DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Parts 121, 129, and 135

[Docket No. FAA–2002–13458; Notice No. 02–16]

RIN 2120–AE92

Corrosion Prevention and Control Program

AGENCY: Federal Aviation Administration, DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: This document proposes to require that the maintenance or inspection programs for all airplanes operated under part 121 of Title 14, Code of Federal Regulations, all U.S.-registered multiengine airplanes operated in common carriage by foreign air carriers or foreign persons under 14 CFR part 129, and all multiengine airplanes used in scheduled operations under 14 CFR part 135 include FAA-approved corrosion prevention and control programs. Such programs are needed because existing maintenance and inspection programs may not provide comprehensive, systematic measures to prevent and control corrosion. These proposals form a part of the FAA's response to legislation emanating from the Aging Aircraft Safety Act of 1991. These actions are intended to control the detrimental effects of corrosion and the resulting airplane structural material loss.

DATES: Comments must be received on or before April 1, 2003.

ADDRESSES: Comments on this proposed rulemaking should be mailed or delivered, in duplicate, to: U.S. Department of Transportation Dockets, Docket No. FAA–2002–13458, 400 Seventh Street, SW, Room Plaza 401, Washington, DC 20590. Comments may also be sent electronically to the following Internet address: *9-NPRM-CMTS@faa.gov*. Comments may be filed and/or examined in Room Plaza 401 between 10 a.m. and 5 p.m. weekdays expect Federal holidays.

FOR FURTHER INFORMATION CONTACT: Frederick Sobeck, Flight Standards Service, Aircraft Maintenance Division (AFS–300), Federal Aviation Administration, 800 Independence Avenue, SW., Washington, DC 20591, telephone (202) 267–7355.

SUPPLEMENTARY INFORMATION:

Comments Invited

Interested persons are invited to participate in the making of the proposed action by submitting such written data, views, or arguments as they may desire. Comments relating to the environmental, energy, federalism, or economic impact that might result from adopting the proposals in this document also are invited. Substantive comments should be accompanied by cost estimates. Comments must identify the regulatory docket or notice number and be submitted in duplicate to the DOT Rules Docket address specified above.

All comments received, as well as a report summarizing each substantive public contact with FAA personnel concerning this proposed rulemaking, will be filed in the docket. The docket is available for public inspection before and after the comment closing date.

All comments received on or before the closing date will be considered by the Administrator before taking action on this proposed rulemaking. Comments filed late will be considered as far as possible without incurring expense or delay. The proposals in this document may be changed in light of the comments received.

Commenters wishing the FAA to acknowledge receipt of their comments submitted in response to this document must include a pre-addressed, stamped postcard with those comments on which the following statement is made: ''Comments to Docket No. FAA–2002–13458.'' The postcard will be date stamped and mailed to the commenter.

Availability of Rulemaking Documents

You can get an electronic copy using the Internet by taking the following steps:

(1) Go to the search function of the Department of Transportation's electronic Docket Management System (DMS) Web page (*http://dms.dot.gov/search*).

(2) On the search page type in the last four digits of the Docket number shown at the beginning of this notice. Click on ''search.''

(3) On the next page, which contains the Docket summary information for the Docket you selected, click on the document number of the item you wish to view.

You can also get an electronic copy using the Internet through the Office of Rulemaking's Web page at *http://www.faa.gov/avr/arm/nprm.cfm?nav=nprm* or the **Federal Register**'s Web page at *http://www.access.gpo.gov/su_docs/aces/aces140.html*.

You can also get a copy by submitting a request to the Federal Aviation Administration, Office of Rulemaking, ARM–1, 800 Independence Avenue SW., Washington, DC 20591, or by calling (202) 267–9680. Make sure to identify the docket number, notice number, or amendment number of this rulemaking.

Background

Corrosion is a natural phenomenon that attacks metal by electrochemical action and converts the metal into a metallic compound, such as an oxide, hydroxide, or sulfate. Corrosion occurs because of the tendency for metals to return to their natural state. Corrosion, if left unchecked, will progressively degrade an airplane's strength until its structure can no longer sustain its design load.

In addition, a detrimental interaction occurs when both corrosion and metal fatigue are present. Metal fatigue is the initiation and propagation of cracks because of repeated stresses. Small amounts of corrosion may cause the formation of fatigue cracks by introducing areas of stress concentration. In turn, once the cracks begin, moisture and corrosion products can collect at the crack sites, accelerating both the corrosion and fatigue processes.

Although corrosion inhibitors and other protective coatings are applied to airplane metal surfaces during the manufacturing process, over time erosion by sand and/or rain and mechanical wear will remove the protective coatings. Therefore, in order to prevent corrosion, a constant cycle of cleaning, inspection, and application of corrosion inhibitors must be followed.

On April 28, 1988, an in-flight accident occurred when a large transport airplane lost approximately 18 feet of the upper fuselage. The National Transportation Safety Board (NTSB) investigation revealed that the probable cause of this accident was the failure of the operator to detect the presence of skin disbonding, with resulting corrosion and metal fatigue, that ultimately led to the separation of the aircraft's skin and structure. The NTSB observed numerous areas of corrosion on the accident airplane and on other airplanes in the operator's fleet. The NTSB noted that the operator did not have a programmatic approach to corrosion prevention and control. In its accident investigation report (NTSB/AAR–89/03; Recommendation No. A–89–59), the NTSB recommended that the FAA ''develop a model program for a comprehensive corrosion prevention and control program (CPCP) to be included in each operator's approved maintenance program.''

Prior to 1988, the FAA lacked compelling evidence that existing maintenance and inspection programs were not controlling corrosion to a safe level. Although many airplane manufacturers had provided maintenance programs for corrosion prevention and control, the FAA saw no reason to mandate such programs.

After the 1988 accident, the FAA sponsored an aging fleet conference at which the Air Transport Association of America (ATA) and the Aerospace Industries Association of America (AIA) committed to identifying and implementing procedures to ensure continued structural airworthiness of aging transport category airplanes. As a result, an Airworthiness Assurance Task Force (AATF) was established that included aircraft operators, manufacturers, and regulatory authorities. An immediate objective of the AATF was to sponsor airplane model-specific working groups to identify aging fleet structural maintenance requirements. The working groups were tasked to: 1. Select service bulletins to be recommended for mandatory implementation; 2. develop baseline corrosion prevention and control programs; 3. review supplemental structural inspection programs; 4. assess repair quality; and 5. review maintenance programs.

Task 2 resulted in the FAA issuing Airworthiness Directives (ADs) that mandated specific corrosion prevention and control programs for the following 11 airplane models: the Airbus A–300, British Aerospace BAC 1–11, Boeing 707/720, 727, 737, and 747, Fokker F–28, Lockheed L–1011, and McDonnell Douglas DC–8, DC–9, and DC–10. The FAA issued the corrosion ADs for the 11 airplane models based on the finding that the initiation and spreading of corrosion in the metallic structures of those airplanes is an ''unsafe condition,'' as that term is used in part 39. The airplanes covered by the ADs incorporated CPCPs of the kind that would be required by this NPRM.

Partly in response to the 1988 accident, legislation was enacted to address aging aircraft issues. This broadly worded Aging Aircraft Safety Act of 1991 (AASA), re-codified now at 49 U.S.C. 44717, instructed the Administrator to ''initiate a rulemaking proceeding for the purpose of issuing a rule to assure the continued airworthiness of aging aircraft.'' The rule issued pursuant to the AASA must require:

- The Administrator to inspect air carrier aircraft, used in air transportation, and the maintenance records of those aircraft, to determine that the aircraft are in safe condition and properly maintained for operation in air transportation.
- The Administrator's inspection and records review as part of the ''heavy maintenance check'' of the aircraft.
- Each air carrier to make available each aircraft used in air transportation, and its records.
- Each air carrier to demonstrate that maintenance of the age-sensitive parts and components of each aircraft used in air transportation, has been adequate and timely enough to ensure the highest degree of safety.

The AASA also instructed the Administrator to establish a program to verify air carrier compliance with their FAA-approved maintenance programs, and a program to train FAA inspectors and engineers to conduct auditing inspections for corrosion and metal fatigue in those aircraft.

Thus, corrosion prevention and control fit within the relatively broad scope of the AASA. The main thrust of the AASA is addressed in the Aging Airplane Safety proposal, published in the **Federal Register** on April 2, 1999 (64 FR 16298). That proposal would require, among other things, damage-tolerance-based inspection programs for most air carrier aircraft used in air transportation.

This proposal would impose requirements to prevent the spreading of corrosion in all other airplanes operated under part 121, all other U.S.-registered multiengine airplanes operated under part 129, and all other multiengine airplanes in scheduled operations under part 135. In other words, most of the airplanes not currently covered by AD. By this proposal, the FAA has not made a finding that corrosion need not be addressed in the airplanes that are excluded in this proposal, i.e., airplanes of the affected models operated under parts 91, or 125, or operated on-demand under part 135. At this time, however, the FAA has not evaluated all of the kinds of requirements that could be imposed to address corrosion in those airplanes, or all of the costs that would be attributable to such requirements.

The current CPCP ADs and the adoption of this proposed rule would differ in noticeable ways. First, each AD requires a CPCP for the affected model of airplane, regardless of the part under which the airplane is operated. As explained further in this proposal, this proposal does not apply to airplanes operated under parts 91, 125, and airplanes operated on-demand under part 135.

Second, unlike the ADs, the rules proposed in this NPRM do not specify the detailed provisions, including special reporting requirements, that would be contained in an operator's FAA-approved CPCP. Nevertheless, the proposal provides that an acceptable CPCP would contain procedures to assure that, whenever corrosion exceeding Level 1 is found in any area, the operator notify the FAA and, in addition, implement an FAA-approved means of reducing future findings of corrosion in that area to Level 1 or better.

A measure of the effectiveness of a CPCP is the level of corrosion damage found on primary structure during repeat scheduled inspections. Level 1 corrosion is corrosion damage that occurs between successive inspections and is local and can be reworked or blended-out within allowable limits as defined by the manufacturer or the FAA. This definition provides the FAA and industry with a quantifiable measure for determining the effectiveness of the CPCP. The FAA believes that such monitoring and notification is important and necessary to achieve one of the goals of this proposal, i.e., the prevention of the unsafe condition of spreading metallic corrosion that prompted the 11 ADs discussed above in the fleet of newer airplanes.

Concurrently with this proposal, the FAA is publishing an advisory circular (AC), ''Development of Corrosion Prevention and Control Programs'' to assist small entities and other affected parties in developing CPCP programs that will be acceptable to the FAA. This AC would contain the detailed provisions necessary for a successful program. In soliciting comments on the draft AC, the FAA seeks comments on the development and implementation of corrosion prevention and control programs.

In this proposal, the FAA is proposing a single set of rules that would apply to all the specified types of airplanes used in air carrier service. This approach would be administratively preferable to ADs issued to specific airplane models and generally provides better notice to the public concerning the types of inspections and maintenance that will be required to prevent corrosion in air carrier airplanes.

A Typical CPCP AD

A typical CPCP AD requires the operator to incorporate a baseline CPCP into its maintenance or inspection program. The baseline CPCP, developed by the manufacturer for all operators of a particular model of airplane, consists of corrosion prevention and control tasks, definitions of corrosion levels, compliance times (implementation thresholds and repeat intervals) and reporting requirements. After an operator has incorporated a baseline CPCP into its maintenance or inspection program, the ADs allow adjustment to the required repeat intervals of the CPCP, provided the maintenance program is controlling corrosion to an acceptable level. The FAA has determined that corrosion damage that occurs between successive inspections and is local and can be reworked or blended-out within allowable limits as defined by the manufacturer or the FAA, is an acceptable level of corrosion. These allowable limits of corrosion damage are defined as Level 1 Corrosion.

Existing Requirements

Sections 23.1529 and 25.1529 require that applicants for type certificates and changes to type certificates for normal, utility, acrobatic, commuter, and transport category airplanes prepare Instructions for Continued Airworthiness (ICA's) for those airplanes, as applicable. Appendix G to part 23 and Appendix H to part 25 currently specify the required content of those instructions for newly type-certificated airplanes. The requirements that applicants for type certificates (TC) prepare ICA's for their airplanes first became effective on October 14, 1980. ICA's were not required for airplanes type certificated before that date. Since January 28, 1981, any person who holds an airplane type certificate or supplemental type certificate (STC) for which the application was made after that date, is required to furnish at least one set of the ICA for each type of airplane to the owner upon its delivery, or upon issuance of the first standard airworthiness certificate, for each type of airplane, whichever occurs later. The holder of the TC or STC is also required to make the ICA available to any other person required to comply with terms of the ICA.

The ICA must include an airplane maintenance manual or a section to be included in the airplane maintenance manual, maintenance instructions, and a segregated and clearly distinguishable section titled the Airworthiness Limitations. The maintenance instructions must contain an inspection program that includes the frequency and extent of the inspections necessary to provide for the continued airworthiness of the airplane. Compliance with Appendices G and H requires the applicant to include maintenance schedules, and information required to apply protective treatments to the structure following the inspection. While the ICA provides owners and operators with useful information to assist them in preventing and controlling corrosion, they may not provide comprehensive, systematic measures for carrying out the inspections and necessary maintenance instructions.

Transport Category Airplanes

Under existing § 25.571, an evaluation of the strength, detail design, and fabrication must show that catastrophic failure due to corrosion will be avoided throughout the operational life of the airplane. Based on the evaluation, corrosion inspections or other procedures necessary to prevent catastrophic failure must be included in the Airworthiness Limitations Section of the ICA. Other corrosion inspections are included in the maintenance instructions of the ICA in accordance with Appendix H of part 25.

Small Airplanes and Commuter Category Airplanes

Requirements similar to those in § 25.571 apply to airplanes certificated to the damage tolerance requirements of § 23.573(b) and § 23.574. Similar to the transport category airplane requirements, any corrosion inspections of critical structure identified during the showing of compliance with those requirements must be listed in the limitations section of the ICA as provided in § 23.575. Other corrosion inspections are included in the maintenance instructions of the ICA in accordance with Appendix G of part 23.

The FAA has determined that these existing requirements have not always resulted in a comprehensive and systematic CPCP for either transport, small, or commuter category airplanes. This proposed rulemaking would specifically require a systematic CPCP for certain airplanes operating under parts 121, 129, and 135.

General Discussion of the Proposal

This proposed rule responds to the provisions of 49 U.S.C. 44717, which requires the Administrator to ''prescribe regulations that ensure the continuing airworthiness of aging aircraft * * *'' and is modeled after the CPCP ADs. As a result of requirements set forth in 49 U.S.C. 44717, the FAA proposes to prohibit the operation of certain airplanes in scheduled operations unless their maintenance or inspection programs include a CPCP. All airplanes operating under part 121, all U.S.-registered multiengine airplanes operating under part 129, and all multiengine airplanes conducting scheduled operations under part 135 would be affected. The airplanes affected by this proposed rule transport a significant portion of the passengers carried in scheduled passenger service and are the most prevalent airplanes operated in such service.

This notice does not propose requirements for rotorcraft or single-engine airplanes, nor does it propose requirements for on-demand passenger or cargo-carrying operations under 14 CFR part 135. In a future notice or notices, the FAA will propose aging aircraft requirements necessary to cover the operation of all the other aircraft used by operators to provide air transportation. For the purpose of developing those proposals, the FAA may consider the information (*e.g.* documents in the public docket) used to develop the rule proposed in this notice. It is possible that future proposals could be similar to the requirements proposed in this notice; however, because of the differences in the designs, operations, and maintenance of those aircraft, differences between this notice and the future proposals are likely.

The scope of this proposal includes the preponderance of the kinds of aircraft the Congress intended to cover under the Aging Aircraft Safety Act (AASA). By this notice, the FAA also solicits comments on the possibility or practicality of future requirements for CPCPs on aircraft not covered by this proposal.

Congress also instructed the Administrator to encourage governments of foreign countries and relevant international organizations to develop programs addressing aging aircraft concerns. Most foreign air carriers and foreign persons engaged in common-carriage operations have maintenance program requirements adopted by their governments. By including part 129 in this proposed rule, foreign air carriers and foreign persons operating U.S.-registered multiengine aircraft within or outside the United States would be required to include a CPCP in their maintenance programs. This action forms a portion of the FAA's response to the requirements in the AASA to help ensure the continued airworthiness of aging U.S.-registered airplanes operated worldwide.

Operator's Corrosion Prevention and Control Program

This proposal would require each operator to incorporate a baseline CPCP into its existing maintenance or inspection program. The operator can then modify the corrosion prevention and control tasks, and compliance times (implementation thresholds and repeat intervals), based upon service experience with its particular operation, so long as the operator's CPCP maintains corrosion to Level 1. Each operator's CPCP should include procedures for assuring that each airplane added to the operator's certificate after its CPCP is approved has completed all overdue inspections and tasks before the aircraft is operated in passenger service.

Baseline Corrosion Prevention and Control Programs

A baseline corrosion prevention and control program is designed to control corrosion so that the damage does not exceed Level 1. Baseline CPCPs contain corrosion prevention and control tasks, definitions of corrosion levels, compliance times (implementation thresholds and repeat intervals) and procedures to modify the program when corrosion damage exceeds Level 1. The reporting requirements that are listed in the CPCP ADs would not be changed by this proposal. Current reporting requirements in parts 121, 129, and 135 are unchanged.

The baseline program is developed for a specific type design of airplane and is usually developed by the manufacturer. If the manufacturer does not provide a program that meets the requirements in this proposed rule, each operator would be required to develop a program and present it to the FAA for approval. One proposed method of developing a program is identified in proposed Advisory Circular XX-XXX.

The FAA is aware that the manufacturer or operators of some airplanes affected by this proposed rule may choose not to develop a CPCP. Airplanes that do not have a CPCP would not be eligible for operation under part 121, and certain airplanes would be prohibited from operating under parts 129 or 135 without a CPCP after the dates specified in the proposal. For airplanes affected by this proposal, a baseline program would need to be developed and any corrosion inspections due would have to be completed. Similar airplanes added to the operator's certificate, subsequently establishment of the baseline programs would need to have all overdue corrosion inspections completed prior to being eligible to enter operations affected by this proposal.

Implementation

This proposed rule would require a CPCP to be in place two years after the effective date of the final rule. The FAA realizes that for some airplanes, the implementation thresholds for certain areas will have been exceeded by the time the rule becomes effective. Therefore, the proposed rule contains a provision for areas that have exceeded their implementation thresholds prior to two years after the effective date of the final rule. This provision would require the operator to develop an implementation schedule that would result in the completion of all overdue corrosion prevention and control tasks no later than four years after the effective date of the final rule.

Section-by-Section Analysis

Section 121.376

Proposed paragraph (a) would specifically require each operator to incorporate an FAA-approved CPCP into its maintenance or inspection program within two years of the effective date of the rule.

Proposed paragraph (b) would specify that a baseline corrosion prevention and control program be designed to control corrosion so that the damage does not exceed Level 1.

Proposed paragraph (b) would also require that the CPCP include corrosion prevention and control tasks, the definition of Level 1 corrosion, compliance times (implementation thresholds and repeat intervals) and procedures to modify the program when corrosion damage exceeds Level 1.

Proposed paragraph (c) would contain a provision for airplanes that have exceeded their implementation thresholds prior to two years after the effective date of the final rule. This provision would require each operator of such an airplane to develop an implementation schedule that would result in the completion of those corrosion prevention and control tasks no later than four years after the effective date of the final rule.

Section 121.376a

Proposed § 121.376a would define Level 1 corrosion, discussed in further detail below.

Section 129.1

The proposal would revise paragraph (b) to add a reference to § 129.35.

Section 129.24

Proposed § 129.24 would define Level 1 corrosion, discussed in further detail below.

Section 129.35

Proposed paragraph (a) would require each foreign air carrier or foreign person that operates an U.S.-registered multiengine airplane in common carriage to incorporate a FAA-approved CPCP into the maintenance or inspection program for each such airplane within two years of the effective date of the rule.

Proposed paragraph (b) would specify that a baseline CPCP is designed to control corrosion such that the damage does not exceed Level 1.

Proposed paragraph (b) would also require that the CPCP include corrosion prevention and control tasks, the definition of Level 1 corrosion, compliance times (implementation thresholds and repeat intervals) and procedures to modify the program when corrosion damage exceeds Level 1.

Proposed paragraph (c) would contain a provision for airplanes that have exceeded their implementation thresholds prior to two years after the effective date of the final rule. This provision would require each operator of such an airplane to develop an implementation schedule that would result in the completion of those corrosion prevention and control tasks no later than four years after the effective date of the final rule.

Section 135.424

Proposed paragraph (a) would require each operator of a multiengine airplane in scheduled service to incorporate a FAA-approved CPCP into the maintenance or inspection program for each such airplane within two years of the effective date of the rule.

Proposed paragraph (b) would specify that a baseline CPCP is designed to control corrosion such that the damage does not exceed Level 1.

Proposed paragraph (b) would require that the CPCP include corrosion prevention and control tasks, the definition of Level 1 corrosion, compliance times (implementation thresholds and repeat intervals) and procedures to modify the program when corrosion damage exceeds Level 1.

Proposed paragraph (c) would contain a provision for airplanes that have exceeded their implementation thresholds prior to two years after the effective date of the final rule. This provision would require each operator of such an airplane to develop an implementation schedule that would result in the completion of those corrosion prevention and control tasks no later than four years after the effective date of the final rule.

Section 135.426

Proposed § 135.426 would define Level 1 corrosion.

Definitions

The purpose of a corrosion prevention and control program is to control corrosion such that the damage does not exceed Level 1. A measure of the effectiveness of a CPCP is the level of corrosion damage found on primary structure during repeat scheduled inspections. In order for the FAA to have some measurable quantity by which to gauge the effectiveness of an individual operator's CPCP, the following definition applies:

Level 1 Corrosion is (1) corrosion damage occurring between successive inspections that is local and can be re-worked/blended-out within allowable limits as defined by the manufacturer or the FAA; (2) corrosion damage that is local but exceeds allowable limits and can be attributed to an event not typical of the operator's usage of other airplanes in the same fleet; or (3) corrosion damage that operator experience over several years has demonstrated to be only light corrosion between successive prior inspections but that the latest inspection shows that cumulative blend-outs now exceed the allowable limits. Level 2 and 3 corrosion along with specific procedures to be followed when Level 1 is exceeded will be included in the draft AC that will be available when this proposal is published.

An operator's CPCP would contain corrosion prevention and control tasks, the definition of Level 1 corrosion, compliance times (implementation thresholds and repeat intervals) and procedures to modify the program when corrosion damage exceeds Level 1. The following definitions apply:

Corrosion Prevention and Control Task: A corrosion prevention and control task usually consists of: 1. Removing equipment and interior furnishings to allow access to the area, 2. cleaning the area, 3. conducting inspections of all areas (Note: nondestructive inspections or visual inspections may be necessary), 4. removing all corrosion, evaluating damage, and repairing damaged structure, 5. unblocking drainage holes, 6. applying corrosion preventive compound(s), and 7. reinstalling dry insulation blankets.

An Implementation Threshold for a given area is the airplane age (years since the initial issuance of the certificate of airworthiness) at which the CPCP should be implemented in the affected area.

A Repeat Interval is the calendar time period between successive corrosion task accomplishments.

Regulatory Impact

Executive Order 12866 and DOT Regulatory Policies and Procedures

Economic Evaluation Summary

Proposed changes to Federal regulations must undergo several economic analyses. First, Executive Order 12866 directs that each Federal agency shall propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs. Second, the Regulatory Flexibility Act of 1980 requires agencies to analyze the economic impact of regulatory changes on small entities. Third, the Trade Agreements Act (19 U.S.C. 2531–2533) prohibits agencies from setting standards that create unnecessary obstacles to the foreign commerce of the United States. In developing U.S. standards, this Trade Act also requires the consideration of international standards and, where appropriate, that they be the basis of U.S. standards. And fourth, the Unfunded Mandates Reform Act of 1995 requires agencies to prepare a written assessment of the costs, benefits and other effects of proposed or final rules that include a Federal mandate likely to result in the expenditure by State, local or tribal governments, in the aggregate, or by the private sector, of $100 million or more annually (adjusted for inflation.

In conducting these analyses, the FAA has determined this rule:

(1) Has benefits which do justify its costs, is a ''significant regulatory action'' as defined in the Executive Order and is ''significant'' as defined in DOT's Regulatory Policies and Procedures;

(2) Would have a significant impact on a substantial number of small entities;

(3) Would not constitute barriers to international trade; and

(4) Does not impose an unfunded mandate on state, local, or tribal governments, or on the private sector. These analyses, available in the docket, are summarized below.

Description of Costs. The primary costs of the proposed rule would be borne by those scheduled operators of multiengine airplanes not currently subject to a mandatory corrosion prevention and control program. Additional costs would also be incurred by manufacturers who participate in the assessment and development of the corrosion programs for the affected airplane models, but this evaluation assumes that all such costs would eventually be passed through to the operators. The FAA itself would incur relatively minor costs for reviewing and approving (1) the corrosion prevention and control programs, and (2) the incorporation of these new procedures into the existing maintenance and inspection programs.

Note that the attributed costs of this proposal do not include the expense of making major repairs or modifications that may be found necessary during the inspections mandated by this proposal. While the agency recognizes that such repairs may constitute a significant expense, their costs are 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.

The methodology used in the evaluation first computes the costs that would be incurred if it were economically viable for all of the airplanes in the affected fleet to meet the requirements of the proposed rule. Based on these costs, and their comparison to the approximate fleet value, the methodology later estimates the numbers of airplanes and models where compliance would not actually be economically viable, and where instead, the airplanes would likely be retired from scheduled service.

Approximately 7,100 airplanes were identified as being subject to the proposed rule. For the majority of these airplanes, the proposal would not generate any additional costs, since the subject airplanes already comply with airworthiness directives that parallel the proposal. Some 2,900 airplanes would be affected by the proposal in one manner or another, and as such would incur costs.

In projecting the cost of the proposed rule, development cost factors were estimated for each airplane model. These factors, ranging from zero to one, represent the proportion of full CPCP development costs that would be incurred for each airplane model group. The factors account for the fact that full compliance programs are in place for some models (factor = 0) and that the development costs for some other models would be reduced to less than 1 either due to their similarities to other models or because some models have partially compliant programs. The factors also account for the fact that airplanes certificated under existing § 25.571, amendment 45 or later, are already required to undergo an evaluation of their strength, detail design, and fabrication to show that failure due to corrosion will be avoided throughout the operational life of the airplane.[1] For these newer models, development factors of .1 were assigned to represent the estimated additional effort (equal to one-tenth of a completely incremental CPCP evaluation and development) that would be necessary to comply with the proposed rule. Taken together, the

[1] Similar requirements exist under § 23.574 for commuter category airplanes, and damage tolerance requirements related to the effects of corrosion for both composite and metallic airframe structure are found in §§ 23.573(a) and (b), respectively.

various cost factors produce an estimated cost equivalence of approximately 47 full CPCP development efforts among the 88 model groups that were identified.

The cost methodology employs a three step functional estimate of the time needed to develop each CPCP. First, the nominal number of development hours is estimated as a function of the average maximum takeoff weight (MTOW) for each model.

Eq. 1. Hours = 2,296 + (.04 x MTOW)

This equation was derived from a two-point linear plot of the estimated costs expended to develop the CPCP for two existing airplane models (the DC–9 and the Piper Navajo). The results of the Eq. 1 estimates were then multiplied by the development factors to account for the reduced development efforts for similar or partially compliant models described above. Finally, a third factor (described below) was applied to account for the possibility that a CPCP would not be developed for an airplane model where it was reasonably expected that the airplanes of that model would have been retired before the effective period of the proposed rule.

The hours for development were converted into cost estimates for each model by applying a fully burdened engineering cost rate of $95 per hour for CPCP development. This produced a cost per model ranging between $32,000 and $427,000. The estimated development cost for all models totals to $10.4 million, or $7.9 million expressed in present value terms.

It was also necessary to estimate the FAA's costs to review and approve the CPCP's described above. The evaluation employs a simple factor of 80 hours of review per newly developed CPCP, at a burdened cost rate of $55 per hour. This produces estimated costs of $4,400 per model and for the affected fleet the total cost is $246,400, or in present value terms $141,171.

Similar to the ''development'' cost factors described above, the evaluation also employed ''implementation'' cost factors for each model. The implementation factors also range between zero and one, and constitute the expected proportions of full incremental implementation effort that would be caused by the proposal for each model. In addition to accounting for the existence of fully or partially compliant CPCP's themselves, the implementation factors also account for those cases whereby an industry developed CPCP may exist for a given airplane model, but either its implementation is not currently mandated by FAA direction, or the associated work level would be increased by this proposal. The evaluation projects the work load equivalence of full incremental implementation in 60 of the 88 affected model groups.

The first stage of implementation for the proposed rule would be incorporating the model-specific CPCP into an operator's maintenance or inspection program. Data were cross-tabulated to determine the distribution and number of unique combinations of operators and subject airplane models to estimate the number of new CPCP's that would need to be incorporated into existing operator programs (487 operator-model combinations.) In turn, the expected cost of these CPCP incorporations for the operators of each model were computed by multiplying the number of operator-model combinations, by an estimated 40 hours incremental work per incorporated program, and by a unit labor rate of $55 per hour. The total expected cost of this work, across all operator-model combinations, sums to $609,400, or $434,494 in present value.

Similar to their review of the actual CPCP's, FAA personnel would also need to review and approve the incorporation of the CPCP's into the existing maintenance and inspection programs of the operators. The calculation of these costs parallels the operator cost calculation from above with the exception that only 8 hours of review work would be necessary per incorporation. These ''second'' FAA review costs sum to $121,880, or $79,683 in present value. FAA review costs are expected to be incurred in 2003.

Next, the calculation of the actual operator inspection activities that would result from the CPCP's are computed. The evaluation assumes that the proposed rule would become final at the end of the year 2000, that the required new CPCP's would be developed by the end of the year 2002, and that inspections and maintenance, where scheduled, would start in the year 2003. The evaluation uses a 20-year study period (from the effective date of the rule) and, therefore, assesses expected costs through the year 2020. The inspections for any particular airplane would not begin before the time specified in the CPCP for that model, and the initiation of work under the CPCP's would vary by airplane model and by individual airplane structure. This evaluation assumes that the preponderance of corrosion related inspection and maintenance work under the proposed rule would begin in the tenth year of an airplane's operation. The evaluation further assumes that the airplanes under this proposal would not be retired from service until age 35.

The four parameters described above are used to estimate the projected number of years that inspections under this proposal would be conducted within the study period. For each airplane model, this period is calculated as the intersection of: (1) The years included within the study period, and (2) the years where the average age of the affected airplanes would be between 10 and 35 years old.

The projected, average number of years that each model would be inspected under the program multiplied by the number of affected airplanes in each model produces the expected airplane-years of program coverage under the proposal, by model. This figure, in turn, is multiplied by the projected number of hours of work per year that the CPCP would require, and by the cost of labor per hour for that work, to produce the estimated cost of implementation. The assumed unit cost rate is $55 per hour. The projected annual number of work hours for each airplane under the proposal is computed as a function of airplane size (maximum takeoff weight).

Eq. 2. Hours = 88 + (.0006 × MTOW)

This functional estimate was derived from a linear regression of the airplane weights and the annual work-hour projections included in 13 CPCP airworthiness directives (the original eleven plus two subsequent directives for the Casa C–212 and the Fokker F–27) mandating industry developed corrosion programs. The ''hours per airplane per year'' results are the product of the functional estimate in Equation 2, above, multiplied by the implementation factors described previously. Finally, the projected inspection costs over the study period are computed as the product of: (1) The numbers of airplane-years of coverage under the program, (2) the work hours per airplane per year, (3) a unit cost factor of $55 per hour for the inspection and maintenance work, and (4) a factor of 1.2 to account for the 20 percent overhead of paperwork and record keeping. These computations forecast a total of $155 million ($64.5 million in present value) in inspection costs through the year 2020.

In addition to the actual costs of inspecting the airplanes, costs can also be attributed to the incremental downtime that would be necessitated by the work required under the proposal. The evaluation assumes that each 40 hours of work necessitated by the CPCP requirement would require 1 additional day of airplane downtime. The projected additional down-days are computed as the product of: (1) The number of airplane years in the program, (2) the work hours per airplane per year, and (3) the assumed unit factor of 1 down-day per 40 hours of added work. Under these assumptions, the evaluation projects 58,658 days of additional downtime for the affected fleet throughout the twenty-year study period as a result of the work attributed to the proposal.

The economic valuation of this 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. Accordingly, the downtime costs were calculated as the product of: (1) The number of additional downtime days that would be required, divided by 365 days per year, (2) the estimated economic value of the fleet for each model, calculated at the median program year for that model, and (3) the 7 percent per year assumed rate of return on capital. These costs total $21.5 million, or in terms of present value $8.6 million.

Next, the present values (7 percent discount rate) of the four component industry costs were calculated. For computational expediency, the present value calculations assume that all development costs occur in the year 2002, operator incorporation costs occur in the year 2003, and both the inspection and downtime costs occur in the median year of the inspection program for each model. The present value of the total expected cost of the proposed rule to industry is $81.5 million, not including the FAA review costs described earlier.

PRESENT VALUE COST TO THE INDUSTRY

Development cost	Operator cost	Inspection cost	Downtime cost	Total Industry cost
$7,913,985	$434,494	$64,524,942	$8,626,515	$81,499,936

As noted in the introductory remarks of the cost section, the calculations described above assume that all of the subject airplanes would comply with the CPCP requirements of the proposed rule. At this point, however, the evaluation recognizes that it may not, in fact, be economical to develop and implement a CPCP for some older airplane models with very few subject airplanes. In order to account for this possibility, the evaluation compares the expected industry costs of the rule with the estimated fleet values of the affected models. For 11 models, the program costs are projected to be prohibitive and the expected compliance costs for the model are removed from the program implementation costs, and instead, a reduction of 50 percent of the value of the airplanes in that model is assigned as the attributed cost of the proposed rule for that model. Under this scenario, the present value costs to industry of the proposed rule would consist of $78.7 million in implementation costs and $1.3 million in costs resulting from reductions in airplane value due to a forecast economic inability to comply with the proposal. The total present-value cost of the proposed requirement to industry is projected at $80.0 million. The present value of the FAA cost for review is estimated at $220,885.

In addition to the proposed requirements for existing airplane models, the proposal would also require baseline corrosion prevention and control programs for future, newly certificated airplane models that would likely be marketed for scheduled passenger operations. For the purpose of example, the evaluation assumes one new certification per year between the effective date of the proposed rule and the end of the evaluation study period. In order to represent the likely sizes of the airplanes that might be certificated, the existing airplane models evaluated above were sorted by maximum takeoff weight, and were grouped into 18 classifications. The average weight of the airplanes in each of these 18 classes was then computed to represent the likely size of airplanes that would be certificated in each of the 18 years of the study period. In an effort to remove the bias of the order in which the various size airplanes were presumed to be certificated over time, the 18 airplane weight classes were assigned randomly across the 18 study years.

As noted above, the existing certification standards for all part 25 models and for certain part 23 models (commuter category and composite materials airplanes) require that future airplane models undergo an evaluation of their strength, detail design, and fabrication to show that failure due to corrosion will be avoided throughout the operational life of the airplane. As previously described, a development factor of .1 was assigned to the existing airplane models that were certificated to these standards, and in a parallel fashion, one-tenth of a full development cost is also assigned to the affected future airplane models. It should be noted that the existing certification procedures that would cause this reduced incremental impact are not required for metallic (non-composite material) airplanes in the normal, utility, or acrobatic categories for part 23. The evaluation assigns to these airplanes (weighing 12,500 pounds or less) a CPCP factor of .5, which recognizes that: (1) In the absence of this rule, these airplanes would not be substantially compliant with a CPCP requirement, but (2) substantial savings (one-half) in CPCP development would be realized as the development of the corrosion program would be included in the development of the airplane itself, rather than retroactively considered for an existing model.

The evaluation also recognizes that not all future airplane models will likely be marketed or used for scheduled passenger operations. In the absence of model-specific information, the evaluation assumes that future models under 6,000 pounds (2 of the 18 models considered here) would not incur additional costs as a result of this rule.

Returning to the computations, the estimated hours necessary to develop a CPCP for each airplane model in the example forecast were computed using the same formula that was used above (Eq 1; Hours = 2,296 + (.04 × MTOW)) with the result being multiplied by a factor of either .1 or .5 depending, respectively, on whether the airplane model was above or below 12,500 pounds. Again, parallel to the previous computations, the development costs were computed by multiplying the expected development hours by an engineering labor rate of $95 per hour. Similarly, the expected FAA review costs were computed as 80 hours of review per CPCP, multiplied by a unit labor factor of $55 per hour. Finally, the industry and FAA costs were combined for a total projected development and review cost of $1.3 million. The present values of these costs sum to $563,835.[2]

[2] This evaluation does not address the "inspection" portion of the costs that would result for these future models since, within the study period, very few airplanes would be certificated and produced, and then age to the point where the

In summary, over the twenty-year study period of this analysis, the proposed CPCP operating requirement for existing certification models is projected to cost $80.0 million to the industry and $221 thousand to the FAA (all costs in present value.) For newly type certificated models, the proposed rule is projected to cost $534 thousand to the industry and $30 thousand to the FAA.

Description of Benefits. The purpose of this rulemaking is to assure that corrosion does not degrade the airworthiness of affected air carrier airplanes. The corrosion prevention and control program contained in this proposal originates, in part, from the recommendations following the investigations of the Aloha Boeing 737–200 accident on April 28, 1988 when 18 feet of upper fuselage separated from the airplane in flight. The National Transportation Safety Board determined the probable cause of that accident was that corrosion and metal fatigue led to separation of the airplane's skin and structure.

All metal airframe structures are vulnerable to corrosion and older aircraft are much more likely to experience corrosion than newer airplanes. Corrosion is a natural process and occurs because of the tendency of metals over time to return to their original state. Maintenance and inspection records reveal that the presence of corrosion is more prevalent and pervasive in older aircraft. A review of the annual total of the number of listings in the Service Difficulty Reports involving corrosion over a subset of U.S. commercial airplanes provides a sense of the magnitude of the problem.

NUMBER OF SERVICE DIFFICULTY REPORTS INVOLVING "CORROSION"

[1990–1997]

Aircraft type	Year of occurrence							
	1990	1991	1992	1993	1994	1995	1996	1997
B–727	2293	1746	3126	2786	2874	2520	2308	2350
B–737	536	521	928	1003	1099	906	868	1223
B–747	523	222	433	441	228	422	522	899
DC–9	564	436	375	732	657	1197	1104	1037
DC–10	117	78	217	122	281	111	364	602
MD–80	4	0	14	21	44	14	5	28
A–300	11	18	32	37	10	17	109	184
Total	4048	3021	5125	5142	5193	5187	5280	6323

The problem of corrosion is that it is both prevalent and destructive. Multiple Site Damage (MSD) is an undesirable condition caused by wide spread cracking of an airplane structure. R. Plelloux, *et al,* in "Fractographic Analysis of Initiation and Growth of Fatigue Cracks at Rivet Holes writes "In the case of MSD, fatigue cracks are reported to initiate at rivet holes in the fuselage lap joints after the epoxy bond failed as a result of corrosion in high humidity environments * * * the cracks grow to a length of approximately 6 to 8 mm (.25 inches to .30 inches) on each side of the rivet, before fracture by tensile instability. Note that rivets (on the airplane skin) are spaced an inch apart center to center. Crack growth in service has been reported to occur over 20,000 to 40,000 cycles." Thus corrosion can cause multiple cracks around a rivet. When the cracks reach a length of .25 to .3 inches fracture by tensile instability occurs. Cracks have been reported in aircraft with much fewer cycles than those recently upgraded from Stage 2 to Stage 3 standards in the last ten years.

Corrosion's detrimental effects are not limited to rivet holes. Corrosion decreases the size of structural members and can also have bad synergisms with factors leading to early cracking. When a fatigue crack reaches a corroded section the growth rate of the crack increases by a factor of 3 (J.P. Chubb, *et al,* "The Effect of Exfoliation Corrosion on the Fatigue Behavior of Structural Aluminum Alloys"). The NTSB report to the FAA on the Aloha Boeing 737 accident cited finding corrosion in the throttle cables (in the leading edge). When the appropriate cable sections were removed from the aircraft and inspected there were indications of corrosion and this corrosion likely weakened the cables so that they separated at lower than design load. Corrosion was present for the entire length of that portion of the cable routed through the leading edge.

Since different sources may use slightly different definitions, for charity, several important definitions are now identified. The definition of multiple site damage is a source of widespread fatigue damage characterized by the simultaneous presence of fatigue cracks in the same structural element (*i.e.*, fatigue cracks that may coalesce with or without other damage leading to a loss of required residual strength). Widespread fatigue damage (WFD) in a structure is characterized by the simultaneous presence of cracks at multiple structural details that are of sufficient size and density whereby the structure will no longer meet its damage tolerance requirement (*i.e.*, to maintain its required residual strength after partial structural failure). Multiple element damage (MED) is a source of widespread fatigue damage characterized by the simultaneous presence of fatigue cracks in similar adjacent structural elements.

The Boeing 737 lap splice design originally required a good bond for load transfer. Environmental degradation caused the bond to deteriorate to the point where all of the load transfer ended up transferred through the fasteners, which were never designed to take that load. MED can also result from corrosive environments as well.

Benefits: A Risk Assessment. The FAA employed GRA,[3] Inc. to provide a risk assessment to help make determinations regarding the likelihood of aviation accidents related to corrosion. Under this contract, GRA qualitatively identified and characterized the types of

inspections from a CPCP would be prevalent. Furthermore, the present values of these few, out-year expenses would be negligible relative to the other costs of this proposal.

[3] "CORROSION PREVENTION AND CONTROL RISK ANALYSIS", FAA Contract No. DTFA01–93–C–00066, Work Order 52, Prepared by GRA, Incorporated, May 12, 1999. A copy of this document is filled in the docket.

potential corrosion hazards faced by aircraft and developed a method to assign quantitative risk evaluation.

For their analysis, GRA relied upon the National Transportation Safety Board (NTSB) Aviation/Incident Database. The NTSB database contains detailed information on over 37,000 accidents that have been catalogued since 1985; it includes a ''sequence of events'' history for each accident that describes the events leading up to an accident. A broad search of the 37,000 NTSB accidents resulted in a total of 1,551 accidents that were examined in detail.

The FAA Incident Data System (AIDS) was used to help assess the impacts of the Airworthiness Directives issued in the early 1990's. The FAA Service Difficulty Reporting System (SDRS) assisted by providing information assessing the incident and severity of the corrosion problem, as well as information of the effectiveness of current safety programs. GRA found it difficult to link incident and service difficulty reports with observed or anticipated changes in accident or incident rates. As a result, GRA took a conservative approach by not attempting to quantify benefits using either AIDS or SDRS.

The methodology employed by GRA is known as ''event tree'' analysis. Event tree analysis is used to characterize a chain of events leading to accidents under a variety of circumstances. This methodology has been used successfully in other environments where, as with aircraft, the probabilities of occurrence are very small.

Event trees are defined by:

- An initiating event
- A further chain of events related to ''safety functions'' which represent aircraft system responses or operator actions when a particular event occurs
- A terminating event
- Estimation of success and failure probabilities at relevant nodes in the event tree

An event tree should define a comprehensive set of accident sequences that encompass the effects of all possible accidents involving the aircraft. These trees begin with the initiating event, or the starting point. Following the initiating event, the set of events related to safety functions, which end with the terminating, event is specified. With the event tree constructed information from the NTSB, 1,551 accidents were used to populate (provide probability estimates) the tree.

Event trees with corrosion-induced initiating events were defined based on these records for the following ten aircraft systems:

- Flight control surfaces/attachments
- Flight control system-internal
- Landing gear
- Fuselage forward
- Fuselage center
- Fuselage aft
- Fuel system
- Nacelle/Pylons
- Engines
- Electrical systems and wiring

The subsequent events, which occur after the initiating event, were defined with the following generic sequence:

- Operator error in addressing/ mitigating the initiating event
- Failure of operator to recover after initial failure to address/mitigate
- Failure of flight control function
- Failure of operator to recover flight control function
- Failure of landing gear during take-off or landing
- Failure of operator to recover landing gear function

Beginning with the initiating event probability, each subsequent event probability is multiplied across each branch. The multiplication of events along each branch results in the probability of an outcome (or terminating event). Summing the terminating event probabilities, which end in damage, equals the probability of a corrosion-related accident by aircraft system. GRA's Table 2 with the estimated corrosion-related accident rates by aircraft system is reproduced below.

ESTIMATED CORROSION-RELATED ACCIDENT RATES BY AIRCRAFT SYSTEM

Aircraft system	Rate per 1,000,000 operations
1. Flight Control Attachments	6.53 E–02
2. Flight Control System (internal)	7.51 E–02
3. Landing Gear	1.89 E–01
4. Fuselage Forward	9.60 E–03
5. Fuselage Center	1.97 E–02
6. Fuselage Aft	2.05 E–03
7. Nacelle/Pylons	2.63 E–02
8. Fuel Systems	1.94 E–02
9. Engine	2.15 E–01
10. Electrical Wiring	8.80 E–02
Total	7.01 E–01
Skin-Related Only (1, 4, 5, 6, 7)	1.23 E–01

These probabilities of occurrence then need to be translated into numbers of accidents. Since the probabilities are rates per one million operations, estimates of future operations were needed. GRA computed the total take-offs and landings at U.S. airports from the May 1996 Official Airline Guide (OAG). This estimate is conservative as it excludes U.S. aircraft performing foreign operations. The initial estimate of affected operations was 23,231,976 for 1996.

GRA then excluded aircraft already subject to existing ADs and discounted the number of operations for other aircraft subject to other overlapping directives and rules. After scaling down the total number of operations, the adjusted estimate was 7,150,932 U.S. operations that would be affected by the proposed rule. To this adjusted OAG base, GRA applied the growth rate in FAA airport operations for air carriers and air taxi/commuters through the year 2008. By 2008, the number of affected operations rises to 9,133,300. Based upon the GRA databases and methodology, in the absence of this rule or other preventative action, it is estimated that over the period of 1999 through 2008 ten accidents due to corrosion are likely to occur in the part 121, 129 and 135 fleets.

More than 27 percent of the airplanes subject to this proposal are already 20 years old or older; 7 percent are over 30 years old; and 1 percent of the airplanes are over 40 years old. The number of airplanes in air carrier service operating beyond their expected life is growing larger. As airplanes age, the likelihood of corrosion increases. Corrosion causes the formation of cracks and accelerates the growth of existing cracks. Thus corrosion is an identified problem presenting a growing threat to aviation safety. Experience has demonstrated that, under existing maintenance and inspection procedures, the FAA cannot assure the continuing airworthiness of these airplanes. This constitutes an unacceptable risk to air transportation.

The FAA has extensively deliberated on how to mitigate this risk. Technical experts and academic leaders were consulted. Based upon these considerations and deliberations, the FAA believes that the corrosion prevention and control procedures proposed in this rule are the best approach to assure the continued protection of the subject fleet from corrosion damage that could impact safety.

The primary benefit of this rule is increased aviation safety through assurance that the affected airplanes are free from dangerous corrosion. As has been shown, service difficulty reports of corrosion are increasing, and without this, or a similar rule, the FAA is convinced that unchecked corrosion will cause increasing numbers of future accidents. A secondary benefit from minimizing corrosion is to extend aircraft service life. In response to a corrosion-related accident, the FAA is likely to ground similar aircraft until it can be assured of their airworthiness. As more accidents occur to different aircraft types, or if the inspections show corrective measures can not restore airworthiness, the FAA may determine that aircraft of a certain age need to be retired from the air carrier fleet. Consequently, in addition to expected safety benefits, society would benefit by a longer utilization of the affected aircraft, thereby reducing the cost of air transportation. The FAA has attempted to quantify the safety benefits and discusses the extended life benefits in qualitative terms.

Safety Benefits. Based on GRA's risk assessment analysis, ten accidents due to corrosion could occur within the affected fleet during the ten year period 1999 through 2008. Since the period of analysis for this rule is 20 years, GRA's estimate has been extended by an additional ten years. A straight-line extrapolation based on the additional ten years of operations growth results in an estimate of about 25 accidents over a 20-year period. In this analysis such a straight-line forecast is viewed as a lower-bound estimate, because the GRA analysis did not factor in the joint problem an aging fleet coupled with unchecked metal corrosion increases the rate-of-risk over time. In order to provide an upper bound estimate, a simple, conservative methodology can be used. The actual probability distribution for corrosion-related accidents in the affected fleet is not known. A normal distribution, however, provides a close approximation of a number of other distributions. To be very conservative in this analysis, the FAA assumes that all affected aircraft remain in operation until a corrosion-related accident terminates their service. Under the assumption that the ten accidents from 1999 to 2008 belong to the left tail of a normal distribution of future corrosion-related accidents for the entire 2,900 affected aircraft, then it can be shown that these 10 accidents are more than 2.45 standard deviations from the mean. Assuming that these observations are 2.45 standard deviations from the mean, then 99.3 percent of the fleet would not have a corrosion-caused accident by 2008. This distribution has approximately a twenty-five year standard deviation. Such a distribution would have more than half of these aircraft still without a corrosion-caused accident fifty years from now. If this methodology can be accepted as providing a reasonable estimate of the upper bound of accidents, then in the absence of this rule, slightly more than 50 corrosion-related accidents are estimated to occur in the study period. This, in turn, provides a range of between 25 to 50 corrosion-caused accidents that may occur in 20 years.

As previously discussed, this proposed rule is directed toward the smaller air carrier aircraft. From NTSB data, GRA estimated that the average casualty counts per accident were 1.100 minor injuries, 0.474 serious injuries, and 1.605 fatalities. As a baseline estimate to compare safety benefits with costs, the FAA estimates that the value of: $38,500 to represent avoiding a minor injury, $51,800 to represent avoiding serious injury, and $2.7 million to represent avoiding a statistical fatality. Based on these values the expected benefit of avoiding one such accident today is $4.6 million, excluding the loss of the airframe, investigation, and ground damage. The FAA believes a conservative benefit estimate of avoiding such an accident is at least $5 million with a reasonable upper bound value of $6 million. Using the lower $5 million estimate and assuming that accidents for the are uniformly distributed over time, then in the thirteenth year the present value benefits of the accidents prevented roughly equals the cost of the proposed rule (at that time the number of accidents equals 34). Thirty-four accidents falls between the upper and lower bound estimates, and is considered a reasonable number that could occur.

This breakeven calculation assumes the proposed rule to be 100 percent effective in preventing these accidents. The FAA can not determine a priori the effectiveness of the proposed rule, but can provide a reasonable effectiveness range and the associated range of benefits. Assuming that the rule would prevent 40 to 80 percent of the expected 25 to 50 accidents, then the rule could be expected to prevent between 9 accidents (40 percent × 25 accidents) to 40 accidents (80 percent × 50 accidents). In the case of the lower bound estimate of 9 accidents, for the present value safety benefits to equal the cost of the rule, the value of an avoided accident would need to increase approximately fourfold. Such an increase is entirely feasible since the assumed 1.6 averted fatalities per accident is conservative. Included in the potentially affected fleet are 178 Beech 1900 airplanes each with 19 passenger seats. If just 2.4 of the prevented accidents are Beech 1900 airplanes with a 75 percent load factor, then the present value benefits exceed the present value of costs.

Exactly how many corrosion-related accidents will occur, which airplanes would suffer such an accident, and how effective the proposed rule would be can not be determined a priori. The FAA risk assessment estimated that this proposed rule would help to avert 25 to 50 accidents. The rule needs only to be effective enough to prevent 2.4 Beech 1900 accidents with 75 percent of the available seats occupied. It is known with certainty that corrosion currently exists in the fleet and if left unchecked will lead to accidents. Based upon this knowledge, and the estimates contained in this analysis, the FAA concludes that the benefits justify the costs of this proposed rule.

Unquantified Benefits. The FAA proposed rule would require scheduled corrosion inspections sooner than the much more costly emergency inspections that would follow a corrosion-caused accident. It is more economical and efficient to correct an unsafe condition proactively, than after an accident makes it clear that corrective action is past due and immediate measures must be taken. Performing the proposed procedures by this rule would allow air carriers to schedule inspections and repairs in a planned, orderly, least cost manner without disrupting aircraft service time. In cases where corrosion is occurring, this proposal would make it known sooner and allow more economical corrective action. On the other hand, without a corrosion inspection plan, metal corrosion will continue, accidents are expected, and once an accident occurs it is highly likely that the FAA will mandate inspections. In that case, there usually is not sufficient time to thoroughly evaluate alternative solutions; instead, immediate corrective action must be selected. Such urgent action is rarely the most economical choice. Compliance with emergency inspections will result in these inspections being unscheduled, airline operators will incur aircraft out-of-service-time costs, airline flight schedules can be disrupted, and flights can be canceled. All of these factors result in reduced airline profits and lower benefits to the traveling public.

As discussed above, it is expected that this proposal would result in corrosion damage observed sooner than it would otherwise, and therefore, the corrections would be less costly. In the absence of the rule, however, it is very possible for some aircraft that corrosion could continue to breakdown the metal undetected until it becomes uneconomic to repair the damage. In that event, earlier inspection could have extended the service life of such aircraft. It is expected that the proposed rule inspections would result in corrosion damage to be repaired before this damage would cause the aircraft to not be airworthy, or to be retired. Thus the proposed rule can extend the service life of the affected aircraft. Without knowing the condition of the affected fleet, it is not possible to accurately quantify the dollar value of this benefit. However, it is possible to provide some idea of the value of longer service life by noting the value of extending the service life by one year of a hypothetical aircraft. In such a case, the annual capital loss equals the value of the aircraft multiplied by airline's rate-of-return on capital. For an aircraft whose resale value is a million dollars and when the rate-of-return on capital equals 10 percent, the annual capital loss is $100,000. In addition, the travelling public suffers when airline service is unexpectedly reduced by the corrosion-caused premature retirement of this aircraft.

The FAA believes that the unquantified benefits discussed above further support and justify this proposal. Addressing corrosion damage in an orderly fashion, rather than waiting for an emergency action to be required, provides for less interrupted commercial service and extends airplane service life. These outcomes are clearly benefits of this proposal, even though there is insufficient data to quantify these benefits at this time.

Comparison of Costs and Benefits. Corrosion is a natural process and occurs because of the tendency over time of metals to return to their original state. Maintenance and inspection records reveal that the presence of corrosion is more prevalent and pervasive in older aircraft. Based upon an independent risk analysis of over 1,500 National Transportation Safety Board accidents and conservative risk assessment results in a forecast of a range between 25 to 50 corrosion-induced accidents over a twenty-year period, with a present value cost between $72.5 million and $145 million. The safety benefits of averting these accidents justify the costs of the proposed rule.

The FAA does not intend to wait for a series of accidents to provide justification for this proposed rule. The FAA needs the assurance of the corrosion prevention and control program to assure the continued airworthiness of the affected fleet. With this program in place the industry avoids unplanned inspections and maintenance resulting from corrosion-related accidents and benefits by an extended aircraft service life.

This proposed rule would extend to a significant number of airplanes the corrosion prevention and control program found to be necessary for in-service commercial jet airplanes based on studies following the Aloha Boeing 737 accident. Based on the analysis contained herein, the FAA concludes that the benefits of this proposed rule justify the costs.

Initial Regulatory Flexibility Analysis

The Regulatory Flexibility Act 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 Act 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 finds that it will, the agency must prepare a regulatory flexibility analysis (RFA) 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 act provides that the head of the agency may so certify, and an RFA is not required. The certification must include a statement providing the factual basis for this determination, and the reasoning should be clear.

Recently, the Office of Advocacy of the Small Business Administration (SBA) published new guidance for Federal agencies in responding to the requirements of the Regulatory Flexibility Act, as amended. Application of that guidance to this proposed rule indicates that it would have a significant impact on a substantial number of small entities. Accordingly, a full regulatory flexibility analysis was conducted and is summarized as follows.

1. A Description of the Reasons Why Action by the Agency Is Being Considered

This action is being considered in order to control airplane structural material loss and the detrimental effects of corrosion because existing maintenance or inspection programs may not provide comprehensive, systematic corrosion prevention and control.

2. A Succinct Statement of the Objectives of, and Legal Basis for, the Proposed Rule

The objective of the proposed rule is to ensure the continuing airworthiness of aging airplanes operating in air transportation by requiring all airplanes operated under part 121, all U.S. registered airplanes used in scheduled passenger carrying operations under part 129, and all multiengine airplanes used in scheduled passenger carrying operations conducted under part 135, to include a Federal Aviation Administration (FAA) approved corrosion prevention and control program (CPCP) in the airplane's maintenance or inspection program.

This proposal represents a critical step toward compliance with the Aging Aircraft Safety Act of 1991. In October of 1991, Congress enacted Title IV of Public Law 102 143, the ''Aging Aircraft Safety Act of 1991,'' to address aging aircraft concerns. The act was subsequently recodified as 49 U.S.C. 44717. Section 44717 of Title 49 instructs the Administrator to ''prescribe regulations that ensure the continuing airworthiness of aging aircraft.''

3. A Description of the Projected Reporting, Recordkeeping and Other Compliance Requirements of the Proposed Rule, Including an Estimate of the Classes or Types of Small Entities That Will Be Subject to the Requirement and the Type of Professional Skills Necessary for Preparation of the Report or Record

The proposed rule would not impose any incremental record keeping authority. Existing 14 CFR part 43, in part, already prescribes the content, form, and disposition of maintenance, preventive maintenance, rebuilding, and alteration records for any aircraft having a U.S. airworthiness certificate or any foreign registered aircraft used in common carriage under parts 121 or 135. The FAA recognizes, however, that the proposed rule would necessitate additional maintenance work, and consequently, would also require that the additional record keeping associated with that work also be performed.

The FAA estimates that each hour of actual inspection and maintenance conducted under the proposal would require an additional 20 percent of an hour (12 minutes) for reporting and record keeping. This record keeping would be performed by the holder of an FAA approved repairman or maintenance certificate. The projected record keeping and reporting costs of the proposal are included as part of the overall costs computed in the evaluation and included below in the Regulatory Flexibility Cost Analysis.

4. An Identification, to the Extent Practicable, of All Relevant Federal Rules That May Duplicate, Overlap, or Conflict With the Proposed Rule

The FAA is unaware of any federal rules that would duplicate, overlap, or conflict with the proposed rule.

5. A Description and an Estimate of the Number of Small Entities to Which the Proposed Rule Would Apply

The proposed rule would apply to the operators of all airplanes operated under 14 CFR part 121, all U.S. registered multiengine airplanes operated under 14 CFR part 129, and all multiengine airplanes used in scheduled operations under 14 CFR part 135. Standard industrial classification coding does not exactly coincide with the subsets of operators who could be affected by the proposed rule. Nevertheless, the following distributions of employment size and estimated receipts per employee for all scheduled air transportation firms (SIC Code 4512) are representative of the operators who would be affected by the proposed rule.

Employment category	Number of firms	Estimated receipts per employee
0–4	137	$611,695
5–9	45	510,555
10–19	52	299,123
20–99	112	264,065
100–499	78	232,666
500+	70	252,334
Totals	494	252,214

Based on existing operator/airplane distributions, the FAA estimates that 210 operators would be subject to the rule and approximately 132 would actually incur costs.[4] The agency has also estimated the numbers of subject and affected airplanes that each operator uses and has categorized the operators by fleet size in the following table.

COUNT OF OPERATORS

Operator category (airplanes)	Subject to rule	Affected by rule
1–10	119	84
11–20	37	16
21–30	12	4
31–40	8	6
41–50	4	4
51 and up	30	18
	210	132

6. Regulatory Flexibility Cost Analysis

The proposed rule would affect certain existing and future production aircraft, and it would also apply to new model airplanes intended for use in scheduled service. This Regulatory Flexibility Cost Analysis focuses on the first of these two categories because: (1) That impact represents almost 99 percent of the evaluated costs of the proposed rule, and (2) it is possible to make some estimate of the distributional impact of these costs based on the existing operator fleet composition.

Table 3 in the Appendix details the computations used to estimate the annualized costs of the proposal per airplane, by model. Column A in Table 3 lists each airplane model and Column B details the estimated counts of the airplanes in each model that would be subject to the proposed rule. As noted in the evaluation, an estimated 7,108 airplanes would be subject to this major provision. These airplanes are included within the regulatory scope of the proposal but the vast majority would be unaffected because they already comply with the proposal. Column C, by comparison, shows the projected counts of those airplanes that would actually be affected; where incremental work would be accomplished and incremental expenses incurred. This column sums to a projected 2,901 airplanes. Column D contains the present value of the projected cost of the major proposal to industry, by airplane model, as computed in the regulatory evaluation and shown previously as Column AG of Table 1 in the Appendix. The present value estimated cost of this provision totals $80.0 million.

Column E of Table 3 divides the cost-per-model data in Column D by the numbers of affected airplanes per model in Column C to produce the expected present value cost of the proposal per affected airplane. It is useful to consider the annualized equivalent of these costs; that is to say, the annual future payments that would be necessary to equal the present value costs for each model. Such payments are a function of: (1) The assumed interest rate, and (2) the time period over which the future payments would be borne. Consistent with the discount factor, this evaluation applies a 7 percent interest rate. As for the time period, the evaluation assesses costs over a 20-year time period, and this analysis assumes that, on average, the CPCP development and implementation costs would be borne over that period. Based on these two assumptions, the annualized cost of the CPCP would range between $484 and $30,170 per airplane (for those airplanes that would actually be affected.)

Next, the annualized cost estimates, by model, per affected airplane, from Table 3 were collated into the original evaluation data set of operators and airplanes. Crosstabulations were performed and aggregated (*see* Table 4 in the Appendix) to project the expected annualized cost per operator. Table 4 includes all 210 of the estimated operators of airplanes that would be subject to the proposed rule, and projects that 132 would actually incur costs. The table includes counts, by operator, the number of airplanes that would be subject to (within the scope of) the proposed rule, and the numbers of airplanes that would actually be affected by the proposal. The data in these calculations are summarized in the table below which shows the average annualized impact per operator; where the operator classifications are grouped both by: (1) The number of all airplanes that the operator uses, and (2) the number of each operator's airplanes that would actually be affected by the proposal.

AVERAGE ANNUALIZED IMPACT PER OPERATOR

Count of airplanes operated	Average annualized impact	Count of airplanes affected	Average annualized impact
1–10	$7,318	1–10	$14,057

[4] The remaining operators use airplane models that would be subject to the proposed rule but are already in full compliance.

AVERAGE ANNUALIZED IMPACT PER OPERATOR—Continued

Count of airplanes operated	Average annualized impact	Count of airplanes affected	Average annualized impact
11–20	17,551	11–20	46,479
21–30	30,711	21–30	72,326
31–40	53,838	31–40	104,708
41–50	64,359	41–50	55,789
51–60	90,769	51–60	196,433
61–70	191,587	61–70	195,857
71–80	144,698	71–80	185,253
81–90	111,116	81–90	111,116
91–100	92,093	91–100	112,023
100 Plus	217,054	100 Plus	460,822

7. Affordability Analysis and Disproportionality Analysis

As a measure of the affordability of the proposal, the table below shows a distribution of the projected annualized impacts of the proposed rule as a percentage of operator annual receipts. Operator receipt levels were estimated assuming: (1) The average of $252,214 annual receipts per employee for SIC Code 4512 operators, described above in Paragraph 5, and (2) an example factor of 5 employees per airplane operated. (This factor varies widely across operators.) The affordability statistic was then calculated for each of the 210 subject operators as the projected annualized cost of the rule for that operator divided by the product of $252,214 times 5 employees per airplane times the number of airplanes operated. Under these assumptions, the expected annualized cost of the proposal for 209 of the 210 operators falls below 0.6 percent of their respective estimated annualized receipts. For one operator, costs would total 1.38 percent of estimated receipts.

The table can also be used to gauge the disproportionality of the proposed rule's relative burden. The percentage impact calculations are shown for three sizes of operators, depending on the numbers of airplanes that they operate. The calculations show a minor disproportionate impact on smaller operators who are slightly under-represented in the lowest ''percentage impact'' categories, and correspondingly, slightly over-represented in the higher impact categories.

COUNT OF OPERATORS BY PERCENTAGE IMPACT AND BY OPERATOR SIZE

Percentage impact	Airplanes operated			
	1–10	11–50	51+	Total
0–.1	68	38	19	125
.1–.2	10	10	6	26
.2–.3	15	4	2	21
.3–.4	16	7	3	26
.4–.5	8	2	0	10
.5–.6	1	0	0	1
1.3–1.4	1	0	0	1
Total	119	61	30	210

8. Business Closure Analysis

The FAA feels that the annualized average impact of the rule as a function of an affected firm's average annual receipts is low. The agency recognizes, and this evaluation has described, that the potential impact for some operators may be above average and may not be distributed evenly over time. The cost methodology for this evaluation further addresses the fact that it may not be economical to develop and implement a corrosion prevention and control program for some older airplane models with few subject airplanes. The evaluation estimated that program costs would be prohibitive for 11 airplane models, and included a 50 percent reduction of fleet resale value as an estimated cost attributable to the rule.

9. Competitiveness Analysis

No quantitative estimate of the proposed rule's potential impact on small business competitiveness has been made. However, the FAA feels that the findings from the Affordability Analysis and the Disproportionality Analysis above support the argument that the proposed rule will not seriously impede small entity competitiveness.

10. Description of Alternatives

The FAA has considered several approaches to this proposed rulemaking and has attempted to minimize the potential economic impact of the proposal, especially the impact on the operation of aircraft most likely to be used by small entities. The principal alternative would be to take no new rulemaking action and to rely on the existing corrosion related requirements in parts 23 and 25. The FAA has determined that these existing requirements have not always resulted in a comprehensive and systematic corrosion prevention and control program for either transport, commuter, or small category airplanes. In addition, the FAA has determined that such inaction would not respond to the provisions of 49 U.S.C. 44717, which requires the Administrator to prescribe regulations that ensure the continuing airworthiness of aging aircraft.

A second alternative would be to omit all small aircraft from the proposal since there is an identifiable correlation between smaller firms and smaller aircraft. Again, the FAA opposes this alternative since it would leave the existing problem for a significant segment of the scheduled passenger industry and would create an unacceptable safety inequity.

As proposed, this rulemaking would apply to all airplanes operated under part 121, all U.S. registered multiengine airplanes operated under part 129, and all multiengine airplanes used in scheduled operations under part 135. The proposed rule would not include helicopters, single-engine airplanes operated under part 135 or part 129, airplanes used in cargo operations under part 135, or airplanes used in unscheduled (on-demand) operations under part 135.

The aircraft and operations omitted from this proposal are not exclusively operated by small entities, but the FAA holds that the excluded airplane categories are more likely to be operated by small entities than, for example, large transport category airplanes would be. As noted above, the proposed rule would actually affect some 2,900 airplanes. By comparison, the exclusions described here, taken together, remove an estimated 5,023 additional aircraft from the proposal. This includes, with overlap, 1,441 helicopters; 4,663 aircraft used in on-demand operations; and 1,812 single-engine aircraft.

The FAA specifically requests comments regarding the exclusion of such aircraft operations from this proposed rule.

11. Compliance Assistance

In its efforts to assist small entities and other affected parties in complying with the proposed rule, the FAA is publishing an advisory circular, ''Development of Corrosion Prevention and Control Programs.'' A notice of availability for this circular will be published concurrently with the proposed rule. This circular details acceptable means of compliance with the proposed rule.

Additionally, the FAA has developed a CPCP for a generic, civil, twin-engine aircraft and will make this document available as part of the appendix to the advisory circular accompanying the proposed rule. This document can serve as a core framework for the baseline program for defining the corrosion prevention and control requirements for a subject airplane model based on the average operating profile and operating environment. This generic CPCP model would be particularly useful to small operators in the event that the type certificate holder for a given model is not available to develop the CPCP for that model.

Trade Impact Assessment

Consistent with the Administration's belief in the general superiority, desirability, and efficacy of free trade, it is the policy of the Administrator to remove or diminish, to the extent feasible, barriers to international trade, including both barriers affecting the export of American goods and services to foreign countries and those affecting the import of foreign goods and services into the United States.

In accordance with that policy, the FAA is committed to develop as much as possible its aviation standards and practices in harmony with its trading partners. Significant cost savings can result from this, both to American companies doing business in foreign markets, and foreign companies doing business in the United States.

This proposed rule would have little or no impact on international trade.

Unfunded Mandates Assessment

Title II of the Unfunded Mandates Reform Act of 1995 (the Act), enacted as Pub. L. 104–4 on March 22, 1995, requires each Federal agency, to the extent permitted by law, to prepare a written assessment of 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. Section 204(a) of the Act, 2 U.S.C. 1534(a), requires the Federal agency to develop an effective process to permit timely input by elected officers (or their designees) of State, local, and tribal governments on a proposed ''significant intergovernmental mandate.'' A ''significant intergovernmental mandate'' under the Act is any provision in a Federal agency regulation that will impose an enforceable duty upon State, local, and tribal governments, in the aggregate, of $100 million (adjusted annually for inflation) in any one year. Section 203 of the Act, 2 U.S.C. 1533, which supplements section 204(a), provides that before establishing any regulatory requirements that might significantly or uniquely affect small governments, the agency shall have developed a plan that, among other things, provides for notice to potentially affected small governments, if any, and for a meaningful and timely opportunity to provide input in the development of regulatory proposals.

The FAA determines that this proposed rule would not contain a significant intergovernmental or private sector mandate as defined by the Act.

Availability of Draft Advisory Material

The FAA has prepared guidance material in the form of an advisory circular (AC) to be used by operators and manufacturers in developing baseline CPCP's and incorporating them into maintenance and inspection programs. The FAA is soliciting comments on the draft AC during the comment period for this notice. A notice of availability for the draft AC is published concurrently with this notice.

International Compatibility

The FAA has reviewed corresponding International Civil Aviation Organization (ICAO) standards and recommended practices and Joint Airworthiness Authority (JAA) regulations. ICAO Aging Aircraft Standards contain requirements for a continuing structural integrity program that includes corrosion prevention and control. At this time the JAA does not have any operating rules for airplanes, and therefore has no general requirement for corrosion programs comparable to this proposal. Nevertheless, in the interest of international harmonization, the FAA will continue to keep the JAA informed of this rulemaking.

Executive Order 13132, Federalism

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

Environmental Analysis

FAA Order 1050.1D defines FAA actions that may be categorically excluded from preparation of a National Environmental Policy Act (NEPA) environmental assessment or environmental impact statement. In accordance with FAA Order 1050.1D, appendix 4, paragraph 4 (j), this rulemaking action qualifies for a categorical exclusion.

Energy Impact

The energy impact of the notice has been assessed in accordance with the Energy Policy and Conservation Act (EPCA) Pub. L. 94–163, as amended (43 U.S.C. 6362) and FAA Order 1053.1. It has been determined that the notice is not a major regulatory action under the provisions of the EPCA.

Reporting Requirements

The proposed rule would not impose any new regulatory requirements for recordkeeping. Existing 14 CFR part 43, in applicable part, already prescribes the content, form, and disposition of maintenance, preventive maintenance, rebuilding, and alteration records for each aircraft having a U.S. airworthiness certificate or any foreign registered aircraft used in common carriage under parts 121 or 135. The FAA recognizes, however, that the proposed rule would necessitate additional maintenance work, and consequently, would also require that the recordkeeping associated with that work also be performed in accordance with existing regulations.

Paperwork Reduction Act

Information collection requirements in the proposed rule have been previously approved by the Office of Management and Budget (OMB) under the provisions of the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)) and have been assigned OMB Control Numbers 2120–0008 and 2120–0039.

List of Subjects

14 CFR Part 121

Air carriers, Aircraft, Airmen, Aviation safety, Charter flights, Drug testing, Reporting and recordkeeping requirements, Safety, and Transportation.

14 CFR Part 129

Air carriers, Aircraft, Aviation safety, Reporting and recordkeeping requirements, Security measures, and Smoking.

14 CFR Part 135

Air taxis, Aircraft, Airmen, Aviation safety, and Reporting and recordkeeping requirements.

The Proposed Amendment

In consideration of the foregoing, the Federal Aviation Administration proposes to amend Chapter I, Title 14 of the Code of Federal regulations parts 121, 129, and 135 as follows:

PART 121—OPERATING REQUIREMENTS: DOMESTIC, FLAG, AND SUPPLEMENTAL OPERATIONS

1. The authority citation for part 121 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40101, 40113, 40119, 44101, 44701–44702, 44705, 44709–44711, 44713, 44716–44717, 44722, 44901, 44903–44904, 44912, and 46105.

2. Add § 121.376 to read as follows:

§ 121.376 Corrosion prevention and control program.

(a) After [insert a date two years after the effective date of the final rule], no certificate holder may operate an airplane unless a corrosion prevention and control program (CPCP) is included in the operator's FAA-approved maintenance program.

(b) The CPCP must—

(1) Be designed to control corrosion such that the damage does not exceed Level 1 as defined in § 121.376a,

(2) Specify corrosion prevention and control tasks,

(3) Specify definitions of corrosion levels, compliance times (implementation thresholds and repeat intervals), and

(4) Specify procedures if corrosion damage exceeds Level 1 in any area, including mechanisms to notify the FAA of the findings and data associated with such damage and to implement FAA-approved means of reducing future findings of corrosion in that area to Level 1 or better.

(c) For airplanes that have exceeded the implementation threshold for a specific area prior to [insert date two years after the effective date of the final rule], the CPCP must include an implementation schedule that will result in the completion of all corrosion prevention and control tasks for that area no later than [insert date four years after the effective date of the final rule].

3. Add § 121.376a to read as follows:

§ 121.376a Level 1 corrosion definition.

For the purposes of this part, Level 1 Corrosion is:

(a) Corrosion damage occurring between successive inspections that is local and can be re-worked/blended-out within allowable limits as defined by the manufacturer or as approved by the FAA;

(b) Corrosion damage that is local but exceeds allowable limits and can be attributed to an event not typical of the operator's usage of other airplanes in the same fleet; or

(c) Corrosion damage that operator experience over several years has demonstrated to be only light corrosion between successive prior inspections but that the latest inspection shows that cumulative blend-outs now exceed allowable limits as defined by the manufacturer or as approved by the FAA.

PART 129—OPERATIONS: FOREIGN AIR CARRIERS AND FOREIGN OPERATORS OF U.S.-REGISTERED AIRCRAFT ENGAGED IN COMMON CARRIAGE

4. The authority citation for part 129 continues to read as follows:

Authority: 49 U.S.C. 106(g), 1511–1522, 40101, 40104–40105, 40113, 40119, 44701, 44901, 44903–44904, 44906, 44912, 44914, 44935–44939, 48107.

5. Revise § 129.1(b) to read as follows:

§ 129.1 Applicability.

* * * * *

(b) In addition to operations of U.S.-registered aircraft within the United States under paragraph (a) of this section, §§ 129.14, 129.16, 129.20, 129.33, and 129.35 also apply to U.S.-registered aircraft operated solely outside the United States in common carriage by a foreign person or foreign air carrier.

6. Add § 129.24 to read as follows:

§ 129.24 Level 1 corrosion definition.

For the purposes of this part, Level 1 Corrosion is:

(a) Corrosion damage occurring between successive inspections that is local and can be re-worked/blended-out within allowable limits as defined by the manufacturer or as approved by the FAA;

(b) Corrosion damage that is local but exceeds allowable limits and can be attributed to an event not typical of the operator's usage of other airplanes in the same fleet; or

(c) Corrosion damage that an operator has experienced over several years has demonstrated to be only light corrosion between successive prior inspections but that the latest inspection shows that cumulative blend-outs now exceed allowable limits as defined by the manufacturer or as approved by the FAA.

7. Add § 129.35 to read as follows:

§ 129.35 Corrosion prevention and control program.

(a) After [insert a date two years after the effective date of the final rule], no foreign air carrier or foreign person may operate U.S.-registered multiengine airplane in common carriage, unless a Corrosion Prevention and Control Program (CPCP) is included in the operator's FAA-approved maintenance program.

(b) The CPCP must—

(1) Be designed to control corrosion such that the damage does not exceed Level 1 as defined in § 129.24,

(2) Specify corrosion prevention and control tasks,

(3) Specify definitions of corrosion levels, compliance times (implementation thresholds and repeat intervals), and

(4) Specify procedures if corrosion damage exceeds Level 1 in any area, including mechanisms to notify the FAA of the findings and data associated with such damage and to implement FAA-approved means of reducing future findings of corrosion in that area to Level 1 or better.

(c) For airplanes that have exceeded the implementation threshold for a specific area prior to [insert date two years after the effective date of the final rule], the CPCP must include an implementation schedule that will result in the completion of all corrosion prevention and control tasks for that area no later than [insert date four years after the effective date of this rule].

PART 135—OPERATING REQUIREMENTS; COMMUTER AND ON-DEMAND OPERATIONS

8. The authority citation for part 135 continues to read as follows:

Authority: 49 U.S.C. 106(g), 1153, 40101, 40105, 44113, 44701–44705, 44707–44717, 44722, and 45303.

9. Add § 135.424 to read as follows:

§ 135.424 Corrosion prevention and control program.

(a) After [insert a date two years after the effective date of the final rule], no certificate holder may operate a multiengine airplane in scheduled service unless a Corrosion Prevention and Control Program (CPCP) is part of the operator's FAA-approved maintenance or inspection program.

(b) The CPCP must—

(1) Be designed to control corrosion such that the damage does not exceed Level 1 as defined in § 135.426,

(2) Specify corrosion prevention and control tasks,

(3) Specify definitions of corrosion levels, compliance times (implementation thresholds and repeat intervals), and

(4) Specify procedures if corrosion damage exceeds Level 1 in any area, including mechanisms to notify the FAA of the findings and data associated with such damage and to implement FAA-approved means of reducing future findings of corrosion in that area to Level 1 or better.

(c) For airplanes that have exceeded the implementation threshold for a specific area prior to [insert date two years after the effective date of the final rule], the CPCP must include an implementation schedule that will result in the completion of all corrosion prevention and control tasks for that area no later than [insert date four years after the effective date of the final rule].

10. Add § 135.426 to read as follows:

§ 135.426 Level 1 corrosion definition.

For the purposes of this part, Level 1 Corrosion is:

(a) Corrosion damage occurring between successive inspections that is local and can be re-worked/blended-out within allowable limits as defined by the manufacturer or as approved by the FAA;

(b) Corrosion damage that is local but exceeds allowable limits and can be attributed to an event not typical of the operator's usage of other airplanes in the same fleet; or

(c) Corrosion damage that an operator has experienced over several years has demonstrated to be only light corrosion between successive prior inspections but that the latest inspection shows that cumulative blend-outs now exceed allowable limits as defined by the manufacturer or as approved by the FAA.

Issued in Washington, DC, on September 25, 2002.

Louis C. Cusimano,

Acting Director, Flight Standards Service.

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