US Department
of Transportation

FEDERAL AVIATION
ADMINISTRATION
Washington, D.C. 20591

PRELIMINARY REGULATORY EVALUATION, INITIAL REGULATORY FLEXIBILITY ANALYSIS, AND TRADE IMPACT ASSESSMENT

National Air Tour Safety Standards

Proposed Rule
(14 CFR Parts 61, 91, 119, 121, 135 and 136)

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Revised September 2002

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Executive Summary

This preliminary regulatory evaluation estimates the benefits and costs of a Notice of Proposed Rulemaking (NPRM) to establish new national safety standards governing commercial air tours. Under current regulations, sightseeing operations that (1) begin and end at the same airport and (2) are conducted within a 25-statute-mile radius of that airport are excepted from the certification requirements of part 119 of Title 14 of the Code of Federal Regulations (CFR) and most of the operating requirements of 14 CFR parts 121 and 135 unless the operator is subject to the requirements of The National Parks Air Tour Management Act of 2000(Air Tour Act). The Air Tour Act required part 91 air tour operators conducting commercial air tour operations over national parks or tribal lands with certain exceptions to apply for certification under part 119. Currently, therefore, such operations are not subject to the same level of oversight as other types of commercial operations.

The proposal would amend 14 CFR to create a new part 136 and would amend parts 61, 91, 119, 121, and 135. Part 136, Subpart A entitled Commercial Air Tours would (1) provide definitions for air tour operations in the United States (other than those operating over National Parks); (2) restrict the exception for sightseeing flights under 14 CFR 119.1(e)(2), to those part 91 operators engaged in air tours or aircraft rides provided in conjunction with charitable or community events organized under state or Federal law, not to exceed 4 events per organization per year with each event lasting no longer than 3 days or one event lasting 3 days or fewer for a local community cause not covered by the preceding exceptions; (3)clarify compliance schedule for drug and alcohol testing, meeting the safety requirements in subparts Y of part 121 and K of part 135, and for helicopter floats retrofit; and (4) establish new air tour safety requirements (e.g., minimum flight altitudes, standoff distances, floats and life preservers). Part 61 would be amended to require a private pilot acting as pilot in command of a passenger-carrying aircraft used in a charity or community event to have at least 500 hours of flight time. Part 119 would also be amended to clarify operators or types of flights that are not air tours including introductory flights, aerobatics demonstrations or training flights, sales demonstrations, and certain other demonstration flights that are not sightseeing. Parts 121 and 135 would be amended to sunset the current sightseeing provision six months after the final rule is published.

The proposed amendments address safety concerns raised following a number of accidents and incidents involving air tour operations. Analyses of these accidents, conducted by the Federal Aviation Administration (FAA) and the National Transportation Safety Board (NTSB), indicate that the rule would yield significant safety benefits.

The FAA estimates that the rule would cost approximately $238 million ($148 million, discounted) over ten years, while accruing safety benefits valued at $490 million ($301 million, discounted) over the same period. The cost and benefit of this rule include operators subject to the provisions of the National Parks Air Tour Management Act of 2000 and thus are overstated. However, when these operators are identified through the implementation of the National Parks Air Tour Management rule the cost and benefit will be adjusted. The FAA also concludes that the proposed rule would have a significant economic impact on a substantial number of small entities. The rule is not expected to affect international trade, nor is it expected to impose an unfunded mandate exceeding $100 million annually on the private sector or state, local, and tribal governments.

Air Tour Safety Standards

Introduction

This preliminary regulatory evaluation estimates the benefits and costs of a Notice of Proposed Rulemaking (NPRM) to establish new national safety standards governing commercial air tours. Under current regulations (14 CFR 119.1(e)(2)), sightseeing operations that (1) begin and end at the same airport and (2) are conducted within a 25-statute-mile radius of that airport are excepted from the certification requirements of 14 CFR part 119 and most of the operating requirements of 14 CFR parts 121 and 135 unless they operate over National Parks or tribal lands. The National Parks Air Tour Management Act of 2000 required part 91 air tour operators conducting commercial air tour operations over units of the national park system or abutting tribal lands to apply for certification under part 119 with certain exceptions. Therefore, some part 91 air tours already are required to obtain a part 119 certificate.

The proposal would amend 14 CFR to create a new part 136 and would amend parts 61, 91, 119, 121, and 135. Part 136, Subpart A entitled Commercial Air Tours would (1) provide definitions for commercial air tours in the United States (other than those operating over National Parks); (2) restrict the exception for sightseeing flights under 14 CFR 119.1(e)(2), to those part 91 operators engaged in air tours or aircraft rides provided in conjunction with charitable or community events, organized under state or Federal law, not to exceed 4 events per organization per year with each event lasting no longer than 3 days or one event lasting 3 days or fewer for a local community cause not covered by the preceding exceptions ; (3) clarify the compliance schedule for drug and alcohol testing, meeting the safety requirements in new subparts Y of part 121 and K of part 135, and for helicopter floats retrofit; and (4) establish new air tour safety requirements (e.g., minimum flight altitudes, standoff distances, floats and life preservers). Part 61 would be amended to require a private pilot acting as pilot in command of a passenger-carrying aircraft used in a charity or community event to have at least 500 hours of flight time. Part 119 would be amended to clarify operators or types of flights that are not air tours including introductory flights, aerobatics demonstrations or training flights, sales demonstrations, and certain other demonstration

flights that are not sightseeing. Parts 121 and 135 would be amended to sunset the current sightseeing provision 6 months after the final rule is published.

The proposed amendments address safety concerns that have been raised as a result of a number of accidents and incidents involving air tour operations. Analyses of these accidents, conducted by the Federal Aviation Administration (FAA) and the National Transportation Safety Board (NTSB), indicate that the rule would yield significant safety benefits.

I. Background

I.A. Industry Description

While some sources use the term "air tour" generically in reference to the entire air tour and sightseeing industry, this regulatory evaluation distinguishes commercial air tours conducted under 14 CFR part 121/135 flight rules from sightseeing flights conducted under 14 CFR part 91. Sightseeing flights are often short airplane or helicopter rides, frequently lasting just 10 or 15 minutes. Typical of this type of operation are rides at state fairs and airshows. Part 121/135 air tours, on the other hand, are usually of longer duration and frequently involve scenic points of interest. Air tour operators are typically more sophisticated entities than those providing part 91 sightseeing tours.[1]

Both air tour and sightseeing flights are typically conducted by one pilot who also provides narration. Most of these operations use small (fewer than 10-passenger) piston-engined airplanes or helicopters in visual meteorological conditions, normally without radar coverage or traffic advisories from an air traffic control facility.[2]

Under current Federal Aviation Regulations, air tours can be conducted under 14 CFR parts 91, 135, or 121. Part 91 sightseeing trips are confined to an area within 25 miles of the departure point and cannot include interim stops. Air tours conducted under parts 135 or 121 do not have such limitations but incur higher operating costs associated with more stringent personnel, equipment, and maintenance requirements. Currently, the same entity may conduct some tours under part 91 and others under part 135. Also, in certain parts of the U.S., additional regulations or restrictions apply to air tours and sightseeing flights regardless of the operator's certification status.

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[1] *Estimates of the Sightseeing Air Tour Industry*, GRA, Inc., January 16, 1998. Beginning in 1995, FAA *General Aviation and Air Taxi Activity and Avionics Survey* also makes a distinction between part 135 air tour operations and part 91 sightseeing operations.

[2] Airplanes accounted for approximately 56 percent of total air tour and sightseeing flight hours in 1998; helicopters accounted for about 33 percent of flight hours. U.S. Department of Transportation, Federal Aviation Administration, 1998 *General Aviation Air Taxi Activity and Avionics Survey*, July 2000 Table 3.2

The data suggest that air tours are conducted throughout the country, but part 121/135 air tour operations are concentrated in a few regions, including Hawaii, Alaska, and the Grand Canyon National Park in Arizona. While part 91 sightseeing operators are less concentrated, activity is most common in Hawaii and Florida.

The distinction between 14 CFR parts 91 and 121/135 is not clear to many potential air tour customers. Some customers mistakenly believe that all air tours are conducted under commercial operations regulations. The NTSB has concluded that "the public assumes that an operator offering commercial service, such as an air tour or scenic flight for revenue, is regulated and surveilled to a level of safety higher than that applied to a general aviation operator. The NTSB also believes that the higher level of safety is consistent with operations covered by the provisions of 14 CFR Part 135."[3]

I.B. Regulatory and Legislative History

Most air tour flights are conducted under 14 CFR part 135. Paragraph 119.1(e)(2) of the CFR excepts certain nonstop sightseeing flights from most part 119 certification requirements and the requirements for part 121 and part 135 operations. As noted above, in order to qualify for the exception, such flights must begin and end at the same airport and be conducted within a 25-statute-mile radius of the airport. These exceptions originated with Civil Aeronautics Regulations adopted in the 1950s.

However, as a result of safety concerns that have emerged with the growth of the air tour industry, the FAA has issued Special Federal Aviation Regulations (SFAR) governing air tour operations in Hawaii and Grand Canyon National Park. Also, Canadian air tour regulations have been extended to U.S. air tour operators flying into Canadian airspace over Niagara Falls. These special regulations are described below.

State of Hawaii (SFAR No. 71, 59 FR 49145 published September 26, 1994 and amended at 60 FR 65913; December 20, 1995 and extended to

[3] National Transportation Safety Board, *Special Investigation Report: Safety of the Air Tour Industry in the United States*, NTSB/SIR-95-01, Adopted June 1, 1995, p 18.

October 26, 2003 at 65 FR 58610; September 29, 2000). SFAR 71--Special Operating Rules for Air Tour Operators in the State of Hawaii--contains operational limitations, procedural requirements, and equipment requirements for air tour and sightseeing operators in Hawaii. For example, helicopter air tour flights beyond the shore of any island are prohibited unless the aircraft is equipped with floats or occupants are wearing life preservers. The regulation also requires pilots to brief passengers on emergency egress and establishes altitude minimums for all air tour flights.

Grand Canyon National Park (SFAR 50-2 and subpart U of part 93; 61 FR 69302, December 31, 1996. SFAR 50-2 and subpart U of part 93 were last amended on March 26, 2001, 66 FR 16582.) In addition to establishing a Grand Canyon National Park Special Flight Rules Area and limiting or prohibiting aircraft operations in certain zones of the Park airspace, these regulations prohibit air tour operations in the vicinity of the Park unless they are conducted under part 121 or part 135 flight rules.

Niagara Falls. In response to a fatal midair collision between air tour helicopters (one American and one Canadian), the Transportation Safety Board of Canada recommended that American air tour companies operating in Canadian airspace over Niagara Falls comply with 14 CFR part 135. Transport Canada subsequently adopted this regulation. (All Canadian air tour operators, regardless of the trip distance, are governed by regulations equivalent to 14 CFR part 135.)

Legislative Action

On April 5, 2000, Congress enacted the National Parks Air Tour Management Act of 2000 as Title 8 of Public Law 106-181. The Act applies to "commercial air tour operations" occurring over a unit of the national park system or tribal lands within or abutting a national park. Section 803(a) of the Act which has been codified as Section 40128(a)(4) of Title 49 of the U.S. Code requires that commercial air tour operators conducting commercial air tour operations under Part 91 apply for operating authority under Parts 119, 121, or 135. However, paragraph (a)(3) allows operators to continue operating over parks under Part 91

if such activity is permitted under Part 119, and the operator secures a letter from the Administrator and the national park superintendent for that particular park. The total number of all operations under this exception is limited to not more than 5 flights in any 30-day period.

The FAA is in the process of codifying the legislation as a new part of its regulations. Once this rule is implemented operators subject to its provisions (and which are presently included in this proposed rule) will be identified and the cost and benefit attributable to these operators will be deducted from the cost and benefit of this proposed rule before a final rule is adopted.

I.C. General Assumptions

Throughout the following analysis of benefits and costs, the FAA employs the following general assumptions:

- costs and benefits are estimated in 2001 dollars;
- total costs and benefits are estimated over a ten-year period;
- discounted costs and benefits are calculated using a seven percent discount rate;
- the number of air tour operations is assumed to remain constant absent the rule;
- sightseeing operations as a proportion of all air tour and sightseeing operations is assumed to remain constant;
- "marginal" part 91 operators are those providing fewer than ten hours of sightseeing flights annually; and
- the word "conservative," used to describe some of FAA's estimates or assumptions, means that the FAA believes its cost estimate is higher than the actual number.

II. Analysis of Costs

The costs of this proposed rule fall into two categories: (1) those requiring current part 91 operators who fly under the 119.1(e)(2) exception to obtain part 119 certificates unless those flights qualify as charitable or community event flights and (2) those associated with the proposed provisions of part 136. The following analysis describes the estimated costs that would be incurred by operators currently conducting air tours or sightseeing flights under parts 91 or 121/135.

Costs are derived, in part, from air tour data compiled by GRA, Inc., in *Estimates of the Sightseeing Air Tour Industry* (January 1998) and summarized in Appendix A of this regulatory evaluation.

II.A. Costs of Restricting the Exception Under 14 CFR 119.1(e)(2)

The requirement that all air tour operations be conducted under air carrier flight rules would affect both part 91 and part 121/135 entities. The rule would require part 91 operators to apply for an air carrier certificate, except for those part 91 operators engaged in air tours or aircraft rides provided in conjunction with charitable or community events organized under state or Federal law, not to exceed 4 events per organization per year with each event lasting no longer than 3 days or one event lasting 3 days or fewer for a local community cause not covered by the preceding exceptions or those part 91 operators authorized to provide not more than 5 flights in any 30-day period over a national park. Some part 121/135 operators would also be affected because they conduct sightseeing flights under part 91 flight rules.

II.A.1. Costs to Part 91 Sightseeing Operators

Costs associated with the restriction of the part 119 exception include lost revenues to those part 91 operators who elect to exit the tour business (in lieu of part 135 certification) and, to those who do obtain part 135 certificates, the costs of certification and additional operating requirements under part 135. The FAA expects that part 91 sightseeing operators would take one of three options following issuance of the rule: exit the sightseeing industry; become certificated under part 135 and choose to operate with only one pilot (thereby reducing regulatory requirements); or become certificated under part 135 and operate with more than one pilot (incurring all regulatory requirements under part 135)[4].

The FAA estimates there are a total of 1,672 operators who conduct operations under part 91, pursuant to the exception at 119.1(e)(2). These operators use a total of 3,100 aircraft. A portion of these operators conduct flights over national parks and they are already required to be certificated under part 91. Approximately 41 percent of these operators conduct air tours less than 10 hours a year. These would likely exit the industry. Approximately 57 percent are one pilot operations, and would likely convert their operations to part 135 operations as one pilot operators. Approximately 2 percent would convert to part 135 operations with more than one pilot.

The FAA assumes that operators whose aircraft provide fewer than ten hours of sightseeing flights annually would choose to exit the industry. For most of these "marginal" sightseeing operators, the costs of becoming certificated and operating under parts 121 or 135 would exceed their air tour revenues. Based on data derived in Appendix A, the FAA estimates that 689 part 91 operators would exit the industry and would incur a loss of revenue as a result (assuming they could not make up the lost revenue in other business areas).[5]

The FAA expects that a majority of part 91 sightseeing operators would obtain a part 135 operating certificate and operate with one pilot. The

[4] The FAA assumes that these part 91 operators will convert to part 135 rather than part 121.

[5] The FAA believes that this is a very conservative assumption and that most of the "marginal" sightseeing operators would make up for the revenue loss in other business areas.

available data suggest that many current part 91 operators are already single-pilot entities. In cases where the operator has two or more pilots, the FAA expects the entity to scale back operations to a single pilot. The FAA estimates that 951 part 91 operators would operate with one pilot under part 135.

The FAA estimates that only about 32 existing part 91 operators would obtain part 135 certificates and operate with more than one pilot. For an operator planning to employ more than one pilot, part 135 certification would likely require a scaling up of operations because a typical part 91 sightseeing operation would not be profitable under part 135. Part 91 air tour fleet estimates are summarized in Table II.1.

Table II.1.--
Current and Post-Rule Part 91 Air Tour Fleet Estimates

	Current Total	Exit air tour business	Obtain pt 135 certificate (1 pilot)	Obtain pt 135 certificate (>1 pilot)
Operators	1,672	689	951	32
Aircraft	3,100	1,033	1,809	258

Source: Appendix A, Table A.6

Of the 983 part 91 operators who will remain in business, a certain portion of them would qualify for the charity and community event or national park overflight exceptions from being certificated as part 135. Data are not available to estimate the number of operators that would be affected. The exceptions are limited to occasional operations while participating in charitable or special community events, or fly over a national park where not more than 5 air tour flights are flown in any 30-day period and would not be business operations. Accordingly, the FAA concludes that these exceptions would have no economic impact on any operations. The FAA requests comments on this conclusion.

Revenue Losses to Marginal Part 91 Sightseeing Operators

Faced with a requirement to obtain a part 135 certificate, some part 91 operators would choose to exit the sightseeing business. The FAA predicts that the 689 "marginal" sightseeing operators would conclude

that their sightseeing revenues do not justify the increased costs associated with part 135 operations. For the purpose of this analysis, the FAA assumes that operators who exit the business will incur revenue losses (although, given the low level of sightseeing revenue for most of these operators, many could make up for the loss of sightseeing revenue in other business areas). Table II.2, below, shows the estimated net revenue loss per year to part 91 operators who exit the sightseeing business. Based on estimates of net revenue per flight hour of $111 and annual flight hours of 4,269, the FAA estimates that operators exiting the industry would incur net revenue losses of approximately $474,000 annually.

Table II.2: Annual Net Revenue Losses to Part 91 Operators Exiting the Sightseeing Business

Marginal Operators	689
Affected Aircraft	1,033
Revenue per Sightseeing Flight Hour	$427
Variable Cost per Flight Hour[6]	$316
Net Revenue per Flight Hour[7]	$111
Total Flight Hours	4,269
Net Revenue Loss per Year (rounded)	$473,900

Source: Appendix A, Table A.6

Revenue Losses and Costs to Part 91 Operators Obtaining Part 135 Operating Certificates

The FAA assumes that 983 part 91 sightseeing operators would obtain part 135 operating certificates. The FAA further assumes that most of these--an estimated 951 operators, each with five or fewer aircraft--would choose to operate under part 135 with only one pilot. One-pilot

[6] See: *Economic Values for Evaluation of Federal Aviation Administration Investment and Regulatory Programs*, U.S. Department of Transportation, FAA, Report FAA-APO-98-8, June 1998. Table 4-6 "Estimated General Aviation and Air Taxi Operating and Fixed Costs-Weighted by Hours-All Hours" Variable operating costs (Including Crew)- All Aircraft. The values given in the table were inflated to 2001 dollars using the GDP deflator.

[7] Net revenue per flight hour is measured as the difference between total revenue per flight hour minus variable operating costs per flight hour.

operations are excepted from certain regulatory requirements, thereby minimizing the regulatory costs of part 135 operations. The remaining 32 operators--each with more than five aircraft--are assumed to obtain part 135 certificates and operate with more than one pilot, incurring higher regulatory costs than the one-pilot operators. The FAA requests comments on the assumption that five or fewer aircraft is the appropriate threshold for an operator not to seek part 135 certification. The following sections describe the incremental costs associated with part 135 certification and operation (including associated revenue losses).

Revenue Losses to Part 91 Operators Scaling Back to One-Pilot Operations under Part 135

Of the 951 operators that the FAA assumes would operate with one pilot under part 135, some would have to scale back operations to operate with one pilot. The extent of the scale-back and associated revenue loss is assumed to be a function of the operator's fleet size. The FAA assumes that operators with a single aircraft would not need to scale back operations. Those with more than one aircraft are assumed to incur net revenue losses equal to: one-half of the revenues of the second airplane, two-thirds of the revenues of the third airplane, three-fourths of the revenues of the fourth airplane, etc. These revenue losses are based on the assumptions that the pilots in question fly air tour flights only part of the time and that air tour flights are evenly distributed through out the day. Thus, if an operator cuts back to only one pilot doing air tours, that pilot would be able to pick up only 1/2 of another pilot's air tour flights; that only 1/3 of a third pilot's air tour flights could be covered, etc. The FAA seeks comments on these assumptions. Operators with more than five air tour aircraft would, by assumption, operate with more than one pilot and meet all relevant part 135 requirements. The FAA believes that this is a conservative assumption. In some cases, for example, two-aircraft operations are actually single-pilot operations. Also, given that 89 percent of part 91 sightseeing aircraft are estimated to log fewer than 50 sightseeing hours per year (Appendix A, Table A.8), many operators should be able to adjust flying schedules to minimize revenue losses.

Table II.3 summarizes the estimated revenue losses according to fleet size. Based on available data, the FAA estimates that average revenue

per aircraft per hour is $575 and that average variable operating cost is $316 per hour. Subtracting average hourly operating cost from average hourly revenue, the FAA estimates that average net revenue per hour is about $259 per aircraft. The FAA also estimates that each aircraft conducts an average of 50 hours of sightseeing flights per year. Based on these estimates, the 951 operators could experience total revenue losses of $6.7 million annually after scaling back operations.

Table II.3.--Estimated Annual Revenue Losses to Part 91 Entities Converting to Single-Pilot Part 135 Operations

Fleet Size	Number of Entities	Net Revenue per Operator Before Rule	Net Revenue per Operator After Rule	Ave. Annual Loss Per Operator	Total Revenue Loss per Year
1	515	$12,950	$12,950	$0	$0
2	202	$25,900	$19,425	$6,475	$1,307,950
3	125	$38,850	$23,699	$15,152	$1,893,938
4	31	$51,800	$26,936	$24,864	$770,784
5	78	$64,750	$29,526	$35,224	$2,747,472
Total(rounded)	951				$6,720,100

Source: fleet distribution from Appendix A, Table A.9

Costs to Part 91 Operators of Obtaining and Operating with a Part 135 Operating Certificate

The proposed rule would require that most entities providing air tours possess an air carrier certificate or operating certificate under part 119. The certification process, which takes from three months to a year, is designed to ensure that prospective certificate holders understand and are capable of fulfilling the responsibilities associated with the conduct of air carrier operations. The certification process includes five phases:

Preapplication phase. In this phase, the prospective certificate holder informs the FAA of the intent to apply for an Air Carrier Certificate.

Subsequently, the applicant meets with FAA personnel to review basic certification requirements. If the applicant decides to proceed with the application process, the next step is completing FAA Form 8400-6, Preapplication Statement of Interest (PASI). Once the PASI is correctly completed, the FAA assigns a FSDO to oversee the certification process. The FSDO designates an inspector as the certification project manager (CPM) and arranges for a preapplication meeting between the applicant and FAA management personnel. The purpose of the meeting is to discuss the formal application process.

Formal application phase. Formal application is made by a letter requesting certification as an air carrier or commercial operator under part 119. Several documents must be submitted with the formal application letter:

- Schedule of Events: list of activities, programs, and aircraft or facility acquisitions that must be accomplished or made ready for FAA inspection before certification

- Company General Manuals: commonly referred to as the General Operations Manual and the General Maintenance Manual, and includes information about the applicant's general policies, duties, personnel responsibilities, operational control policy, and procedures

- Initial Company Training Curriculum: includes at least (a) basic indoctrination training, (b) emergency training, (c) initial aircraft ground training, and (d) initial aircraft flight training

- Management Résumés: includes qualifications, certificates, ratings, and aviation experience for the (a) general manager, (b) director of operations, (c) director of maintenance, (d) chief pilot, and (e) chief inspector

- Documentation of purchases, leases, contracts, and/or letters of intent: includes evidence that the applicant has, or is in the process of acquiring, the facilities and services required to conduct the type of operation proposed

Document compliance phase. After the formal application has been submitted, FAA inspectors thoroughly evaluate all manuals and other documents. Typically, these evaluations uncover deficiencies that are identified to the applicant for correction.

Demonstration and inspection phase. This phase would include actual performance of activities and/or operations under FAA observation. This includes onsite evaluations of aircraft maintenance equipment and support facilities. During these demonstrations and inspections, the FAA evaluates the effectiveness of the policies, methods, procedures, and instructions as described in the applicant's manuals.

Certification phase. Once the document compliance and demonstration and inspection phases are satisfactorily completed, the CPM prepares an air carrier certificate and approves operations specifications ("op specs"). The op specs contain authorizations, limitations, and provisions specific to the applicant's operation.

Administrative Costs (14 CFR part 119)

Time Out of Air Tour Revenue Service. The certification process typically takes between three months and one year. The FAA would require all affected part 91 sightseeing operators to complete their part 119 certificate application within 6 months. The operators would convert over to 135 operations as the FAA completed their applications.

Application Workhours. The FAA assumes in this analysis that affected part 91 operators would contract out most of the initial paperwork associated with the certification application process. However, the certification process also involves meetings with FAA inspectors. In addition to the preapplication meeting, an applicant would attend three or four meetings, totaling about 30 hours on average, with the FAA certification team.[8] The total number of work hours required for a given operator depends on the size of the entity. Small operations may require the participation of a single person; very large operations may require the participation of three or more company employees. This

[8] This estimate is based on estimates provided by consultants who specialize in assisting operators obtain part 135 operating certificates.

regulatory evaluation estimates that an average of two employees would be required.

Total costs are estimated in Table II.4. The FAA estimates that the 983 operators applying for part 135 certification would incur labor costs of approximately $1.7 million during the certification process.

Table II.4.--Estimated Certification Application Labor Hours

Number of Operators	983
Number of Employees	2
Total Employees	1,966
Hours/per Employee	30
Total Hours	58,980
Cost per Hour[9]	$29.10
Total Cost(rounded)	$1,716,300

Document Preparation. Although some operators may be able to prepare the necessary certification documents themselves, the FAA assumes in this analysis that document preparation will be contracted out. The complexity of manuals and other documents depends on the scale of the operation. Operators with one pilot do not have to submit management résumés or training programs, for example. The following paragraphs describe the types of documents required for specific types of operations.

- *Letter of compliance*. This document describes how the applicant would comply with the relevant Federal Aviation Regulations. Based on FAA discussions with industry, costs for preparing this document range from $430 to $5,360. For the purpose of this analysis, the FAA assumes a per entity

[9] Hourly compensation is estimated as total annual compensation divided by total annual work hours (based on a 40-hour work week and 52 weeks per year). Annual total compensation per person is estimated as the median compensation for a chief pilot of a 1-2 person department, approximately $56,390 (source: 1996 *National Business Aircraft Association Salary Survey*)adjusted to $60,518 using the 2001 GDP deflator. The FAA has assumed all the certification work would be performed by the Chief Pilot, although some of this work could be performed by clerical staff, in order to avoid underestimating the costs of this proposed rule.

cost of $430. The FAA requests comments on this assumption and requests that comments be accompanied with clear and detailed supporting economic documentation.

- *Management personnel résumés*. The FAA concludes that these documents are typically available for all affected personnel. Costs are assumed to be negligible.

- *General operations manual*. This document is not required for part 135 certificate holders with one pilot. For operators with more than one pilot, one manual would be required per aircraft type. According to industry, the first manual can be prepared for about $430, and subsequent manuals are generally slightly cheaper. The FAA assumes an average of three aircraft types per affected operator.

- *General maintenance manual*. This manual is not required for aircraft seating fewer than 10 passengers. The FAA predicts that almost all aircraft affected by the proposed rule will have fewer than 10 passenger seats and, therefore, has not included the costs of a general maintenance manual.

- *Minimum equipment list (MEL)*. The MEL can be prepared for approximately $430 per affected aircraft type. The FAA assumes two aircraft types per affected one-pilot entity and three types per part 135 entity with more than one pilot.[10]

- *Aircraft maintenance manuals/programs*. The FAA assumes that the operator will use the manufacturer's progressive maintenance manual or approved aircraft inspection manual. Therefore, the FAA has not included any additional costs associated with maintenance manuals.

- *Aircraft flight manual*. The FAA assumes that the operator will use the manufacturer's aircraft flight manual.

[10] The FAA has included the costs of MEL preparation to avoid underestimating the costs of this proposed rule. It is likely, however, that operating with a MEL will result in a net cost savings to most certificate holders.

Accordingly, the FAA has included no additional costs associated with flight manuals.

- *Passenger briefing cards*. According to industry sources, a standard quantity of 500 to 1000 cards can be purchased for about $540.

- *Hazardous materials/security program*. The FAA assumes that affected part 91 air tour operators will not carry hazardous materials. Although operators who do not carry hazardous materials still must comply with the hazardous materials recognition requirements, compliance is much simpler than for those operators carrying hazardous materials. The cost of developing a program has been included as part of the cost of the Letter of Compliance.

The costs of document preparation are summarized in Table II.5. In total, the FAA estimates that document preparation costs would equal $1.85 million during the certification process.

Table II.5.--Document Preparation Costs

	1 Pilot	>1 Pilot
Compliance Letter	$ 408,930	$13,760
Management Résumés	0	0
Gen. Ops. Manual	0	$41,280
Gen. Maint. Manual	0	0
Mini. Equip. List	$ 817,860	$41,280
AC maint. program	0	0
Aircraft Flight Manual	0	0
Pax Brief Cards	$ 513,540	$17,280
Total	$1,740,330	$113,600

Management Personnel Requirements (14 CFR §119.69-71)

As noted earlier, the FAA estimates that about 32 of 1,700 affected part 91 sightseeing operators would obtain part 135 certificate and operate with more than one pilot. These operators would be required to have a

chief pilot, a director of operations, and a director of maintenance. The FAA assumes that the proposed rule would not affect the net employment of affected entities (i.e., operators could hire three qualified individuals to replace employees who serve similar functions but do not meet the management qualifications). Costs are measured as the estimated difference in compensation between management-qualified personnel and non-qualified personnel--approximately $21,400 per year for each position, or a total of $2.05 million annually for all affected entities. Costs are summarized below in Table II.6.

Table II.6.--Incremental Management Costs for New Part 135 Operators With More Than One Pilot

Compensation Differential:	
Chief Pilot	$21,400
Director of Operations	$21,400
Director of Maintenance	$21,400
Cost per operator per year	$64,200
Number of Operators	32
Total Cost per Year	$2,054,400

Insurance Costs

The FAA assumes that there are no incremental insurance costs associated with the proposed amendments. Insurance carriers report that insurance costs for part 135 operators are between 30 percent and 100 percent higher than for part 91 entities on a per-aircraft basis. While this difference in insurance costs roughly tracks the difference in replacement costs of the aircraft used by part 91 operators as opposed to the larger, more expensive aircraft typically used by part 135 operators, a number of other factors are involved. Currently, there is a significant difference in the types of air tour operations permitted under 14 CFR parts 91 and 135. The differences in insurance costs reflect actual differences in insurance risks (in terms of passenger liability claims since part 135 air tour flights typically have six or more paying passengers, with a higher claim pay out in the event of an accident than a part 91 air tour) between the types of operations. In principle, an operator who converts to part 135 as a result of the

proposed rule but does not change the nature of his operations would experience no difference in liability and, therefore, no difference in insurance costs (in fact, in the long run the proposed regulations could result in lower insurance costs to small air tour operators). Limitations on the types of operations could be explicitly written into the operator's insurance policy, regardless of the types of operations that are legally possible under part 135. The FAA invites comments on these assumptions regarding insurance costs and risks and requests that comments be accompanied with clear and detailed supporting economic documentation.

Crewmember Flight and Duty Time (14 CFR 135.267, 135.273)

The FAA concludes that flight and duty limitations would not result in additional costs to affected part 91 sightseeing entities. This analysis is based on an assumption that most of the part 91 operators who convert to part 135 would operate with one pilot. The cost of scaling back operations to one pilot, where necessary, is already accounted for in this analysis. The FAA concludes that the revenue-loss estimate from the scale-back is very conservative and that it is unlikely that flight and duty restrictions would force a further scale-back beyond that already assumed. This combined with the fact that most part 91 air tour operators fly a small number of sightseeing flights per year (50 hours annually for core operators), implies that part 135 flight and duty limits will not be a constraint for most entities.

Training and Competency Checks

The FAA assumes that one pilot from each affected single-pilot entity and five pilots from all other part 135 entities would require a competency flight check and oral examination annually (assuming that all affected operations take place under visual flight rules). The part 135 check ride and examination would each require approximately two hours per year. Part 91 pilots already undergo a flight review every two years (including a flight check and oral examination that each require approximately two hours). Therefore, the incremental impact of converting to part 135 is approximately one additional hour for the check ride and one additional hour for the examination per year. Annual proficiency check costs are summarized in Table II.7. The FAA estimates that the average annual cost per operator for these checks ranges

between $345 (for single-pilot entities) and $1,725 (for operators with multiple pilots). In total, operators would incur costs of approximately $399,500 annually from this provision.

Table II.7.--Pilot Proficiency Check Costs
For Part 135 Operators

	1 Pilot	>1 Pilot	Total
Incremental Checkride Costs			
Variable Operating Cost/hr	$ 316	$ 316	n/a
Number of Operators	951	32	983
Pilots/hrs per Operator	1	5	n/a
Total annual cost	$300,516	$50,560	$351,076
Incremental Exam Costs			
Add'l Annual Pilot Exam Hrs	1	5	n/a
Total annual cost @ $43.65/hr*	$ 41,511	$6,984	$ 48,495
Total annual cost for checkride and exam (rounded)	$342,000	$57,500	$399,500

Based on pilot hourly salary of $29.10 plus 50% override for associated costs.

Hazardous Materials Training

Part 135 operators are required to develop and implement a hazardous materials training program, whether or not they intend to carry hazardous materials. The cost of documenting the training program is included in the administrative costs described earlier. The FAA assumes that one person per single-pilot operator and five people from each operator with multiple pilots would require hazardous materials training. In some cases, such courses are offered by maintenance facilities free of charge to their clients. Also, some consultants offer home study courses. For the purpose of this analysis, the FAA assumes that each person would receive eight hours of training at the average hourly wage rate. As shown in Table II.8, the FAA estimates

that operators, in total, would incur annual training costs of approximately $388,000.

Table II.8.--Annual Hazardous Material Training Costs For Part 135 Entities

	1-Pilot	>1 Pilot	Total
Number of Operators	951	32	983
Annual Hazmat Training Hrs/Entity	8	40	n/a
Total Hours	7,608	1,280	8,888
Total Annual Cost @ $43.65 per hour* (rounded)	$332,100	$55,900	$388,000

Based on pilot hourly salary of $29.10 plus a 50% override for associated costs.

Maintenance Costs

The incremental maintenance costs for operators converting to part 135 are difficult to quantify because there are few reporting requirements for part 91 operators and little systematic surveillance. Part 91 operating and maintenance practices vary significantly between operators. Many part 91 helicopter operators, for example, report that they already follow the manufacturer's recommended aircraft maintenance and inspection programs. FSDOs and helicopter repair firms similarly report that, in general, the difference between maintenance/overhaul cycles for part 91 and part 135 operators is minimal. This is particularly true of critical parts that have life limits and engine components that have set intervals between overhauls.

In the case of airplanes, some operators report that part 135 maintenance requirements may result in higher costs than part 91 operations. It is likely that some part 91 sightseeing operators fly longer between engine overhauls than allowed under part 135. In general, it is also likely that part 91 operations involve a lower general level of maintenance because they are not surveilled by FAA inspectors. The extent of these practices is not clear, however, and as in the case of helicopters, some part 91 airplane sightseeing operators already maintain their airplane to part 135 standards.

For the purpose of this analysis, the FAA assumes that the engine and propeller could be overhauled every 2,400 hours, on average, under part 91. Under part 135, engine-propeller overhaul would be required once every 2,000 hours, on average. The average engine-propeller overhaul cost for a twin-engine piston airplane is approximately $43,000, or $21,500 per engine-prop. Therefore, overhaul costs would rise from approximately $18 per flight hour ($43,000 ÷ 2,400) to $21.50 per flight hour ($43,000 ÷ 2,000), a difference of $3.50.[11]

Part 135 also requires a 100-hour maintenance check costing approximately $2,150, or $21.50 per flight hour on average.[12] Part 91 requires an equivalent 100-hour maintenance check for aircraft carrying any person for hire; therefore, incremental inspection costs are assumed to be zero.

The FAA estimates, therefore, that per-hour maintenance costs will increase by approximately $3.50 per flight hour for airplanes. Additional maintenance costs for the affected part 91 sightseeing fleet can be determined by multiplying $3.50 by the number of annual flight hours (all flight hours, not only air tour flight hours) for the affected part 91 airplane fleet.

Based on available data, the FAA estimates that airplanes averaging 50 air tour hours per year average approximately 370 total flight hours annually (Appendix A, Table A.7). Accordingly, estimated costs are based on maintenance cycles that assume 370 flight hours per year. Table II.9 shows the increased maintenance costs for the 2,067 aircraft in the core part 91 fleet. In total, the FAA estimates increased maintenance costs of approximately $2.7 million annually for those part

[11] This is a conservative estimate. Depending on the operating conditions, operators who overhaul at 2,500 hours may do a "top-overhaul" at 2,000 hours at which time only the cylinder heads are overhauled. (The cost per cylinder is about $540.)

[12] Part 91 and part 135 100-hour maintenance checks require from 16-18 hours for single-engine fixed gear airplanes to 24-26 hours for multi-engine retractable gear airplanes. These figures include the time required to inspect the airplane, search the relevant airworthiness directives and service bulletins, run up the engines, etc. Required work hours also vary depending on the degree to which the mechanic is familiar with a specific airplane and the amount of repair work.

91 operators becoming certificated under part 135 of which $2.3 million would be incurred by single pilot operators.

Table II.9.--Incremental Part 135 Maintenance Costs
For the Affected Part 91 Air Tour Fleet

Number of aircraft affected	2,067
Avg annual flt hours per operator	370
Total annual flt hrs	764,790
Incremental cost/hour	$3.50
Total annual cost	$2,676,765

Miscellaneous Costs

Additional Recordkeeping Requirements

Part 91 sightseeing operators who convert to part 135 would incur some additional recordkeeping costs. These requirements include: (1) general recordkeeping requirements (§135.63), (2) reporting of mechanical irregularities (§135.65, §135.415, §135.417), (3) reporting of potentially hazardous meteorological conditions (§135.67), flight locating (§135.79), and (4) informing personnel of operational information (§135.81). Based on discussions with existing part 135 air tour operators, the FAA estimates that the rule would require an additional 20 hours per year per single-pilot operator and about 100 hours per year for operators with more than one pilot. As shown in Table II.10, the FAA estimates that the converted part 91 operators, in total, would incur annual costs of approximately $647,000.

Table II.10.--Recordkeeping Costs for Affected Part 91 Entities

	1 Pilot	>1 Pilot	Total
Operators	951	32	983
Average annual hours per operator	20	100	n/a
Total annual hours	19,020	3,200	22,220
Total annual cost @ $29.10 per hour (rounded)	$ 553,500	$ 93,100	$646,600

Summary of Costs to Part 91 Operators of Restricting the Part 119 Exception

Table II.11 summarizes the total first-year costs to part 91 entities of restricting the exception that has allowed them to conduct sightseeing flights within 25 miles of the airport. The FAA estimates that part 91 entities converting to part 135 would incur first-year costs totaling approximately $16.9 million. Part 91 operators who choose to operate under part 135 with only one pilot would incur costs of $13.7 million or approximately $14,400 per operator while the part 91 operators who elect to operate with more than one pilot would incur costs of $2.8 million or approximately $86,400 per operator. In subsequent years, costs to part 91 operators who obtain part 135 operating certificates are estimated to decrease to $13.4 million annually. Part 91 operators who choose to withdraw from the air tour business would experience net revenue losses of $474,000 thus raising the total initial cost of restricting the part 119 exception to $16.9 million.

Table II.11--Annual (First-Year) Costs to Part 91 Entities
By Cost Element

	Part 91 Marginal (Exit)[1]	Part 91 1 Pilot (Convert to Part 135)	Part 91 > 1Pilot (Convert to Part 135)	Part 91 Total
Net Revenue Losses	$ 473,900	$6,720,100	$0	$7,194,000
Administrative	$ 0	$3,400,760	$169,470	$3,570,230
Management	$ 0	0	$ 2,054,400	$ 2,054,400
Insurance	$ 0		$ 0	$ 0
Flight/Duty	$ 0		$ 0	$ 0
Training: Checkrides	$ 0	$342,000	$57,500	$399,500
Training: Hazmat	$ 0	$332,100	$55,900	$388,000
Maintenance	$ 0	$2,342,655	$334,110	$ 2,676,765
Recordkeeping	$ 0	$553,500	$93,100	$646,600
Total	$ 473,900	$13,691,115	$2,764,480	$16,929,495

1 For the purpose of this analysis, the FAA assumes that operators who exit the business will incur revenue losses (although, given the low level of sightseeing revenue for most of these operators, many could make up for the loss of sightseeing revenue in other business areas).

II.A.2. Costs to Part 135 Entities Conducting Part 91 Sightseeing Flights

For several reasons, some part 135 air tour operators currently conduct sightseeing flights under part 91 flight rules. First, lesser qualified (and presumably less costly) pilots can be employed on part 91 flights. Second, the current regulations permit operators to reduce regulatory costs by dividing their pilots between part 135 and part 91 operations. Third, operators may divide their aircraft fleets along similar lines, applying part 135 maintenance standards, for example, only to certain aircraft.

The proposed amendments remove part of the incentive to maintain mixed fleets for air tours. In the absence of a detailed survey of affected part 135 entities, however, it is virtually impossible to estimate the total cost impact. The decision on how to mix part 135 and part 91 air tour operations depends as much on an operator's other lines of business as on the demand for air tours. If part 91 sightseeing flights constitute a core source of revenue, it is likely that the operator would convert to part 135. If, on the other hand, sightseeing is a marginal business, the operator would be more inclined to scale back air tour operations.

Data are insufficient to quantify the effects of the proposed rule on entities that conduct both part 135 air tour and part 91 sightseeing flights. The FAA postulates that the benefit-cost ratio for this group would be about equal to that for part 91 operators. This assumes that a part 135 operator conducting part 91 operations would act like a part 91 operator when conducting those part 91 operations. To the extent that a part 135 operator would act like a part 135 operator while conducting part 91 operations then the benefit-cost ratio is over-estimated. For a given operator, relative benefits and costs depend on the proportion of part 91 air tour operations: the lower the part 91 activity, the lower the costs and benefits.

II.B. Costs Associated with Proposed Amendments to Part 136

In addition to the existing part 135 requirements described in the previous section, the proposal would impose additional requirements on air tour operations under the proposed part 136. These requirements

would likely impose additional costs on former part 91 operators who convert to part 135, as well as on existing part 121/135 air tour operators[13]. Those entities operating outside of Hawaii and Grand Canyon National Park would be most affected by the new requirements because operators in those two locations have already been operating under similar regulations. Operators are expected to incur costs from proposals that would (1) set new altitude, visibility, and cloud clearance requirements, (2) require floats for helicopters flying over water, (3) require life preservers, (4) require helicopter performance plans, and (5) require passenger emergency egress briefings.

II.B.1 Minimum Flight Altitudes, Visibility, Cloud Clearance

The proposed rule would establish minimum flight altitudes, visibility, and cloud clearance requirements. First, aircraft would be allowed to fly no closer than 1,500 feet above ground level (AGL) above any person, structure, vehicle, or vessel. Over terrain or water that is devoid of persons, structures, vehicles, or vessel, the minimum altitude would be 1,000 feet. Second, the rule would prohibit airplane or helicopter air tours during the day when the visibility is less than two miles (3 miles at night). Finally, the rule would prohibit air tours closer than 500 feet below, 1,000 feet above, and 2,000 feet horizontally from any cloud.

Consistent with previous analyses of this issue, the FAA assumes that the proposed minimum flight altitude restrictions (proposed 14 CFR § 136.3) would have no direct impact on consumer preferences.[13] However, altitude minima, in conjunction with cloud clearance and visibility limitations, may affect operator revenues by restricting the number of air tour flights. For example, if operations are restricted to 1,500 feet above the surface and 500 feet below the clouds, flights would have to be canceled if the ceiling is below 2,000 feet.

The cost of these provisions is measured as the expected net revenue loss (revenues less variable operating costs) associated with air tour flights that would be canceled under this amendment but would not be canceled under existing requirements. Several issues complicate the estimate of lost revenue. First, estimating the effects of these

[13] Taylor, Dan, *Air Tour Operators in the State of Hawaii...*, op. cit., p 9.

requirements is complicated by rule language that would permit deviations under certain conditions.[14] While the use of deviation authority has worked well in Hawaii under SFAR 71 the FAA cannot estimate whether deviations would be applied for at other locations. The decision by the operator to seek a deviation is determined in part by competitive pressures to provide the best possible tour. The operator must also consider the operating environment. To obtain altitude and standoff deviations, the operators must show that they can operate safely at the site-specific areas where they apply to fly under deviation authority. Single engine helicopter operators must also identify a suitable landing area that is acceptable to the FAA. In some cases, these deviations would involve other costs. Therefore, the decision to apply for a deviation would depend on a specific operator's determination of the relative benefits and costs including expected net revenue losses associated with air tours that would be cancelled in the absence of a deviation. The incentive to obtain a deviation applies equally to part 91 and part 135 operators, however, the part 91 operator may be less likely to obtain a deviation because of the closer scrutiny and oversight of an operator who seeks a deviation. Given all these variables, estimating the total number of deviations requested and granted is beyond the scope of this study. The FAA makes the simplifying assumption that no deviation requests are made. The FAA requests comments on the likelihood of operators seeking deviations in other areas of the country.

Second, weather conditions vary widely depending on the region of the country and time of year. For example, the ceiling is lower than 1,500 feet approximately 13 percent of the time in Alaska, while it occurs only one percent of the time in Arizona.[15] It is likely that areas with poor weather have, all other things being constant, a lower share of air

[14] Authorization for lower altitudes could be granted for specific, unpopulated areas, and would require additional pilot check rides. In addition, single-engine helicopters would be required to have a suitable landing site available at all times at the lower altitude. The FAA Administrator may also authorize a person to operate a helicopter clear of clouds if that aircraft has equipment required by §135.159. Finally, the FAA Administrator may authorize a helicopter to operate when the visibility is not less than one mile and when the helicopter is being operated at a speed that provides adequate opportunity to see and avoid air traffic or obstructions.

[15] These are unweighted averages of reporting airports in Alaska and Arizona respectively.

tour activity than areas with better visibility. Thus, these estimates--by over-weighting areas with poor weather--may overstate costs.

Finally, the analysis excludes one of the largest air tour markets--Hawaii. Hawaiian air tour providers are already subject to altitude minima, cloud clearance, and visibility requirements under SFAR 71. The calculation of lost revenue starts with an estimate of national air tour activity less Hawaii. These calculations are summarized in Table II.12. In total, the FAA estimates that operators affected by this provision have annual revenues of approximately $309 million.

Table II.12.--Estimated Affected Air Tour Population Less Hawaii

		Part 91 Core	Part 121/135 Major[16]	Part 135 Other
	Total			
1	Operators	983	89	364
2	Aircraft	2,067	530	787
3	Flight Hours	101,232	140,000	79,530
4	Total Revenues (millions)	$58.2	$242.9	$55.3
	Hawaii			
5	Operators	9	27	0
6	Aircraft	20	82	0
7	Revenues	$3.8	$44.0	$0
	Total less Hawaii			
8	Operators	974	62	364
9	Aircraft	2,047	448	787
10	Revenues	$54.4	$198.9	$55.3

Source: Appendix A, Tables A.5, A.6, A.10

The FAA acknowledges that the probability of a weather-related flight cancellation depends on a number of factors in addition to ceiling and

[16] "Major" part 121/135 operators include primarily large, dedicated air tour operators in areas such as Hawaii and GCNP, for which the FAA has substantial data. "Other" part 135 operators include small air tour operators in other parts of the country for which the FAA has limited data. See Appendix A for derivation of population estimates.

visibility (e.g. low lying ground fog) but believes that this is a conservative approximation of the potential altitude minima and ceiling effects. Interviews with several air tour operators indicate that there is a wide range of ceiling and visibility conditions that render air tour operations uneconomical. Operators report that, regardless of Federal Aviation Regulations, flights are sometimes canceled if minimums are less than 1,000 feet and 3 miles; in other cases, visibility of one mile is considered adequate for sightseeing. The FAA assumes that, on average, conditions less than 1,000 feet and 2 miles result in the cancellation of a flight.

According to the national data in Table II.13, conditions are at or below the 1,000-foot/2-mile level 8.33 percent of the time (see intersection of column labeled "2 miles" and row labeled "1,000"). Currently, then, the FAA estimates that approximately eight percent of air tours are canceled due to weather.

Table II.13--National Average Percentage Distributions of Weather Observations Less Than Selected Ceilings or Visibilities[17]

	1/2 mile	1 mile	1.5 miles	2 miles
100	0.66	1.06	1.41	1.72
200	1.06	1.72	2.28	2.78
300	1.41	2.28	3.02	3.68
400	1.72	2.78	3.68	4.48
600	2.28	3.68	4.85	5.90
800	2.78	4.48	5.90	7.17
1000	3.24	5.21	6.86	**8.33**
1200	3.68	5.90	7.76	9.40
1500	4.28	6.86	9.01	10.90
2000	5.21	8.33	10.90	**13.16**
3000	6.86	10.90	14.21	17.09

Note: Numbers in the first column represent ceiling in feet.

[17] Keech, Ward L., *Establishment Criteria for Runway Visual Range System at Non Precision Instrumented Runway,* U.S. Department of Transportation, FAA, APO-APO-88-14, November 1988, p. 17. The matrix was estimated from airport-specific data maintained by FAA.

The FAA believes that the combined effect of the proposed visibility, cloud clearance, and minimum altitude amendments would require a ceiling of 2,000 feet and visibility of two miles. From Table II.13, observed weather conditions would fall below these thresholds 13.16 percent of the time. Assuming that air tour revenues are affected proportionately to air tours, this implies an incremental net revenue loss of approximately $7.45 million per year. Calculations are summarized in Table II.14.

Table II.14.--Estimated Annual Net Revenue Losses Due to Proposed Visibility, Cloud Clearance, and Minimum Altitude Requirements (in millions)

	Part 91 "Core"	Part 121/135 Major	Part 135 Other
Revenue: Current Regulations	$54.4	$198.9	$55.3
Net Revenue: Current Regs	$27.2	$99.45	$27.65
Revenue: Proposed Regs	$51.8	$189.3	$52.6
Net Revenue: Proposed Regs	$25.9	$94.65	$26.3
Difference: Current-Proposed	$1.3	$4.8	$1.35

Notes: Net revenue is assumed to be about 50 percent of total revenue.

II.B.2. Standoff Distances

Proposed 14 CFR §136.5 stipulates that no person may conduct an air tour in an airplane or helicopter closer than a horizontal radius of 1,500 feet to any person, structure, vehicle, or vessel, or 1,000 feet to raw terrain. The Administrator may make an exception to allow operators of airplanes to conduct an air tour at a specific site at a horizontal radius of 500 feet to raw terrain and may allow helicopters to conduct an air tour at a specific site at a radius of 300 feet to raw terrain. The FAA estimates that this provision would have no impact on the costs or revenues of affected air tour operators.

II.B.3. Helicopter Floats

The proposed rule would require that any helicopter flown over water beyond any shoreline must be equipped with floats. Based on the GRA study[18], the FAA assumes that approximately 450 helicopters are currently engaged in air tour or sightseeing service. Of those, the FAA estimates that 25 percent, or 112 helicopters, would be affected by this provision. The remaining 75 percent are assumed to (1) operate only over land or (2) already comply with 14 CFR §135.183, which requires helicopter floats for overwater operations.

Based on available data, the FAA assumes that about two-thirds of the helicopters in air tour service can be fitted with fixed floats, which are the most economical type of flotation device. The remaining one-third would require emergency floats. Cost estimates based on these assumptions are described in the following sections.

System certification costs. System certification costs are assumed to be negligible. The FAA is unaware of any helicopter model used in air tour service for which an approved flotation system design is not already available. For some models, more than one supplemental type certificate (STC) exists for flotation systems.

System equipment and installation costs. There are two basic flotation system options: (1) fixed floats and (2) emergency floats. Emergency floats require an inflation system, while fixed floats are always inflated. Emergency floats are fired electrically before ditching, or, in some cases, are designed to inflate automatically upon hitting the water.

Emergency helicopter flotation systems typically consist of four major components: inflation bags, inflation devices and systems, float mounts and bag covers, and controls. They are stowed in a packed condition and enclosed in a protective cover. For lighter helicopters with skid landing gear, the floats are usually mounted on top of the skid and pop open upon deployment. Heavier helicopters that do not have skid landing

[18] See Appendix Table A.11.

gear require more sophisticated (and, therefore, heavier and more expensive) fuselage mounting.

Based on the types of helicopters involved in air tour service (see Tables A.13 and A.15), the FAA concludes that fixed floats would be a feasible (and more economical) option for most affected air tour entities. Only one known air tour helicopter model--the Eurocopter AS-350--cannot be equipped with fixed floats. The AS-350 is one of the more expensive air tour helicopters and typically is used by larger sightseeing operators. For the purpose of this analysis, therefore, the FAA assumes that affected AS-350 models would be equipped with emergency floats and that all other helicopter models would be equipped with fixed floats.

Installation of the floats would be performed either by the operator or by the manufacturer when the helicopter is assembled. Kits--obtained from either the manufacturer or aftermarket vendors--include a complete set of instructions covering installation and servicing. In the case of fixed floats, installation would cost approximately $1,600 (2 mechanics working 10 hours each at a fully burdened compensation rate of $80 per hour). In the case of emergency floats, installation costs are estimated to be $4,000 (2 mechanics working 25 hours each).

Table II.15 summarizes equipment and installation costs for fixed and emergency floats. The FAA estimates that first-year acquisition and installation costs would total $4.4 million for all affected operators.

Table II.15.--Average Unit Equipment and Installation Costs
(Weighted by population of primary-use helicopters)

Manuf.	Model	Estimated Portion of all in Category	System Cost	Install Cost
Bell	47G-2	0.02	$10,720	$1,600
Bell	47G-3B-1	0.17	$10,720	$1,600
Bell	206B	0.53	$15,010	$1,600
Bell	206L	0.03	$21,445	$1,600
Enstrom	280C	0.05	$21,445	$1,600
Hiller	UH-12E	0.08	$21,445	$1,600
Hughes	269B	0.02	$19,300	$1,600
Hughes	269B	0.02	$19,300	$1,600
Hughes	369E	0.03	$19,300	$1,600
Robinson	R22	0.07	$15,010	$1,600
Wtd Avg.			$15,825	**$1,600**
Total Fixed			$1,187,000	**$120,000**
Emerg. Floats				
Aerospatiale	AS-350B	1.00	$80,400	$4,000
Wt. Avg.			**$80,400**	**$4,000**
Total Emerg			**$2,974,800**	**$148,000**
TOTAL 1ST YR			**$4,161,800**	**$268,000**

Aircraft downtime. Given the estimated rates of aircraft utilization, and the proposed 18-month compliance schedule, the FAA concludes that most affected operators would be able to install floats during the off-season or during scheduled maintenance without incurring additional downtime.

Operating Costs. Operating costs would include: (1) maintenance and (2) aircraft operating/performance penalties. Manufacturers have different policies, but generally there are no life limits on floats. Interviews with industry suggest observed life limits vary from 5 to 15 years depending on operating conditions. For the purpose of this analysis, the FAA assumes that floats would be replaced incrementally over time and that, over the course of a 10-year period, the entire system would be replaced once.[19]

[19] Emergency flotation systems require a 180-day inspection. "Float bags that have exceeded 10 calendar years of service since original installation will continue to be tested under the regular 180-day test procedure. Any such float bag exceeding 10 calendar years of service, which requires maintenance or repair more extensive than a coating to seal fabric porosity, must be retired. Muller, Mark; Greenwood, Richard (Galaxy Scientific Corporation); *Survey and Analysis..., op. cit.*, p. 17.

Inspection and maintenance costs. Fixed floats generally require an inspection every 12 to 18 months. The FAA assumes that the inspection would occur once per year. The costs of the annual inspection are included in the estimate of incremental replacement costs. Annual maintenance cost are estimated to equal one-tenth of the total system installation and equipment cost based on the assumption that the entire system is replaced incrementally over a 10-year period.

Emergency floats require a preflight check that entails a visual check of the float bottle and its pressure, float bag covers, inflation system valves, hoses, and electrical connections. This regulatory analysis postulates that this check would be accomplished during the routine preflight check, without any additional cost impact to the operator. In addition, a detailed 180-day (or 500-flight-hour, which ever comes first) inspection would be required. This inspection would involve a complete float bag inflation test. While this process can be time and labor consuming, it is usually accomplished during other routine maintenance; therefore, the FAA assumes that no additional downtime will be necessary. Finally, emergency systems require a hydrostatic test of the nitrogen bottle used to inflate the bags, which costs approximately $160 every three years.

Estimated maintenance and inspection costs are summarized in Table II.16. The FAA estimates total maintenance and inspection costs of approximately $483,000 per year. The annual cost for a fixed float helicopter is estimated at approximately $1,740 and $9,530 for a emergency float equipped helicopter.

Table II.16.--Annual Maintenance and Inspection Costs for Floats

1	**Fixed Float Maintenance and Inspection**	
2	Annual cost per helicopter	$ 1,743
3	**Total annual cost--fixed floats**	$130,700
4		
5	**Emergency Float Maintenance**	
6	Hydrostatic Test (annualized)	$ 53
7	Inspection (annualized)	
8	30 hrs/year @ 48$/hr	$1,440
9	Replacement parts	$ 8,040
10	Total Inspection Costs	$ 9,480
11	Annual Cost per helicopter	$ 9,533
12	**Total annual cost--emerg. floats**	$352,720
13		
14	**TOTAL ANNUAL COST**	**$483,420**

Notes: Line 2. Annual maintenance cost equals one-tenth of the total system installation and equipment cost (consistent with the assumption that the entire system is replaced incrementally over a 10-year period).
Line 8. Inspection labor costs.
Line 9. Again, this is one-tenth of the equipment cost of an emergency float system (consistent with the assumption of incremental system replacement).

Weight penalties. Weight penalties may vary widely between affected helicopter types. In most cases, the floats cannot be removed easily from the aircraft, so performance penalties would apply whenever the affected aircraft flies. The FAA assumes that performance penalties would apply during all flights of affected helicopters.

The additional weight of the floats affects operator revenues in two ways: (1) increased fuel consumption and (2) possible passenger off-load penalties. These costs are related. On a flight operating at full capacity, for example, one passenger might have to be off-loaded, but there would be little change in aircraft operating weight. On the other hand, when there is no reduction in the number of passengers flown (because the flight is operating at less than capacity), the operator

would still incur a fuel consumption penalty. The FAA has insufficient information to estimate the extent of the off-load penalty. The only capacity level data the FAA has relates to Grand Canyon National Park air tours. The FAA believes it would not be appropriate to apply this load factor data to a nation-wide analysis since Grand Canyon air tours are extensively marketed to tourists thus enabling Grand Canyon air tour operators to maximize seat occupancy. Nevertheless, in the case of the most commonly used helicopter for commercial air tours, the addition of floats would not force the operator to off-load a passenger. At worse, the operator would adjust the quantity of fuel carried to keep the weight and balance within the helicopter's limits. Therefore, for the purposes of this regulatory evaluation, 100 percent of the operating penalty will be assumed to derive from increased fuel consumption.

Again, the analysis considers two notional helicopter types: (1) one configured with fixed floats and (2) one configured with emergency floats. This distinction is important, not only because of differences in float system cost and weight, but also because of operating differences between the two helicopter types. The FAA estimates, for example, the annual average flight hours for helicopters that would be equipped with fixed floats are 556. Helicopters equipped with emergency floats, on the other hand, would log an average of approximately 1,253 flight hours per year.[20] Table II.17 illustrates the costs associated with the additional weight of the floats. The FAA estimates total annual weight-related costs of $614,000.

[20] GRA, Inc., *Estimates of the Sightseeing and Air Tour Industry*, February 2, 1998, Table 3.2b

Table II.17.--Estimated Annual Incremental Fuel Consumption

1	Gallons/Airborne Hour/Pound Increase for Helicopters Less Than 6,000 Pounds	0.028124
2	**Helicopter flight hours per year**	
3	Fixed Floats	556
4	Emergency Floats	1,253
	Weight Increase	
5	Fixed Floats	100
6	Emergency Floats	130
	Gallons Per Airborne hour	
7	Fixed Floats	2.8124
8	Emergency Floats	3.6561
	Gallons per Year	
9	Fixed Floats	1,563
10	Emergency Floats	4,582
	Annual Cost/Helicopter (@ $2.14/gallon)	
11	Fixed Floats	$3,345
12	Emergency Floats	$9,805
	Annual Fleet Cost	
13	Fixed Floats	$250,875
14	Emergency Floats	$362,785
15	**TOTAL ANNUAL COST**	$613,660

Notes: Line 1. Incremental fuel consumption estimates expressed in gallons per hour per pound. Washington Consulting Group, *Impact of Weight Changes on Aircraft Fuel Consumption*, March 17, 1994.

Total flotation system costs. Total flotation systems costs for the estimated 112 helicopters are shown in Table II.18. In the first year, the FAA estimates that flotation systems would cost a total of $5.5 million, decreasing to about $1 million annually in subsequent years.

Table II.18.--Total Flotation System Costs

	1st year	Annual, years 2-10
Equipment	$4,161,800	$0
Installation (1st yr only)	$268,000	$0
Maintenance	$483,420	$483,420
Operating Penalties	$613,660	$613,660
Total	$5,526,880	$1,097,080

II.B.4. Personal Flotation Equipment

The proposed rule would require that all occupants wear an approved un-inflated life preserver throughout the flight when an air tour is conducted over water beyond any shoreline. This applies to airplanes, whether or not the airplane is within gliding distance of the shoreline and to helicopters whether the shoreline is within the autorotative capabilities of the helicopter. The costs associated with these provisions include: (1) procurement, (2) maintenance (including replacement), and (3) the operational costs associated with the weight of the vests. The FAA assumes that the requirement to wear a life preserver would have a negligible impact on consumer preferences--that is, all other things being equal, the demand for air tours is assumed to be unaffected by this provision. For the purpose of this analysis, the costs of this requirement are applied only to air tour operations. In the absence of reliable data on the number of air tours conducted over water, the FAA assumes that of the approximately 2,850 airplanes and 450 helicopters currently engaged in air tour or sightseeing service, 25 percent of these aircraft would be affected by these provisions. Thus some 713 airplanes and 112 helicopters would incur costs. The FAA requests comments on this assumption and requests that comments be accompanied with clear and detailed supporting economic documentation.

Costs are summarized in Table II.19. The FAA estimates that first year costs would total $357,000, decreasing to about $200,000 per year in subsequent years. The helicopter costs may be overstated since the

helicopter tour industry's T.O.P.S. program[21] voluntarily requires occupants to wear flotation devices.

Table II.19. --Annual Life Preserver Costs

		Airplanes	Helicopters
1	Life Preserver Cost/Aircraft (5 @ $38)	$190	$190
2	Maintenance (4 times/yr/vest @ $9.75)	$195	$195
3	Life Preserver Operating Cost		
4	Weight of vests at 1.5 pounds each	7.5	7.5
5	Gallons/Airborne Hour/Pound Increase	0.012291	0.028124
6	Annual Flight Hours (air tour only)	163	322.6
7	Gallons/Airborne Hour	0.0921825	0.21093
8	Gallons/year	15.02575	68.04602
9	Cost/year at $2.14 per gallon	$32	$146
10	**Total 1st year costs**	**$297,320**	**$59,470**
11	**Total annual costs, years 2-10**	**$161,850**	**$38,190**

Notes: Line 1. Average number of airplane seats calculated from Table A12, A14. Average number of salable seats per air tour helicopter (GRA, Inc., *Estimates of the Sightseeing and Air Tour Industry*, February 2, 1998, Table 3.4b).
Line 2. Maintenance cost assumption from SFAR 71 Final Regulatory Evaluation.
Line 4. Life preserver weight assumption from SFAR 71 Final Regulatory Evaluation.
Line 5. Incremental fuel consumption estimates expressed in gallons per hour per pound. Washington Consulting Group, *Impact of Weight Changes on Aircraft Fuel Consumption*, March 17, 1994.
Line 6. Air tour flight hours.

II.B.5. Helicopter Performance Plan

Proposed 14 CFR §136.17 requires that an air tour operator complete a helicopter performance plan before each helicopter flight. The pilot in command would be required to comply with the performance plan. The plan must be based on information in the helicopter flight manual, considering the maximum density altitude to which the operation is

[21] Tour Operators Program of Safety (T.O.P.S.), an independent safety organization which includes 13 helicopter air tour companies as members, requires each passenger and the pilot to wear an approved personal flotation device for over water flights. Source: www.topsafety.org/tops2

planned, and must address such elements as maximum gross weight and center of gravity (CG), maximum gross weight and CG for hovering in or out of ground effect, and maximum combination of weight, altitude and temperature. The FAA estimates that this provision would have an annual cost of $761,000.

Table II.20.-- Helicopter Performance Plan

1	Number of Helicopters	375
2	Annual Air Tour Hours per Helicopter	1050
3	Total Flight Hours	393,750
4	Number of Tours	525,000
5	Cost per Plan	$1.45
6	Annual Cost	$761,250

Notes: Line 1. Excludes Hawaii-based helicopters that already are required to complete a plan.
Line 2.Based on Appendix Tables A. 13,15 and GRA Estimates Table 2.4
Line 4. Average tour is 45 minutes
Line 5. Hourly wage of $29.10 x 0.05 hour

II.B.6. Helicopter Operating Limitations

Proposed 14 CFR §136.19 would require that the pilot in command operate the helicopter at a combination of height and forward speed that would permit a safe landing in the event of engine power loss. The FAA estimates that this provision would have no impact on operator costs or revenues.

II.B.7. Passenger Briefing Costs

Proposed 14 CFR §136.13 would require that passengers be briefed before takeoff for an air tour flight with a flight segment that is conducted over water beyond any shoreline. The briefing would include information on water ditching procedures, use of personal flotation gear, and emergency egress procedures.

Some of the costs associated with this provision--printed briefing cards, for example--have already been accounted for. In addition to the development of visual aids, costs also include the time required to give the presentation. The FAA estimates that the annual cost of this provision would be $147,300 as shown in Table II.21.

Table II. 21. Passenger Briefing Cost

		Airplanes	Helicopters
1	Number of Aircraft	713	112
2	Annual Air Tour Hours per Aircraft	163	322.6
3	Total Air Tour Hours	116,219	36,131
4	Number of Tours	154,960	48,175
5	Number of Briefings	77,480	24,090
6	Cost per Briefing	$1.45	$1.45
7	Annual Cost	$112,345	$34,930

Notes: Line 2.From Table II-19
Line 4. Average tour is 45 minutes
Line 5. Assumes one-half of briefings will be provided by a recording
Line 6 Hourly wage of $29.10 x 0.05 hour

II.C. Summary of Costs

Table II.22 summarizes the total costs of the proposed rule by major provision. Over ten years, the FAA estimates that affected operators would incur costs and revenue losses totaling $238 million ($148 million, discounted). Part 91 operators are expected to incur certification and increased operating costs totaling $137 million ($85 million, discounted) over ten years. Part 91 and part 121/135 operators would incur costs totaling $74.5 million ($46 million, discounted) from the new altitude, visibility, and cloud clearance restrictions. Those operators providing overwater tours would incur estimated costs totaling $19 million ($12.6 million, discounted) over ten years. Helicopter operators would incur performance planning costs of $7.6 million ($4.7 million, discounted) over the analysis period.

Table II.22: Summary of Total Costs of Proposed Rule
by Major Provision

	First Year Costs	10-Yr Costs	10-Yr Discounted Costs
Certification Related Costs	$16,929,539	$137,163,315	$84,869,295
Altitude, Visibility, Cloud	$7,450,000	$74,500,000	$45,703,278
Floats, Life Preservers	$6,030,849	$19,030,665	$12,604,951
Helicopter Performance	$761, 520	$7,612,500	$4,670,016
Totals	$31,171,638	$238,306,480	$147,847,540

Table II.23 displays the total costs organized by the type of operation affected. It shows the total cost impact of the proposed rule on (1) existing part 91 sightseeing operators, (2) existing part 121/135 air tour operators, and (3) operators providing overwater tours. Current part 91 operators, including those operators exiting the air tour industry, are expected to incur costs totaling $150 million ($93 million, discounted), while current part 121/135 operators would incur costs totaling $69 million ($42 million, discounted) over ten years. Costs to overwater tours, which are the same as above, are listed independently from (and are not included in) the part 91 and part 121/135 costs because they do not apply to all operators.

Table II.23: Summary of Total Costs of Proposed Rule
By Type of Operation

	First-Year Costs	10-Year Costs	10-Year Discounted Costs
Current part 91*	$18,229,539	$150,163,315	$92,844,364
Current part 121/135	$6,911,250	$69,112,500	$42,398,225
Overwater tours	$6,030,849	$19,030,665	$12,604,951
Totals	$31,171,638	$238,306,480	$147,847,540

*Total of lost revenues, certification related costs, and the estimated net revenue losses to current part 91 operators due to the visibility, cloud clearance and altitude requirements.

II. D. Consumer Losses

Air tour passengers may incur direct costs or opportunity costs as a result of this proposed rule. These costs could be attributable to either a tour operator exiting the tour business as a result of this proposed rule or an increase in flight cancellations due to the proposed minimum flight altitudes, visibility, and cloud clearance requirements. The FAA is unable to provide a quantitative estimate of these losses. However, based on the assumptions made in this evaluation, the FAA has estimated the number of air tour flight hours lost as set forth in Table II.24.

Table II.24.—Air Tour Hours Lost

Losses Related To:		Number of Air Tour Hours Lost
Part 91 Exiting Air Tour Operations		
• Net Revenue Loss divided by	$473,900	
• Net Revenue per Hour	$111	= 4,269
Part 91 Converting to Single-Pilot		
• Net Revenue Loss divided by	$6,720,100	
• Net Revenue per Hour	$259	= 25,946
Subtotal		30,215
Weather Minimums		
• Total Flight Hours multiplied by	320,762	
• Increased % of Tours Cancelled	4.83	= 15,493
Total		**45,708**

Assuming one-hour tours, there would be approximately 46,000 fewer air tours available to the public or approximately 92,000 fewer air tour flights assuming half hour tours. The FAA requests comments on how the dollar value to consumers of the lesser availability of air tours should be estimated in the final rule.

III. ANALYSIS OF BENEFITS

The purpose of the proposed rule is to reduce air tour accidents and

associated fatalities, injuries, and property damage. The following analysis estimates the reduction in accidents and associated benefits of each of the rule's major provisions: (1) restricting the 25-mile exception under 14 CFR 119.1(e)(2) that allows sightseeing tours under part 91; (2) cloud clearance, visibility, and ceiling requirements; and (3) float and life preserver requirements.

III.A. Benefits of Restricting the Exception Under 14 CFR 119.1(e)(2)

Based on available data, the FAA has estimated the benefit of restricting the exception that has allowed sightseeing flights to be conducted under part 91. As stated earlier in this regulatory evaluation, reliable data on the air tour industry is limited. As noted earlier, the FAA did not publish separate air tour flight hour or primary-use aircraft inventory data until 1993 and did not break out part 135 air tour and part 91 sightseeing activity until 1995. For this study, the ratio of part 135 to part 91 air tour activity for the years 1993-1994 was assumed to be roughly equal to the same ratio for the period 1995-1998. Part 91 and part 135 air tour hours are available for the years 1995-1998 from the annual General Aviation Survey. Hours for 1999 and 2000 were estimated based on the average number of hours flown between 1993 and 1998. Accident rates for part 135 and part 91, then, were computed for the period 1993-2000.

III.A.1. Analysis of Air Tour and Sightseeing Accident Data, 1993-2000

Based on accident lists compiled by the NTSB and FAA's Office of Accident Investigation, the FAA has compiled a list of part 91 sightseeing and part 121/135 air tour accidents over the period 1993 through 2000. The accidents are listed in Appendix B. The FAA has compared the number of accidents with the number of air tour hours flown over the eight-year period, deriving the accident rates shown in Table III.1. Over the period, part 91 sightseeing flights experienced an accident rate of about 69 per million flight hours, whereas the part 121/135 air tour accident rate was about 45 per million flight hours. While the part 121/135 accident rate is lower, the fatality rate is higher than that of part 91 operators. This apparent anomaly is due to two factors: (1) at least for airplane operations, part 121/135 operators tend to have larger airplanes and carry more passengers, therefore, a single fatal accident in a large airplane can significantly

raise the fatality rate, and (2) although rare, the typical part 121/135 commercial air tour accident involves controlled flight into terrain at cruise speed, resulting in a high fatality rate and few survivors. On the other hand, part 91 commercial air tour operators experience more accidents than part 121/135 operators but a higher proportion result from mechanical problems. Accidents caused by mechanical problems are often survivable, particularly helicopter accidents. .

Table III.1. --Estimate of Part 121/135 and Part 91
Airplane and Helicopter Accident Rates
(1993-2000)

		Part 121/135 Air Tour	Part 91 Sightseeing
1	Number of Accidents *		
2	Airplane	28	38
3	Helicopter	18	35
4	Total	46	73
5	Flight Hours[22]		
6	Airplane	423,367	717,798
7	Helicopter	594,928	343,592
8	Total	1,018,295	1,061,390
9	Accident Rate(per million flight hours)		
10	Airplane	66.14	52.94
11	Helicopter	30.26	101.87
12	Total	45.17	68.78

Excludes accidents included in Altitude Minima, Visibility and Ceiling Analysis

Subtracting the part 121/135 accident rate from the part 91 rate gives a risk differential of 23.6 accidents per million flight hours. The benefits to be derived from this provision and the water ditching provision however, apply equally to both part 121/135 and part 91 operations. Table III.2 translates the potential risk reduction into monetary benefits, based on the number of flight hours per aircraft and

the average value of an accident. For core part 91 operators, the FAA estimates annual benefits of $2,220 per aircraft, or $4.6 million for the fleet. For marginal part 91 operators, the FAA estimates annual benefits of $222 per aircraft, or $229,000 for the fleet.

Table III.2. -- Estimated Benefits of Restricting 119.1(e)(2)
Based on Analysis
Of 1993-2000 Accident Data

		Core Part 91 Group	Marginal Part 91 Group
1	**Risk reduction**		
2	Annual accidents avoided	23.6/mil flt hr	23.6/mil flt hr
3	Annual flt hrs per aircraft	50	5
4	Annual accidents avoided/AC	0.00118	0.000118
5	**Accident Value**		
6	Aircraft Damage	$268,300	$268,300
7	**Casualties**		
8	Fatalities per Accident	0.4521	0.4521
9	Benefits of Averted Fatalities by Avoiding an Accident	$1,356,300	$1,356,300
10	Injuries Per Accident	0.4932	0.4932
11	Value per Injury	$521,800	$521,800
12	Value of Injuries per Accident	$257,350	$257,350
13	**Total Accident Value**	$1,881,950	$1,881,950
14	**Annual Benefits per Aircraft**	$2,220	$222
15	**Total Annual Benefits**	$4,588,740	$229,325

Notes: Line 8. Fatalities per accident computed from the 1993-2000 accident listing (Appendix B).
Line 9. To provide a benchmark comparison of the expected safety benefits of rulemaking actions with estimated costs in dollars, a value of $3.0 million per avoided fatality is used.
Line 10. Injuries per accident estimated from the 1993-2000 accident list (Appendix B).
Line 11. Table 2-4,page 2-5, Economic Values for Evaluation of Federal Aviation Administration Investment and Regulatory Programs, June 1998. Value is for a serious injury consistent

[22] Flight hours were estimated from data published in the *1995-1998 General Aviation Surveys*.

with ICAO standards and is derived from an aviation injury database maintained by NTSB.

Line 15. Line 14 x Number of Aircraft (Core Part 91 – 2,067, Marginal Part 91 – 1,033).

III.B. Benefits Associated with Proposed Part 136

Cloud clearance, Visibility, Ceilings

The estimated benefits of the proposed cloud clearance, visibility and ceiling minima can be ascribed to: (1) increased time for the pilot to react in an emergency, to notify and instruct passengers, and to select a suitable emergency landing site; (2) prevention of situations in which the pilot unexpectedly encounters instrument flight conditions; and (3) avoidance of adverse weather conditions. As in the discussion of costs, benefits are disaggregated into: (1) "core" part 91 operators (that is, operators who are assumed to obtain either single-pilot or standard part 135 certification), (2) major part 121/135 operators, and (3) other part 135 operators.

Estimated benefits are based on an analysis of Hawaiian air tour operations. This data is different from the data used in the part 119 exception analysis and is being employed since it is the best representative data to address the proposed weather provisions. The causes of accidents involving commercial air tours appear, from the data available, to be relatively uniform throughout the country; inadvertent flight into Instrument Meteorological Conditions and Controlled Flight Into Terrain. Commercial air tours, wherever they occur, tend to have similar characteristics; they fly relatively slow, low, and close to physical landmarks. The regulatory evaluation prepared for SFAR 71 identified seven helicopter accidents and five airplane accidents related to weather and low flying during the period 1982-1994. Between 1995 and 2000 there were three additional accidents under similar flight conditions involving two helicopters and one airplane. Together, these fifteen accidents resulted in 63 fatalities and 13 serious injuries. During the period 1982-2000, Hawaiian air tour operators logged approximately 2.108 million flights. This is approximately equal to 1.581 million flight hours (an average air tour is approximately 45 minutes in length). This yields an accident rate of approximately 9.49 per million flight hours. The monetary benefits of avoiding accidents

at that rate, as shown in Table III.4, total approximately $40 million annually.

Table III.4. --Estimated Benefits Associated With Altitude Minima, Visibility and Ceiling Provisions

		Part 91 Core	Pt 121/135 Major	Part 135 Other
1	Total annual accidents avoided (per million flt hrs)	9.49	9.49	9.49
2	Annual flight hours/aircraft	50	264	122
3	Annual accidents avoided/AC	0.00047	0.0025	0.0012
4	**Accident Value**			
5	Aircraft Damage	$268,300	$483,000	$483,000
6	Fatalities			
7	Fatalities per Accident	3.3	4.6	4.6
8	Benefits of Averted Fatalities by Avoiding an Accident	$9,900,000	$13,800,000	$13,800,000
9	Injuries			
10	Injuries per Accident	0. 333	1.00	1.00
11	Value per Injury	$521,800	$521,800	$521,800
12	Value of Injuries	$173,760	$521,800	$521,800
13	Total Accident Value	$10,342,060	$14,804,800	$14,804,800
14	**Annual Benefits Per Aircraft**	$4,860	$37,010	$17,765
15	Total Aircraft	2,067	530	787
16	Less Hawaii	20	82	-
17	Number of Affected Aircraft	2,047	448	787
18	**Total Annual Benefits**	**$9,948,420**	**$16,580,480**	**$13,981,055**

Notes: Line 1. Accident rate from Table C 1.
Line 7. Estimated by dividing the total number of fatalities related to flying into bad weather or flying low by the total number of accidents (part 91 - 10 fatalities/3 accidents = 3.3 fatality rate; part 135 - 55 fatalities/12 accidents = 4.6 fatality rate).
Line 8. To provide a benchmark comparison of the expected safety benefits of rulemaking actions with estimated costs in dollars, a value of $3.0 million per avoided fatality is used.
Line 10. Estimated by dividing the total number of serious injuries by the total number of accidents (part 91 - 1

injuries/3 accidents = 0. 333 injury rate; part 135 – 12 injuries/12 accidents = 1.00 injury rate).
Line 18. Due to rounding, totals may not be precise.

Helicopter Floats and Life Preservers

The FAA believes that the benefits described above may contribute to a reduction in the probability of emergency ditching. The FAA also believes that the additional water safety equipment proposed in this rule would contribute to saving lives and is an important element of the overall strategy to improve commercial air tour safety. The benefits from helicopter floats and life preservers are considered together. This follows because the probability of survival following water impact is a function of: (1) the probability of escaping from the helicopter, and (2) the probability of surviving in the water until rescued.[23] When a helicopter without floats lands in water, it typically sinks quickly. The floats provide additional time to exit the aircraft. Life preservers that were donned prior to ditching would increase the chances of surviving. Life preservers would help the occupants after egress from the helicopter to swim to shore. Again, benefits are estimated using the Hawaiian air tour analysis. Between 1982 and 1994, Hawaiian helicopter air tour operators experienced three inadvertent water landings without floats which resulted in eight fatal drownings. These accidents were all caused by mechanical failures and therefore are not attributable to the other requirements of this proposal. While these accidents also resulted in a number of injuries, the value of these injuries as well as the damage to aircraft are excluded from the following analysis because only drowning would be prevented by this proposed provision.

As noted earlier, the FAA has assumed that about 450 helicopters provide air tours and that about 25 percent of those would be affected by this part of the rule. Table III.5 computes an estimate for the benefits that would be generated assuming that Hawaiian overwater operations are typical of other similarly affected entities. As in the case of costs, benefits are computed for fixed and emergency float systems. The FAA estimates total annual benefits of approximately $2.5 million.

[23] Other factors also affect the probability of survival such as impact forces, helicopter attitude at impact, etc.

Table III.5. --Estimated Benefits Associated With Float Requirements

	Fixed-Floats	Emergency Floats
Risk reduction		
Annual accidents avoided (per million flight hours)*	3.40	3.40
Annual flight hours/aircraft	555.8	1253.0
Annual accidents avoided/AC	0.0019	0.0043
Accident Value		
Aircraft Damage	$268,300	$268,300
Fatalities		
Fatalities per Accident	2.6667	2.6667
Benefits of Averted Fatalities by Avoiding an Accident**	$8,000,100	$8,000,100
Injuries		
Injuries per Accident	0.00	0.00
Value per Injury	$521,800	$521,800
Value of Injuries	0	0
Total Accident Value	$8,268,400	$8,268,400
Annual Benefits/Aircraft	$15,710	$35,555
Total Annual Benefits	$1,178,250	$1,315,535

Notes:
*See Appendix Table C 2 for calculation of accident avoidance rate and fatalities per accident.
** To provide a benchmark comparison of the expected safety benefits of rulemaking actions with estimated costs in dollars, a value of $3.0 million per avoided fatality is used.

While Hawaiian air tour operators usually cannot adjust their routes to avoid flying over water, it is possible that air tour operators on the mainland might have more opportunities to adjust their routes to avoid the fuel penalty and the expense of floats. However, even on the mainland, many of the known commercial helicopter air tours fly over water such as Lake Mead; Niagara Falls; Statue of Liberty; Ocean City, Maryland; Alaska; and Florida. The FAA does not know what effect these possible route adjustments would have on the estimated benefits or consumer enjoyment. The FAA therefore requests comments, including

economic data, on this issue. The FAA is also preparing another proposed rule that will require improved flotation devices in commercial helicopters. The FAA has reviewed this proposal in connection with the flotation rule and has not found any duplication of regulation or unnecessary requirements.

Airplane Life Preservers

While in the cost section the FAA assumed that 25 percent of the airplane air tour fleet would incur passenger life preserver costs, the FAA has insufficient data to estimate the overall benefits of this provision. However, the results of one accident suggest that the benefits are positive. On July 3, 1997, an airplane ditched in the water about 100 feet from the shoreline near Skagway, Alaska. All five passengers and the pilot evacuated the airplane into the water. Although the airplane was equipped with inflatable life vests, the passengers were not wearing them, as would be required by this proposed rule. The sole surviving passenger donned a life vest thrown from the plane by the pilot and together with the pilot was rescued by a helicopter after about ten minutes. A post accident investigation found that with the exception of this life vest, all of the airplane's life vests were located in the airplane. The four passengers without life vests perished. The benefits of avoiding these four fatalities, using a benchmark value of $3.0 million per fatality, would be $12 million. The benefits if this single accident had been avoided outweigh the ten-year estimated costs of $1.7 million. In a similar accident that occurred on June 22, 1994, an airplane crashed into the Taku Inlet near Juneau Alaska. The pilot and three passengers received serious injuries as a result of hypothermia. Six other passengers received fatal injuries and one passenger was not found. An autopsy stated the cause of death were either hypothermia or asphyxiation. Since it is not known how many of these passengers died of asphyxiation and might have survived if they had been wearing a life preserver, no benefit is attributed to this accident.

III.C. Benefits Summary

Table III.6 displays the total estimated benefits organized by major provision. Over ten years, the FAA estimates that the quantifiable benefits of upgrading safety requirements for the air tour industry

would total $490 million ($301 million, discounted). Restricting part 119.1(e)(2) would produce benefits totaling $48 million ($30 million, discounted) over ten years. Increasing altitude, visibility, and cloud clearance restrictions under part 136 would produce benefits of $405 million ($249 million, discounted), and floats and life preservers would produce benefits totaling $37 million ($23 million, discounted) over ten years. The FAA has not quantified the benefits of the proposed helicopter performance plan provision although the FAA believes it will contribute to the overall safety of helicopter commercial tour operations.

Table III.6. --Summary of Total Benefits by Major Provision

	Annual Benefits	10-Yr Benefits	10-Yr Discounted Benefits
Restrict 119.1(e)(2)	$4,818,066	$48,180,660	$29,557,236
Altitude, Visibility, Cloud	$40,509,955	$405,099,550	$248,515,130
Floats, Life Preservers*	$3,693,785	$36,937,850	$22,660,145
Totals	$49,021,806	$490,218,060	$300,732,511

*Benefits include the $12 million attributable to airplane life preservers allocated equally over the 10-year period.

Table III.7 displays total benefits organized by the type of operation affected. It shows total benefits associated with (1) existing part 91 sightseeing operations, (2) existing part 121/135 air tour operations, and (3) overwater aircraft tours. Total benefits associated with existing part 91 operators are estimated to be $148 million ($91 million, discounted) over ten years. Estimated benefits to part 121/135 operations would total $306 million ($187 million, discounted). Benefits associated with overwater tours, which are the same as in Table III.6, are listed independently (and are not included in) the part 91 and part 121/135 benefits because they do not apply to all operators.

Table III.7: Summary of Total Benefits
by Type of Operation

	Annual Benefits	10-Year Benefits	10-Year Discounted Benefits
Current part 91	$14,766,486	$147,664,860	$90,587,491
Current part 121/135	$30,561,535	$305,615,350	$187,484,875
Overwater helicopter and airplane	$3,693,785	$36,937,850	$22,660,145
Totals			
	$49,021,806	$490,218,060	$300,732,511

IV. Benefit-Cost Comparison

Table IV.1 summarizes ten-year benefits and costs of the proposed rule organized by the type of operation currently conducted. As shown, the FAA has estimated total benefits of $490 million ($301 million, discounted) and total costs of $238 million ($148 million, discounted) over ten years. The FAA estimates that the benefits associated with current part 91 sightseeing operators who convert to part 135 (as amended by this rule) would total $148 million ($91 million, discounted), with a corresponding cost of $150 million ($93 million, discounted). The benefits associated with existing part 121/135 air tour operators are estimated at $306 million ($187 million, discounted), with a corresponding cost of $69 million ($42 million, discounted). In addition, estimated benefits of $37 million ($23 million, discounted) are associated with upgrades to the overwater requirements. The overwater provisions are estimated to cost $19 million ($13 million, discounted) over ten years.[24] Based on these estimates, the FAA concludes that the benefits of the proposed rule would justify the costs. The cost and benefit of this rule include operators subject to the provisions of the National Parks Air Tour Management Act of 2000 and thus are overstated. However, when these operators are identified through the implementation of the National Parks Air Tour Management rule the cost and benefit will be adjusted. The FAA believes the proposed rule would improve the safety of commercial air tours

[24] The costs and benefits of the overwater provisions are not included in the breakdown of part 91 and part 121/135 costs and benefits. They are calculated separately because they do not apply to all operators.

throughout the country. The FAA invites comments on the benefits and costs of the proposed rule on various regions of the country, particularly in areas where the air tour industry is not well established. Comments should include specific economic data.

Table IV.1.--Summary of Total Benefits and Costs by Type of Operation

	10-Yr Benefit	10-Yr Cost	10-Yr Discounted Benefit	10-Yr Discounted Cost
Current part 91	$147,664,860	$150,163,315	$90,587,491	$92,844,364
Current part 121/135	$305,615,350	$69,112,500	$187,484,875	$42,398,225
Overwater provisions	$36,937,850	$19,030,665	$22,660,145	$12,604,951
Totals	$490,218,060	$238,306,480	$300,732,511	$147,847,540

To state the comparison differently, the FAA has also computed the cost of the proposed rule per estimated life saved. The proposal would have to be less than 56 percent effective for the cost per fatality avoided to appreciably exceed the benchmark value of $3.0 million. This is based on an adjusted cost of $220 million (to reflect the cost savings attributable to avoided aircraft damage expenses resulting from fewer accidents) and an estimated 130 lives saved if the proposal were 100 percent effective over 10 years and no other factors were involved. Table IV.2 displays a sensitivity analysis of the cost per life saved. If, for example, the proposal were 100 percent effective over 10 years, the FAA estimates that the cost per life saved would be $1.7 million and if it were 75 percent effective the cost would be $2.3 million.

Table IV.2—Sensitivity Analysis: Cost of Proposed Rule per Life Saved

Effectiveness of Proposed Rule	Estimated Fatalities Avoided	Cost Per Fatality Avoided
100%	130	$1,687,500
75%	98	$2,255,964
56%	73	$3,021,381

V. Initial Regulatory Flexibility Analysis

The Regulatory Flexibility Act(RFA) of 1980 establishes "as a principle of regulatory issuance that agencies shall endeavor, consistent with the objective of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of the business, organizations, and governmental jurisdictions subject to regulation." To achieve that principle, the RFA requires agencies to solicit and consider flexible regulatory proposals and to explain the rationale for their actions. The Act covers a wide range of small entities, including small businesses, not-for-profit organizations, and small governmental jurisdictions.

Agencies must perform a review to determine whether a proposed or final rule will have a significant economic impact on a substantial number of small entities. If the determination is that it will, the agency must prepare a regulatory flexibility analysis as described in the Act.

However, if an agency determines that a proposed or final rule is not expected to have a significant economic impact on a substantial number of small entities, section 605(b) of the 1980 RFA provides that the head of the agency may so certify and a regulatory flexibility analysis is not required. The certification must include a statement providing the factual basis for this determination, and the reasoning should be clear.

The FAA conducted the required review of this proposal and determined that it would have a significant economic impact on a substantial number of small entities. Accordingly, pursuant to Section 603 of the Regulatory Flexibility Act, the Federal Aviation Administration has prepared the following initial regulatory flexibility analysis.

Reasons Why Agency Action Is Being Considered

The FAA is proposing national safety standards to govern commercial air tours as a result of accidents and incidents involving air tour operators and NTSB recommendations made in response to those accidents and incidents. The rationale for each of the major provisions of the NPRM--discussed in detail in the regulatory evaluation--are summarized below:

Restriction of the exception for sightseeing flights under 14 CFR §119.1(e)(2). Based on available accident data, the FAA concludes

that (1) there are significant differences in risks between sightseeing flights conducted under 14 CFR part 91 and air tours conducted under air carrier regulations, and (2) these risk differentials justify the proposal that the exception (from 14 CFR parts 119, 121 and 135 certification and operating requirements) for part 91 sightseeing operators be restricted. Regulatory action is also justified in view of the public expectation that all operators offering air tours— are regulated and surveilled to a level of safety higher than that applied to the general aviation operator.

Safety provisions addressing the risks of overwater operations. Based on an analysis of the risks of overwater operations and NTSB recommendations, the FAA concludes that the benefits of these provisions justify the costs and potential inconvenience to passengers. Based on survivors' testimony, life preservers alone are insufficient in preventing loss of life in helicopter accidents over water. Without floats, helicopters sink very quickly upon impact, giving occupants little time to exit the aircraft. The FAA believes that helicopter floats, in conjunction with life preservers, would significantly improve the chances of survival. Airplane occupants will also benefit from the requirement to wear life preservers when air tours are conducted over water. Therefore, with certain exceptions, this proposal would require life preservers for both airplanes and helicopters and floats for helicopters.

Statement of Objectives and Legal Basis

The objective of this proposal is to provide a higher and uniform level of safety for all commercial air tours.

Under the United States Code, the FAA Administrator is required to consider the following matter, among others, as being in the public interest: assigning, maintaining, and enhancing safety and security as the highest priorities in air commerce. [See 49 U.S.C. §40101(d)(1).] Additionally, it is the FAA Administrator's statutory duty to carry out her responsibilities "in a way that best tends to reduce or eliminate the possibility or recurrence of accidents in air transportation." [See 49 U.S.C. §44701(c).] Accordingly, this notice proposes to amend Title 14 of the Code of Federal Regulations to provide definitions for

commercial air tours, and establish new safety requirements for such operations.

Description of Small Entities Affected

The FAA concludes that virtually all of the entities affected by the proposed amendments are small according to thresholds established by the Small Business Administration (i.e., employ fewer than 1,500 employees). An estimated 1,672 part 91 operators and 453 part 121/135 operators would be affected by the rule. The part 91 operators own about 3,100 aircraft, while the part 121/135 operators have about 1,300 aircraft. This rule would impose annualized costs per operator of: (1) $600 to part 91 operators who exit the sightseeing industry; (2) $11,200 to part 91 operators who obtain part 135 certificates as single-pilot operators; (3) $75,000 to part 91 operators who obtain part 135 certificates and operate with more than one pilot; (4) $14,400 to current part 121/135 operators; (5) $19,200 to $39,500 to any operator owning one helicopter that is operated over water; and (6) $220 additional to any operator owning an airplane that is operated over water.

Projected Reporting, Recordkeeping and Other Compliance Requirements

Entities converting to part 135 operations would be subject to the reporting requirements applicable to all part 135 air carriers. The FAA estimates the annualized cost for a single pilot operator would be $510 and for an operator with more than one pilot $2,540. The reporting requirements of part 136 would impose an additional cost of $30 for an airplane that is operated over water, and $340 for any operator owning one helicopter operated over water.

Overlapping, Duplicative, or Conflicting Federal Rules

The proposed rule would not overlap, duplicate, or conflict with existing Federal Rules.

Analysis of Alternatives

The FAA invites comment from potentially affected operators regarding possible alternatives to the provisions discussed above. Some options that were considered during the formulation of this proposal are discussed below.

Grandfather part 91 operators: The FAA considered allowing existing part 91 sightseeing operators other than those eligible

for the limited exception provided in the National Park Air Tour Management Act to continue operating under part 91, while requiring that operators entering the sightseeing/air tour market operate under part 135. While this alternative could reduce the cost of the rule by about $150 million over ten years, it could also reduce total benefits by $148 million over the same period. Given the significant reduction in benefits, the FAA believes that the rule's objective-- providing a higher and more uniform level of air tour safety for the flying public--would not be met under this alternative. Accordingly, the FAA has chosen not to grandfather existing operators.

Lengthen the compliance period: As written, the rule would require full compliance within six months from the date of issuance with complete phase in of the helicopter floats within 18 months of the effective date. To reduce the burden on small entities, safety requirements of subpart O of part 121 and subpart E of part 135 would be met within 120 days from the date the final rule is issued. The FAA considered a longer compliance period. Lengthening the compliance period to ten years, for example, would save some compliance costs on aircraft due to be removed from service within the ten-year period. The FAA believes, however, that the sightseeing/air tour accident history justifies FAA action in the near term. Between 1993 and 2000, there were some 75 accidents involving part 91 sightseeing flights and 53 accidents involving part 135 air tours. Combined, some 110 people died in these accidents. The FAA believes, therefore, that the higher standards should be implemented expeditiously and has chosen not to adopt this alternative.

Require helicopter floats or life preservers instead of both: The proposed rule would require both floats and life preservers for overwater air tours flights in helicopters. In lieu of this requirement, the FAA considered requiring either —one rather than both--similar to existing requirements under SFAR 71 for Hawaii operations. Under this alternative, helicopter operators could avoid the costs of floats ($15.4 million over ten years) by providing life preservers ($403,000 over ten years). Although this alternative would result in substantial cost savings, the FAA believes that the safety objectives would not be met through this

alternative. Based on survivors' descriptions, the FAA believes that life preservers alone are insufficient in preventing loss of life in helicopter accidents over water. Helicopters typically take on water and sink very quickly upon impact, giving occupants little time to exit. Helicopter floats, in conjunction with life preservers, would significantly improve the chances of survival. For this reason, the FAA has chosen not to adopt this alternative.

Affordability Analysis

The FAA lacks reliable revenue and profit data for many of the entities affected by this rule and, therefore, is unable to explicitly compare the potential costs imposed to revenues or profits. This is because part 91 operators represent the small end of the industry, entering and exiting the market easily and continuously with no reporting or notification requirements. The FAA believes, however, that the higher-cost provisions of the rule (e.g., helicopter floats) would apply to the larger, more financially viable part 135 entities. The FAA invites comment on the potential impact of the proposal on revenues and profits.

Business Closure Analysis

The FAA estimates that about 700 part 91 operators currently providing sightseeing flights would elect to stop providing the service. These operators, however, provide relatively few sightseeing flights (fewer than ten hours annually). The FAA concludes, therefore, that sightseeing revenue represents a small percentage of total revenue, and that these operators would remain in business and obtain revenues elsewhere.

Disproportionality Analysis

Almost all entities in the air tour/sightseeing market are small. Accordingly, the costs imposed by this proposal would be borne almost entirely by small businesses. It is likely that the larger of the small entities would be better able to absorb the estimated costs and could experience a competitive advantage over the smaller entities operating in the same market. Air tour safety needs to be and can be significantly improved, and the FAA believes that the only way to accomplish this is to impose higher standards on these entities.

Key Assumptions Analysis

The FAA has made several conservative assumptions in this analysis, which may have resulted in an overestimate of the costs of the proposal. For example, the FAA assumes that one-quarter of all helicopters in air tour service will incur the costs of floats. It is highly possible that the actual percentage will be lower than one-quarter because some operators already have floats to comply with 14 CFR 135.183, and others who currently operate marginally over water may change their flight plans to remain over land. Also, the helicopter life preserver costs may be overestimated since there is a voluntary industry standard to which 13 helicopter tour operators subscribe that requires occupants to wear a personal flotation device.

The FAA has also endeavored to avoid underestimating revenue losses to part 91 operators. To estimate lost revenue associated with scaling down operations to obtain a certificate using only a single-pilot, the FAA assumes that part 91 operators have as many pilots as they do aircraft. In fact, some operators have one pilot and more than one aircraft. Such operators would experience little or no loss in revenue by becoming single pilot part 135 operators, even though the FAA assumes in this analysis some lost revenue for all but the first aircraft.

In addition, the FAA assumes that no requests for exemptions will be granted, that performance penalties apply to all flights (not just air tours), and that additional paperwork to comply with the provisions of part 135 will not be absorbed into existing recordkeeping duties. Each of these assumptions leads to a conservative estimate of costs.

VI. International Trade Impact Assessment

The Trade Agreement Act of 1979 prohibits Federal agencies from establishing any standards or engaging in 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. The FAA has assessed the potential effect of this proposed rule and determined that it would have only a domestic impact and therefore no affect on any trade-sensitive activity. The FAA is unaware of any evidence that suggests that safety regulations (as opposed to noise limitations) adopted in Hawaii and the Grand Canyon

National Park, for example, affected the demand for air tour flights by foreign visitors. Conversely, widely publicized air tour accidents may adversely affect all air tour operators. The proposed regulations strengthen the entire air tour industry by standardizing requirements for all operators.

VII. Unfunded Mandates Reform Act Analysis

The Unfunded Mandates Reform Act of 1995 (the Act) is intended, among other things, to curb the practice of imposing unfunded Federal mandates on State, local, and tribal governments. Section 202(a) (2USC 1532) of Title II of the Act requires that each Federal agency, to the extent permitted by law, prepare a written statement assessing the effects of any Federal mandate in a proposed or final agency rule that may result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of $100 million or more (adjusted annually for inflation) in any one year; such a mandate is deemed to be a "significant regulatory action." Section 203(a) of the Act (2 U.S.C. 1533) provides that before establishing any regulatory requirements that might significantly or uniquely affect small governments, an agency shall have developed a plan under which the agency shall: (1) provide notice of the requirements to potentially affected small governments, if any; (2) enable officials of affected small governments to provide meaningful and timely input in the development of regulatory proposals containing significant Federal intergovernmental mandates; and, (3) inform, educate, and advise small governments on compliance with the requirements. With respect to (2), Section 204(a) of the Act (2 U.S.C. 1534) requires the Federal agency to develop an effective process to permit elected officers of State, local, and tribal governments (or their designees) to provide the input described.

This proposed rule does not contain a significant Federal intergovenmental/private sector mandate. Therefore, the requirements of Title II do not apply.

Appendix A
Description of Affected Operators

Despite the fact that the air tour industry has been the subject of much scrutiny and analysis,[25] data describing basic activity levels, financial status, and risk are scarce and often conflicting. The FAA, therefore, commissioned Gelman Research Associates (GRA)in 1997 to analyze the size and characteristics of the air tour/sightseeing industry. The resulting GRA study, *Estimates of the Sightseeing Air Tour Industry* (February 2, 1998) forms the basis of this benefit/cost analysis and is derived from several sources:

> *FAA General Aviation and Air Taxi Activity and Avionics Survey* data. The FAA *General Aviation and Air Taxi Activity and Avionics Survey* covers, through probability sampling, all U.S. registered civil aircraft except those operated under 14 CFR part 121. Specifically, the survey includes: (1) part 91--general operating and flight rules; (2) part 125--certification and operations: aircraft having a seating capacity of 20 or more passengers or a maximum payload capacity of 6,000 pounds or more (but not for hire); (3) part 133--helicopter external load operations; (4) part 135 operations; and (5) part 137 agricultural operations. Because the survey relies on sampling, estimates are subject to error. This is especially true for subpopulations of general aviation aircraft. *Survey* data were used to derive estimates of (1) the gross level of air tour activity nationally and (2) the distributions of affected air tour operators and aircraft by size

[25] See, for example: Muckle, Archie, Jr., *Final Regulatory Evaluation, Regulatory Flexibility Determination, and Trade Impact Assessment: Special Federal Aviation Regulation at the Grand Canyon*, FAA Office of Aviation Policy and Plans, May 1987. Taylor, Dan, *Final Regulatory Evaluation, Final Regulatory Flexibility Determination, and Trade Impact Assessment: Air Tour Operators in the State of Hawaii*, FAA Office of Aviation Policy and Plans, August 1994. NTSB, *Special Investigation Report: Safety of the Air Tour Industry..., op. cit. Safety Issue Analysis--Accidents Involving Part 91 and Part 135 Air Tour Operators: 1988-1995*, FAA Office of Accident Investigation, Safety Analysis Branch, October 7, 1996. Elrod, Norman R., and Becker, Gary, *Revised Final Regulatory Evaluation, Revised Final Regulatory Flexibility Analysis, and International Trade Impact Assessment*, FAA Office of Aviation Policy and Plans, October 1997. It should also be noted that the 1998 General Aviation and Air Taxi Activity Survey made several changes to the survey. Revised estimates indicate the number of aircraft used in air tour operations in 1995 totaled 1,000 and that the number declined to 800 in 1996, increased to 900 in 1997 and to 1,000 in 1998 (Table 1.3).

and location of operator, type of aircraft, annual flight hours, etc.[26]

Direct interviews with FAA Flight Standards District Offices (FSDO). GRA interviewed FSDO staff in nine geographical areas (in which a high number of air tour flight hours were expected): (1) Hillsboro, Oregon; (2) Renton, Washington; (3) Anchorage, Alaska; (4) Juneau, Alaska; (5) Nashville, Tennessee (Great Smokey Mountain National Park); (6) Orlando, Florida (Disney World); (7) Rochester, New York (Niagara Falls); (8) Salt Lake City, Utah; and (9) Van Nuys, California.

FSDO electronic mail survey. A survey questionnaire was also prepared and sent to 76 FSDOs to collect air tour fleet, operations, and revenue information. The survey was distributed via the FAA's electronic mail system. In total, 38 responses were received.

Grand Canyon database. As part of its analysis of the impact of Special Aviation Regulations on the Grand Canyon National Park (GCNP), the FAA has compiled a detailed database of operators conducting air tours in the GCNP area.

FAA vitals database. The FAA's Flight Standards Service maintains a Vital Information Subsystem (VIS) database of all certificated air carriers (which includes part 135 operators conducting air tours). The database includes employment and fleet information for most air carriers.[27]

A.1. Affected Air Tour Operators and Aircraft

The 1995 FAA *General Aviation and Air Taxi Activity and Avionics Survey* reports 1,267 aircraft used in air tour or sightseeing operations, of which 675 are airplanes and helicopters (the remainder being lighter-

[26] For a detailed discussion of the *Survey* methodology see Appendix A of the 1995 *Survey*. Preliminary 1996 survey results were not available in time to be included in the GRA study.

[27] GRA cross-checked information from the sources listed above against data from Dun and Bradstreet (D&B). The D&B data was also searched to identify additional air tour or sightseeing entities. According to GRA, "only 46 such firms were located. Because of the lack of complete data..., D&B data were excluded from this analysis..." GRA, *Estimates..., op. cit.*, p 12.

than-air vehicles, gliders, experimental aircraft, etc.).[28] These statistics, however, understate the affected population because they only account for aircraft for which air tours or sightseeing is the primary use. According to the U.S. Air Tour Association (USATA), there are 275 air tour operators in the United States, employing approximately 970 aircraft (airplanes and helicopters providing air tour service).[29] These figures, too, likely understate the affected population because they undercount smaller, marginal sightseeing operators.

The discrepancies between different sources are explained, in part, by the lack of established definitions, the diverse array of entities that are characterized as air tour operations, and the lack of a formal reporting requirement for part 91 sightseeing entities. It is also important to emphasize that the GRA study measures air tour activity during one, presumably representative, calendar year (1997). Many affected airplanes, however, may drop in and out of the sightseeing business from year to year. Thus, activity measured over a longer period could give a different picture of the industry.

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[28] Note that these represent the published "primary-use" estimates. The actual survey data, however, also provide air tour activity information (numbers of flight miles and flight hours) for "non-primary use" aircraft. The 1998 survey reported that there were 659 airplanes and helicopters primarily used for air tours or sightseeing.

[29] United States Air Tour Association, "Overview of Air Tour Issues at National Parks," printed from the USATA website in January 1998. Similar statistics were cited by Jim Petty, President of Air Vegas, in testimony before the Senate Committee on Commerce, Science and Transportation Hearing on S.269, July 31, 1997:

> The air tour industry flies an annual average of 2 million passengers. Domestic air tour passengers comprise 40 percent or 800,000 of the yearly number--foreign air tour passengers account for 60 percent or 1,200,000. Additionally, 30 percent of this yearly number is comprised of passengers either under 15 years of age or over 50 years. Twelve percent, 240,000, are handicapped passengers and 20 percent, 400,000, chose air tours for health related reasons.

Table A.1.--Combined Air Tour/Sightseeing Industry Statistics
(Comparison of USATA Data, FAA General Aviation Survey Data, and
GRA Analysis of the Air Tour Industry)[30]

	USATA	1995 General Aviation Survey	GRA Study
Operators	275	NA	2,125
Aircraft	970	675	4,417
Flight Hours	400,000	325,000	325,000

A.2. GRA Classification of the Air Tour Industry by Type of Operation

Costs and benefits depend not only on the total number of operators and aircraft, but on their distribution according to different characteristics (type of certificate, size, frequency of operations, etc.). The following subsections give different perspectives of the air tour industry using various classification systems.

The GRA study classifies air tour operations by CFR part as follows:[31]

- Part 135 Operations
- Part 91 Operations
- Marginal Part 91 Operations (operations by aircraft that log fewer than 10 air tour hours per year)

The available data suggest that most entities involved in air tour operations are relatively small. According to GRA's FSDO survey, 62 percent of air tour operators, including both part 135 and part 91 operators, have just one or two airplanes, and 84 percent have five or fewer airplanes (including airplanes not necessarily used for air tour or sightseeing flights). These estimates may understate the true proportion of small operators because FSDOs are less likely to have accurate information on part 91 sightseeing activity.

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[30] FAA *General Aviation Survey* column: Data are adjusted to exclude lighter-than-air, gliders, and experimental aircraft. The aircraft count includes only aircraft for which air tour operations constitute the primary use. However, the flight hour data include air tour flight hours for "primary use" and "non-primary-use" aircraft. The 1998 General Aviation Survey indicated 659 aircraft flew 316,000 hours.

[31] GRA, *Estimates..., op. cit.*, p 3.

Part 135 subsegments. The characteristics of the Part 135 air tour subsegment are derived by GRA primarily from FSDO interviews, an examination of Dun and Bradstreet files on small specialty firms, *General Aviation Survey* data, and information collected during other rulemaking projects related to air tour operations.

While these sources give a reasonably accurate picture of major part 135 air tour operations, they are less complete with respect to smaller part 135 entities. The main problem with measuring activity in the small part 135 subsegment is that the data are incomplete. For example, approximately one-half of the FSDOs did not respond to the electronic mail survey (although the non-responding regions represent a very small fraction of the air tour industry and likely did not report because of the infrequent nature of air tour activity in the region). For the purpose of expanding the estimate to the entire industry, GRA assumes, based on discussions with responding FSDOs, that there is one small part 135 operator per non-reporting FSDO. These small part 135 operations are assumed, based on industry information, to generate approximately one-half the revenue per flight hour of the major part 135 air tour entities. Using these assumptions, GRA has derived expanded estimates of part 135 air tour activity. The GRA results are shown in Table A.2.

Table A.2.--Estimated Characteristics of the Part 135
Major and Small Air Tour Subsegments
(GRA part 135 classification)[32]

	(1) FSDO Majors	(2) FSDO Small	(3) Expanded Small	(4) Industry Total
Operators	89	58	36	183
Aircraft	530	177	110	817
Hours	140,000	21,615	13,416	194,530
Revenues (mil $)	$242.87	$11.70	$10.09	$264.65
Aircraft/Operator	6	3.1	3.1	4.5
Hours/Aircraft	264.2	122.1	122.0	214.2
Revenue/Hour	$1,735	$541	$752	$1,512

Notes: Column (1)--Estimate based on FSDO interviews and data collected from other rulemakings.
Column (2)--Estimate based on FSDO interviews.
Column (3)--Expansion of FSDO estimate assuming one small entity per non-reporting FSDO.
Column (4)--Expanded industry total. The flight hour industry total includes an estimate of part 91 sightseeing hours logged by part 135 air tour operators. Revenue per hour based on the sum of columns 1-3.

Although the "expanded" small entities constitute 20 percent of the total number of operators, they account for only about eight percent of flight hours and about four percent of revenues. Also, it should be noted that the table above is a description of entities conducting part 135 air tours. Some of these operators may also conduct sightseeing (or other services) under part 91 flight rules, and their estimated flight hours conducted under part 91 are included.

Part 91 sightseeing subsegment. Estimating the size and characteristics of the part 91 sightseeing segment is even more difficult. The FAA assumes that the FAA *General Aviation Survey* results provide a reasonably accurate estimate of total sightseeing activity (approximately 220,000 flight hours per year, of which approximately 150,000 hours are in airplanes or helicopters). However, the survey does not provide information on operator characteristics, and, as noted

[32] Source: GRA, *Estimates...*, *op. cit.*, Table 4.1, p 29.

above, likely underestimates the affected aircraft population. The GRA study, therefore, uses FSDO survey and industry data to calculate population estimates.[33] The results are shown in Table A.3.

Table A.3.--GRA Estimated Characteristics of the Part 91 Sightseeing Subsegment[34]

	(1) Core Part 91	(2) Marginal Part 91	(3) Industry Total
Operators	1,142	800	1,942
Aircraft	2,400	1,200	3,600
Hours	125,220	5,280	130,500
Revenues (millions)	$72.01	$2.25	$74.27
Aircraft per Operator	2.1	1.5	1.9
Hours per Aircraft	52.2	4.4	36.3
Revenue per Hour	$575	$427	$569

Notes: Column (1)--Data compiled from: (i) FSDO interview data, (ii) FAA *General Aviation Survey* data.
Column (2)--Data compiled from the FAA *General Aviation Survey*. Represents respondents who report logging fewer than 10 air tour hours per aircraft per year.
Column (3)--GRA total part 91 estimates. Based on data from the *General Aviation Survey*, there are approximately 4,400 part 91 sightseeing aircraft reduced by 800 aircraft that also conduct part 135 air tours. [Note that some of the remaining 3,600 aircraft may be involved in non-air tour part 135 activity. An adjustment to account for these aircraft is made below.]

It should be noted that Table A.3 is a description of part 91 *sightseeing providers*; that is, operators who conduct part 91 sightseeing and not part 135 air tours. This does not necessarily mean that these operators do not hold a part 135 certificate. For example, GRA's analysis of the General Aviation Survey results shows that

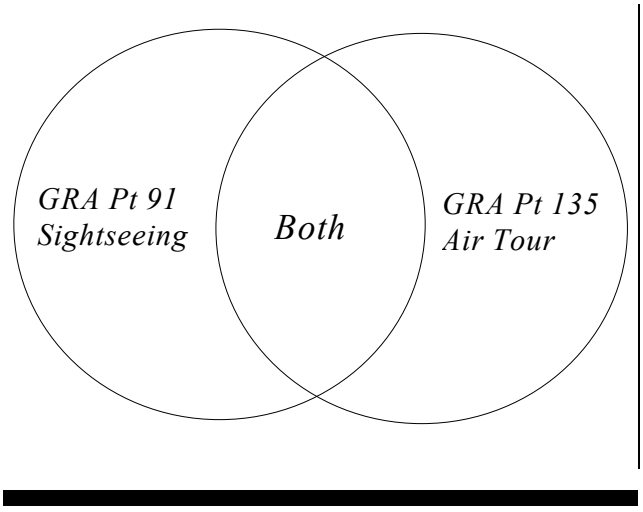
[33] The FAA acknowledges that these are estimates derived from partial sampling. According to GRA: "Some of the FSDO interviews indicated clearly that the FSDO managers and inspectors believe that there are an unknown number of part 91 sightseeing operations in their district. Unfortunately, they did not know any specifics about the operators. The actual FSDO survey uncovered approximately 60 part 91 sightseeing operators. We further located another 60 through a search of the files of Dun and Bradstreet. However, we know that the D&B search is incomplete, as their file of small specialty firms is limited." GRA, *Ibid*.

[34] Source: GRA *Estimates...*, *op. cit.*, Table 4.1, p 31.

approximately 500 of the 3,600 aircraft listed in Table A.3 are also used in part 135 on-demand service. Tables A.2 and A.3, however, comprise non-overlapping sets of operators, airplanes, flight hours, and revenue. For example, the sum of Table A.2 airplanes and Table A.3 airplanes gives a correct (or, at least consistent) count of the total number of airplanes in part 91 and part 135 air tour service.

This last point is important to the cost and benefit analyses that follow. Figure A.1 illustrates the industry classification system used in the GRA study. The set labeled "GRA Pt 91 sightseeing" identifies those operators conducting sightseeing flights under part 91. These operators--those described in Table A.3--do not conduct air tour flights under part 135 but may conduct other types of part 135 operations. The sets "GRA Pt 135 Air Tour" and "Both" identify, respectively, operators conducting air tour flights exclusively under part 135 and operators conducting both part 135 air tour flights and part 91 sightseeing flights. The union of "Pt 135 Air Tour" and "Both" corresponds to the group of operators summarized in Table A.2.

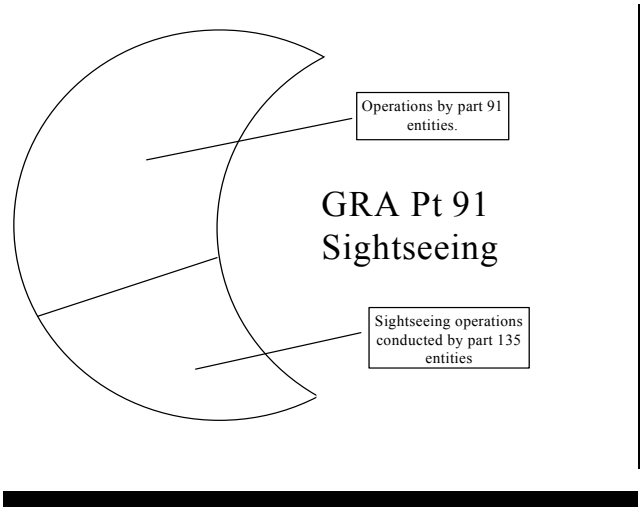
Figure A.1.--GRA Classification of Air Tour Operators



A.3. Adjustment of the GRA Classification

The FAA estimates that approximately 270 operators identified in the "GRA part 91" subsegment already hold part 135 certificates. This means that part of the crescent-shaped set corresponding to "GRA part 91 sightseeing" operations in Figure A.1 is actually conducted by part 135 certificate holders, as shown in Figure A.2. An analysis of the *General Aviation Survey* data indicates that approximately 500 of the "GRA part 91" sightseeing aircraft conduct other part 135 on-demand operations (but not part 135 air tour flights). It is unknown how many hours of part 91 sightseeing service these aircraft fly. It is assumed that they average approximately 50 hours per year (the part 91 subsegment average).

Figure A.2.--Partition of GRA Part 91 Group



The FAA assumes that the misclassified aircraft and operators are proportionately distributed among the part 91 subgroups identified in Table A.3. Table A.4 summarizes the number of misclassified aircraft and operators.

Table A.4.--Part 135 Aircraft and Operators Misidentified as Part 91
(derived from Table A.3)

		Core Part 91	Marginal Part 91	Total
1	Aircraft/Operator	2.1	1.5	1.9
2	Aircraft	333	167	500
3	Sightseeing Hours	24,000	1,000	25,000
4	Hours/Aircraft	72	6	50
5	Operators	159	111	270

Notes: 1. Average number of aircraft per operator using information from Table A.3.
2. Based on General Aviation Survey data, the FAA estimates that approximately 500 of the aircraft listed in Table A.3 are used in part 135 on-demand service. These aircraft logged approximately 25,000 flight hours in 1995.
3. "Operators" (line 5) is an estimate of the number of part 135 certificate holders by subgroup. This is estimated by dividing the number of misclassified aircraft per subgroup (line 2) by the average number of airplanes per operator (line 1).

The GRA data are adjusted by adding the misclassified operators, aircraft, and flight hours to the GRA part 135 air tour group (described in Table A.2) and subtracting the same data from the part 91 group (described in Table A.3). The adjusted data are shown in Tables A.5 and A.6.

Table A.5.--Adjusted Characteristics of Part 135
Air Tour Subsegments

	(1) FSDO Majors	(2) FSDO Small	(3) Expanded Small	(4) Industry Total
Operators	89	58	306	453
Aircraft	530	177	610	1,317
Hours	140,000	21,615	57,915	219,530
Revenues (mil$)	$242.87	$11.70	$43.55	$298.12
Aircraft/Operator	6.0	3.1	2.0	2.9
Hours/Aircraft	264.2	122.1	94.9	166.7
Revenue/Hour	$1,735	$541	$752	$1,358

Table A.6.--Adjusted Characteristics of Part 91 Sightseeing Subsegment

	(1) Core Part 91	(2) Marginal Part 91	(3) Industry Total
Operators	983	689	1,672
Aircraft	2,067	1,033	3,100
Hours	101,232	4,269	105,501
Revenues (millions)	$58.20	$1.83	$60.03
Aircraft per Operator	2.1	1.5	1.9
Hours per Aircraft	49.0	4.1	34.0
Revenue per Hour	$575	$427	$569

The adjusted data are used to further classify the air tour industry into the following subgroups:

- Major Part 135 Operations--This group consists of part 135 operators in the largest air tourism markets: Grand Canyon National Park, Hawaii, and Alaska. The majors, on average, operate more aircraft, conduct more operations, and earn greater revenues than other air tour operators.

- Smaller Part 135 Operations--This group consists of part 135 operators in locations other than Grand Canyon National Park, Hawaii or Alaska. These locations include natural points of interest such as Niagara Falls, Great Smokey National Park, Mt. St. Helens, and man-made attractions such as Disney World.

- Core Part 91 Operators--This group consists of entities conducting sightseeing flights under 14 CFR part 91 rules exclusively.

- Marginal Part 91 Operators--This group consists of part 91 entities conducting fewer than 10 air tour flight hours per aircraft per year.

A.4. Distribution of Air Tour Aircraft by Annual Flight Hours

The data in Table A.7 show that, while the air tour industry is relatively small in revenue terms, it is a complex amalgam of entities. Approximately 40 percent of all air tour providers log fewer than 10 air tour or sightseeing hours per year. This group accounts for about one-fourth of all aircraft used in air tour operations, but less than three percent of total air tour industry flight hours. Aside from anecdotal information, little is known about the characteristics of this industry subsegment (e.g. types of flights conducted, other sources of revenue, etc.), or even whether they represent a relatively homogeneous group.

Table A.7.--Air Tour and Sightseeing Hours by Usage Classification

		Total Hours per Aircraft	Air Tour Hours per Aircraft	Percent Air Tour Hours
Prime Use	Airplane	325.7	202.5	62.2
	Helicopter	737.5	551.9	74.8
	Total	443.2	306.8	69.2
10+ Hours	Airplane	372.3	53.5	14.4
(Not Prime	Helicopter	324.0	30.0	9.3
Use)	Total	371.1	52.3	14.1
1-10 Hours	Airplane	161.6	4.2	2.6
	Helicopter	270.5	5.9	2.2
	Total	174.1	4.4	2.5

At the other end of the spectrum, large part 135 entities (some of which operate more than 20 aircraft, although not all in air tour service) constitute less than five percent of all air tour operators but account for approximately half of total industry flight hours. Information on these entities is more readily available--primarily because they are subject to FAA inspection and oversight as certificated air carriers.

Table A.8 shows the distribution of aircraft by annual flight hours and CFR part. Part 91 operators tend to log fewer flights per year than

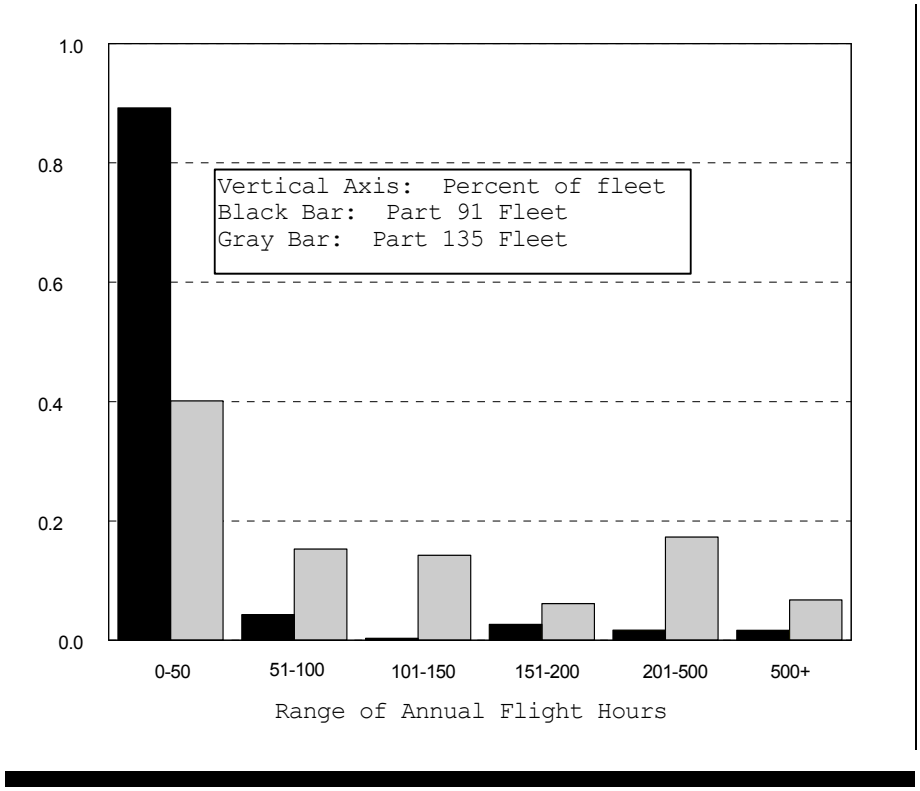
part 135 operators. This is also illustrated in Figure A.3: almost 90 percent of aircraft used in part 91 sightseeing service log fewer than 50 hours per year, while part 135 aircraft are more uniformly distributed.

Table A.8.--Distribution of Air Tour Fleet by Annual Flight Hours

	Part 91 Sightseeing				Part 135 Air Tour				Total	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Hour Range	% of Fleet	Cum	% of Fleet Flt hrs	Cum	% of Fleet	Cum	% of Fleet Flt hrs	Cum	% of Fleet	% of Fleet Flt hrs
≤50	89.19	89.19	38.01	38.01	40.13	40.13	2.59	2.59	77.11	17.89
51-100	4.33	93.52	7.45	45.46	15.33	55.45	5.46	8.05	7.04	6.32
101-150	0.35	93.86	0.88	46.35	14.27	69.72	9.95	18.00	3.77	6.03
151-200	2.68	96.55	10.13	56.48	06.16	75.88	6.21	24.21	3.54	7.90
201-500	1.76	98.31	9.10	65.58	17.34	93.22	31.93	56.14	5.60	22.07
500+	1.69	100.00	34.42	100.00	6.78	100.00	43.86	100.00	2.95	39.78
Total	100.00		100.00		100.00		100.00		100.00	100.00

Notes: Column (1): The range of annual flight hours.
Column (2): The columns labeled "% of Fleet" show the number of aircraft that fly a given number of air tour flight hours per year as a percentage of the total fleet. For example, column (2) shows that 89.19 percent of the part 91 sightseeing fleet logs 50 or fewer air tour flight hours annually.
Column (3): Columns labeled "Cum" show the cumulative percentage of aircraft which fly a given number of air tour flight hours. For example, column (3) shows that 89.19 percent of the part 91 fleet logs fewer than 50 air tour flight hours per year; 93.52 percent log fewer than 100 hours per year; 93.86 percent log fewer than 150 hours per year; etc.
Column (4): Columns labeled "% of Fleet Flt Hrs" show the distribution of flight hours. For example, column (4) shows that 38.01 percent of part 91 sightseeing flight hours were flown by aircraft which fly 50 or fewer sightseeing flight hours per year.

Figure A.3.--Distribution of Air Tour Aircraft
By Flight Hours



A.5. Distribution of Air Tour Operators by Fleet Size and by Industry Subsegment

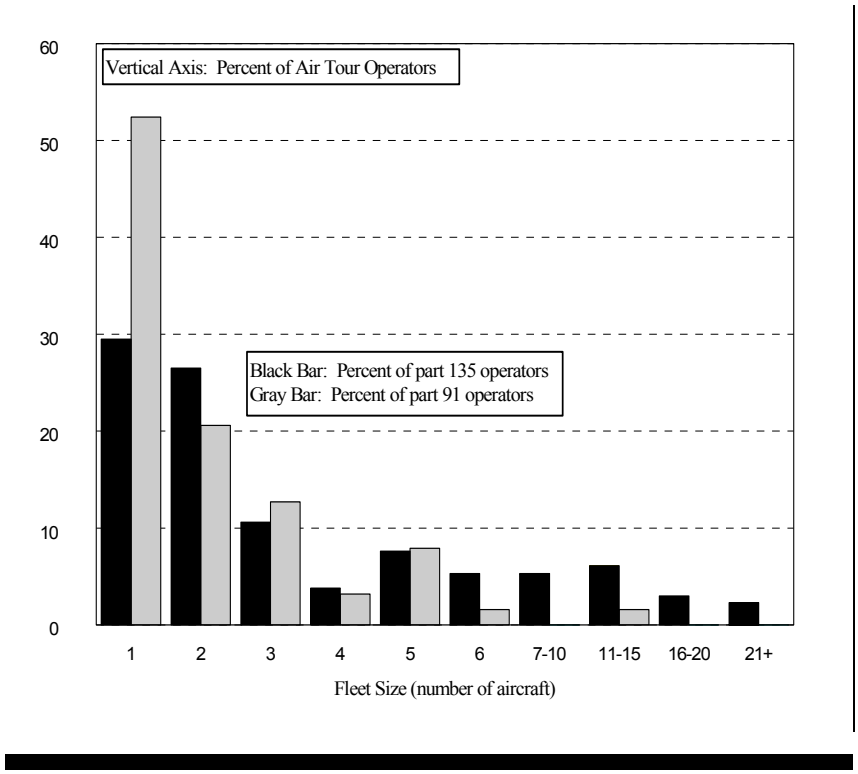
As noted earlier, the size of an operation is also a determinant of the costs of compliance. Based on FSDO interviews and other industry sources, GRA's analysis yields the distributions of entity size shown in Table A.9. [It is worth noting that these figures are based on fleet totals for each operator, not on the number of aircraft actually used in air tour operations.]

Table A.9.--Distribution of Air Tour Operators By Fleet Size and Industry Subsegment
(expressed as a ratio of the total)[35]

Number of Aircraft	Major Part 135	Other Part 135	Part 91 Sightseeing	Total
1	0.247	0.362	0.524	0.362
2	0.225	0.276	0.206	0.233
3	0.101	0.103	0.127	0.110
4	0.034	0.034	0.032	0.033
5	0.067	0.103	0.079	0.081
6	0.079	0.017	0.016	0.043
7	0.022	0.017	0.000	0.014
8	0.034	0.017	0.000	0.019
9	0.011	0.000	0.000	0.005
10+	0.180	0.069	0.016	0.100

[35] Source: GRA *Estimates...*, *op. cit.*, Table 2.2, p 14.

Figure A.4.--Distribution of Part 135 and Part 91 Operators by Fleet Size[36]



A.6. Distribution of Operators by Location

The incremental costs of the proposed rule are also a function of the location of affected operators--many provisions of the proposal are already applicable to some operators via existing regulations. The FAA has little data on the national distribution of all air tour operators but is able to identify certain important markets--(1) Hawaii, (2) Grand Canyon National Park, and (3) Alaska--based on interviews with FAA FSDOs. The data are summarized in Table A.10.

[36] Based on FSDO survey data on 195 part 135 and part 91 air tour operators. The figures reflect total fleet size, and are not limited to the air tour/sightseeing fleet. GRA, *Ibid.*, p 10.

Table A.10.--Summary of Characteristics of Selected Air Tour Markets[37]

	Number of Operators	Number of Helicopters	Number of Airplanes	Total Aircraft	Total Seats	Estimated Revenues
Part 91						
Hawaii	9	11	9	20	52	$ 3.8
Part 135						
Hawaii	27	63	19	82	370	$ 44.0
GCNP	29	35	182	217	1,952	$139.3
Alaska	33	75	156	231	1,252	$ 59.0
Total	89	173	357	530	3,574	$242.3

A.7. Distribution of Air Tour Aircraft by Aircraft Types

According to the GRA study, of the 4,417 aircraft estimated to conduct air tours or sightseeing flights in the U.S., 3,976 are airplanes and 441 are helicopters (again, not including gliders and experimental aircraft). The distribution of aircraft by aircraft type--based on *General Aviation Survey* data--is shown in Table A.11.

Table A.11.--Distribution of Air Tour Aircraft By Aircraft Type

	Total
Airplanes	3,976
Helicopters	441
Total	4,417

More detailed information on aircraft types used in air tour service, however, is limited. Published *General Aviation Survey* tabulations are summarized in the Tables A.12 through A.15. It should be emphasized that these tables reflect primary-use aircraft only: Tables A.12 and A.13 correspond to aircraft for which part 91 sightseeing operations constitute the primary use. Tables A.14 and A.15 correspond to aircraft for which part 135 air tour operations constitute the primary use.

[37] Source: GRA *Estimates...*, *op. cit.*, Table 2.4, p 17.

Table A.12.--Part 91 Sightseeing Airplane Fleet Types
(Primary Use Only)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
				Percent of Total		Flight Hours	Hours per Airplane	
Manufacturer	Model	Engs.	Pax	AC	Seats	AT/Tot	Tot	AT
Fleet	7	1	2	0.4	0.2	0.746	63	47
Cessna	172N	1	4	16.5	16.9	0.340	251	85
Cessna	182J	1	4	18.3	18.7	1.000	75	75
Cessna	182P	1	4	17.4	17.8	0.601	335	201
Classic	Waco YMF	1	2	0.9	0.5	1.000	880	880
Dehavilland	DHC-2	1	8	3.6	7.3	1.000	203	203
Dehavilland	U-6A	1	8	3.6	7.3	1.000	207	207
Republic	RC-3	1	4	0.9	0.9	0.749	118	88
Howard-Jbmstr	DGA-15P	1	5	0.9	1.1	0.492	150	74
Piper	J3C-65	1	2	4.5	2.3	0.741	48	35
Piper	PA-18-125	1	2	0.9	0.5	1.000	10	10
Piper	PA-18-150	1	2	0.9	0.5	1.000	10	10
Piper	PA-28-180	1	4	17.4	17.8	0.519	27	14
Piper	PA-34-200	2	7	0.9	1.6	0.502	259	130
Waco	YMF	1	3	0.4	0.3	1.000	473	473
Waco	UPF-7	1	2	12.5	6.4	0.829	92	77
Fleet Avg.						0.644	161	104

Notes: Column 3: Number of engines per airplane.
Column 4: Average number of passenger seats per airplane according to the FAA Make Model Series database.
Column 5: The number of airplanes per type as a percentage of the reported primary-use fleet total. This does not consider airplanes for which air tour operations are not the primary use.
Column 6: The estimated number of seats per type as a percentage of the total number of seats for the fleet. Again, this reflects the primary-use fleet total only.
Column 7: The ratio of reported air tour flight hours to total flight hours by airplane type.
Column 8: The average number of flight hours per airplane by airplane type.
Column 9: The average number of air tour flight hours per airplane by airplane type.

The data reveal differences in the patterns of aircraft usage between part 91 and part 135 entities. Not surprisingly, for example, part 135 air tour operators log substantially more flight hours per aircraft on average than part 91 sightseeing operators (see Section III for a discussion of the economics of part 91 and part 135 operations). Part 135 primary use airplanes accumulate over three times the total number of flight hours per year than their part 91 counterparts (approximately three times the number of air tour and sightseeing flight hours as well).

Table A.13.--Part 91 Sightseeing Helicopter Fleet Types
(Primary Use Only)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
				Percent of Total		Flight Hours	Hours per Aircraft	
Manufacturer	Model	Engs	Pax	AC	Seats	AT/Tot	Tot	AT
Bell	47G-2	1	3	2.4	1.7	0.801	91	73
Bell	47G-3B-1	1	3	17.6	12.7	0.910	196	178
Bell	206B	1	5	49.6	59.5	0.413	645	266
Bell	206L	1	7	1.6	2.7	0.849	940	798
Enstrom	280C	1	3	4.8	3.5	1.000	14	14
Hiller	UH-12E	1	4	8.0	7.7	0.320	73	23
Hughes	269B	1	3	1.6	1.2	0.502	319	160
Hughes	269B	1	3	1.6	1.2	0.255	128	33
Hughes	369E	1	4	3.2	3.1	0.850	550	468
Robinson	R22	1	2	7.2	3.5	0.454	1180	536
Aerospatiale	AS-350B	1	6	2.4	3.5	1.000	1867	1867
Fleet Avg						0.529	532	282

See Table A.12 for column notes.

While helicopters tend to have higher utilization rates than airplanes, the same pattern holds: part 135 helicopters log about 2.3 times the number of total flight hours per year than part 91 helicopters, and approximately four times the number of air tour flight hours. (The latter difference is due to the fact that a higher fraction of part 91

helicopter flight hours consist of non-air tour and sightseeing activity.)

On average, part 135 air tour aircraft are also larger than part 91 sightseeing aircraft. The weighted-average seating capacity of a part 91 airplane (sightseeing primary use only) is 3.9 seats per airplane compared to 6.3 seats per part 135 airplane (air tour primary use). Similarly, the average seating capacity of a part 91 helicopter is about 4.2 seats per aircraft, compared to 5.8 seats per part 135 helicopter.

Table A.14.--Part 135 Air Tour Airplane Fleet Types
(Primary Use Only)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
				Percent of Total		Flight Hours	Hours per Aircraft	
Manufacturer	Model	Engs.	Pax	AC	Seats	AT/Tot	Tot	AT
Beech	C-99	2	17	4.6	12.5	1.000	954	954
Cessna	U206F	1	6	25.9	24.8	0.600	299	180
Cessna	U206G	1	6	25.9	24.8	0.500	499	249
Cessna	T207A	1	6	1.7	1.7	1.000	113	113
Dehavilland	DHC-6-300	2	22	2.3	8.1	0.900	1071	965
Piper	PA-28R-200	1	4	29.3	18.7	0.500	697	349
Piper	PA-32-300	1	6	6.3	6.1	0.780	490	382
Piper	PA-34-220T	2	7	1.7	1.9	0.400	360	144
Piper	PA-44-180	2	4	2.3	1.5	0.800	55	44
Fleet Avg						0.594	520	309

See Table A.12 for column notes.

Table A.15.--Part 135 Air Tour Helicopter Fleet Types
(Primary Use Only)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
				Percent of Total		Flight Hours	Hours per Aircraft	
Manufacturer	Model	Engs.	Pax	AC	Seats	AT/Tot	Tot	AT
Bell	206B	1	5	16.0	13.8	0.871	1129	984
Bell	206L	1	5	4.0	3.4	1.000	1623	1,623
Aerospatiale	AS-350B	1	6	80.0	82.8	0.974	1207	1,176
Fleet Avg						0.960	1212	1,163

See Table A.12 for column notes.

Appendix B

Part 91 and Part 135 air tour accidents, 1993-2000

(Excluding non-air tour accidents involving air tour operators)

Table B.1.—Part 91 Accidents

1993-1995

Date	Location	NTSB #	F	S	Aircraft Model
1/25/93**	Volcano N P, HI	LAX93LA104	4	1	UH-1100
2/20/93	Chena, AK	ANC93LA036	0	0	Substantial:Maule-M5
6/15/93	Orlando, FL	MIA93LA143	0	0	Substantial:Hughes-369
6/19/93	Panama City, FL	MIA93LA144	0	0	Substantial:Bell-47-G
7/15/93	Burkburnett, TX	DEN93LA079	0	0	PA-11
7/30/93	Matawan, NJ	BFO93LA142	0	0	North American AT-6
8/7/93	Marlboro, NJ	NYC93FA145	2	1	Destroyed:Curtis-TRV-4000
8/22/93	Auburn, WA	SEA93LA181	0	0	Substantial:Hiller-UH-12E
9/2/93	Centre, Hall, PA	BFO93LA154	0	0	Substantial: PA-28-161
3/25/94	Orlando, FL	MIA94LA100	0	4	Substantial:Bell-206L
4/18/94	Hanapepe, HI	LAX94FA197	1	4	Destroyed:Hughes-369D
4/22/94	Marathon, FL	MIA94FA125	2	1	Destroyed:Bell-47-D1
5/7/94	Crystal Beach, TX	FTW94LA147	0	0	UH-12
7/1/94	Greeneville, ME	NYC94LA104	0	0	Substantial:Cessna-172P
7/2/94	Bristol, NH	NYC94LA108	0	0	Substantial:Cessna-172N
7/21/94	Haines, AK	ANC94LA091	0	0	C-207
7/24/94	Seaside, OR	SEA94FA194	2	0	Destroyed:Hughes-369HS
7/31/94	Readington, NJ	NYC94LA141	0	0	Substantial:Boeing-PT-13
7/31/94	Readington, NJ	NYC94LA141B	0	0	Minor:Piper-J-3
8/6/94	Pittstown, NJ	NYC94LA151	0	0	Substantial:Cessna-172RG
8/20/94	Nags Head, NC	ATL94LA161	0	0	Substantial:Cessna-207
12/14/94	Oasis, CA	LAX95LA051	0	2	GA-AA-1
3/18/95	San Gorgonio, CA	LAX95LA139	0	0	Destroyed:Enstrom-F28C-2
3/25/95	Burnet, TX	FTW95LA146	0	0	Substantial:Hughes-369HS
7/4/95	Orting, WA	SEA95LA139	0	3	Substantial:Hughes-369HS
8/17/95	Anchorage, AK	ANC95LA143	0	1	Substantial:Waco-UPF-7
9/10/95	Livermore, CA	LAX95LA332	1	2	Destroyed:Enstrom-F28-C
9/29/95	Staten Island, NY	NYC95LA231	0	0	Substantial:Waco-UPF-7
12/29/95	Kailua Kona, HI	LAX96LA092A	0	0	Substantial:Waco-YMF
Total Excluding ** Accident		Accidents: 28	8	18	

Notes: Column labeled "F"--Fatalities.

Column labeled "S"--Serious Injuries

Table B.1. —Part 91 Accidents

1996-2000

10/22/2000	Half Moon Bay, CA		LAX01LA021	0	0	Substantial CE-172-P
10/27/2000	Key West, FL		MIA01LA019	0	0	Substantial WACO-UPF7
08/08/2000	Manteo, NC		ATL00LA076	0	0	Substantial CE-172
06/17/2000	Ruidoso,NM		DEN00LA113	0	0	Substantial Enstrm-F28-280C
05/27/2000	Ft.Walton Beach,FL		MIA00LA176	0	0	Substantial BHT-47-G2
04/15/2000	Lakeland, FL		MIA00LA143	0	0	Substantial New Standard
06/11/1999	Sevierville,TN		MIA99LA181	0	0	Substantial Robinson R-44
10/24/1998	Clinton IA		CHI99LA012	0	0	Substantial UH12-C
08/29/1998	Big Bear, CA		LAX98LA279	0	0	Destroyed B-75-A75N1
08/12/1998	Marco Island, FL		MIA98LA221	0	0	Substantial Enstrm-F28-F
08/04/1998	Bryce Canyon,UT		FTW98LA342	0	0	Substantial Enstrm-F28-F
05/09/1998	Ft.Walton Beach,FL		MIA98LA154	0	0	Substantial BHT-47-G2
05/03/1998	Stanwood, WA		SEA98LA069	0	0	Substantial Bell47G
03/15/1998	Chamblee,GA		ATL98LA057	0	0	Substantial B-75-A75N1
02/03/1998	Miami,FL		MIA98LA070	0	0	Substantial Bell 206B
12/31/1997	New York,NY		NYC98LA058	0	0	Substantial AS-355
12/06/1997	Saipan		LAX98LA053	0	0	Destroyed HU369
10/31/1997	Cleveland, OH		NYC98LA025	0	0	Substantial Hughes 269B
09/20/1997	McGee, MS		ATL97LA139	0	0	Substantial Bell 47G
08/27/1997	Portage, WI		CHI97LA282	0	0	Substantial Cessna 172
07/28/1997	Kissimmee,FL		MIA97LA222	0	0	Substantial Waco-YMF
07/26/1997	Mt.Vernon,OH		IAD97LA104	0	0	Substantial BHT-47-G3
07/25/1997	Sedona, AZ		LAX97LA261	0	0	Substantial WACO-YMF
07/19/1997	Yamhill, OR		SEA97LA171	0	0	Substantial Hughes 269B
07/16/1997	Pahoa, HI		LAX97LA245	0	0	Substantial WACO-YMF
05/03/1997	St.Thomas, VI		MIA97LA155	0	0	Substantial PA 31-350
01/14/1997	Sanibel, FL		MIA97LA062	0	0	Substantial Waco-UPF
10/05/1996	Spokane, WA		SEA97FA003	0	0	Destroyed Enstrom F-28C
03/07/1996	Flager Beach, FL		MIA96FA096B	4	0	Destroyed PA-44-180
05/11/1996	Taos, NM		FTW96LA211	0	0	Substantial Boeing E75
07/11/1996	Pigeon Forge, TN		MIA96LA180	0	1	Substantial Bell-206B
08/20/1996	Whitefield, NH		IAD96FA138	4	0	Destroyed Piper PA24
01/12/1997	Saipan		LAX97FA086	2	3	Destroyed Enstrm-F28-A
05/17/1997	Orlando, FL		MIA97LA168	0	2	Substantial Bell 260L
07/19/1997	Chicago,IL		CHI97FA218A	4	0	Destroyed Cessna172P
07/27/1997	Bullhead City, AZ		LAX97FA259	2	0	Destroyed PiperJ3C
08/24/1997	Ocean City,MD		IAD97FA112	3	0	Destroyed WACO-YMF
09/06/1997	Gilbertsville,KY		NYC97FA178	2	0	Destroyed CessnaU206B
11/08/1997	Sedona, AZ		LAX98LA033	0	1	Destroyed WacoYMF

06/20/1999	Fayetteville,WV		NYC99LA153	0	3	Substantial Cessna 172M
08/10/1999	Custer, SD		CHI99FA285	2	2	Destroyed BHT-206B
12/28/1999	Avalon, CA		LAX00FA061	0	1	Destroyed AS350D
04/02/2000	Stanwood,WA		SEA00FA061	1	1	Substantial BHT-47
07/02/2000	West Linn, OR		SEA00LA121	0	1	Substantial FH-1100
08/12/2000	Davis,WV		NYC00FA226	1	3	Substantial CE-172
No. Accidents		45		25	18	
Total Part 91 Accidents: 1993-2000		73		33	36	

** = Accidents included in "Air Tour Operations in the State of Hawaii" analysis and therefore excluded from the total shown above and from the benefits estimates presented in Table III.2.

Table B.2. --Part 135 Accidents

1993-1995

Date	Location	NTSB #	F	S	Aircraft Type
6/2/93	Skagway, AK	ANC93LA077	0	0	PA-32
6/18/93	Juneau, AK	ANC93LA096	0	0	PA-28
8/7/93	Tusayan, AZ	LAX93FA316	0	0	Destroyed:Bell-206-L1
8/7/93	Tusayan, AZ	LAX93FA316B	0	3	Destroyed:Bell-206-L3
9/11/93	Cooper Landing, AK	ANC93FA173	0	3	C-180
2/23/94**	Humuula, HI	LAX94LA134	0	2	AS-350
3/25/94	Hawaii National Park, HI	LAX94LA174	0	0	HU-50
5/23/94	Page, AZ	FTW94LA173	0	0	C-172
6/22/94	Juneau, AK	ANC94FA070	7	4	DHC-3
7/14/94**	Kalaupapa, HI	FTW94MA236	0	1	AS-350
7/14/94**	Hanalei, HI	FTW94MA235	3	4	AS-350
7/18/94	Anchorage, AK	ANC94LA088	0	0	C-206
7/19/94	Juneau, AK	ANC94FA089	0	0	AS-350
8/7/94	Kodiak, AK	ANC94FA100	6	1	DHC-2
8/11/94	Kukuihaele, HI	LAX94FA317	0	0	AS-350
9/3/94	Volcano, HI	LAX94LA352	0	0	HU-50
10/24/94	Kaupo, HI	LAX95LA019	0	0	AS-350
2/13/95	Tusayan, AZ	DCA95MA019	8	2	Destroyed PA-31-350
5/31/95	Skagway, AK	ANC95LA062	0	0	AS-350
6/30/95	Talkeetna, AK	ANC95LA902	0	0	C-185
7/7/95	Haines, AK	ANC95FA101	6	0	Destroyed:Piper-32-300
10/11/95	Hana, HI	LAX96LA009	0	0	HU-369
Total Excluding ** Accidents		Accidents: 19	27	13	

** = Accidents included in Altitude Minima, Visibility and Ceiling Analysis and therefore are excluded from the total shown above and from benefits estimates presented in Table III.2.

Table B.2. --Part 135 Accidents

1996-2000

02/28/96	Grand Canyon Airport, AZ	LAX96FA122	0	0	Substantial PA-31-350
07/28/1996	Denali NP,AK	ANC96LA107	0	0	Substantial Cessna 185
09/01/1996	Skwnrna, AK	ANC96LA140	0	0	SubstantialPA-28-161
05/17/1998	Monument Valley, UT	FTW98LA220	0	0	Substantial CE-172-P
11/07/1996	Bruneau, ID	SEA97LA028	0	0	Substantial PA-28-151
11/12/1996	Hana,HI	LAX97LA039	0	0	Substantial HU369
06/04/1997	Lake Powell, UT	SEA97LA128	0	0	Destroyed Cessna 177B
06/29/1999	Talkeetna, AK	ANC99LA083	0	0	Substantial Cessna 206
08/07/1999	Ketchikan, AK	ANC99LA107 B	0	0	Minor DHC-6-300
08/07/1999	Ketchikan, AK	ANC99LA107 A	0	0	Substantial DHC-6-300
11/12/1999	Van Nuys, CA	LAX00LA035	0	0	Substantial GA-AG-5B
04/16/2000	Grand Canyon	LAX00LA156	0	0	Substantial BHT-407-X
04/21/2000	Kahului, HI	LAX00LA167	0	0	Substantial AS-350-BA
05/07/200 0	Monument Valley, UT	FTW00LA141	0	0	Substantial Cessna 182
08/16/2000	Yakutat, AK	ANC00LA105	0	0	Substantial CE-185
09/18/2000	Hoover Dam	LAX00FA342	0	0	Substantial SK-55
09/23/2000	Valle, AZ	LAX00FA347	0	0	Destroyed CE-207-A
09/23/1996	Anchorage, AK	ANC96FA162	3	2	Destroyed CE-206G
07/03/1997	Skagway, AK	ANC097FA09 7	4	0	Destroyed PA-32
03/24/1998	Monument Valley, UT	FTW98FA157	0	3	Substantial CE-207-T207A
05/30/1998	Juneau, AK	ANC98FA061 A	0	1	Substantial AS-350-B2
06/25/1998**	Kauai, HI	LAX98FA211	6	0	Destroyed AS-350-BA
08/05/1998	Ketchikan, AK	ANC98FA116	1	2	Destroyed CE-185-A185F
06/09/1999	Juneau, AK	ANC99FA073	7	0	Destroyed AS-350-BA
09/10/1999	Juneau, AK	ANC99FA139	0	1	Destroyed AS-350-B2
09/25/1999**	Volcano, HI	DCA99MA088	10	0	Destroyed PA-31-350
12/28/1999	Avalon, CA	LAX00FA061	0	1	Substantial AS-350-D
04/18/2000	Grand Canyon, AZ	LAX00FA160	0	6	Destroyed BHT-206-L3
07/21/2000**	Kahului, HI	LAX00MA273	7	0	Destroyed AS-355-F1
08/25/2000	Hilo, HI	LAX00FA310	1	0	Destroyed PA-31-350
No. Accidents Excluding **	27		16	16	
Total Part 135 Accidents 1993-2000 Excluding ** Accidents = 46			43	29	

Notes: Column labeled "F"--Fatalities.

Column labeled "S"--Serious Injuries

** = Accidents included in Altitude Minima, Visibility and Ceiling Analysis and therefore are excluded from the total shown above and from benefits estimates presented in Table III.2.

Table C1 – Accident and Fatality Rates for
Altitude Minima, Visibility and Ceiling Provisions

	Hawaii Air Tour Flights	
1982	73641	
1983	85692	
1984	99180	
1985	114578	
1986	111702	
1987	105174	
1988	106603	
1989	115786	
1990	113220	
1991	118260	
1992	108804	
1993	114068	
1994	117849	
1995	121615	
1996	125355	
1997	129408	
1998	112491	
1999	116388	
2000	118754	
TOTAL	2108568	
Total number of accidents involving low flying and visibility *		15
Millions of flights		2.108
Length of average air tour		45 minutes
Convert to million flight hrs.		1.581
Accident rate per million flight hrs.		9.49
Total number of fatalities		63
Fatalities per accident		4.2

Source: Final Regulatory Evaluation: "Air Tour Operators in the State of Hawaii", August 1994, Table B-1 and estimates for 1998-2000 based on historic share of air tours of total air taxi and commercial operations.
* Includes 10 accidents which occurred prior to 1993.

Table C 2 – Accident and Fatality Rates for Air Tour Water Landings without Flotation Gear

Hawaii Air Tour Helicopter Flights		
1982	62,595	
1983	72,838	
1984	84,303	
1985	97,391	
1986	94,947	
1987	89,398	
1988	90,613	
1989	98,418	
1990	96,237	
1991	100,521	
1992	92,483	
1993	96,958	
1994	100,172	
TOTAL	**1,176,874**	
Total number of accidents w/o flotation *		3
Millions of flights		1.176
Length of average air tour		45 minutes
Convert to million flight hrs.		0.882
Accident rate per million flight hrs.		**3.40**
Total number of fatalities		8
Fatalities Per Accident		**2.6667**

Source: Final Regulatory Evaluation: "Air Tour Operators in the State of Hawaii", August 1994, Tables B-1 and B-2.
* Includes 1 accident which occurred prior to 1993.