the U.S. Government provides for payment of up to $1.5 billion (as adjusted for inflation occurring after January 1, 1989) about the required amount of insurance. And last, the cross-waiver requirement will also generate potential cost-savings by likely mitigating or eliminating litigation costs among reentry participants.

Final Regulatory Flexibility Determination

The Regulatory Flexibility act of 1980 (RFA) was enacted by Congress to ensure that small entities (small business and small not-for-profit government jurisdictions) are not unnecessarily and disproportionately burdened by Federal regulations. The RFA, which was amended March 1996, requires regulatory agencies to review rules to determine if they have ``a significant economic impact on a substantial number of small entities.''

The Small business Administration has defined small business entities relating to space vehicles (Standard Industrial Codes 3761, 3764, and 3769) as entities comprising fewer than 1,000 employees, the FAA has been unable to determine the extent to which the final rule will impact the five commercial space reentry entities currently developing reentry technology, due to the lack of information for the required cost of insurance, as explained previously in the cost section

of this evaluation. The final rule could impose additional costs on potential small reentry operators in the form of higher insurance requirements that they might otherwise fulfill (which often result in higher premiums), as the result of the final requirement to cover MPL for both third party liability and Government property. On the other hand, the final rule requirement could be partially offset or entirely offset by the potential cost-savings from the federal Government's statutory risk sharing feature of the final rule. This feature will shift the cost of insurance coverage form the licensee for liability beyond MPL after 30 days, up to $1.5 billion (as adjusted for inflation occurring after January 1, 1989). This cost-savings is estimated to be at least $4,200 for all of the potentially affected operators over the 5-year period (2001-2005). Still, with some degree of uncertainty, this information suggests that the potential cost of compliance for reentry small operators might not be significant.

Despite the absence of quantitative cost information for potential reentry licensees and pursuant to the Regulatory Flexibility Act (5 U.S.C. 605(b)), the FAA certifies with reasonable certainty that the final rule will not impose a significant economic impact on a substantial number of small entities. While there may be significant costs incurred by some operators, such costs are not expected to impact a substantial number of them. Since there is not cost of compliance information available to derive a quantitative cost estimate, there is still uncertainty about compliance costs. As the result of this uncertainty, the FAA solicited comments from industry on the final rule. The FAA did not receive any comments form industry addressing this uncertainty issue

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pertaining to the potential cost of compliance.

International Trade Impact Assessment

The Trade Agreement Act of 1979 prohibits Federal agencies from engaging in any standards or related activities that create unnecessary obstacles to the foreign commerce of the United States. Legitimate domestic objectives, such as safety, are not considered unnecessary obstacles. The statute also requires consideration of international standards and where appropriate, that they be the basis for U.S. standards. In addition, consistent with the Administration's belief in the general superiority and desirability of free trade, it is the policy of the Administration to remove or diminish to the extent feasible, barriers to international trade, including both barriers affecting the export of U.S. goods and services to foreign countries and barriers affecting the import of foreign goods and services in the United States.

As noted in the benefits section of this evaluation, the final rule will implement statutory provisions such as measures aimed at strengthening the competitive position of U.S. reentry operators by allowing the U.S. Government to share risks of additional liability for reentry activity. Government-backed practices exist in other countries for launch operators that compete with U.S. launch operators. The final rule will ensure that U.S. reentry operators will remain competitive with their counterparts abroad. For this reason, the final rule is not

expected to place domestic commercial space reentry operators at a competitive trade disadvantage with respect to foreign interests competing for similar business in international markets. It will also not hinder the ability of foreign commercial space rivals to compete in the United States. Therefore, the final rule is neither expected to affect trade opportunities of U.S. commercial space reentry operators doing business abroad nor will it adversely impact the trade opportunities of foreign firms doing business in the United States.

Unfunded Mandates Reform Act Assessment

The Unfunded Mandates Reform Act of 1995 (the Act), enacted as Pub. L. 104-4 on March 22, 1995, is intended, among other things, to curb the practice of imposing unfunded Federal mandates on State, local, and tribal governments.

Title II of the Act requires each Federal agency to prepare a written statement assessing the effects of any Federal mandate in a proposed or final agency rule that may result in a $100 million or more expenditure (adjusted annually for inflation) in any one year by State, local, and tribal governments, in the aggregate, or by the private sector; such a mandate is deemed to be a ``significant regulatory action.'' In 1999 dollars, this estimate of $100 million translates into $107 million using the GDP implicit price deflators for 1995 and 1999.

Based on the evaluation and impacts reported herein, the final rule is not expected to meet the $107 million per year cost threshold. Consequently, it will not impose a significant cost on or uniquely affect small governments. Therefore, the requirements of Title II of the Unfunded Mandates Reform Act of 1995 do not apply to the final regulation.

Executive Order 13132, Federalism

The FAA has analyzed this final rule under the principles and criteria of Executive Order 13132, Federalism. The FAA determined that this action will not have a substantial direct effect on the States, or the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, the FAA determined that this final rule does not have federalism implications.

Environmental Assessment

FAA Order 1050.1D defines FAA actions that may be categorically excluded from preparation of a National Environmental Policy Act (NEPA) environmental assessment (EA) or environmental impact statement (EIS). In accordance with FAA Order 1050.1D, appendix 4, paragraph 4(i), regulatory documents which cover administrative or procedural requirements qualify for a categorical exclusion.

Energy Impact

The energy impact of the rulemaking action has been assessed in accordance with the Energy Policy and Conservation Act (EPCA) and Public Law 94-163, as amended (42 U.S.C. 6362). It has been determined

that it is not a major regulatory action under the provisions of the EPCA.

List of Subjects in 14 CFR Part 450

Armed forces; Claims; Federal building and facilities; Government property; Indemnity payments; Insurance; Reporting and recordkeeping requirements; Rockets Space transportation and exploration.

The Amendment

In consideration of the foregoing, the Federal Aviation Administration amends Chapter III of title 14 of the Code of Federal Regulations as follows:

1. Subchapter C of Chapter III, Title 14, Code of Federal Regulations, is amended by adding a new Part 450 to read as follows:

PART 450--FINANCIAL RESPONSIBILITY

Subpart A--Financial Responsibility for Licensed Reentry Activities

Authority: 49 U.S.C. 70101-70121; 49 CFR 1.47.

Subpart A--Financial Responsibility for Licensed Reentry Activities

Sec. 450.1 Scope of part; basis.

This part sets forth financial responsibility and allocation of risk requirements applicable to commercial space reentry activities that are authorized to be conducted under a license issued pursuant to this subchapter.

Sec. 450.3 Definitions.

(a) For purposes of this part--

Bodily injury means physical injury, sickness, disease, disability, shock, mental anguish, or mental injury sustained by any person,

including death.

Contractors and subcontractors means those entities that are involved at any tier, directly or indirectly, in licensed reentry activities, and includes suppliers of property and services, and the component manufacturers of a reentry vehicle or payload. Contractors and subcontractors include those entities as defined in Sec. 440.3(a)(2) of this chapter involved in licensed launch activities associated with a particular reentry.

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Customer means

(1) A person who procures reentry services from a licensee or launch services associated with a particular reentry;

(2) Any person to whom the customer has sold, leased, assigned or otherwise transferred its rights in the payload (or any part thereof), to be reentered by the licensee, including a conditional sale, lease, assignment, or transfer of rights.

(3) Any person who has placed property on board the payload for reentry or payload services; and

(4) Any person to whom the customer has transferred its rights to reentry services.

Federal range facility means a Government-owned installation at which launches or reentries take place.

Financial responsibility means statutorily required financial ability to satisfy liability as required under 49 U.S.C. 70101-70121.

Government personnel means employees of the United States, its agencies, and its contractors and subcontractors, involved in reentry services for licensed reentry activities or launch services for licensed launch activities associated with a particular reentry. Employees of the United States include members of the Armed Forces of the United States.

Hazardous operations means activities, processes, and procedures that, because of the nature of the equipment, facilities, personnel, or environment involved or function being performed, may result in bodily injury or property damage.

Liability means a legal obligation to pay claims for bodily injury or property damage resulting from licensed reentry activities.

License means an authorization to conduct licensed reentry activities, issued by the Office under this subchapter.

Licensed launch activities means the launch of a launch vehicle as defined in a regulation or license issued by the Office and carried out pursuant to a launch license.

Licensed reentry activities means the reentry of a reentry vehicle, including a reusable launch vehicle (RLV), as defined in a regulation or license issued by the Office and carried out pursuant to a license.

Maximum probable loss (MPL) means the greatest dollar amount of loss for bodily injury or property damage that is reasonably expected to result from licensed reentry activities;

(1) Losses to third parties, excluding Government personnel and other launch or reentry participant's employees involved in licensed reentry activities, that are reasonably expected to result from licensed reentry activities are those having a probability of occurrence on the order of no less than one in ten million.

(2) Losses to Government property and Government personnel, as

defined in this section, that are reasonably expected to result from licensed reentry activities are those having a probability of occurrence on the order of no less than in one hundred thousand.

Office means the Associate Administrator for Commercial Space Transportation of the Federal Aviation Administration, U.S. Department of Transportation.

Property damage means partial or total destruction, impairment, or loss of tangible property, real or personal.

Regulations means the Commercial Space Transportation Licensing Regulations, codified at 14 CFR Ch. III.

Third party means:

(1) Any person other than:

(i) The United States, its agencies, and its contractors and subcontractors involved in reentry services for licensed reentry activities or launch services for licensed launch activities associated with a particular reentry;

(ii) The licensee and its contractors and subcontractors involved in reentry services for licensed reentry activities or launch services for licensed launch activities associated with a particular reentry; and

(iii) The customer and its contractors and subcontractors involved in reentry services for licensed reentry activities or launch services for licensed launch activities associated with a particular reentry.

(2) Government personnel, as defined in this section, are third parties.

United States means the United States Government, including its agencies.

(b) Except as otherwise provided in this section, any term used in this part and defined in 49 U.S.C. 70101-70121 or in Sec. 401.5 of this chapter shall have the meaning contained therein.

Sec. 450.5 General.

(a) No person shall commence or conduct reentry activities that require a license unless that person has obtained a license and fully demonstrated compliance with the financial responsibility and allocation of risk requirements set forth in this part.

(b) The Office shall prescribe the amount of financial responsibility a licensee is required to obtain and any additions to or modifications of the amount in a license order issued concurrent with or subsequent to the issuance of a license.

(c) Demonstration of financial responsibility under this part shall not relieve the licensee of ultimate responsibility for liability, loss, or damage sustained by the United States resulting from licensed reentry activities, except to the extent that:

(1) Liability, loss, or damage sustained by the United States results from willful misconduct of the United States or its agents;

(2) Covered claims of third parties for bodily injury or property damage arising out of any particular reentry exceed the amount of financial responsibility required under Sec. 450.9(c) of this part and do not exceed $1,500,000,000 (as adjusted for inflation occurring after January 1, 1989), above such amount, and are payable pursuant to 49 U.S.C. 70113 and Sec. 450.19 of this part. Claims of employees of entities listed in paragraphs (1)(ii) and (iii) of the definition of

``third party'' in Sec. 450.3(a) of this part for bodily injury or property damage are not covered claims;

(3) Covered claims for property loss or damage exceed the amount of financial responsibility required under Sec. 450.9(e) of this part and do not result from willful misconduct of the licensee; or

(4) The licensee has no liability for covered claims by third parties for bodily injury or property damage arising out of any particular reentry that exceed $1,500,000,000 (as adjusted for inflation occurring after January 1, 1989) above the amount of financial responsibility required under Sec. 450.9(c) of this part.

(d) A licensee's failure to comply with the requirements in this part may result in suspension or revocation of a license, and subjects the licensee to civil penalties as provided in part 405 of this chapter.

Sec. 450.7 Determination of maximum probable loss.

(a) The Office shall determine the maximum probable loss (MPL) from covered claims by a third party for bodily injury or property damage, and the United States, its agencies, and its contractors and subcontractors for covered property damage or loss, resulting from licensed reentry activities. The maximum probable loss determination forms the basis for financial responsibility requirements issued in a license order.

(b) The Office issues its determination of maximum probable loss no later than ninety days after a licensee or transferee has requested a determination and submitted all information required by the Office to make the determination. The Office shall consult with Federal agencies that are involved in, or whose personnel or property are exposed to risk of damage or loss as a result of, licensed reentry activities before issuing

a license order prescribing financial responsibility requirements and shall notify the licensee or transferee if interagency consultation may delay issuance of the MPL determination.

(c) Information requirements for obtaining a maximum probable loss determination are set forth in appendix A to this part. Any person requesting a determination of maximum probable loss must submit information in accordance with Appendix A requirements, unless the Office has waived requirements. In lieu of submitting required information, a person requesting a maximum probable loss determination may designate and certify certain information previously submitted for a prior determination as complete, valid, and equally applicable to its current request. The requester is responsible for the continuing accuracy and completeness of information submitted under this part and shall promptly report any changes in writing.

(d) The Office shall amend a determination of maximum probable loss required under this section at any time prior to completion of licensed reentry activities as warranted by supplementary information provided to or obtained by the Office after the MPL determination is issued. Any change in financial responsibility requirements as a result of an amended MPL determination shall be set forth in a license order.

(e) The Office may make a determination of maximum probable loss at any time other than as set forth in paragraph (b) of this section, upon request by any person.

Sec. 450.9 Insurance requirements for licensed reentry activities.

(a) As a condition of each reentry license, the licensee must comply with insurance requirements set forth in this section and in a license order issued by the Office, or otherwise demonstrate the required amount of financial responsibility.

(b) The licensee must obtain and maintain in effect a policy or policies of liability insurance, in an amount determined by the Office under paragraph (c) of this section, that protects the following persons as additional insureds to the extent of their respective potential liabilities against covered claims by a third party for bodily injury or property damage resulting from licensed reentry activities:

(1) The licensee, its customer, and their respective contractors and subcontractors, and the employees of each, involved in licensed reentry activities or in licensed launch activities associated with a particular reentry;

(2) The United States, its agencies, and its contractors and subcontractors involved in licensed reentry activities or in licensed launch activities associated with a particular reentry; and

(3) Government personnel.

(c) The Office shall prescribe for each licensee the amount of insurance required to compensate the total of covered third-party claims for bodily injury or property damage resulting from licensed reentry activities. Covered third-party claims include claims by the United States, its agencies, and its contractors and subcontractors for damage or loss to property other than property for which insurance is required under paragraph (d) of this section. The amount of insurance required is based upon the Office's determination of maximum probable loss; however, it will not exceed the lesser of:

(1) $500 million; or

(2) The maximum liability insurance available on the world market at a reasonable cost, as determined by the Office.

(d) The licensee must obtain and maintain in effect a policy or policies of insurance, in an amount determined by the Office under paragraph (e) of this section, that covers claims by the United States, its agencies, and its contractors and subcontractors involved in licensed reentry activities resulting from licensed reentry activities. Property covered by this insurance must include all property owned, leased, or occupied by, or within the care, custody, or control of, the United States and its agencies, and its contractors and subcontractors involved in licensed reentry activities, at a Federal range facility. Insurance must protect the United States and its agencies, and its contractors and subcontractors involved in licensed reentry activities.

(e) The Office shall prescribe for each licensee the amount of insurance required to compensate claims for property damage under paragraph (d) of this section resulting from licensed reentry activities in connection with any particular reentry. The amount of insurance is based upon a determination of maximum probable loss; however, it will not exceed the lesser of:

(1) $100 million; or
(2) The maximum available on the world market at a reasonable cost, as determined by the Office.
(f) In lieu of a policy of insurance, licensee may demonstrate financial responsibility in another manner meeting the terms and conditions applicable to insurance as set forth in this part. The licensee must describe in detail the method proposed for demonstrating financial responsibility and how it assures that the licensee is able to cover claims as required under this part.

Sec. 450.11 Duration of coverage; modifications.

(a) Insurance coverage required under Sec. 450.9, or other form of financial responsibility, shall attach upon commencement of licensed reentry activities, and remain in full force and effect as follows:
(1) For ground operations, until completion of licensed reentry activities at the reentry site; and
(2) For other licensed reentry activities, thirty days from initiation of reentry flight; however, in the event of an abort that results in the reentry vehicle remaining on orbit, insurance shall remain in place until the Office's determination that risk to third parties and Government property as a result of licensed reentry activities is sufficiently small that financial responsibility is no longer necessary, as determined by the Office through the risk analysis conducted to determine MPL and specified in a license order.
(b) Financial responsibility required under this part may not be replaced, canceled, changed, withdrawn, or in any way modified to reduce the limits of liability or the extent of coverage, nor expire by its own terms, prior to the time specified in a license order, unless the Office is notified at least 30 days in advance and expressly approves the modification.

Sec. 450.13 Standard conditions of insurance coverage.

(a) Insurance obtained under Sec. 450.9 shall comply with the following terms and conditions of coverage:
(1) Bankruptcy or insolvency of an insured, including any additional insured, shall not relieve the insurer of any of its obligations under any policy.
(2) Policy limits shall apply separately to each occurrence and, for each occurrence to the total of claims arising out of licensed reentry activities in connection with any particular reentry.
(3) Except as provided in this paragraph herein, each policy must pay claims from the first dollar of loss, without regard to any deductible, to the limits of the policy. A licensee may obtain a policy containing a deductible amount if the amount of the deductible is placed in escrow account or otherwise demonstrated to be unobligated, unencumbered funds, of the licensee, available to compensate claims at any time claims may arise.
(4) Each policy shall not be invalidated by any action or inaction of

the licensee or any additional insured, including nonpayment by the licensee of the policy premium, and must insure the licensee and each additional insured regardless of any breach or violation of any warranties, declarations, or conditions contained in the policies by the licensee or any additional insured (other than a breach or violation by the licensee or an additional insured, and then only as against that licensee or additional insured).

(5) Exclusions from coverage must be specified.

(6) Insurance shall be primary without right of contribution from any other insurance that is carried by the licensee or any additional insured.

(7) Each policy must expressly provide that all of its provisions, except the policy limits, operate in the same manner as if there were a separate policy with and covering the licensee and each additional insured.

(8) Each policy must be placed with an insurer of recognized reputation and responsibility that either:

(i) Is licensed to do business in any State, territory, possession of the United States, or the District of Columbia; or

(ii) Includes in each of its policies of insurance obtained under this part a contract clause in which the insurer agrees to submit to the jurisdiction of a court of competent jurisdiction within the United States and designates an authorized agent within the United States for service of legal process on the insurer.

(9) Except as to claims resulting from the willful misconduct of the United States or its agents, the insurer shall waive any and all rights of subrogation against each of the parties protected by required insurance.

(b) [Reserved.]

Sec. 450.15 Demonstration of compliance.

(a) A licensee must submit evidence of financial responsibility and compliance with allocation of risk requirements under this part, as follows, unless a license order specifies otherwise due to the proximity of the licensee's intended date for commencement of licensed activities:

(1) The waiver of claims agreement required under Sec. 450.17(c) of this part must be submitted at least 30 days before commencement of licensed launch activities involving the reentry licensee;

(2) Evidence of insurance must be submitted at lest 30 days before commencement of licensed launch activities involving the reentry licensee;

(3) Evidence of financial responsibility in a form other than insurance, as provided under Sec. 450.9(f) of this part, must be submitted at least 60 days before commencement of licensed launch activities involving the reentry licensee; and

(4) Evidence of renewal of insurance or other form of financial responsibility must be submitted at least 30 days in advance of its expiration date.

(b) Upon a complete demonstration of compliance with financial responsibility all allocation of risk requirements under this part, the requirements shall preempt any provisions in agreements between the

licensee and an agency of the United States governing access to or use of United States reentry property or reentry services for licensed reentry activities which address financial responsibility, allocation of risk and related matters covered by 49 U.S.C. 70112, 70113.

(c) A licensee must demonstrate compliance as follows:

(1) The licensee must provide proof of insurance required under Sec. 450.9 by:

(i) Certifying to the Office that it has obtained insurance in compliance with the requirements of this part and any applicable license order;

(ii) Filing with the Office one or more certificates of insurance evidencing insurance coverage by one or more insures under a currently effective and properly endorsed policy or policies of insurance, applicable to licensed reentry activities, on terms and conditions and in amounts prescribed under this part, an specifying policy exclusions;

(iii) In the event of any policy exclusions or limitations of coverage that may be considered usual under Sec. 450.19(c) of this part, or for purposes of implementing the Government's waiver of claims for property damage under 49 U.S.C. 70112(b)(2), certifying that insurance covering the excluded risks is not commercially available at reasonable cost; and

(iv) Submitting to the Office, for signature by the Department on behalf of the United States Government, the waiver of claims and assumption of responsibility agreement required by Sec. 450.17(c) of this part, executed by the licensee and its customer.

(2) Certifications required under this section must be signed by a duly authorized officer of the licensee.

(d) Certificate(s) of insurance required under paragraph (c)(1)(ii) of this section must be signed by the insurer issuing the policy and accompanied by an opinion of the insurance broker that the insurance obtained by the licensee complies with the specific requirements for insurance set forth in this part and any applicable license order.

(e) The licensee must maintain, and make available for inspection by the Office upon request, all required policies of insurance and other documents necessary to demonstrate compliance with this part.

(f) In the event the licensee demonstrates financial responsibility using means other than insurance, as provided under Sec. 450.9(f) of this part, the licensee must provide proof that it has met the requirements set forth in this part and in a license order issued by the Office.

Sec. 450.17 Reciprocal waiver of claims requirements.

(a) As a condition of each reentry license, the licensee shall comply with reciprocal waiver of claims requirements as set forth in this section.

(b) The licensee shall implement reciprocal waivers of claims with its contractors and subcontractors, its customer(s) and the customer's contractors and subcontractors, and the launch licensee and its contractors and subcontractors and customers, under which each party waives and releases claims against the other parties to the waivers and agrees to assume financial responsibility for property damage it sustains and for bodily injury or property damage sustained by its own employees, and to hold harmless and indemnify each other from bodily

injury or property damage sustained by its employees, resulting from reentry activities, including licensed launch activities associated with a particular reentry, regardless of fault.

(c) For each licensed reentry in which the U.S. Government, its agencies, or its contractors and subcontractors is involved in licensed reentry activities or licensed launch activities associated with a particular reentry, or where property insurance is required under Sec. 440.9(d) of this subchapter or Sec. 450.9(d), the Federal Aviation Administration of the Department of Transportation, the licensee, and its customer shall enter into a reciprocal waiver of claims agreement in the form set forth in appendix B to this part or the satisfies its requirements.

(d) The reentry licensee and its customer, the launch licensee and its customer, and the Federal Aviation Administration of the Department of Transportation on behalf of the United States and its agencies but only to the extent provided in legislation, must agree in any waiver of claims agreement required under this part to indemnify another party to the agreement from claims by the indemnifying party's contractors and subcontractors arising out the indemnifying party's failure to implement properly the waiver requirement.

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Sec. 450.19 United States payment of excess third-party liability claims.

(a) The United States pays successful covered claims (including reasonable expenses of litigation or settlement) of a third party against the licensee, the customer, and the contractors and subcontractors of the licensee and the customer, and the employees of each involved in licensed reentry activities, the licensee, customer and the contractors and subcontractors of each involved in licensed launch activities associated with a particular reentry, and the contractors and subcontractors of the United States and its agencies, and their employees, involved in licensed reentry activities and licensed launch activities associated with a particular reentry, to the extent provided in an appropriation law or other legislative authority providing for payment of claims in accordance with 49 U.S.C. 70113, and to the extent the total amount of such covered claims arising out of any particular reentry:

(1) Exceeds the amount of insurance required under Sec. 450.9(b); and

(2) Is not more than $1,500,000,000 (as adjusted for inflation occurring after January 1, 1989) above that amount.

(b) Payment by the United States under paragraph (a) of this section shall not be made for any part of such claims for which bodily injury or property damage results from willful misconduct by the party seeking payment.

(c) The United States shall provide for payment of claims by third parties for bodily injury or property damage that are payable under 49 U.S.C. 70113 and not covered by required insurance under Sec. 450.9(b), without regard to the limitation under paragraph (a)(1) of this section, because of an insurance policy exclusion that is usual. A policy exclusion is considered usual only if insurance covering the excluded risk is not commercially available at reasonable rates. The

licensee must submit a certification in accordance with Sec. 450.15(c)(1)(iii) of this part for the United States to cover the claims.

(d) Upon the expiration of the policy period prescribed in accordance with Sec. 450.11(a), the United States shall provide for payment of claims that are payable under 49 U.S.C. 70113 from the first dollar of loss up to $1,500,000,000 (as adjusted for inflation occurring after January 1, 1989).

(e) Payment by the United States of excess third-party claims under 49 U.S.C. 70113 shall be subject to:

(1) Prompt notice by the licensee to the Office that the total amount of claims arising out of licensed reentry activities exceeds, or is likely to exceed, the required amount of financial responsibility. For each claim, the notice must specify the nature, cause, and amount of the claim or lawsuit associated with the claim, and the party or parties who may otherwise be liable for payment of the claim;

(2) Participation or assistance in the defense of the claim or lawsuit by the United States, at its election;

(3) Approval by the Office of any settlement, or part of a settlement, to be paid by the United States; and

(4) Approval by Congress of a compensation plan prepared by the Office and submitted by the President.

(f) The Office will:

(1) Prepare a compensation plan outlining the total amount of claims and meeting the requirements set forth in 49 U.S.C. 70113;

(2) Recommend sources of funds to pay the claims; and

(3) Propose legislation as required to implement the plan.

(g) The Office may withhold payment of a claim if it finds that the amount is unreasonable, unless it is the final order of a court that has jurisdiction over the matter.

Appendix A to Part 450--Information Requirements for Obtaining a Maximum Probable Loss Determination for Licensed Reentry Activities

Any person requesting a maximum probable loss determination shall submit the following information to the Office, unless the Office has waived a particular information requirement under 14 CFR 450.7(c):

I. General Information

A. Reentry mission description.

1. A description of mission parameters, including:

a. Orbital inclination; and

b. Orbit altitudes (apogee and perigee).

c. Reentry trajectories.

2. Reentry flight sequences.

3. Reentry initiation events and time for each event.

4. Nominal landing location, alternative landing sites and contingency abort sites.

5. Identification of landing facilities, (planned date of reentry), and reentry windows.

6. If the applicant has previously been issued a license to conduct reentry activities using the same reentry vehicle to the same reentry (site) facility, a description of any differences

planned in the conduct of proposed activities.

B. Reentry Vehicle Description.

1. General description of the reentry vehicle including dimensions.

2. Description of major systems, including safety systems.

3. Description of propulsion system (reentry initiation system) and type of fuel used.

4. Identification of all propellants to be used and their hazard classification under the Hazardous Materials Table, 49 CFR 172.101.

5. Description of hazardous components.

C. Payload.

1. General description of any payload, including type (e.g., telecommunications, remote sensing), propellants, and hazardous components or materials, such as toxic or radioactive substances.

D. Flight Termination System/Flight Safety System.

1. Identification of any flight termination system (FTS) or Flight Safety System (FSS) on the reentry vehicle, including a description of operations and component location on the vehicle.

II. Flight Operations

A. Identification of reentry site facilities exposed to risk during vehicle reentry and landing.

B. Identification of accident failure scenarios, probability assessments for each, and estimation of risks to Government personnel, individuals not involved in licensed reentry activities, and Government property, due to property damage or bodily injury. The estimation of risks for each scenario shall take into account the number of such individuals at risk as a result of reentry (flight) and landing of a reentry vehicle (on-range, off-range, and down-range) and specific, unique facilities exposed to risk. Scenarios shall cover the range of reentry trajectories for which authorization is sought in the license application.

C. On-orbit risk analysis assessing risks posed by a reentry vehicle to operational satellites during reentry.

D. Reentry risk analysis assessing risks to Government personnel and individuals not involved in licensed reentry activities as a result of inadvertent or random reentry of the launch vehicle or its components.

E. Nominal and 3-sigma dispersed trajectories in one-second intervals, from reentry initiation through landing or impact. (Coordinate system will be specified on a case by case basis)

F. Three-sigma landing or impact dispersion area in downrange (+/-) and crossrange (+/-) measured from the nominal, and contingency landing or impact target. The applicant is responsible for including all significant landing or impact dispersion constituents in the computations of landing or impact dispersion areas. The dispersion constituents should include, but not be limited to: variation in orbital position and velocity at the reentry initiation time; variation in re-entry initiation time offsets, either early or late; variation in the bodies' ballistic coefficient; position and velocity variation due to winds; and variations in re-entry retro-maneuvers.

G. Malfunction turn data (tumble, trim) for guided (controllable) vehicles. The malfunction turn data shall include the

total angle turned by the velocity vector versus turn duration time at one second interval; the magnitude of the velocity vector versus turn duration time at one second intervals; and an indication on the data where the re-entry body will impact the earth, or breakup due to aerodynamic loads. A malfunction turn data set is required for each malfunction

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time. Malfunction turn start times shall not exceed four-second intervals along the trajectory.

H. Identification of debris casualty areas and the projected number and ballistic coefficient of fragments expected to result from each failure mode during reentry, including random reentry.

III. Post-Flight Processing Operations

A. General description of post-flight ground operations including overall sequence and location of operations for removal of vehicle and components and processing equipment from the reentry site facility and for handling of hazardous materials, and designation of hazardous operations.

B. Identification of all facilities used in conducting post-flight processing operations.

C. For each hazardous operation:

1. Identification of location where each operation is performed, including each building or facility identified by name or number.

2. Identification of facilities adjacent to location where each operation is performed and exposed to risk, identified by name or number.

3. Maximum number of Government personnel and individuals not involved in license reentry activities who may be exposed to risk during each operation. For Government personnel, identification of his or her employer.

4. Identify and provide reentry site facility policies or requirements applicable to the conduct of operations.

Appendix B to Part 450--Agreement for Waiver of Claims and Assumption of Responsibility

This Agreement is entered into this _____ day of _____, by and among [Licensee] (the ``Licensee''), [Customer] (the ``Customer''), and the Federal Aviation Administration of the Department of Transportation, on behalf of the United States Government (collectively, the ``Parties''), to implement the provisions of Sec. 450.17(c) of the Commercial Space Transportation Licensing Regulations, 14 CFR Ch. III (the ``Regulations'').

In consideration of the mutual releases and promises contained herein, the Parties hereby agree as follows:

1. Definitions

Contractors and Subcontractors means entities described in Sec. 450.3 of the Regulations, 14 CFR 450.3.

Customer means the above-named Customer on behalf of the

Customer and any person described in Sec. 450.3 of the Regulations, 14 CFR 450.3.

License means License No. _____ issued on _____, by the Associate Administrator for Commercial Space Transportation, Federal Aviation Administration, Department of Transportation, to the Licensee, including all license orders issued in connection with the License.

Licensee means the Licensee and any transferee of the Licensee under 49 U.S.C. Subtitle IX, ch. 701.

United States means the United States and its agencies involved in Licensed Activities.

Except as otherwise defined herein, terms used in this Agreement and defined in 49 U.S.C. Subtitle IX, ch. 701--Commercial Space Launch Activities, or in the Regulations, shall have the same meaning as contained in 49 U.S.C. Subtitle IX, ch. 701, or the Regulations, respectively.

2. Waiver and Release of Claims

(a) Licensee hereby waives and releases claims it may have against Customer and the United States, and against their respective Contractors and Subcontractors, for Property Damage it sustains and for Bodily Injury or Property Damage sustained by its own employees, resulting from Licensed Activities, regardless of fault.

b. Customer hereby waives and releases claims it may have against Licensee and the United States, and against their respective Contractors and Subcontractors, for Property Damage it sustains and for Bodily Injury or Property Damage sustained by its own employees, resulting from Licensed Activities, regardless of fault.

(c) The United States hereby waives and releases claims it may have against Licensee and Customer, and against their respective Contractors and Subcontractors, for Property Damage it sustains, and for Bodily Injury or Property Damage sustained by its own employees, resulting from Licensed Activities, regardless of fault, to the extent that claims it would otherwise have for such damage or injury exceed the amount of insurance or demonstration of financial responsibility required under sections 440.9(c) and (e) or sections 450.9(c) and (e), respectively, of the Regulations, 14 CFR 440.9(c) and (e) or 14 CFR 450.9(c) and (e).

3. Assumption of Responsibility

(a) Licensee and Customer shall each be responsible for Property Damage it sustains and for Bodily Injury or Property Damage sustained by its own employees, resulting from Licensed Activities, regardless of fault. Licensee and Customer shall each hold harmless and indemnify each other, the United States, and the Contractors and Subcontractors of each Party, for Bodily Injury or Property Damage sustained by its own employees, resulting from Licensed Activities, regardless of fault.

(b) The United States shall be responsible for Property Damage it sustains, and for Bodily Injury or Property Damage sustained by its own employees, resulting from Licensed Activities, regardless of fault, to the extent that claims it would otherwise have for such damage or injury exceed the amount of insurance or demonstration of

financial responsibility required under Secs. 440.9(c) and (e) or Secs. 450.9(c) and (e), respectively, of the Regulations, 14 CFR 440.9(c) and (e) or 14 CFR 450.9(c) and (e).

4. Extension of Assumption of Responsibility and Waiver

(a) Licensee shall extend the requirements of the waiver and release of claims, and the assumption of responsibility, hold harmless, and indemnification, as set forth in paragraphs 2(a) and 3(a), respectively, to its Contractors and Subcontractors by requiring them to waive and release all claims they may have against Customer and the United States, and against the respective Contractors and Subcontractors of each, and to agree to be responsible, for Property Damage they sustain and to be responsible, hold harmless and indemnify Customer and the United States, and the respective Contractors and Subcontractors of each, for Bodily Injury or Property Damage sustained by their own employees, resulting from Licensed Activities, regardless of fault.

(b) Customer shall extend the requirements of the waiver and release of claims, and the assumption of responsibility, hold harmless,and indemnification, as set forth in paragraphs 2(b) and 3(a), respectively, to its Contractors and Subcontractors by requiring them to waive and release all claims they may have against Licensee and the United States, and against the respective Contractors and Subcontractors of each, and to agree to be responsible, for Property Damage they sustain and to be responsible, hold harmless and indemnify Licensee and the United States, and the respective Contractors and Subcontractors of each, for Bodily Injury or Property Damage sustained by their own employees, resulting from Licensed Activities, regardless of fault.

(c) The United States shall extend the requirements of the waiver and release of claims, and the assumption of responsibility as set forth in paragraphs 2(c) and 3(b), respectively, to its Contractors and Subcontractors by requiring them to waive and release all claims they may have against Licensee and Customer, and against the respective Contractors and Subcontractors of each, and to agree to be responsible, for any Property Damage they sustain and for any Bodily Injury of Property Damage sustained by their own employees, resulting from Licensed Activities, regardless of fault, to the extent that claims they would otherwise have for such damage or injury exceed the amount of insurance or demonstration of financial responsibility required under Secs. 440.9(c) and (e) or Secs. 450.9(c) and (e), respectively, of the Regulations, 14 CFR 440.9(c) and (e) or 14 CFR 450.9(c) and (e).

5. Indemnification

(a) Licensee shall hold harmless and indemnify Customer and its directors, officers, servants, agents, subsidiaries, employees and assignees, or any or them, and the United States and its agencies, servants, agents, subsidiaries, employees and assignees, or any or them, from and against liability, loss or damage arising out of claims that Licensee's Contractors and Subcontractors may have for Property Damage sustained by them and for Bodily Injury or Property Damage sustained by their employees, resulting from Licensed

Activities.

(b) Customer shall hold harmless and indemnify Licensee and its directors, officers, servants, agents, subsidiaries, employees and assignees, or any of them, and the United States and its agencies, servants, agents, subsidiaries, employees assignees, or any of them, from and against liability, loss or damage arising out of claims that Customer's Contractors and Subcontractors, or any person on whose behalf Customer enters into

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this Agreement, may have for Property Damage sustained by them and for Bodily Injury or Property Damage sustained by their employees, resulting from Licensed Activities.

(c) To the extent provided in advance in an appropriations law or to the extent there is enacted additional legislative authority providing for the payment of claims, the United States shall hold harmless and indemnify Licensee and Customer and their respective directors, officers, servants, agents, subsidiaries, employees and assignees, or any of them, from and against liability, loss or damage arising out of claims that Contractors and Subcontractors of the United States may have for Property Damage sustained by them, and for Bodily Injury or Property Damage sustained by their employees, resulting from Licensed Activities, to the extent that claims they would otherwise have for such damage or injury exceed the amount of insurance or demonstration of financial responsibility under Sec. 440.9(c) and (e) or 450.9(c) and (e), respectively, of the Regulations, 14 CFR 440.9(c) and (e) or 14 CFR 450.9(c) and (e).

6. Assurances Under 49 U.S.C. 70112(e)

Nothwithstanding any provision of this Agreement to the contrary, Licensee shall hold harmless and indemnify the United States and its agencies, servants, agents, employees and assignees, or any of them, from and against liability, loss or damage arising out of claims for Bodily Injury or Property Damage, resulting from Licensed Launch Activities, regardless of fault, except to the extent that: (i) As provided in section 7(b) of this Agreement, claims result form willful misconduct of the United States or its agents; (ii) claims for Property Damage sustained by the United States or its Contractors and Subcontractors exceed the amount of insurance or demonstration of financial responsibility required under Sec. 440.9(e) or Sec. 450.9(e) of the Regulations (14 CFR 440.9(e) or 450.9(e); (iii) claims by a Third Party for Bodily Injury or Property Damage exceed the amount of insurance or demonstration of financial responsibility required under Sec. 440.9(c) or Sec. 450.9(c) of the Regulations (14 CFR 440.9(c) or 450.9(c)), and do not exceed $1,500,000,000 (as adjusted for inflation after January 1, 1989) above such amount, and are payable pursuant to the provisions of 49 U.S.C. 70113 and Sec. 440.19 or Sec. 450.19 of the Regulations (14 CFR 440.19 or 450.19); or (iv) Licensee has no liability for claims exceeding $1,500,000,000 (as adjusted for inflation after January 1, 1989) above the amount of insurance or demonstration of financial responsibility required under Sec. 440.9(c) or Sec. 450.9(c) of the Regulations (14 CFR

440.9(c) or 450.9(c)).

7. Miscellaneous

(a) Nothing contained herein shall be construed as a waiver or release by Licensee, Customer or the United States of any claim by an employee of the Licensee, Customer or the United States, respectively, including a member of the Armed Forces of the United States, for Bodily Injury or Property Damage, resulting form Licensed Activities.

(b) Notwithstanding any provision of this Agreement to the contrary, any waiver, release, assumption of responsibility or agreement to hold harmless and indemnify herein shall not apply to claims for Bodily Injury or Property Damage resulting from willful misconduct of any of the Parties, the Contractors and Subcontractors of any of the Parties, and in the case of Licensee and Customer and the Contractors and Subcontractors of each of them, the directors, officers, agents and employees of any of the foregoing, and in the case of the United States, its agents.

(c) In the event that more than one customer is involved in Licensed Activities, references herein to Customer shall apply to, and be deemed to include, each such customer severally and not jointly.

(d) This Agreement shall be governed by and construed in accordance with United States Federal law.

In Witness Whereof, the Parties to this Agreement have caused the Agreement to be duly executed by their respective duly authorized representatives as of the date written above.

Licensee

By: _____.
Its: _____.

Customer

By: _____.
Its: _____.

Department of Transportation

By: _____.
Its: _____.

Issued in Washington, DC, on August 28, 2000.
Patricia G. Smith,
Associate Administrator for Commercial Space Transportation.
[FR Doc. **00**-**22565 Filed** 9-18-**00**; 8:45 am]
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