AIRCRAFT REGULATORY ANALYSIS BRANCH, APO-320

OFFICE OF AVIATION POLICY AND PLANS

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

PROPOSED RULE

AGING AIRPLANE SAFETY

June, 1997

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EXECUTIVE SUMMARY

This regulatory evaluation examines the impacts of a proposed rule to amend parts 119, 121, 129, 135, and 183 of Title 14 of the Code of Federal Regulations (14 CFR). The proposed rule would: (1) require all airplanes operated under part 121, all U.S. registered, mutiengine airplanes operated under part 129, and all multiengine airplanes used in scheduled operations conducted under part 135, to undergo inspections after their 14th year in service to ensure that the maintenance of these airplanes' age sensitive parts and components has been adequate and timely, and (2) require that damage-tolerance (DT)-based supplemental inspections and procedures be developed and implemented for these airplanes.

The twenty-year projected costs of the proposal are as follows.

COSTS	FOR SIP DEVELOPMENT AND IMPLEMENT	FOR FAA/DAR INSPECTION AND REVIEW	TOTALS
TO OPERATORS	$95,524,573	$64,764,366	$160,288,939
TO THE FAA	$385,000	$37,418,040	$37,803,040
TOTALS	$95,909,573	$102,182,406	**$198,091,979**
PRESENT VALUES	$49,038,322	$50,585,134	**$99,623,455**

Since this proposed rule would address an anticipated problem in the aging aircraft fleet, the FAA is unable to quantify the expected benefits of the proposal on the basis of historical accident rates that would be reduced. The FAA finds that the proposed actions are necessary to ensure the continuing airworthiness of aging airplanes and that the anticipated benefits of the proposed rule would justify its costs.

The FAA has made an initial determination that the proposed amendment would not have a significant economic impact on a substantial number of small entities, and it would not constitute a barrier to international trade.

Aging Airplane Safety

I. Introduction

This regulatory evaluation examines the impacts of a proposed rule to amend parts 119, 121, 129, 135, and 183 of Title 14 of the Code of Federal Regulations (14 CFR). The proposed rule would: (1) require all airplanes operated under part 121, all U.S. registered airplanes operated under part 129, and all multiengine airplanes used in scheduled operations conducted under part 135, to undergo inspections after their 14th year in service to ensure that the maintenance of these airplanes' age sensitive parts and components has been adequate and timely, and (2) require that damage-tolerance (DT)-based supplemental inspections and procedures be developed and implemented for these airplanes.

II. Background

In April 1988, a high-cycle transport airplane en route from Hilo to Honolulu, Hawaii, suffered major structural damage to its pressurized fuselage during flight. This accident was attributed in part to the age of the airplane involved. The economic benefit of operating certain older airplanes has resulted in the operation of many such airplanes beyond their previously projected retirement ages. Because of the problems revealed by the accident in Hawaii and the continued operation of older airplanes, both the FAA and industry agreed that increased attention should be focused on the aging fleet and on maintaining its continued operational safety. In October of 1991, Congress enacted Title IV of Public Law 102-143, the "Aging Aircraft Safety Act of 1991" (AASA), to address aging aircraft concerns that arose from the Hawaii incident.

49 U.S.C. 44717 (formerly section 402 of the AASA) instructs

the Administrator to "prescribe regulations that ensure the continuing airworthiness of aging aircraft." 49 U.S.C. 44717 also requires the Administrator to "make inspections, and review the maintenance and other records, of each aircraft an air carrier uses to provide air transportation." The purpose of these inspections would be to "enable the Administrator to decide whether the aircraft is in safe condition and maintained properly for operation in air transportation." 49 U.S.C. 44717 specifies that these inspections and reviews shall be carried out as part of each aircraft's heavy maintenance check conducted "after the 14th year in which the aircraft has been in service." It also states that the air carrier shall "demonstrate to the Administrator, as part of the inspection, that maintenance of the aircraft's age-sensitive parts and components has been adequate and timely enough to ensure the highest degree of safety."

49 U.S.C. 44717 further indicates that the rule issued by the Administrator shall require an air carrier to make its aircraft, as well as any records about the aircraft that the Administrator may require to carry out the review, available for inspection as necessary to comply with the rule. It also states that the Administrator shall establish procedures to be followed for carrying out such an inspection.

On October 5, 1993, the FAA published Notice No. 93-14, "Aging Airplane Safety" (58 FR 51944). The proposals contained in that notice would have required operator certification of aging airplane maintenance actions and established a framework for the Administrator to impose operational limits on certain airplanes. Once an airplane exceeded those limits, additional maintenance actions would be necessary, such as inspection programs or parts replacements. Operational limits would have been established in a separate rulemaking.

Other proposals in the notice included: 1) a definition of the terms "heavy maintenance check (HMC)" and "years in service"; 2) a requirement for certificate holders to establish an HMC interval for each airplane they operate; 3) a requirement for certificate holders to certify, at the start of each airplane's 15th year in service and at all HMC intervals thereafter, that the airplane had met all maintenance program requirements; and 4) a requirement for certificate holders to notify the FAA at least 30 days prior to the start of an airplane's HMC.

After further review, and taking into consideration public comments to Notice No. 93-14, the FAA decided to withdraw that notice, and to issue this NPRM instead. The principal reasons for the issuance of this notice are: (1) the FAA's finding that in order to assure the continuing airworthiness of aging aircraft it is necessary for the FAA to inspect aging airplanes after their 14th year in service, and (2) to expand the use of DT-based supplemental inspections and procedures to a larger proportion of the airplanes used in air transportation.

III. Discussion of Costs and Benefits

Costs

The proposed rule would generate primary costs to those scheduled operators of multiengine airplanes not currently subject to a mandatory damage-tolerance based supplemental inspection program. Additional costs may be incurred by manufacturers who participate in the development of supplemental inspection programs for the affected airplane models. In addition to the costs for development and implementation of new supplemental inspection programs, the rule would also impose costs related to the additional FAA physical inspections and records reviews mandated by the Congress, and reflected in the proposed rule, to assure the continued airworthiness of aging airplanes. These costs would be incurred by both of the following categories of operators of aging airplanes: (1) those who currently have damage-tolerance based supplemental inspection programs, and (2) those who would be required to develop such programs under the proposed rule. Finally, the FAA itself would incur costs in conducting these inspections and records reviews, and in reviewing and approving the supplemental inspection programs.

It should be noted that the attributed costs of this proposal do not include the expense of making repairs that may be found necessary during either the SIP directed inspections or the oversight inspections conducted by the FAA. While the agency recognizes that such repairs may constitute a significant expense, the costs of such repairs is not attributed to this proposed rule because existing FAA regulations require that repairs be made as found to be necessary to assure the continued airworthiness of the airplane.

It is also noted that this evaluation focuses on existing airplanes and does not directly address the costs that the proposed rule would eventually impose on new production airplanes, primarily because such costs (particularly their present value) would constitute an insignificant proportion of the costs represented in this study.

SIP Development and Implementation Costs

The SIP development and implementation costs are calculated from a 1996 data collection of the fleet that would be affected. The worksheets for these calculations are included in the Appendix as Table 1. Approximately 1,190 airplanes were identified as being potentially subject to the requirements for SIP development and implementation under the proposed rule. The airplanes were then aggregated into 55 make-model groups consistent with the airplane groupings that would be covered under each individual supplemental inspection document. cost factors, ranging from .3 to 1.0, were then assigned to each airplane model group. These factors represent estimates of the proportion of full SIP development costs that would be incurred for each airplane model group; recognizing that full program development costs for some models would be reduced either due to similarities between certain models or because some models already had a non-damage-tolerance based SIP. Applying these cost factors produced the cost equivalence of 47 full SIP development efforts for the 55 models.

The methodology used to estimate the likely costs of the proposal first computed the costs that would be incurred: (1) if it were economically viable for every affected airplane in the database to meet the requirements of the proposed rule, and (2) if every existing, affected airplane continued to operate throughout the study period (year 2018). Following these calculations, the evaluation then estimates: (1) the number of airplanes and models where compliance would not, in fact, be economically viable, (2) the costs that would, instead, be incurred as a result of that inability, and (3) the costs that would not be incurred due to the retirement of airplanes from scheduled service during the study period for reasons unrelated to the proposed rule.

As input to later calculations, data were collected and aggregated concerning the average airplane weight in each airplane-model group (Table 1, Column 2), the average and maximum ages of the airplanes (Columns 5 and 6), the average numbers of seats (Column 4), the counts of airplanes in each model group (Column 7), whether or not there was a design life goal based on an imposed life limit of a major structural component (Column 8), and whether each model grouping was already in compliance with a non-damage-tolerance based SIP as defined in §91.60 (Column 11). These data are used as controls or factors in the calculations that follow.

Under the proposal, the affected airplanes (15 years or older) would be generally subject to a mandated SIP within 4 years after the effective date of the rule (the year 2002.) However, in an effort to reduce the economic impact, the proposal would delay the required compliance dates for those airplane models that meet any of several conditions. Compliance would be delayed for airplanes with 9 or fewer passenger seats until the year 2010. Airplanes that have an FAA defined design life goal would not be required to have a damage-tolerance based SIP until they had reached their design life goal, or until the year 2010, whichever occurs first. Similarly, compliance could be delayed up until the year 2010 for those models required by airworthiness directive to be maintained under a non-damage-tolerance based SIP. Based on these criteria, along with airplane age, the expected date of compliance for each group model fleet was projected. Column 12 shows the year that each model group would be subject to the proposal. Column 13 calculates the age of the oldest airpiane in each model group in the year that the group would be subject to the proposal in order to determine if any of the airplanes in that group would be at least 15 years old at that time. The information in Columns 12 and 13 are combined in Column 14 to project the actual year that the supplemental inspection document would be due.

Based on engineering estimates, the cost methodology employs a functional estimate (dependent on the size of the airplane) of the time needed to develop the SIP for each model.

Eq. 1 Hours = 9,206.6 + (No. of Seats X 276.2)
(Maximum value not to exceed 25,776)

This function produces a range between 10,311 and 25,776 hours necessary to develop the SIP for each model group (Column 18). Approximately 841,000 engineering hours would be required to produce SIP's for all affected models. Based on an assumed, fully burdened engineering rate of $95 per hour, the SIP development cost estimates for the various model groups range between $980,000 and $2.45 million per model group (Column 19). The total SIP development cost, assuming full SIP development for every model group sums to $79.9 million. These costs were then reduced by the factors described above to account for related model efficiencies and for models with partially compliant SIP's in place . The application of these factors reduced the range of costs to a level between $310,000 and $2.45 million per group, with a total potential SIP development cost estimate of $67.8 million (Column 20). Again, at this point in the methodology, the estimates assume that SIP's would actually be developed for all affected mcdeis.

For some airplane models, the FAA expects that the SIP development work would uncover the need for model specific structural modifications, either to make certain areas of the airplane inspectable or to replace structural elements that are determined to be uninspectable and subject to critical fatigue damage. Absent the SIP development work itself, estimates of the extent and magnitude of these modifications are inexact. As such, the FAA has employed a cost estimate that it considers to be cn the high side of feasible costs.

Similar to the SIP development costs, the evaluation assumes a functional estimate of the likely structural modification costs for each airplane based on the size of the airplane. Separate functions were employed for airplanes certificated under Part 25 and for those airplanes certificated under either Part 22 or CAR, based on the logic that the older and smaller airplanes were more likely to require modifications for inspectability.

Eq. 2 (Part 25) Mod Cost = $6,429 + (No. of Seats X $536)
Eq. 3 (Part 23/CAR) Mod Cost = $48,214 + (No. of Seats X $4,018)
(Seats not to exceed 30 in either equation)

The cost estimates of the likely modifications are computed in Column 21 and range from $10,200 to $168,800 per affected airplane depending on airplane size and certification basis. (It should be noted that these costs are per airplane, whereas the SIP development costs are per model group.)

In the absence of more specific information, the evaluation assumes that one-half of all affected models would require structural modifications as a result of SIP development findings. The unit modification cost estimates from above were multiplied by the numbers of airplanes in each model group and then by one-half (Column 22). These products were then summed across all models to yield a total potential modification cost of $65.0 million for the affected fleet.

The third major cost component of SIP development and impiementation involves conducting the actual inspections identified in the SIP for each model. For each model group, the evaluation assumes that the SIP directed inspections would begin when the fleet leader for that group reached 20 years of age or at the date the SIP development was due, whichever occurred later (Column 24). Under this logic, SIP directed inspections would begin anywhere between the years 2002 and 2014, depending on the characteristics of the individual airplane model group.

Again, based on engineering estimates, the cost methodology employs a functional model (dependent on the size of the airplane) of the expected number of critical locations that would need to be inspected on each airplane.

Eq. 4 Locations = 24.25 + (No. of Seats X .7437)

It was assumed that each location would require four hours of inspection and that the burdened (including overhead) labor rate for that work would cost $55 per hour. These estimates produce a likely inspection cost ranging between $6,000 and $30,000 per airplane per inspection (Column 25). Similar to the estimates of modification costs, these costs cannot be precisely estimated in the absence of the actual SIP development work for each model, and as such, the FAA has used what it considers to be high-end estimates.

In addition to the actual inspection work itself, the evaluation considers the incremental airplane downtime that would be necessitated by the additional work caused under this proposal. The evaluation assumes that each 40 hours of work caused by this proposal would require one additional day of airplane downtime (Column 26). The economic cost of downtime was computed under the assumption that the average productive return on capital is equal to 7 percent of the value of that capital per year. Downtime costs were calculated as the product of the number of additional downtime days, divided by 365 days per year, times the average estimated value of the airplane at the year the SIP would be required, times 7 percent. This produced a unit downtime cost per airplane, per inspection, ranging between $63 and $7,181 depending on the age and size of the airplane involved (Column 27).

The numbers of inspections that could be expected throughout the study period (year 2018) were computed based on the factors: (1) the number of years between the year the SIP would be due and the year 2018, (2) the annual number of hours that each airplane would fly (ranging between 858 and 1154 hours per year, depending on airplane size), and (3) an assumed inspection interval of every 4,000 hours (Column 28). Finally the unit labor and downtime costs related to the SIP directed inspections were multiplied by the numbers of airplanes in each model and by the expected numbers of inspections for that model during the study period (Columns 29 and 30). These products were then summed to represent the total potentiai SIP directed inspection cost of the Proposal: $33.5 million.

For the next step (Column 31), the three major component costs of the SIP development and implementation proposal were summed. The $67.8 million for SIP development, the $65.0 million for structural modifications, and the $33.5 million for SIP directed inspections produced a total potential cost of $166.3 miilion. At this point, however, the evaluation methodology recognizes that the potential unit costs of the proposal would not be realized for all models. For some airplane models, the potential unit costs of the proposal could constitute significant proportions of, or actually exceed, the economic values of the airplanes involved.

For each airplane model group, the potential costs of compliance were compared to the estimated economic value of that group in the year the SIP would be due (Columns 32 and 33). In cases where the potential compliance cost would exceed 50 percent of the group value, the methodology assumes that a SIP would not be developed and implemented, and the related compliance costs would not be incurred. Instead, the affected 34 models would be retired or transferred out of scheduled service, and the attributed costs of the proposal for these models would be a 50 percent reduction in their economic value. This methodology produces a potential cost of $109.1 million for those models where compliance would be economically feasible (Column 34), and an attributed $33.6 million in reduced value for the models that could not reasonably comply (Column 35). Total potential costs under this assumption equal $142.7 million.

As noted at the beginning of this section, the $142.7 million estimate was computed under the scenario whereby, external to the effects of the proposed rule, all of the affected 1,190 airplanes that exist today would continue to fly through the end of the study period, year 2018. In fact, some significant proportion of these costs would never be incurred due to normal rotation and retirement of the affected airplanes. The replacement cycle for the airplanes subject to this proposal varies widely within the industry. For some mainstream scheduled commuter carriers, it is common practice that airplanes are routinely replaced due to economic practicalities at a stage where few if any of the costs of this proposal would be incurred. Conversely, the economics of some smaller or niche carriers are such that airplanes may continue to fly for 40 years or more. In the absence of more specific projections, the evaluation assumes that at least one-third of the potential $142.7 million costs would not be incurred, leaving a projected cost of $95.1 million (Column 37).

Twc relatively minor additions are necessary to compute the full expected cost of the SIP development and implementation provision. First, the supplemental inspection document for each airplane model would have to be incorporated into the maintenance program of each affected operator. Based on the projected models where full compliance would be feasible, the FAA estimates that there would be 91 unique model/operator combinations whereby the supplemental inspection program would have to incorporated. The analysis assumes that this would require 80 hours of work per model/operator combination at a labor rate of $55 per hour, producing a SIP incorporation cost of $440,400. Added to the

$95.1 million cost above, this produces a total operator-manufacturer cost of $95.5 million.

Similarly, the FAA would incur costs to review and approve both the SIP's for each model and the SIP incorporations for each model/operator combination. SIP review costs are estimated at $184,800, consisting of 160 hours of review at $55 per hour for each of the 21 SIP's to be developed. The costs for review of SIP incorporations are projected at $200,200, consisting of 40 hours of review at $55 per hour for each of the 91 expected model/operator combinations. Adding these two figures produces a projected cost of $385,000 to the FAA for reviews related to the development and implementation of the SIP's.

Costs of FAA and/or DAR Inspections

The proposed rule would also necessitate that the FAA inspect all airplanes that are, or due to this proposal would be, subject to a SIP requirement to ensure that the maintenance of these airplanes' age sensitive parts and components has been adequate and timely. These inspections could begin at the start of an airplane's 15th year and would repeat at intervals not to exceed 5 years. Three categories of costs are associated with this provision: (1) the direct costs of the inspectors, (2) the personnel costs incurred by the operator to prepare for the inspections, and (3) the incremental airplane downtime caused by the inspections. The calculation of these costs are shown in Tables 2-A through 2-C, respectively, in the Appendix.

Using the dataset described in the previous section, the FAA estimates that there are 2,850 airplanes age 15 and older that are either currently subject to a SIP requirement as a result of airworthiness directive or would be as a result of the proposed rule. For the purposes of calculation, the evaluation assumes that this number would remain essentially steady over the study period. Higher or lower forecasts of aging airplane fleet size would have a direct relationship to the cost estimates presented here.

The number of person hours required per inspection (Table 2-A) was estimated as a function of airplane size, ranging linearly from 24 person hours for an airplane of 50,000 pounds or less, up to a maximum of 120 person hours for airplanes of 200,000 pounds or more. In addition, it was assumed that for every individual hour of actual on-site inspection, an additional one-half hour of ancillary or overhead activity would be required. At a labor rate of $55 per hour, the direct inspector costs would range between $1,980 and $9,900 per airplane, per inspection, depending on airplane size. These unit costs were multiplied by the count of airplanes in each weight category and were summed to produce a total inspector cost of $18.7 million for the fleet of affected airplanes age 15 and over. Since each airplane must be inspected every five years, the average annual cost would be one-fifth of that total, or $3.7 million.

The proposed rule would specifically empower designated airworthiness representatives (DAR's) to conduct the records reviews and maintenance inspections required under this proposal. Operators who choose to engage a DAR for the necessary reviews and inspections would directly bear the costs of that work. Conversely, operators who choose to rely on FAA inspectors may lose a degree of control over scheduling and availability but would not bear the direct costs of the inspections. In the absence of more specific information, this analysis assumes that one-half of the work would be accomplished by DAR's, and as such, the burden of this expense would be evenly divided between the operators and the FAA.

The second component of these costs concerns the time spent by operator personnel in their preparations to make the aircraft and its associated records available for inspection and review (Table 2-B). The evaluation assumes that operator personnel would expend one-fourth as much time preparing for the inspections as the inspectors would to conduct them (ranging from 6 to 30 hours per airplane inspection, depending on airplane size.) Again assuming a burdened labor rate of $55 per hour, the projected cost of operator personnel would total $3.1 million for all affected airplanes over five years, or $624,000 per year.

The third cost component consists of the incremental airplane downtime necessitated by the additional inspections (Table 2-Cj. Depending on airplane size, the additional downtime is projected to range between approximately .7 and 1.6 days per airplane inspection. Parallel to the downtime cost estimations calculated above for the SIP directed inspections (7 percent annual value of capital), the analysis projects an economic valuation for these costs ranging from $118 to $2,671 per airplane, per inspection. Multiplying these unit costs by the numbers of airplanes in each size category produces a $3.7 million expense for the affected fleet every five years, and an annual expense of $744,000.

The combined cost of the three components for FAA and DAR inspections would total $3,238,218 per year for the operators of affected airplanes, and $1,870,902 per year for the FAA (based on the above assumption that one-half of the inspections would be conducted by DAR's and borne by the operators.) Over the 20 year study period, these costs would total $64.8 million ($32.1 million present value) for operators, and $37.4 million ($18.5 million present value) for the FAA (Tables 3 and 4 in the Appendix).

Combined Costs

The table below summarizes both the standard and present value costs of the proposal. The table shows a combined proposal cost of $198.1 million with a present value of $99.6 million.

SUMMARY OF PROJECTED NPRM COSTS

STRAIGHT COSTS	FOR SIP DEVELOPMENT AND IMPLEMENT	FOR FAA/DAR INSPECTION AND REVIEW	TOTAL
TO OPERATORS OF AIRPLANES THAT NEED SIPS	$95,524,573	$4,383,547	$99,908,120
AIRPLANES WITH SIP IN PLACE	$0	$60,380,819	$60,380,819
OPERATOR SUBTCTAL	$95,524,573	$64,764,366	$160,288,939
TO THE FAA	$385,000	$37,418,040	$37,803,040
TOTAL	$95,909,573	$102,182,406	**$198,091,979**

PRESENT VALUE COSTS	FOR SIP DEVELOPMENT AND IMPLEMENT	FOR FAA/DAR INSPECTION AND REVIEW	TOTAL
TO OPERATORS OF AIRPLANES THAT NEED SIPS	$48,849,466	$2,170,064	$51,019,530
AIRPLANES WITH SIP IN PLACE	$0	$29,891,367	$29,891,367
OPERATOR SUBTOTAL	$48,849,466	$32,061,431	$80,910,897
TO THE FAA	$188,856	$18,523,703	$18,712,559
TOTAL	$49,038,322	$50,585,134	**$99,623,455**

Benefits

The FAA has extensively deliberated on how best to extend its Aging Aircraft Program to include additional aircraft models and respond to the AASA mandate. Technical experts and academic ieaders were consulted, and the costs and benefits estimated for many alternative approaches.

The FAA believes that the proposal described in this regulatory evaluation is the best approach to achieving the objective of assuring the continued safety of the air carrier fleet while striking the most cost effective balance of fully responding to the law, minimizing overall costs, and minimizing the impact on small entities.

The purpose of this proposal is to assure the continued structural airworthiness of air carrier aircraft as they continue in service. In this context, the rule does not increase safety in some measurable way, instead it maintains the level of safety estabiished at the time each model's type design was approved by the FAA.

In the absence of the Aging Aircraft Program, the FAA would be unable to determine some critical aspects of the air carrier aircraft as they age. Absent the ability to make this determination, the agency would be forced to require air carrier aircraft to be retired at some arbitrary age.

There are, then, two principal benefits of the proposal. The first is that the FAA and the industry are able to monitor the airworthiness of the affected aircraft as they age, and either take timely corrective action to maintain their continued airworthiness or retire them from service before they become unairworthy. The second benefit is that aircraft are able to stay in service longer because their continued airworthiness can be demonstrated, rather than being retired at an arbitrary age.

Clearly there are safety aspects of this proposal, but it is not possible to reasonably estimate if the rule would prevent some number of accidents. One reason for this is that the FAA would take preventive action before an accident pattern due to age emerged.

It is possible, however, to provide a sense of scale by estimating the years of extended service the proposal would have to provide the affected fleet of aircraft to make benefits exceed the related costs. For example, the cost calculations project that it would be economically viable for 927 airplanes to comply with the SIP development requirements of the proposal. At the respective times that their SIP's would be required, the affected airplanes would have a cumulative estimated value of $649 million, with a present value of $321 million. By comparison, the present value cost of compliance for all of the airplanes subject to the proposed SIP development and implementation requirement is $51 million. If it is assumed that the average annual value of capital is 7 percent of its worth, then extending the useful life of the subject fleet by one year would be worth 7 percent of $321 million, or $22.5 million (again, present value). Accordingly, the projected costs of this provision would be recovered in 2.27 years of extended useful life ($51 million cost divided by $22.5 million annual benefit = 2.27 years.) Note that the assumed timing of the "counter case" retirement of the affected models would, in turn, change the period necessary to recover the costs. If it is assumed that, in the absence of this proposed rule, no retirement action would have been taken until 5 years after the proposed rule would require SIP development, then the respective value of the subject fleet at that time would be lower ($188 million - present value), causing the annual value of extended useful life to be lower ($13.1 million), and finally requiring more time (3.9 years) to recover costs.

Comparison of Costs and Benefits

The FAA is unable to quantify the expected benefits of the proposal on the basis of historical accident rates that would be reduced. However, the proposed actions are necessary to ensure the continuing airworthiness of aging airplanes and the FAA finds that the benefits of the proposed rule would justify its costs.

IV. Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA) was enacted by Congress to ensure that small entities are not unnecessarily or disproportionately burdened by Government regulations. The RFA requires a Regulatory Flexibility Analysis if a rule will have a significant economic impact on a substantial number of small entities. FAA Order 2100.14A, Regulatory Flexibility Criteria and Guidance, establishes threshold cost values and small entity size standards for complying with RFA review requirements in FAA rulemaking actions. The significant cost threshold (adjusted to 1997 values) for scheduled operators of aircraft where the entire fleet has a seating capacity of more than 60 is $138,000 annually. For scheduled operators of smaller airplanes, the threshold value is $77,200. The small entity size threshold for operators of any size aircraft for hire is 9 or fewer airplanes.

The proposed rule contains two major cost inducing provisions: (1) the development and implementation of new damage-tolerance based supplemental inspection programs, primarily for smaller airplanes, and (2) the additional FAA physical inspections and records reviews mandated by Congress to assure the continued airworthiness of all aging airplanes. The table below shows the derivation of the expected annualized cost per airplane for both provisions. These unit costs were applied to a dataset of operators, by subject airplane, and accumulated for each operator to estimate the average annualized impact of the proposal. The proposal would affect an estimated 130 small operators. The annualized average cost of the proposal for these entities ranges from $1,236 dollars up to $55,853 per year. Since the highest projected average cost is below the significant impact threshold, the FAA finds that the proposal would not have a significant impact on a substantial number of small entities.

	PRESENT VALUE COST	AIRPLANES	PRESENT VALUE AVERAGE COST	YEARS	ANNUALIZED COST PER AIRPLANE
FOR MODELS THAT NEED **SIPs**					
SIP DEVELOP AND IMPLEMENT COSTS	**$48,849,466**	1190	$41,050	10	**$5,844.60**
FAA/DAR INSPECTION COSTS	**$2,170,064**	567	$3,827	20	$361.24
FOR MODELS THAT HAVE **SIPs**					
FAA/DAR INSPECTION COSTS	**$29,891,367**	2283	$13,093	20	**$1,235.89**

The FAA recognizes, however, that these costs could represent a considerable expense, particularly to small operators of older airplanes. In crafting the proposed rule, the agency investigated a wide variety of alternatives to minimize the economic burden of the proposal on all operators, while achieving the objective that all affected aircraft are inspected and kept in safe operating condition. The FAA has determined that compliance could be delayed for airplanes with 9 or fewer passenger seats until the year 2010. Airplanes that have an FAA defined design life goal would not be required to have a damage-tolerance based SIP until they had reached their design life goal, or until the year 2010, whichever occurs first. Similarly, compliance could be delayed up until the year 2010 for those models required by airworthiness directive to be maintained under a non-damage-tolerance based SIP.

V. Trade Impact Assessment

The rule will not constitute a barrier to international trade, including the export of U.S. goods and services to foreign countries and the import of foreign goods and services into the United States.

APPENDIX

TABLE 1 - SIP DEVELOPMENT AND **IMPLEMENTATION** COSTS

GROUP	CERT BASIS 1	AVERAGE WEIGHT 2	RELATED MODEL FACTOR 3	NOMINAL OR ACTUAL SEATS 4	AVERAGE AGE 6	MAXIMUM AGE 6	AIRPLANE COUNT 7	DESIGN LIFE GOAL? 8
BAe31	P23/CAR	15,523	1	19	8.2	13	199	Y
Beech1 300	P23/CAR	12,474	0.6	13	8	8	2	N
Beech 18	P23/CAR	8,948	1	9	36.4	42	14	N
Beech1 900C	P23/CAR	15,402	1	19	9	14	83	Y
Beech 1900D	P23/CAR	17,000	0.3	19	3.4	5	75	Y
Beech50	P23/CAR	6,002	1	6	30.2	43	4	N
Beech99/99A	P23/CAR	7,946	1	15	20.4	29	20	Y
Beech99B/99C	P23/CAR	11,139	0.3	15	13.9	16	12	Y
BeechKA	P23/CAR	7,878	0.3	14	23.6	31	9	N
BeechQA	P23/CAR	4,676	1	9	30.4	35	14	N
BeechSKA	P23/CAR	12,973	1	13	13.5	19	6	Y
Cessna310	P23/CAR	5,489	1	5	21	21	1	N
Cessna320	P23/CAR	5,289	1	5	30	30	2	N
Cessna40 1	P23/CAR	6,288	0.3	6	30	30	1	N
Cessna402	P23/CAR	6,231	1	9	18.9	30	75	Y
Cessna4 14	P23/CAR	6,336	0.6	8	21	21	1	N
Cessna42 1	P23/CAR	7,434	0.6	7	23	23	1	N
Cessna500	P25	6,033	1	7	11	18	2	N
CL600	P25	22,846	1	19	3.4	8	29	N
Convair240	P23/CAR	4 1,703	1	37	46	49	12	N
Convair440	P23/CAR	33,824	0.3	48	40.9	45	8	N
Convair580	P23/CAR	54,485	0.3	SO	43.5	45	15	N
Convair600	P23/CAR	51,831	0.3	SO	45.1	49	23	N
DBM20	P25	28,600	1	8	31	32	3	N
DC3	P23/CAR	23,423	1	33	53.9	57	28	N
DC4	P23/CAR	66,530	1	SO	52.5	53	4	N
DC6	P23/CAR	102,708	1	80	42.4	45	13	N
DHC6	P23/CAR	11,334	1	19	22.9	30	55	Y
DHC7	P25	39,026	1	SO	16.3	20	34	N
Drn328	P25	30,000	1	40	2	3	20	N
Emb110	P23/CAR	12,934	1	19	15.6	18	16	Y
Evangel4500	P23/CAR	5,489	1	9	28	28	1	N
F226	P23/CAR	12,474	1	19	19.2	20	12	Y
F227	P23/CAR	9,726	1	19	11.3	16	93	Y
FH27	P23/CAR	41,912	1	U	39	39	1	N
FK27	P23/CAR	35,006	0.6	U	24.7	33	40	N
GA159	P23/CAR	36,000	1	30	31.5	37	4	N
GA500	P23/CAR	6,698	1	6	33.8	37	13	N
GA680	P23/CAR	8,483	0.6	9	31.8	33	6	N
GrummanG44	P23/CAR	5,500	1	4	60	so	1	N
IAI1120W	P23/CAR	20,656	1	9	18.7	22	3	N
L188	P23/CAR	113,916	1	150	37.9	39	24	N
L382	P23/CAR	154,675	1	128	27.1	31	15	N
LJ25	P25	7,719	0.3	9	19	26	3	N
LJ35	P25	18,262	1	19	19.5	20	2	N
MU2	P23/CAR	14,599	1	9	17	17	1	N
PA23	P23/CAR	5,200	1	6	27.4	34	5	N
PA3 1	P23/CAR	6,608	1	9	18.5	29	74	Y
PA34	P23/CAR	4,570	1	6	30.1	32	7	N
PBNIs	P23/CAR	6,321	1	8	23.7	29	33	N
PBNTri	P23/CAR	8,705	1	16	18.9	23	7	Y
SC7	P23/CAR	10,206	1	20	21.3	28	3	N
Short8330	P25	22,751	1	30	17.2	19	6	Y
Shorts360	P25	24,490	0.6	36	11.7	15	46	Y
YS11	P23/CAR	55,000	1	SO	27.7	29	8	N
		SUM	47				1180	

TABLE 1 CONTINUED

GROUP	DESIGN LIFE HOURS a	ESTIMATED DESIGN YEARS 10	81 .60 AD SID? 11	YEAR RULE AFFECTS 12	MAX AGE AT YEAR RULE AFFECTS 13	YEAR SID DUE 14	AVERAGE AGE YEAR SID DUE 15
BAe31	30,000	26	N	2010	26	2010	21.2
Beech 1300		0	N	2002	13	2004	15
Beech1 8		0	N	2010	55	2010	49.4
Beech1 900C	45,000	39	N	2010	27	2010	22
Beech1 900D	45,000	39	N	2010	18	2010	16.4
Beech50		0	N	2010	56	2010	43.2
Beech99/99A	46,000	40	N	2008	40	2008	31.4
Beech99B/99C	46,000	40	N	2010	29	2010	26.9
BeechKA		0	N	2002	36	2002	28.6
BeechQA		0	N	2010	48	2010	43.4
BeechSKA	30,000	26	N	2004	26	2004	20.5
Cessna3 10		0	N	2010	34	2010	34
Cessna320		0	N	2010	43	2010	43
Cessna40 1		0	N	2010	43	2010	43
Cessna402	7,700	9	N	2002	35	2002	23.9
Cessna4 14		0	N	2010	34	2010	34
Cessna42 1		0	N	2010	36	2010	36
Cessna500		0	N	2010	32	2010	24
CL600		0	N	2002	13	2004	10.4
Convair 240		0	Y	2010	62	2010	59
Convair440		0	Y	2010	58	2010	53.9
Convair580		0	Y	2010	58	2010	56.5
Convair 600		0	Y	2010	62	2010	58.1
DBM20		0	N	2010	45	2010	44
DC3		0	Y	2010	70	2010	66.9
DC4		0	N	2002	58	2002	57.5
DC6		0	Y	2010	68	2010	55.4
DHC6	33,000	29	N	2002	35	2002	27.9
DHC7		0	N	2002	25	2002	21.3
Dm328		0	N	2002	8	2009	14
Emb110	30,000	26	N	2005	26	2005	23.6
Evangel4500		0	N	2010	41	2010	41
F226	35,000	30	N	2007	30	2007	29.2
F227	35,000	30	N	2010	29	2010	24.3
FH27		0	N	2002	U	2002	44
FK27		0	Y	2010	46	2010	37.7
GA159		0	N	2002	42	2002	36.5
GA500		0	N	2010	50	2010	46.8
GA680		0	N	2010	46	2010	U . 8
GrummanG44		0	N	2010	63	2010	63
IAI1120W		0	N	2010	35	2010	31.7
L188		0	Y	2010	52	2010	so.9
I.382		0	N	2002	36	2002	32.1
LJ25		0	N	2010	39	2010	32
LJ35		0	N	2002	25	2002	24.5
MU2		0	N	2010	30	2010	30
PA23		0	N	2010	47	2010	40.4
PA31	13,000	15	N	2002	34	2002	23.5
PA34		0	N	2010	45	2010	43.1
PBNIs		0	N	2010	42	2010	36.7
PBNTri	23,900	21	N	2002	28	2002	23.9
SC7		0	N	2002	33	2002	26.3
Shorts330	67,600	so	N	2010	32	2010	30.2
Shorts360	28,800	25	N	2007	25	2007	21.7
YS11		0	N	2002	34	2002	32.7

TABLE 1 CONTINUED

GROUP	NOMINAL VALUE PER AIRPLANE IN YEAR SID DUE	AVERAGE VALUE PER GROUP IN YEAR SID DUE	HOURS TO DEVELOP SID	COST TO DEVELOP SID	FACTORED COST TO DEVELOP SID	MODIFICATION COST PER AFFECTED AIRPLANE
	16	17	, 18	19	20	21
BAe3 1	$480,765	$95,672,180	14,453.70	$1,373,101	$1,373,101	$ 124,554
Beech1 300	$ 693,088	$1,386,177	12,796.71	$1,215,688	$729,413	4100,446
Beech 18	$203,637	$2,850,9 16	11,692.05	$1,110,745	$1,110,745	484,375
Beech 1900C	$443,367	$36,799,444	14,453.70	$1,373,101	$1,373,101	$ 124,554
Beech 1900D	$814,761	$61,107,080	14,453.70	$1,373,101	$411,930	$ 124,554
Beech50	$ 143,025	4572,102	10,863.56	$1,032,038	$1,032,038	$72,321
Beech99/99A	$ 183,022	$3,660,432	13.349.04	$1,268,159	$1,268,159	$ 108,482
Beech99B/99C	$248,715	$2,984,578	13,349.04	$1,268,159	$380,448	$ 108,482
BeechKA	$181,623	$1,634,603	13,072.88	$1,24 1,923	$372,577	$ 104,464
BeechQA	$115,744	$1,620,418	11,692.05	$1,110,745	$1,110,745	$84,375
BeechSKA	$433,374	$2,600,244	12,796.71	$1,215,688	$1,215,688	$ 100,446
Cessna3 10	$132,471	$132,471	10,587.40	$1,005,803	$1,005,803	$68,304
Cessna320	$ 128,356	$256,712	10,587.40	$1,005,803	$1,005,803	$68,304
Cessna401	(148,910	$ 148,910	10,863.56	$1,032,038	4309,611	$72,321
Cessna402	$ 163,472	$12,260,430	11,692.05	$1,110,745	$1,110,745	$84,375
Cessna4 14	$ 149,897	$149,897	11,415.89	$1,084,510	$650,706	$80,357
Cessna42 1	$ 172,488	$ 172,488	11,139.73	$1,058,274	4634,964	$76,339
Cessna500	$ 157,509	$315,018	11.139.73	$1,058,274	$1,058,274	$10,179
CL600	$1,875,980	$54,403,408	14,453.70	$1,373,101	$1,373,101	4 16,607
Convair240	$877,543	$10,530,514	19.424.66	$1,845,342	$1,845,342	$ 168,750
Convair440	$715,439	$5,723,513	22'462.47	$2,133,934	$640,180	4 168,750
Convair580	$1,140,521	$17,107,822	23,014.80	$2,186,406	4655,922	4 168,750
Convair600	$1,085,918	$24,976,108	23,0 14.80	$2,186,406	$655,922	$ 168,750
DBM20	$607,960	$1,823,880	11,415.89	$1,084,510	$1,084,510	410,714
DC3	$ 50 1,448	$14,040,531	18,320.00	$1,740,400	$1,740,400	4 168,750
DC4	$1,388,337	$5,553,348	23,014.80	$2,186,406	$2,186,406	$ 168,750
DC6	$2,132,668	$27,724,687	25,776.00	$2,448,720	$2,448,720	4 168,750
DHC6	$252,727	$13,899,972	14,453.70	$1,373,101	$1,373,101	$ 124,554
DHC7	$1,156,026	$39,304,901	23,0 14.80	$2,186,406	$2,186,406	022,500
Dm328	$ 1,75 1,892	$35,039,836	20,253.15	$1,924,049	41,924,049	422,500
Emb110	$324,915	$5,198,648	14,453.70	$1,373,101	$1,373,101	4124,554
Evangel4500	$132,471	$132,471	11,692.05	$1,110,745	$1,110,745	$84,375
F226	$276,181	$3,314,175	14,453.70	$1,373,101	$1,373,101	$124,654
F227	$234,256	$21,785,774	14,453.70	$1,373,101	$1,373,101	4 124,554
FH27	$881,843	$881,843	21,357.81	$2,028,992	$2,028,992	$ 168.750
FK27	$739,758	$29,590,313	21,357.81	$2,028,992	$1,217,395	4 168,750
GA159	$7 60,209	$3,040,834	17,491.51	$1,661,693	$1,661,693	4 168,750
GA500	$ 157,345	$2,045,486	10,863.56	$1,032,038	$1,032,038	$72,321
GA680	4194,070	$1,164,419	11,692.05	$1,110,745	$666,447	$84,375
GrummanG44	$ 132,697	$132,697	10,311.23	4979,567	4979,567	$64,286
IAI1120W	$444,519	$1,333,557	11,692.05	$1,110,745	$1,110,745	$84,375
L188	$2,363,263	$56,718,317	25,776.00	$2,448,720	$2,448,720	$ 168,750
L382	$3,134,727	$47,020,908	25,776.00	$2,448,720	$2,448,720	4 168,750
LJ25	$178,351	$535,054	11,692.05	$1,110,745	4333,224	$11,250
u35	4413,873	$827,747	14,453.70	41,373,101	$1,373,101	$16,607
MU2	$319,901	$319,901	11,692.05	$1,110,745	$1,110,745	$84,375
PA23	$ 126,525	4632,625	10,587.40	$1,005,803	41,005,803	$ 68.304
PA31	$ 178,505	$13,209,390	11,692.05	$1,110,745	$1,110,745	484,375
PA34	$ 113,563	$794,943	10,863.56	$1,032,038	$1,032,038	$72,321
PBNIs	$ 149,589	$4,936,424	11,692.05	$1,110,745	$1,110,745	$84,375
PBNTri	$219,794	$1,538,560	13,625.21	$1,294,395	$1,294,395	$112,600
SC7	4229,519	$688,557	14,729.86	$1,399,337	41,399,337	$128,671
Shorts330	$487,622	$2,925,730	17,491.51	41,661,693	$1,661,693	422,600
Shorts360	$709,088	$32,618,036	19,148.49	$1,819,107	$1,091,464	422,500
YS11	$1,151,117	$10,360,055	23.0 14.80	$2,186,406	$2,186,406	$ 168,760
		$716,199,084	841,071.56	$79,901,796	$67,801,971	

TABLE 1 CONTINUED

GROUP	GROUP MODIFICATION COST AT 60% INCIDENCE 22	HOUR8 FLOWN PER YEAR 23	THRESHOLD INSPECTION YEAR 24	LABOR INSPECTION COST PER AIRPLANE 26	DOWNTIME INSPECTION DAYS PER AIRPLANE 26	DOWNTIME INSPECTION COST PER AIRPLANE 27
BAe31	$12,393,080	1154	2010	$8,444	3.84	4354
Beech1 300	$ 100,446	1154	2009	47,462	3.39	445 1
Beech18	4590,625	858	2010	4 6,808	3.09	4121
Beech 1900C	$5,168,973	1154	2010	48,444	3.84	8326
Beech 1900D	$4,670,759	1154	2012	48,444	3.84	$600
Beech50	$ 144,643	858	2010	46,317	2.87	$79
Beech99/99A	$1,084,821	1154	2008	47,789	3.54	8124
Beech99B/99C	$ 650,893	1154	2010	47,789	3.54	8169
BeechKA	4470,089	1154	2002	47,626	3.47	4121
BeechQA	4590,625	858	2010	$ 6,808	3.09	$69
BeechSKA	$30 1,339	1154	2004	47,462	3.39	$282
Cessna3 10	434,152	858	2010	46,153	2.80	$71
Cessna320	$ 68,304	858	2010	46,153	2.80	$69
Cessna40 1	436,161	858	2010	46,317	2.87	$82
Cessna402	$3,164,063	858	2002	46,808	3.09	$97
Cessna4 14	440,179	858	2010	46,644	3.02	$87
Cessna42 1	438,170	858	2010	46,490	2.95	497
Cessna500	410,179	858	2010	46,480	2.95	$89
CL600	4240,804	1154	2009	$8,444	3.84	41,381
Convair240	$1,012,500	1154	2010	411,389	5.18	4871
Convair440	4675,000	1154	2010	413,188	5.99	4823
Convair580	$1,265,625	1154	2010	413,516	6.14	41,344
Convair600	$1,940,625	1154	2010	413,516	6.14	4 1,279
DBM20	416,071	858	2010	46,644	3.02	$352
DC3	$2,362,500	1154	2010	$ 10,734	4.88	$469
DC4	4337,500	1154	2002	413,516	6.14	$ 1,636
DC6	$1,096,875	1154	2010	4 18,424	8.37	$ 3,425
DHC6	$3,425,223	1154	2002	$ 8,444	3.84	$186
DHC7	$ 382,500	1154	2002	413,516	6.14	$ 1,362
Dm328	4225,000	1154	2014	411,880	6.40	41,814
Emb110	4996,429	1154	2005	48,444	3.84	4239
Evangel4500	442,188	858	2010	$6,808	3.09	$79
F226	4747,321	1164	2007	$8,444	3.84	$203
F227	$5,791,741	1154	2010	$8,444	3.84	4172
FH27	484,375	1154	2002	4 12.634	6.70	4964
FK27	$3,375,000	1154	2010	$ 12,534	6.70	$808
GA159	4337,500	1154	2002	4 10,243	4.66	4679
GA500	4470,089	858	2010	46,317	2.87	487
GA680	4253,125	858	2010	46,808	3.08	4116
GrummanG44	432,143	858	2010	45,989	2.72	$69
IAI1120W	$ 126,563	858	2010	46,808	3.09	$264
L188	$2,025,000	1154	2010	429,877	13.68	46,155
I.382	$1,265,625	1154	2002	426,278	11.84	47,181
U25	$ 16,875	858	2010	46,808	3.09	$106
LJ35	$ 16,607	1164	2002	$8,444	3.84	4305
MU2	442,188	858	2010	$6,808	3.09	$190
PA23	4170,759	858	2010	46,153	2.80	468
PA31	$3,121,875	858	2002	46,808	3.09	4106
PA34	4253,125	858	2010	$6,317	2.87	$63
PBNIs	$1,392,188	858	2010	46,808	3.09	$89
PBNTri	$393,750	1154	2002	$7,953	3.61	4152
SC7	$ 192,857	1154	2002	$8,607	3.9 1	4172
Shorts330	467,500	1154	2010	4 10,243	4.66	4435
Shorts360	4517,500	1154	2007	411,225	6.10	4694
YS11	4759,375	1154	2002	413,516	6.14	41,356
	$65,029,420					

TABLE 1 **CONTINUED**

GROUP	NUMBER OF INSPECTIONS THROUGH 2018 28	COMBINED INSPEC COST PER AIRPLANE **THROUGH** 2018 29	TOTAL **GROUP INSPEC** COST THROUGH 2018 . **30**	TOTAL NOMINAL COST 31	NOMINAL COST AS PERCENT OF GROUP VALUE 32	**IS RULE** COST> 50% **GROUP** VALUE 33	DIRECT **COST OF RULE** FOR **COMPLIERS** 34
BAe31	2.3	420,234	$4,026,566	$17,792,747	18.6%	FALSE	$17,792,747
Beech 1300	2.6	420,573	441,146	$871,005	62.8%	TRUE	$0
Beech 18	1.7	411,778	$ 164,892	41,866,262	65.5%	TRUE	$0
Beech 1900C	2.3	420,171	$1,674,193	$8,2 16,267	22.3%	FALSE	$8,216,267
Beech1 900D	1.7	415,374	$1,153,050	$6,235,739	10.2%	FALSE	$6,235,739
Beech50	1.7	$ 10,872	443,488	$1,220,169	213.3%	TRUE	$0
Beech99/99A	2.9	422,949	8458,980	$2,811,960	76.8%	TRUE	$0
Beech99B/99C	2.3	418,304	8219,648	41,250,989	41.9%	FALSE	$1,250,989
BeechKA	4.6	435,633	4320,697	$1,163,363	71.2%	TRUE	$0
BeechQA	1.7	411,690	$ 163,660	$1,865,030	115.1%	TRUE	$0
BeechSKA . .	4.0	430,976	4185,856	$1,702,883	65.5%	TRUE	$0
Cessna3 10	1.7	$ 10,581	$ 10,581	$1,050,536	793.0%	TRUE	$0
Cessna320	1.7	$ 10,577	421,154	$1,095,261	426.6%	TRUE	$0
Cessna401	1.7	$ 10,878	$ 10,878	4356,650	239.5%	TRUE	$0
Cessna402	3.4	423,475	$1,760,625	$6,035,433	49.2%	FALSE	$6,035,433
Cessna4 14	1.7	411,442	411,442	4702.327	468.5%	TRUE	$0
Cessna421	1.7	411,182	411,182	4684,316	396.7%	TRUE	$0
Cessna500	1.7	411,168	422,336	$1,090,789	346.3%	TRUE	$0
CL600	2.6	425,544	4740,776	$2,354,681	4.3%	FALSE	$2,354,681
Convair240	2.3	428,198	4338,376	$3,196,218	30.4%	FALSE	$3,196,218
Convair440	2.3	$ 32,225	4257,800	$1,572,980	27.5%	FALSE	41,572,980
Convair580	2.3	434,177	$5 12,655	$2,434,202	14.2%	FALSE	$2,434,202
Convair600	2.3	434,029	4782,667	$3,379,214	13.5%	FALSE	$3,379,214
DBM20	1.7	411,893	435,679	$1,136,260	62.3%	TRUE	$0
DC3	2.3	425,768	4721,504	$4,824,404	34.4%	FALSE	$4,824,404
DC4	4.6	469,697	4278,788	$2,802,694	60.5%	TRUE	$0
DC6	2.3	450,254	4653,302	$4,198,897	15.1%	FALSE	$4,198,897
DHC6	4.6	439,687	$2,183,335	$6,981,659	50.2%	TRUE	$0
DHC7	4.6	468,438	$2,326,892	$4,895,798	12.6%	FALSE	$4,895,798
Dm328	1.2	$ 16,433	4328,660	$2,477,709	7.1%	FALSE	$2,477,709
Emb110	3.8	432,995	4527,920	$2,897,450	65.7%	TRUE	$0
Evangel4500	1.7	411,706	411,706	$1,164,639	879.2%	TRUE	40
F226	3.2	427,670	8332,040	$2,452,462	74.0%	TRUE	$0
F227	2.3	419,817	$1,842,981	$9,007,823	41.3%	FALSE	$9,007,823
FH27	4.6	$ 62,089	$62,089	$2,175,456	246.7%	TRUE	$0
FK27	2.3	$30,687	$1,227,480	$5,819,875	19.7%	FALSE	$5,819,875
GA159	4.6	$50,242	4200,968	$2,200,161	72.4%	TRUE	$0
GA500	1.7	$ 10,886	4141,518	$1,643,645	80.4%	TRUE	$0
GA680	1.7	411,769	470,614	4980,186	85.0%	TRUE	$0
GrummanG44	1.7	410,300	410,300	$1,022,010	770.2%	TRUE	$0
IAI1120W	1.7	412,021	436,063	$1,273,371	96.6%	TRUE	$0
L188	2.3	482,874	$1,988,976	$6,462,696	11.4%	FALSE	$6,462,696
L382	4.6	4 153,908	$2,308,620	$6,022,965	12.8%	FALSE	$6,022,965
LJ25	1.7	411,753	435,259	4385,358	72.0%	TRUE	$0
u35	4.6	440,242	480,484	41,470,192	177.6%	TRUE	$0
MU2	1.7	411,896	411,896	$1,164,829	364.1 %	TRUE	$0
PA23	1.7	$ 10,576	452,880	$1,229,442	194.3%	TRUE	$0
PA31	3.4	423,506	$1,739,444	$5,972,064	45.2%	FALSE	$5,972,064
PA34	1.7	$10,845	475,915	41,361,078	171.2%	TRUE	$0
PBNIs	1.7	411,724	4386,892	$2,889,825	68.5%	TRUE	$0
PBNTri	4.6	437,284	4260,988	$1,949,133	126.7%	TRUE	$0
SC7	4.6	440,386	4121,158	$1,713,352	248.8%	TRUE	$0
Shorts330	2.3	424,661	$147,366	41,876,559	64.1%	TRUE	$0
Shorts360	3.2	438,141	41,754,486	$3,363,450	10.3%	FALSE	$3,363,450
YS11	4.6	468,411	4616,699	$3,561,480	34.4%	FALSE	$3,561,480
			$33,504,550	$166,335,941			$109,075,631

TABLE 1 CONTINUED

GROUP	LOST VALUE 60% COST OF RULE FOR REMAINDER 36	COMBINED RULE COST 36	EXPECTED COST - REDUCED BY 33.3% 37	APPROXIMATE DISCOUNTED COST 38
BAe31	40	$17,792,747	$11,861,832	$4,922,238
Beech 1300	$ 693,088	4693,088	4462,059	4287,747
Beech1 8	41,425,458	$1,425,458	4950,305	4394,343
Beech 1900C	40	$8,216,267	$5,477,512	$2,272,973
Beech 19000	$0	$6,235,739	$4,157,159	$1,725,073
Beech50	$286,051	4286,051	4190,701	479,134
Beech99/99A	$1,830,216	$1,830,216	$1,220,144	4579,682
Beech99B/99C	40	$1,250,989	4833,993	4346,077
Beech KA	$817,301	4817,301	4544,868	4388,483
BeechQA	$8 10,209	4810,209	4540,139	4224,139
BeechSKA	$1,300,122	$1,300,122	4866,748	4539,767
Cessna3 10	$66,235	466,235	444,157	418,324
Cessna320	$128,356	$128,356	485,571	435,509
Cessna40 1	$74,455	474,455	449,637	420,697
Cessna402	40	$6,035,433	$4,023,622	$2,868,787
Cessna4 14	474,949	474,949	449,966	420,734
Cessna42 1	$86,244	486,244	457,496	423,859
Cessna500	$157,509	4157,509	4105,006	443,574
CL600	40	$2,354,681	$1,569,787	4977,584
Convair240	$0	$3,196,218	$2,130,812	4884,211
Convair440	$0	$1,572,980	$1,048,653	4435,154
Convair580	40	$2,434,202	$1,622,801	4673,405
Convair600	$0	$3,379,214	$2,252,809	4934,836
DBM20	$911,940	4911,940	4607,960	4252,282
DC3	$0	$4,824,404	$3,216,269	$1,334,637
DC4	$2,776,674	$2,776,674	$1,851,116	$1,319,820
DC6	$0	$4,198,897	$2,799,265	$1,161,595
DHC6	$6,949,986	$6,949,986	$4,633,324	$3,303,496
DHC7	$0	$4,895,798	$3,263,865	$2,327,091
Drn328	$0	$2,477,709	$1,651,806	4733,422
Emb110	$2,599,324	$2,599,324	$1,732,883	$1,008,553
Evangel4500	466,235	$66,235	444,167	$ 18,324
F226	$1,657,088	$1,657,088	$1,104,725	4661,686
F227	$0	$9,007,823	$6,005,215	$2,491,951
FH27	4440,921	4440,821	4283,948	4208,681
FK27	$0	$5,819,875	$3,879,917	$1,610,027
GA159	$1,520,417	$1,520,417	$1,013,611	4722,691
GA500	$1,022,743	$1,022,743	4681,829	4282,935
GA680	4582,210	$682,210	4388,140	4161,064
GrummanG44	466,349	4 66,349	444,232	418,356
IAI1120W	4666,778	4666,778	4444,618	4184,460
L188	$0	$6,462,696	$4,308,464	41,787,859
L382	$0	$6,022,965	$4,015,310	$2,862,861
W25	4267,627	4267,527	$178,351	474,009
w35	4413,873	4413,873	4275,916	4 186,724
MU2	4159,951	4169,951	4106,634	*444,249*
PA23	4316,312	4316,312	4210,875	487,606
PA31	$0	$5,972,064	$3,981,376	$2,838,666
PA34	4397,471	4397,471	4264,981	4 109,958
PBNIs	$2,468,212	$2,468,212	$1,645,475	4682,813
PBNTri	4769,280	4769,280	4612,853	4365,667
SC7	$344,279	4344,279	4228,619	4163,644
Shorts330	$1,462,865	$1,462,865	4975,243	4404,691
Shorts360	$0	$3,363,450	$2,242,300	$1,139,872
YS11	$0	$3,561,480	$2,374,320	$1,692,857
	$33,610,629	$142,686,259	$95,124,173	$48,849,466

TABLE 2-A
FAA AND/OR DAR INSPECTION COSTS
DIRECT COSTS OF INSPECTORS

AIRPLANE WEIGHT (1000's) CATEGORY	COUNT OF AIRPLANES 15 YRS AND UP	FM I DAR HOURS PER . INSPECTION	COST PER INSPECTION AT HRLY RATE 465	TOTAL FAA / DAR INSPECTOR COSTS	OPERATOR INCURRED FM / DAR INSPECTOR COSTS (ONE HALF)
0 TO 50	546	36	41,980	41,081,080	4540,640
50 TO 100	185	72	431960	4732,600	4366,300
100 TO 150	592	108	45,940	$3,516,480	41,758,240
150 TO 200	878	144	47,920	$6,953,760	$3,476,880
200 AND UP	649	180	49,900	$6,425,100	$3,212,550
TOTALS	2,850		PER 5 YEARS	418.709.020	$9,354,510
			PER YEAR	$3,741,804	41,870,902

TABLE 2-B
FAA AND/OR DAR INSPECTION COSTS
PERSONNEL COSTS TO OPERATOR

AIRPLANE WEIGHT (1000's) CATEGORY	AIRPLANE COUNT 15 YRS AND UP	OPERATOR HOURS PER INSPECTION	COST PER INSPECTION AT HRLY RATE 455	TOTAL OPERATOR PERSONNEL CDSTS
0 TO 50	546	6	4330	4180,180
50 TO 100	185	12	4660	4122,100
100 TO 150	592	18	4990	4586,080
150 TO 200	878	24	41,320	$1,158,960
200 AND UP	649	30	41,650	41,070,850
TOTALS	2,850		PER 6 YEARS	43.118.170
			PER YEAR	4623,834

TABLE 2-C
FM AND/OR DAR INSPECTION CDSTS
INCREMENTAL AIRPLANE DOWNTIME COSTS TO OPERATOR

AIRPLANE COUNT 15 YRS AND UP	ESTIMATED VALUE PER AIRPLANE	NORMAL INCREMENTAL DOWNTIME PER INSPECT (DAYS)	SCHEDULE CONFLICT DOWNTIME PER INSPECT (DAYS)	ESTIMATED ECONOMIC VALUE OF DOWNTIME PER INSPECT	TOTAL OPERATOR DOWNTIME COSTS
546	4845,768	0.225	0.5	4118	464,208
185	$2,475,398	0.45	0.5	4451	483,434
592	$4,105,027	0.675	0.5	4925	4547,622
878	$5,470,155	0.9	0.5	$ 1,469	$1,289,518
649	$8,571,426	1.125	0.5	$2,671	41,733,630
2,850				PER 5 YEARS	$3,718,411
				PER YEAR	4743,692

	OPERATOR TOTALS
PER 5 YEARS	$16,191,091
PER YEAR	$3,238,218

TABLE 3-A
FAA AND/OR DAR INSPECTION COSTS FOR OPERATORS
ANNUAL COSTS FOR AIRPLANES THAT NEED TO DEVELOP A SIP

AIRPLANE WEIGHT (1000's) CATEQORY	"NEED SIP" AIRPLANE COUNT 15 YRS AND UP	OPERATOR PORTION OF INSPECTOR COSTS	OPERATOR PERSONNEL COSTS	OPERATOR DOWNTIME COSTS	TOTAL ANNUAL COST
OTO 60	471	$93,268	$3 1,086	611,078	$136,422
60T0 100	46	618,216	$6,072	$4,149	$28,437
100 TO 160	34	$20,196	$0,732	$6,290	$33,218
160 TO 200	16	$11,880	$3,960	$4,406	$20,246
200 AND UP	1	6990	$330	$634	6 1,864
SUBTOTAL	667	$144,640	$48,180	$26,467	$219,177
				PER AIRPLANE:	$387

TABLE 3-B
FAA AND/OR DAR INSPECTION COSTS FOR OPERATORS
ANNUAL COSTS FOR AIRPLANES THAT ALREADY HAVE A SIP

AIRPLANE WEIGHT (1000's) CATEQORY	"SIP DONE" AIRPLANE COUNT 15 YRS AND UP	OPERATOR PORTION OF INSPECTOR COSTS	OPERATOR PERSONNEL COSTS	OPERATOR DOWNTIME COSTS	TOTAL ANNUAL COST
0 TO 60	76	$ 14,860	$4,960	$1.764	$21,664
60 TO loo	139	$55,044	$18,348	$12,638	$86,930
100 TO 160	668	$331,462	$110,484	$103,234	$646,170
160 TO 200	863	$683,496	$227,832	6263,497	$1,164,825
200 AND UP	648	$641,620	$2 13,840	$346,192	$1,201,552
SUBTOTAL	2,283	$1,726,362	$676,464	$717,226	$3,019,041
				PER AIRPLANE:	$ 1,322

TABLE 4

FAA AND/OR DAR INSPECTION COSTS

20-YEAR PROJECTION

	COSTS TO OPERATORS						COSTS TO FM	
	AIRPLANES CURRENTLY WITHOUT SIPS		AIRPLANES WITH SIPS		COMBINED OPERATOR COSTS			
YEAR	**COSTS**	**DISCOUNTED COSTS**	COSTS	**DISCOUNTED** COSTS	COSTS	**DISCOUNTED COSTS**	COSTS	**DISCOUNTED** COSTS
1999	$219,177	$191,438	$3,019,041	$2,636,947	$3,238,218	$2,828,385	81,870,902	$1,634,118
2000	$219,177	$178,914	$3,019,041	$2,464,437	$3,238,218	$2,643,351	81,870,902	$1,527,213
2001	$219,177	8 167,209	$3,019,041	$2,303,212	$3,238,218	$2,470,421	81,870,902	81,427,302
2002	$219,177	8 156,270	$3,019,041	$2,152,534	$3,238,218	$2,308,805	81,870,902	81,333,927
2003	$219,177	8 146,047	$3,019,041	$2,011,714	$3,238,218	$2,157,762	81,870,902	81,246,661
2004	$219,177	8 136,493	$3,019,041	$1,880,107	$3,238,218	$2,016,600	81,870,902	$1,165,104
2005	$219,177	8 127,563	$3,019,041	$1,757,109	$3,238,218	81,884,673	81,870,902	$1,088,882
2006	$219,177	$119,218	$3,019,041	$1,642,158	$3,238,218	$1,761,376	81,870,902	$1,017,647
2007	$219,177	$111,419	$3,019,041	$1,534,727	$3,238,218	$1,646,146	$1,870,902	$951,072
2008	$219,177	$104,130	$3,019,041	81,434,325	$3,238,218	81,538,454	$1,870,902	$888,052
2009	$219,177	$97,317	$3,019,041	51,340,490	$3,238,218	81,437,808	$1,870,902	$830,703
2010	$219,177	$90,951	$3,019,041	51,252,795	$3,238,218	81,343,745	81,870,902	$776,358
2011	$219,177	$85,001	$3,019,041	$1,170,836	$3,238,218	81,255,837	$1,870,902	$725,568
2012	8219,177	$79,440	$3,019,041	51,094,239	$3,238,218	$1,173,679	81,870,902	$678,101
2013	8219,177	$74,243	$3,019,041	51,022,654	$3,238,218	81,096,897	81,870,902	8633,739
2014	$219,177	$69,386	$3,019,041	5955,751	$3,238,218	$1,025,137	81,870,902	8592,280
2015	$219,177	$64,847	$3,019,041	5893,225	$3,238,218	5958,072	81,870,902	$553,532
2016	$219,177	$60,604	$3,019,041	$834,790	$3,238,218	8895,394	81,870,902	$517,320
2017	$219,177	$56,640	$3,019,041	5780,178	$3,238,218	$836,817	$1,870,902	$483,477
2018	5219,177	552,934	$3,019,041	5729,138	$3,238,218	$782,072	81,870,902	$451,847
	$4,383,547	$2,170,064	$60,380,819	$29,891,367	$64,764,366	$32,061,431	$37,418,040	$18,523,703

TABLE 6

SUMMARY OF PROJECTED NPRM COSTS

STRAIGHT COSTS	FOR SIP DEVELOPMENT AND IMPLEMENT	FOR FAA/DAR INSPECTION AND REVIEW	TOTAL
TO OPERATORS OF:			
AIRPLANES THAT NEED SIPS	$95,524,573	$4,383,547	$99,908,120
AIRPLANES WITH SIP IN PLACE	$0	$60,380,819	$60,380,819
OPERATOR SUBTOTAL	$95,524,573	$64,764,366	$160,288,939
TO THE FM:	6386,000	$37,418,040	$37,803,040
TOTAL	$95,909,573	8102,182,406	$198,091,979

PRESENT VALUE COSTS	FOR SIP DEVELOPMENT AND IMPLEMENT	FOR FAA/DAR INSPECTION AND REVIEW	TOTAL
TO OPERATORS OF:			
AIRPLANES THAT NEED SIPS	$48,849,466	$2,170,064	$61,019,530
AIRPLANES WITH SIP IN PLACE	$0	$29,891,367	$29,891,367
OPERATOR SUBTOTAL	$48,849,466	$32,061,431	$80,910,897
TO THE FAA	$ 188,866	$18,523,703	$18,712,559
TOTAL	$49,038,322	$50,585,134	$99,623,455