

110200



FAA-99-6265-14



U.S. Department
Of Transportation

**FEDERAL AVIATION
ADMINISTRATION**

Washington, D.C. 20591

**FINAL REGULATORY EVALUATION,
FINAL REGULATORY FLEXIBILITY DETERMINATION,
TRADE IMPACT ASSESSMENT, AND UNFUNDED MANDATES
ACT ASSESSMENT**

**Financial Responsibility
Requirements for Licensed Reentry Activities**

Final Rule
(14 CFR Part 450)

**OFFICE OF AVIATION POLICY AND PLANS,
OPERATIONS REGULATORY ANALYSIS BRANCH, APO-310**

Archie Muckle, Jr.

July 2000

TABLE OF CONENTS

Section	Page
EXECUTIVE SUMMARY	i
I. INTRODUCTION	1
II. BACKGROUND	1
A. Basis for the Final Rule	1
B. The Final Rule	2
III. MAJOR ASSUMPTIONS	4
IV. ANALYSIS OF COSTS AND BENEFITS	6
A. Baseline for Analysis	6
B. Analysis of Costs	7
C. Analysis of Benefits	17
V. FINAL REGULATORY FLEXIBILITY DETERMINATION	19
VI. INTERNATIONAL TRADE IMPACT ASSESSMENT	19
VII. UNFUNDED MANDATES ACT ASSESSMENT	20

EXECUTIVE SUMMARY

This final regulatory evaluation examines the costs and benefits of the final rule to add a new Part 450 to Title 14 of the Code of Federal Regulations. The final rule was prompted by the Commercial Space Act of 1998, Public Law 105-303 (henceforth, referred to as "The CSA"). The CSA directs the FAA to issue requirements for reentry operators to obtain liability insurance covering certain risks associated with the licensed reentry of a reentry vehicle. This final rule will require, among other things, commercial space reentry licensees to satisfy certain financial responsibility obligations by acquiring liability insurance to cover certain liability risks associated with their intended future reentry activities. The FAA will determine for each reentry operation the amount of required liability insurance after examining the risks associated with an operator's reentry vehicle, its operational capabilities, and its designated reentry site. The final rule will provide general rules for demonstrating compliance with insurance requirements and implementing statutory-based Government/industry risk sharing provisions. The final rule will impose obligations comparable to those currently utilized for commercial launches.

This final rule will generate potential qualitative benefits in three forms. First, in terms of third parties, this final rule will provide added assurance that damage to property or casualty losses resulting from reentry activities will, in most instances, be adequately covered by operators' liability insurance. Second, this final rule will ensure that U.S. reentry operators are not subject to a competitive trade disadvantage by their rivals abroad. On the international front, the original argument that can be made on benefits is that US licenses will not be disadvantaged by international competitors operating under government backed liability/risk allocation programs. Last, the final rule cross-waiver requirement will also generate potential benefits by reducing inter-party litigation costs.

The final rule will require FAA licensed reentry vehicle operators to acquire insurance, as a condition of their license, to cover potential liability to third parties and to cover potential damage or loss of Government property, up to prescribed amounts. The potential incremental cost impact of this requirement will be the difference in insurance premiums paid for reentry activity insurance by reentry operators in the absence of the final rule and insurance premiums paid as a result of the final rule. Unfortunately, there is insufficient information available on the amount of insurance that these operators might otherwise obtain in the absence of the rule and, on the average, costs for that insurance. Also, some provisions of the statute, as implemented through the final rule, like the Government's assumption of some of the liability risk, could lower insurance costs, while other provisions, like defining Government employees as third parties, could increase the amount of liability insurance that must be obtained. For this reason, a quantitative assessment cannot be made on the extent to which the final rule will impose higher or lower liability insurance costs on those operators.

One provision of this rulemaking will require private party participants in licensed reentry activities to waive claims against one another. The signing of inter-party waivers will result in a shifting of risks among private party participants in licensed activities. The cross-waiver provision will limit the opportunity for, and therefore the costs of, litigation among the parties because responsibility for damages to or injury to any of the parties is borne by the damaged party.

The FAA estimates that, as a consequence of the U.S. government's assumption of liability risk coverage between Maximum Probable Loss and up to \$1.9 billion (in 1999 dollars, in accordance with the Commercial Space Act of 1998 allowance for annual adjustments for inflation after January 1, 1989) for third party claims via the CSA, the final rule will result in a \$5,300 (\$4,100, discounted) reallocation of expected liability from licensees to the Federal government over a 5-year period. This estimate of \$5,300 is based on the work performed by Princeton Synergetics Inc. (PSI), under contract

with the FAA, which analyzed the consequences of the U.S. government's assumption of risk exposure of up to \$1.9 billion (in 1999 dollars) for 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 \$8,150 over the same period, in 1999 dollars. Thus, the total expected cost to the FAA will be about \$13,450, over the next 5 years. This cost estimate is considered to be negligible.

The FAA does not believe that the final rule will impose a significant economic impact on a substantial number of small entities. While there may be some costs incurred by some operators, such costs are not expected to impact a substantial number of them in a significant way. This final rule will not result in a competitive trade disadvantage (e.g., access to and the ability to compete in foreign markets) to U.S. commercial space operators conducting business abroad nor will it result in a competitive trade disadvantage to foreign commercial space operators operating within the United States. In terms of the Unfunded Mandates Act, the final rule will not impose a Federal mandate of greater than \$100 million per year on either the private (e.g., commercial space operators and affiliated support groups such as contractors and product suppliers) or public (state and local municipalities) sector. Therefore, the requirements of Title II of the Unfunded Mandates Reform Act of 1995 do not apply to the final regulation.

I. INTRODUCTION

This regulatory evaluation examines the costs and benefits of the final rule to add a new Part 450 to Title 14 of the Code of Federal Regulations (CFR). This final rule implements the financial responsibility requirements imposed on commercial space reentry licensees by the Commercial Space Act of 1998: Public Law 105-303 (henceforth, referred to as the CSA). The CSA directs the FAA to establish financial responsibility requirements covering certain risks associated with licensed reentry activities. The FAA will determine for each licensed reentry the amount of required liability insurance. The FAA's decision on the amount of liability insurance required will be based on an examination of the risks associated with the operator's reentry operation, the operator's reentry vehicle, an examination of its operational capabilities, and an examination of its designated reentry site; the amount of liability insurance for a reentry vehicle operator is capped at \$500 million (in 1999 dollars), based on maximum probable loss.¹ This final rule will provide general rules for demonstrating compliance with insurance requirements and implementing the statutory-based Government/industry risk sharing provisions.

II. BACKGROUND

A. Basis for the Final Rule

The CSA became law in October 1998 and it grants new authority to the Secretary of Transportation over the licensing and regulation of reentry vehicle operators and commercial or non-federal reentry site operators. The Secretary is authorized to license reentries and reentry site operators when those activities are conducted within the United States or by U.S. citizens abroad. The statutory objective in licensing reentry activities is to ensure protection of public health and safety and the safety of property. In addition, the statutory

¹ This figure of \$500 million is considered to be a constant, unless Congress changes it.

objective is to ensure that licensed reentry activities are consistent with U.S. national security and foreign policy interests, including treaty obligations entered into by the United States. The Secretary of Transportation has delegated responsibility over commercial space transportation to the Administrator of the Federal Aviation Administration (FAA), who in turn has delegated regulatory and related commercial space transportation authority to the Associate Administrator for Commercial Space Transportation (AST).

In addition to licensing authority, the CSA further amends 49 U.S.C. Subtitle IX, chapter 701, popularly referred to as the Commercial Space Launch Act of 1984 (CSLA), by extending existing requirements for financial responsibility and risk allocation to licensed reentries. In doing so, Congress has committed the Government to share in the operational risks associated with commercial reentry activity. The CSA stipulates that no later than 9 months after its enactment, the Secretary of the U.S. Department of Transportation must issue guidance on obtaining sufficient liability insurance. In accordance with that mandate, the final rule was initiated.

Perhaps of greatest significance to prospective reentry vehicle operators is legislative affirmation in CSA that the payment of excess claims (or "indemnification") provisions of 49 U.S.C. 70113 apply to a licensed reentry just as they do for a licensed launch. However, unaffected by the Commercial Space Act of 1998 is the existing sunset provision that appears in 49 U.S.C. 70113(f) as amended. It limits eligibility for Government indemnification to reentries conducted under a license for which a complete and valid application has been received by the agency by the end of 2000.

B. The Final Rule

The FAA issues this financial responsibility rule for licensed reentry activities in a form that closely parallels regulations covering financial responsibility for licensed launch activities. The FAA's approach to licensing reentry of a reentry vehicle is discussed more completely in a related rulemaking covering licensing requirements for

Reusable Launch Vehicle (RLV) missions and reentry of a reentry vehicle.

In accordance with the CSA, the final rule will require the licensee to have liability insurance as a condition of its license. Also, Government property insurance is required if Government range or test assets (e.g., buildings, launch pad, etc.) will be sufficiently exposed to risk of damage or loss as a result of reentry activities. Liability insurance to cover risks to third parties, including Government personnel, for injury, damage or loss will be required, based upon the FAA's determination of maximum probable loss (MPL).

The final rule will require that FAA set financial responsibility requirements to cover claims by third parties at the lesser of maximum probable loss, or \$500 million, provided insurance is available on world markets at a reasonable cost. In addition, the Statute provides a mechanism for the Government to pay third party claims that exceed the required level of financial responsibility, up to \$1.9 billion (in 1999 dollars, in accordance with the Commercial Space Act of 1998 allowance for annual adjustments for inflation after January 1, 1989) above the requirement. This statutory provision of the final rule will appear in section 450.19 of the Code of Federal Regulations (CFR), Title 14.

The final rule will require that reentry insurance remain in place for a period of at least 30 days following a planned reentry, with exceptions for aborted reentries where the reentry vehicle could pose risks to other space objects or for reentries rescheduled to take place at some future time. This requirement appears in section 450.11 of the rule.

The final rule will require that as a condition of a license, participants in licensed activities enter into cross-waivers of claims for damages or injuries. For launch operators, cross-waivers have been standard practices under the CSLA. The CSLA requires launch operators to have cross-waivers when conducting FAA licensed space launch activities. However, the CSA places a statutory requirement

for extending cross-waivers to reentry activities. This final requirement will appear in section 450.17 of the CFR.

III. MAJOR ASSUMPTIONS AND DEFINITIONS

Assumptions:

1. All monetary values displayed in this evaluation are expressed in 1999 base-year dollars.
2. In this evaluation, the "sunset clause" provision contained in 49 U.S.C. is assumed to be extended beyond its expiration date of December 31, 2000. This clause relates to Government indemnification and assures that all substantially complete license applications received by December 31, 2000 will be encompassed by this final rulemaking. The FAA assumes in this evaluation that license applications after December 31, 2000 will continue to be covered by Government indemnification. This rationale is based on the premise that Congress will enact the appropriate legislation.
3. The time-horizon of 5 years is used for this evaluation because it approximates the length of time the sunset clause may be extended beyond its current expiration date.
4. Over the next 5 years (2001 - 2005), this evaluation assumes there will be about 28 reentry operations involving 5 operators, based on a similar projection used for another rulemaking action.
5. This evaluation assumes that any reentry operator potentially impacted by this rule would have acquired liability insurance to cover the risk associated with its intended operation (s) in the absence of the final rule. This assessment is based on the rationale that any entity that plans to engage in reentry operations would do so as a profit-maximizer. The objective of a profit-maximizer is to generate enough profits in such a way that would enhance its ability to attract capital for the purpose of financing existing and future reentry operations. In order to achieve this objective, a reentry operator would have to acquire enough insurance to cover those risks associated with its intended activities, to the extent it can at a reasonable price.
6. This evaluation assumes there is no difference in "risk" between ELV and RLV launch and reentry operations. This assumption is based on the fact that "risk" to the public from an RLV launch and reentry standpoint will be no greater than that allowed for ELV launch under FAA regulations.

Definitions²

Maximum Probable Loss establishes the dollar value of the maximum magnitude of loss resulting from sufficiently probable events that may cause casualties or property damage; the accidental event in question must be sufficiently probable to warrant financial responsibility protection.

Incremental Benefits are defined as those potential benefits that will accrue solely as the result of the final rule and beyond the baseline scenario.

Incremental Costs are defined as those potential costs that will be incurred solely as the result of the final rule and beyond the baseline scenario.

Reentry Vehicle is defined as a vehicle designed to return to Earth from Earth orbit or from outer space, or a reusable launch vehicle designed to return to Earth from orbit or from outer space, substantially intact.

Reentry subject to the FAA's licensing authority is the purposeful return to Earth of a reentry vehicle.

Third party refers to any person or entity other than the United States, its agencies, or its contractors or subcontractors involved in launch and/or reentry services; the licensee or transferee; the licensee's or transferee's contractors, subcontractors, or customers involved in launch or reentry services; or, any such customer's contractors or subcontractors involved in launch and/or reentry services. It should be noted that this definition, by not listing the employees of the U.S. government with those excluded from the list of third parties, includes Government employees involved in providing launch and/or reentry services as third parties. Although employees of other participants are also third parties, responsibility for

² Based primarily on those definitions contained in Princeton Synergetics, Inc. (PSI) report entitled, "Economic Impact Assessment of Financial Responsibility Requirements for Licensed Reentry Activities (14 CFR 450), March 1999.

covering their claims is addressed through reciprocal waivers of claims. Hence, the FAA does not consider their potential claims in setting liability insurance requirements. All persons off the launch range or reentry site are considered to be third parties.

Third party Liability Claims represent covered claims by a third party for death, bodily injury, or loss of or damage to property resulting from activities carried out under the license in connection with any particular reentry.

Threshold Probability represents the probability of an event resulting in claims that exceed the MPL determination. The threshold probability is a quantitative measure selected by the FAA as representing the probability of occurrence associated with accidental events from reentry related activities. The values of 10^{-7} and 10^{-5} are used for third party [bodily injury] and Government property damage, respectively. The values of one in ten million are used for losses to third parties, excluding Government personnel and other launch or reentry participants' employees involved in licensed reentry activities. The values of one in one hundred thousand are used for losses to Government property and Government personnel that are reasonably expected to result from licensed reentry activities.

Licensed Activities include those activities that are covered by an FAA license. Activities covered in Part 450 include licensed reentry activities.

Government Property refers to any property or facility (such as buildings, launch pads, range sites, launch vehicle and spacecraft components, etc.) owned by the Government or Government contractors involved in the licensed activity on the launch or reentry site. Property off the launch range is, unless specifically designated, considered as third party property.

Casualty is a person suffering death or serious injury as the result of an event associated with licensed activities.

IV. ANALYSIS OF COSTS AND BENEFITS

A. 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. The CSA authorizes the Secretary of the U.S. Department of Transportation to require reentry licensees to meet financial responsibility requirements, generally satisfied by acquiring liability insurance to cover certain 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.

B. Analysis of Costs

Commercial space reentry operators are likely to also be launch activity 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 recently released final rule for launch financial responsibility, cost-saving knowledge will be gained that will be helpful in meeting similar final 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 acquired a high level of proficiency and cost-saving practices. The potential cost compliance with 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 formalizing statutory requirements in regulations. The statute limits insurance requirements based on maximum probable loss (MPL) and should result in greater certainty of the potential liability insurance costs (and resulting lower business risk) to commercial space transportation firms. The final 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 will be nearly the same or less than an existing requirement for launch activity, and reentry insurance coverage falls within the typical period of coverage routinely obtained by the commercial space industry. The shifting of expected costs above MPL for covering damage, loss, or injury claims from the licensees to the Government will also aid the commercial space transportation industry. The shifting of these costs onto the Government will relieve reentry 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 others 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 \$5,300 (\$4,100, discounted) over a five-year period. This estimate is based on work performed by Princeton Synergetics Inc.³ (PSI), under contract with the FAA, which analyzed the consequences of the U.S. government's assumption of exposure of up to about \$1.9 billion (in 1999 dollars) for 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 \$8,150 (\$6,150, discounted) over five years, in 1999 dollars. Thus, the total cost to the FAA will be about \$13,450 (\$5,300 + \$8,150) over the next 5 years, as the result of the final rule. This cost estimate is considered to be negligible and represents the amount that will mostly likely be incurred by the FAA for ensuring compliance with financial responsibility aspects of the

³ The basis for this analysis is Contract DTOS-59-59 by Princeton Synergetics Inc. (PSI) entitled Economic Impact Assessment of Financial Responsibility Requirements for Licensed Reentry Activities (14 CFR Part 450). Princeton, New Jersey. March 9, 1999.

licensing process (which take into account those final provisions to protect private party participants and the Federal government against claims by third parties and provisions of cross-waivers).

Insurance Requirements for Licensed Reentry Activities

In accordance with the CSA, the final rule will require FAA licensed reentry operators to acquire insurance to cover potential damage to, or loss of Government property, up to a specified amount. The licensee will also be required to obtain insurance to cover liability of participants in reentry activities in the event of death, injury damage or loss to third parties (including Government personnel). The potential incremental cost impact to operators subject to this final requirement will be the difference in insurance costs paid by reentry operators in the absence of the final rule and insurance costs paid as a result of the final rule, for a certain amount of liability insurance coverage. Unfortunately, there is insufficient information available on the amount of insurance coverage the operators might otherwise obtain to estimate the average costs for property and liability insurance for reentry operators in the absence of the final rule. There is also insufficient information as to what the potential cost of compliance will be as the result of the final rule requirement for liability insurance. Some provisions of this rulemaking, like the Government assumption of some risk, will reduce insurance costs, while other provisions, like defining Government employees as third parties, will increase insurance requirements. It is for this reason that a quantitative assessment cannot be made on the extent to which the final rule will result in liability insurance cost, in the form of premiums, above the amount that will have been incurred in the absence of the final rule.

In terms of 1999 dollars, the CSA authorizes DOT to set financial responsibility requirements covering claims for damage or injury to third parties at the maximum probable loss or \$500 million (if the maximum probable loss exceeds \$500 million) as long as insurance is available on the world market at reasonable cost. The final rule also requires operators to have enough insurance to protect the Government

in the event of loss or damage to Government property by the setting of financial responsibility requirements for damage to or loss of Government property at maximum probable loss, or \$100 million (if the maximum probable loss exceeds \$100 million), provided insurance is available on the world market at a reasonable cost. A more detailed discussion of maximum probable loss is shown in the preamble to this rule.

In addition, in accordance with the statute, the rule contains provisions whereby the Government covers excess third party claims above the required level of financial responsibility, up to \$1.9 billion (in 1999 dollars) above the required level of insurance, subject to Congressional appropriation (s). The parties affected under this provision are the licensee, the payload owner or customer, the U.S. government, and their contractors and subcontractors.

As a result of Government payment of excess claims provisions of the CSLA, the licensee faces decreased costs for obtaining insurance to cover the risks of catastrophic losses from injury, loss of life, or property damage to third parties, subject to Congressional appropriation of funds. Under those provisions, the Government may cover, at no cost to the licensee, claims exceeding the financial responsibility requirement, up to \$1.9 billion in 1999 dollars. The U.S. government will bear the cost of this commitment for which a special appropriation will be necessary.

The reentry or payload owner is affected in the same manner as the licensee (with a decrease in risk due to "indemnification" provided by the U.S. government and the cap on the insurance requirement); the magnitude of the impact depends on the extent to which the cost of insurance is passed on by the licensee as part of the reentry operator's cost of doing business. The FAA is unable to quantify the degree of pass-through. For this evaluation, from a worst case point of view, it is assumed that the total effect is borne by the licensee.

For each reentry undertaken, the MPL or risk exposure of the licensee is equivalent to the financial responsibility requirement. Prior to

the enactment of the CSA, this exposure will have been for all damages to third parties above the amount of commercial insurance obtained by the licensee. Determining the expected value of the change in risk exposure can approximate the cost-savings to licensees. Similarly, the expected cost to the U.S. Treasury can be calculated which is equal to the approximate cost-savings to the licensee.

To calculate the expected value of the risk exposure to be shifted from the licensee to the United States, the threshold probability used in determining maximum probable loss (10^{-7}) for third parties has been used. The reduction in the cost of risk exposure to the licensees for third party damage occurs between the required level of insurance (assumed to be equal to the MPL) and about \$1.9 billion (in 1999 dollars) above MPL. It is potential costs associated with covering this range of liability for which the U.S. government assumes responsibility. It is assumed that the probability of being in this range of damage is the threshold probability (10^{-7}) for each reentry. The probability distribution within this damage range is not known. However, assuming that the maximum value of damage for which the U.S. intends to indemnify licensees occurs with a probability equal to the threshold probability, an approximation may be made of the expected value of cost-savings to the licensee per reentry activity.

The financial responsibility requirement is assumed here to be maximum probable loss, and companies are assumed to meet the requirement. Using this approach means that for any given licensed reentry activity, the cost-savings to the reentry licensee (about \$190) are approximately the expected value of damages in the range from MPL to about \$1.9 billion (in 1999 dollars) above the financial responsibility requirement. This value is obtained simply by multiplying the estimate of \$1.9 billion (in 1999 dollars) by 10^{-7} . This modest number belies the significance of this final rule to reentry licensees. Although the risk is extremely small, in the unlikely event high losses were to be associated with a reentry, the rule, based on the statute, provides a mechanism that protects the licensee from ruinous liability. If equivalent coverage were provided

by an insurance company, the cost-savings will be more than \$190 because the insurance company will have increased the premium to cover not only the additional risk of loss but also to cover the administrative cost of establishing the insurance policy and to provide some profit for issuing the policy. The approximate cost-savings to licensees for these launches are about \$5,300 (\$4,100, discounted) over five years at 7 percent. This estimate of \$5,300 only reflects the approximate value of the indemnification costs to the U.S. Federal government.

An additional impact on the licensee is a small increase in the risk of bearing the costs of injury or loss of life to third parties due to the redefinition of Government employees and Government contractor employees as third parties. The cost of this addition to the licensee is the possible increase in the maximum probable loss when Government employees and Government contractor employees are defined as third parties. Comments received in response to the NPRM for launch licensing, which closely parallels this final rule for reentry licensing, indicate that third party insurance costs may increase as a result of classifying Government employees and Government contractor employees as third parties. This change is likely to be small, however, since the number of Government third parties is relatively small.

As the result of the above provisions and lack of sufficient information, there is uncertainty as to what the actual cost impact of this final rule will be. Because of this uncertainty, the FAA solicited comments from the commercial space industry (namely, each of the potentially impacted reentry operators) as to the cost of additional insurance premiums (or reduction in insurance premiums) as the result of the NPRM with respect to their future reentry activities. The FAA received no comments on this issue.

Provisions Requiring Private Party Participants
In Licensed Activities to Waive Claims Against One Another

Another provision in the CSLA requiring private party participants in licensed activities to waive claims against one another does not appear in the baseline case (prior to the CSA or this final rule). The signing of inter-party waivers represents an additional requirement imposed, with associated paperwork costs, and it results in a shifting of risks among private party participants in licensed activities.

The non-government parties affected by this provision are the licensees and the payload owners and other private party participants in licensed activities. The private parties in licensed activities sign waivers by which the parties agree to forfeit the right to sue each other for their own damages or injuries associated with the activities.

The licensee and customer not only assume responsibility for their own losses, but now each also assumes responsibility for claims of its contractors and subcontractors against other private party participants in the event the cross-waiver requirement has not been properly applied to those parties.

Payload owners and other private party participants in licensed reentry activities face increased exposure for their own losses after signing cross waivers, but conversely, claims against them are either waived by other firms. This cross-waiver is likely to require increased paperwork costs. The U.S. government, the licensee, and the payload owner all may face increased paperwork costs as a consequence of signing cross-waivers. The Government must ensure compliance with the provision, execute a waiver agreement when its property or personnel are involved in a licensed reentry, and consequently faces higher administrative costs. The licensee must sign and obtain waivers from other private parties participating in licensed activities.

The payload owners and other private party participants in licensed reentry activities must sign the waivers. These costs are considered negligible to licensees because the waiver may often be a clause in a contract with a customer or subcontractor, similarly as in launch operations.⁴ While the costs to "other private parties" were not analyzed, it is assumed that the costs are negligible to them as well. In addition, the final rule will accommodate a cross-waiver of claims among the Government and private party participants, with the Government waiving claims above the insurance requirement to cover the damage or loss of Government property, and private parties waiving claims for their property loss or damage against the Government.

The cross-waiver provision obviates the need for, and therefore the costs of, litigation among the parties because responsibility for certain damages to or injury to any of the parties is borne by the damaged party itself. A by-product of the final cross-waiver requirement is reduced uncertainty and business risk faced by these participants. The payload owners and other private participants in licensed activities can manage or provide for their (maximum) exposure under the cross-waiver provision because losses will be borne by either the participant or the licensee. Each participant's maximum exposure will be the total value of its property that can be damaged or lost and casualty losses of employees (serious and fatal injuries) sustained during licensed activities. Before the final cross-waiver requirement, the potential exposure was unknown to each participant because of potential inter-party litigation.

The waiver of claims against the Government by private party participants in licensed reentry activities represents a change from the baseline case. In addition, the final requirement that maximum probable loss be used to determine financial responsibility differs from the baseline case as well, since no regulatory requirement of that nature from the FAA existed prior to the CSA as implemented by

⁴ The FAA recognizes that in launch operations, there are standard clauses for waivers that result in negligible costs of doing business. This evaluation recognizes the similarities between the two types of operations and assumes similar results. While there may be some differences in such practices, they are not known at this time.

the final rule. There is a difference between the level of financial responsibility required of licensees to protect Government assets in the baseline case and under the final requirements of this section. The final new provision will require insurance coverage at the maximum probable loss or \$100 million, whichever is less, against Government property loss or damage. Under this final requirement, licensees are not liable for damages to Government property above the level of financial responsibility that will be set by the FAA, as explained previously.

Principles established by the final rule for launch financial responsibility will be equally applicable to this final action. That rulemaking expanded the definition of Government property for the determination of financial responsibility associated with Government property. It includes Government range assets that are not on the launch facility, but are known and identified as being exposed to damage or loss as a result of licensed launch activities. This interpretation may lead to an increase in the level of required insurance to protect Government property. In addition, the inclusion of the off-range property in property insurance rather than in third party insurance may decrease licensee third party insurance requirements (or costs). Since different threshold probabilities are used for Government property insurance and third party insurance, this may lead to increased Government risk.

The FAA anticipates that the licensee, payload owners, and U.S. government are all affected by this provision. The amendments to the Commercial Space Launch Act require the Government to waive property damage claims above the required level of insurance for a licensed reentry activity. Before the CSA and the final rule, no such waiver applied to Government property, nor was reentry authorized.

All private party participants (the licensee, payload owners and others) now bear financial risk for damages and/or injury to their own property or employees since the cross-waivers with the Government

limit suits against the Government. Although these parties previously might have sought to recover damages from the Government, they must now agree to bear certain losses themselves. Since Government employees are defined as third parties, the possible losses of Government employees are now included in the calculation of maximum probable loss to third parties. There will be a corresponding increase in the value of maximum probable loss to third parties (which will now include Federal government employees as third parties). Government/private parties cross-waivers have the effect of diminishing the risk to the U.S. Treasury because the private parties waive certain claims against the Government under the waivers. However, the redefinition of Government employees as third parties has changed the risks to the U.S. government because claims against private party participants for injuries to or losses of Government employees in excess of required liability insurance would be covered through, payment of excess claims responsibilities of the USG.

Government Administrative Costs

Increased paperwork costs are incurred by the Government, the reentry licensee and payload owners(s), and other private party participants in licensed activities because the waivers must be signed and maintained. These costs are assumed to be insignificant to the reentry licensee and other private party participants, as were the costs of maintaining private party waivers for licensed launches. The average administrative cost associated with the financial responsibility aspects of each reentry license (for data collection, maximum probable loss determination, documentation, and verification of insurance compliance, as well as the verification and maintenance of cross-waivers) is estimated at about \$25,000 in 1999, dollars.

The FAA estimates that Government costs are about \$291 as the result of the final cross-waiver provision associated with the issuance of a reentry license.⁵ The Government costs associated with the financial

⁵ Based on the use of data received from the FAA, Princeton Synergetics, Inc. (PSI) stated that 570 hours (for 105 projected launches over the next 5 years) will be required for all of the expected license applications in the regulatory evaluation for the final rule for launch licensing. This evaluation also uses the same approach and estimates that 168 hours will be

responsibility aspects of the licensing process are about the same for reentry-specific and reentry operator licenses. These costs include data collection, the determination of maximum probable loss, documentation, and the verification of insurance compliance as well as the verification and maintenance of cross-waivers. The FAA believes, based on information gathered by Princeton Synergetics, Inc., and adjusting the wage rate, that the average annual costs of implementing the cross-waiver provisions to the U.S. government will not exceed the estimate of \$1,650 or the estimate of \$8,150 (\$6,150, discounted) over the 5-year period (See Table 1).

Year	Rule	Estimated Number of Licenses Issued ⁶ Baseline	After The Rule		Baseline	
			Annual Cost	Discounted Cost	Annual Cost	Discounted Cost
2001	1	0	\$ 291	\$ 272	\$0	\$0
2002	2	0	\$ 582	\$ 411	\$0	\$0
2003	5	0	\$1,455	\$1,188	\$0	\$0
2004	8	0	\$2,328	\$1,776	\$0	\$0
2005	12	0	\$3,492	\$2,490	\$0	\$0
Total	28	0	\$8,148	\$6,147	\$0	\$0

Source: Based upon information provided by PSI and adjusted by U.S., Department of Transportation, Federal Aviation Administration. Office of Aviation Policy and Plans. June 2000.

required for all expected reentry applications (for 28 projected reentries and applications over the next 5 years, as shown in figure 2-1 of the full regulatory evaluation for the commercial Space Transportation Reusable Launch Vehicles and Reentry Licensing Final Rule). The estimate of 168 hours was derived as follows: $570/105 = 5.43$ hours per operation (or 6 rounded up, worst case); 6×28 equals 168. PSI also stated that the hourly wage including fringe benefits was \$60. The FAA has revised the wage estimate because it appears that \$60 was an industry wage rather than the federal government wage. That is, because \$60 multiplied by 2,087 hours equals \$125,220, which is more than a GS-15 Step 10, the highest paid GS employee. The FAA has recalculated the wage rate of a GS-14 (Step 5) employee to be \$36.55 ($\$76,280/2,087$ hours = $\$36.55$) + 32.5 percent fringe benefits or \$48.43/hour in 1999 dollars. On a per application/license basis, the cost associated with cross-waivers will amount to about \$291 (multiplying 6 by \$48.43 [$\$36.55 \times 1.325$]). Based on the number of applications for licenses expected to be reviewed by the FAA over the next 5 years, the total cost of processing cross-waivers will be about \$8,150 (rounded up from \$8,136). The estimate of \$8,150 was derived by multiplying 168 hours by \$48.43.

⁶ This table was prepared using two assumptions. The first scenario represents what would take place under the rule. And under the last scenario, which represents the baseline, the FAA would not issue a license for reentry activity without an appropriate regulation (s) (including interim measures). While it is reasonable to assume that some of those financial responsibility requirements currently employed under launch would also be applicable for reentry, in the absence of the rule, it is uncertain, though, to what extent. If financial responsibility requirements were in place similar or identical to that for launch, it would more than likely be as an interim measure until a rule were promulgated.

C. Analysis 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 achieve in a worldwide position of leadership in commercial space flight. Specifically, the final rule will ensure that the United States reentry operators are not subject to a competitive trade disadvantage by their rivals abroad as a result of their inability to determine how much liability insurance to obtain 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 any damages 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 for risks resulting from their intended reentry activities and statutory risk sharing provisions whereby the U.S. government provides for up to \$1.9 billion (in 1999 dollars) above the insurance required consistent with this final rule. And last, the cross-waiver requirement will also generate potential cost-savings by likely mitigating or eliminating litigation costs among reentry participants.

V. 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 than 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 from the licensee for liability beyond MPL after 30 days, up to \$1.9 billion (as adjusted for inflation from January 1, 1989 to January 1, 1999). This cost-savings is estimated to be at least \$5,300 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 no 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 from industry

addressing this uncertainty issue pertaining to the potential cost of compliance.

VI. 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 American goods and services to foreign countries and barriers affecting the import of foreign goods and services into 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 are done in other countries around the world for launch operators who 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.