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Fire Protection Requirements for Cargo or Baggage Compartments; Final Rule

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Parts 121 and 135

[Docket No. 25430, Amdt. Nos. 121-202 and 135-31]

RIN 2120-AC04

Fire Protection Requirements for Cargo or Baggage Compartments

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: These amendments upgrade the fire safety standards for cargo or baggage compartments in certain transport category airplanes used in air carrier, air taxi, or commercial service. Ceiling and sidewall liner panels that are not constructed of aluminum or glass fiber reinforced resin must be replaced with improved panels prior to a specified date. These standards are the result of research and fire testing and are intended to increase airplane fire safety.

EFFECTIVE DATE: March 20, 1989.

FOR FURTHER INFORMATION CONTACT: Gary L. Killion, Manager, Regulations Branch, ANM-114, Transport Airplane Directorate, Aircraft Certification Service, FAA, 17900 Pacific Highway South, C-68966, Seattle, Washington 98168; telephone (206) 431-2114.

SUPPLEMENTARY INFORMATION:

Background

On October 28, 1987, the FAA issued Notice of Proposed Rulemaking (NPRM) 87-11 (52 FR 42512; November 5, 1987). This notice proposed to upgrade the fire safety standards for cargo or baggage compartments in certain transport category airplanes used in air carrier, air taxi, or commercial service.

During the early post-World War II period, it was recognized that timely detection of a fire by a crewmember while at his or her station and prompt control of the fire when detected were necessary for protection of the airplane from a fire originating in a cargo or baggage compartment. Because the requirements for detection and extinguishment varied depending on the type and location of the compartment, a classification system was established. Three classes were initially established and defined as follows:

Class A—A compartment in which the presence of a fire would be easily discovered by a crewmember while at his or her station, and of which all parts are easily accessible in flight. This is typically a small compartment used for crew luggage and located in the cockpit where a fire would be readily detected and extinguished by a crewmember. Due to the small size and location of the compartment, and the relatively brief time required to extinguish a fire, a liner is not needed to protect adjacent structure.

Class B—A compartment with sufficient access in flight to enable a crewmember to effectively reach any part of the compartment with the contents of a hand fire extinguisher and which incorporates a separate, approved smoke or fire detector system to give warning at the pilot or flight engineer station. A Class B compartment is typically much larger than a Class A compartment and can be located in an area remote from the cockpit. Because of the larger size of the compartment and the greater time interval likely to occur before a fire would be controlled, a liner meeting the flame penetration standards of § 25.855 and Part I of Appendix F of Part 25 must be provided to protect adjacent structure. A Class B compartment is typically the large cargo portion of the cabin of an airplane carrying a combination of passengers and cargo (frequently referred to as a "combi" airplane) or the relatively small baggage compartment located within the pressurized portion of an airplane designed for executive transportation.

Class C—As defined at the time of initial classification, any compartment that did not fall into either Class A or B was a Class C compartment. Class C compartments differ from Class B compartments primarily in that built-in extinguishing systems are required for control of fires in lieu of crewmember accessibility. The volumes of Class C compartments in currently used domestic jet transport category airplanes range from approximately 700 to 3,000 cubic feet.

Later, two additional classes were established and defined as follows:

Class D—A compartment in which a fire would be completely contained without endangering the safety of the airplane or the occupants. A Class D compartment is similar to a Class C compartment in that both are located in areas that are not readily accessible to a crewmember. In lieu of providing fire or smoke detection and extinguishment, Class D compartments are designed to control a fire by severely restricting the supply of available oxygen. Because an oxygen-deprived fire might continue to smolder for the duration of a flight, the capability of the liner to resist flame penetration is especially important. The volumes of Class D compartments in transport category airplanes currently used in domestic air carrier service range from approximately 225 to 1,630 cubic feet. Some airplanes designed for executive transportation and used in air taxi service also have relatively small (15-25 cubic feet) Class D compartments located outside the pressurized portions of the cabin.

Class E—A cargo compartment of an airplane used only for the carriage of cargo. In lieu of providing extinguishment, means must be provided to shut off the ventilating airflow to or within a Class E compartment. In addition, procedures, such as depressurizing the airplane, are stipulated to minimize the amount of oxygen available in the event a fire occurs in a Class E compartment.

The FAA conducted a series of full-scale tests at its Technical Center to investigate the capability of three liner materials to resist flame penetration under conditions representative of actual cargo or baggage compartment fires. The tests were conducted using simulated Class C and D compartments. Copies of Report No. DOT/FAA/CT-83/44, A Laboratory Test for Evaluating the Fire Containment Characteristics of Aircraft Class D Cargo Comparment Lining Material, dated October 1983, and Report No. DOT/FAA/CT-84/21, Suppression and Control of Class C Cargo Compartment Fires, dated February 1985, have been placed in the Rules Docket. Copies of these reports, which describe the FAA testing, are available for public inspection and are also available for purchase from the National Technical Information Service in Springfield, Virginia 22161. Although cargo or baggage is sometimes placed in compartments in preloaded containers, the tests were conducted with bulk-loaded baggage because cargo or baggage is frequently bulk-loaded directly into the compartments in actual service. In conjunction with those tests, the FAA developed a method of testing liner materials utilizing a 2 gallons-per-hour kerosene burner. The materials tested—glass fiber reinforced resin (rigid fiberglass) Kevlar and Nomex—comprise the primary liner materials currently used in domestic jet transport airplanes.

Although liners constructed of Kevlar or Nomex met the existing standards of Part 25, it was found from those tests that a fire could rapidly burn them under representative conditions. In addition to the fire hazards associated with the initial flame penetration, the ability of the compartment to restrict the supply of oxygen in the compartment would be hindered. That, in turn, could result in a fire of increased intensity. In contrast, the capability of liners constructed of glass fiber reinforced resin to resist

flame penetration was typically found to be very high regardless of the resin used. This is because the fiberglass remains after the resin burns out and serves as a flame arrester. As a result of those tests, new type certification standards were adopted for Class C or D cargo or baggage compartments in transport category airplanes (Amendment 25–60; 51 FR 18236; May 16, 1986). The newly adopted standards, which are applicable to airplanes for which application for type certificate is made after June 16, 1986, include new test methods for the ceiling and sidewall liner panels. In addition, the maximum volume of a Class D compartment is limited to 1,000 cubic feet.

Subsequent testing conducted at the Technical Center showed that liners constructed of aluminum were better in regard to flame penetration resistance than those of Kevlar or Nomex, although not generally as good as those constructed of glass fiber reinforced resin. On the other hand, nonglass fiber reinforced resin construction, such as blankets or battings, was found to be unsatisfactory because the supporting material would burn away rapidly. In the absence of the supporting material, the fiberglass would fall out of place.

Although Amendment 25–60 provides new standards for future transport category airplanes, it does not affect airplanes currently in service nor the airplanes that will be produced under type certificates for which application was made prior to June 16, 1986. Although the majority of the transport category airplanes currently used in U.S. air carrier, air taxi and commercial service utilize liners constructed of glass fiber reinforced resin for ceiling and sidewalls of cargo or baggage compartments, certain models use liners constructed of Kevlar or Nomex. In order to preclude the continued use of such materials, Notice 87–11 proposed to add a new § 121.314 and to amend § 135.169 to require improved standards for the cargo or baggage compartment liners in transport category airplanes used in such service.

Due to the additional burden of retrofitting existing airplanes, the standards proposed in Notice 87–11 differ somewhat from those provided by Amendment 25–60 for future designs. As proposed in Notice 87–11, existing installations with liners constructed of glass fiber reinforced resin would be acceptable without further tests. Previously approved installations utilizing aluminum ceiling or sidewall liner panels could also be retained; however, aluminum could not be used to replace other materials. Ceiling and sidewall panels constructed of other materials would have to be replaced with panels constructed of glass fiber reinforced resin or with materials tested using the apparatus and procedures recently adopted for Part 25. The acceptance criteria for such materials would be the same as for materials tested for compliance with Part 25.

The term "liner," as used in this final rule and in Amendment 25–60 also includes any design features which would affect the capability of the liner to safely contain a fire. In the case of glass fiber reinforced resin or aluminum panels, the materials of such features would have to have the fire integrity of the basic material; or the design features would have to be tested along with the basic panel material unless they have been previously found satisfactory. For example, joints that are constructed with fireproof fasteners and are not subject to gaps caused by distortion need not be tested. On the other hand, the test specimens would include joints constructed with nonfireproof fasteners or joints subject to distortion. Similarly, test specimens would include lamp lenses, if failure of the lenses would allow flames to pass; however, lamps need not be included in the test specimen if the lamp incorporates a fireproof body which would prevent the passage of flames.

Unlike the new standards of Part 25, the standards proposed in Notice 87–11 would not be applicable to compartments with volumes less than 200 cubic feet. The fire hazards associated with relatively small compartments are not as great due to the limited volume of oxygen and amount of combustible materials that would be contained in them. The present liners used in those compartments are, therefore, considered to provide an acceptable level of safety.

The new standards of Part 25 for future type designs include a maximum volume of 1,000 cubic feet for a Class D compartment. A corresponding requirement was not proposed in Notice 87–11 because the redesign and retrofit of airplanes with Class D compartments larger than 1,000 cubic feet was considered to be extremely burdensome and did not appear to be warranted due to a lack of adverse service experience. Recent service experience has shown, however, that additional new standards, such as requirements for fire or smoke detectors and extinguishment, may be needed for both Class B and Class D compartments. (The installation of such equipment would, in effect, make such compartments Class C.) The FAA is, therefore, considering further rulemaking in that regard. Nevertheless, such further rulemaking would not lessen the need for the new standards proposed in Notice 87–11.

Compliance with the standards proposed in Notice 87–11 would not be required for transport category airplanes type certificated on or before January 1, 1958, because their advanced age and limited numbers in Part 121 or 135 operation would make compliance impractical from an economic standpoint. That date was selected because the rule would include Boeing 707 and Douglas DC–8 vintage and later airplanes, and would exclude older airplanes, such as the Douglas DC–6's or DC–7's.

As proposed in Notice 87–11, all other transport category airplanes which are operated under the provisions of Part 121 or 135 would have to meet the new standards within two years after the effective date of the amendment. The two year compliance period is intended to allow operators and manufacturers time to select and qualify prospective liner materials and incorporate them with a minimum of disruption to fleet schedules or assembly lines.

Discussion of Comments

Comments were received from a diversity of commenters ranging from organizations representing various aircraft manufacturers and operators, to aviation trade unions. Commenters also included a foreign airworthiness authority and producers of candidate interior materials. Two commenters support the proposed new standards without qualification. The seven other commenters support the general intent of the rulemaking; however, they offer suggested changes and additions.

One commenter recommends that the proposed standards should apply to compartments smaller than 200 cubic feet, as well as to larger compartments. As noted above, the fire hazards associated with relatively small compartments are not as great due to the limited volume of oxygen and amount of combustible materials that would be contained in them. Furthermore, service experience does not indicate that improved liners are needed in such compartments.

The same commenter recommends that all Class D compartments should be upgraded to Class C compartments by providing fire detection and extinguishing means. This would be beyond the scope of Notice 87–11 and could not be adopted at this time. The FAA is, however, considering future rulemaking in that regard as noted above.

The commenter also recommends that all cargo compartments should be required to have liners. All cargo or baggage compartments, except Class A compartments, are presently required to have liners. By definition, a Class A compartment must be located such that the presence of a fire would be easily detected by a crewmember while at his or her station. In addition, all parts of a Class A compartment must be easily accessible in flight. Class A compartments are typically small compartments located in the cockpit and used for crew luggage. Due to the brief time needed to detect and extinguish a fire, a liner would serve no useful purpose in a Class A compartment.

One commenter is concerned that the language of proposed § 121.314 (a)(1) and (2) would imply that glass fiber reinforced resin construction does not necessarily satisfy the test requirements of Part III of Appendix F to Part 25. In contrast, another commenter is concerned that the language would imply that glass fiber reinforced resin construction would pass the new standards of Part 25. That commenter notes that some liners constructed of glass fiber reinforced resin do not meet the new standards and proposes that all constructions, including glass fiber reinforced resin, should be required to meet the new standards. The second commenter is correct in noting that glass fiber reinforced resin construction does not necessarily meet the new standards of Part 25. It was found, however, to be so likely to meet or exceed the new standards that the cost of conducting a test for each installation to show compliance with the new standards would not be justified. Glass fiber reinforced resin construction is, therefore, considered acceptable without further testing, insofar as compliance with § 121.314 is concerned.

Three commenters object to the statement in proposed § 121.314 that the term "liner" includes any design feature which would affect the capability of the liner to safely contain a fire. They assert that there are installation features of almost every existing cargo compartment which do not meet the new standards of Part 25. One of the three commenters draws a parallel to the recent rulemaking concerning cabin interior materials (Amendment 25-61; 51 FR 26208; July 21, 1986). In that regard, the commenter notes that the FAA exempted a number of interior components in that rulemaking because they would make an insignificant contribution to the flammability of the interior when compared to the large interior surfaces.

The commenters incorrectly assume that proposed § 121.314 would require all design features to be tested to show compliance with the new standards of Part 25. The design features are not considered as separate entities insofar as compliance with the proposed standards is concerned. Rather, they are considered as part of the liner and then only to the extent that they would affect the capability of the liner to safely contain a fire. Design features which could fail without compromising the capability of the liner would not have to be considered at all. As parts of the liners, design features which would affect the capability of the liners to safely contain fires would be subject to the same exceptions for glass fiber reinforced resin and aluminum as the basic liner panel material.

The parallel made to the recent interior materials rulemaking is inappropriate. The purpose of the interior materials rulemaking is to minimize the contribution of the materials to a fire that is already burning in the cabin. A relatively small component would make an insignificant contribution to the flammability of the cabin. The purpose of the proposed cargo or baggage compartment liner standards, on the other hand, is to prevent a fire in a compartment from penetrating the compartment walls and spreading to other parts of the airplane. The consequences of flames penetrating a design feature in a liner are just as great as those of flames penetrating a portion of the basic liner material. In addition, it is pointless to have a liner with excellent capability to resist flame penetration if the joints or attachments can fail and allow the liner to fall out of place.

One commenter states they were advised by the FAA Technical Center that the test apparatus required for compliance with the new standards of Part 25 is not appropriate for testing joints, seams, fasteners, etc. While the test apparatus and procedures were originally developed using only basic liner panels, the Technical Center has since demonstrated that the test apparatus can be used effectively when the liner does incorporate joints, seams, fasteners, etc.

One commenter expresses concern that there would be a detrimental impact on the airlines' current maintenance programs which allow for temporary repair of liner damage with fire resistant tapes. Some current repair methods may, in fact, not meet the new standards and have to be replaced. Nevertheless, as in the case of design features, it is pointless to have a liner with excellent capability to resist flame penetration if a substandard repair were to fail in the event a fire occurred and leave an opening in the liner.

One commenter believes the proposed two-year compliance period should be extended to four years in order to provide sufficient time for operators to comply during major scheduled maintenance periods. The commenter asserts that such scheduled maintenance periods occur at three to five year periods and that airplanes would have to be removed from scheduled service to comply within the proposed two-year period. The FAA does not concur that airplanes would have to be removed from scheduled service to comply within two years. The existing liners are, in fact, routinely removed at intermediate times for inspection of structure surrounding the cargo or baggage compartments. Replacement liners could easily be installed during those inspections.

One commenter believes that the term "rigid fiberglass" does not accurately describe the materials in question. The commenter notes that the resistance of such materials to fire penetration is due to their being reinforced with fiberglass rather than their being "rigid" per se. The commenter further notes that resins used in laminates fabricated with such fiberglass reinforcement may be flexible or rigid and thereby produce flexible or rigid laminates. The commenter states that as long as the materials are fiberglass-reinforced laminates (as opposed to fiberglass batting, such as is used in thermal or accoustical insulation), they are highly resistant to fire penetration. The FAA concurs that "rigid fiberglass" is not an accurate description. The term "rigid fiberglass" has, therefore, been removed leaving only the term "glass fiber reinforced resin."

One commenter notes that the trademarks "Kevlar" and "Nomex" are the property of the commenter and serve as the exclusive designation for aramid fiber products manufactured by the commenter. The commenter is particularly concerned that the use of those terms in the NPRM implies that the impact is only on those products and that the organic materials of other manufacturers are not affected. The commenter is further concerned that the use of those terms implies that Kevlar or Nomex cannot be a component of the replacement materials used to comply with the proposed standards. The commenter also asserts fiberglass construction, as well as Kevlar and Nomex construction, failed to meet the new standards of Part 25.

The FAA regrets any implication that the products of the commenter are unsatisfactory by definition and that similar materials of other producers are satisfactory. Nevertheless, as noted in the preamble to Notice 87-11, Kevlar and Nomex are the only two materials, other than fiberglass and aluminum, that are widely used in the construction of the cargo or baggage compartment liners that are in service today. Furthermore, the liners used in the compartments of the Boeing 757 and 767, the Saab SF-340, and the Lockheed L-1011 are known to the aircraft industry and the general public as "Kevlar" or "Nomex." Because, as the commenter notes, there may be other such constructions which do, in fact, meet the new standards, the use of the generic term "aramid fiber products" in lieu of "Kevlar" and "Nomex" in the NPRM would have misled the public.

The FAA also regrets any implication that future materials identified as "Kevlar" or "Nomex" are unsuitable regardless of whether they meet the new standards of Part 25. Obviously, any material which meets those standards is acceptable regardless of the name given to it. The FAA is, however, concerned that the use of the same name for materials with such different performance characteristics could lead to the inadvertent use of the wrong material. In order to preclude a hazard through the inadvertent use of the "Kevlar" or "Nomex" construction that has been found unsatisfactory, the FAA strongly recommends that the commenter assign new or modified designations to the materials that do meet the new standards.

As noted above, glass fiber reinforced resin construction was found to be so likely to meet or exceed the new standards of Part 25 that the cost of conducting a test for each installation would not be justified.

The regulatory evaluation prepared for Notice 87-11 was based, in part, on the understanding that 44 Saab SF-340 airplanes would have to be modified to replace existing liners constructed of Kevlar and that all of the airplanes produced by Airbus Industrie already have liners constructed of materials which would meet the new standards. One commenter states that the SF-340 airplanes would not be affected because the volume of the largest cargo or baggage compartment in the Model SF-340 is 189 cubic feet. The commenter is, of course, correct in believing that compartments which are less than 200 cubic feet would not be affected. The comment that the largest compartment in the Model SF-340 is only 189 cubic feet in volume is, however, contrary to the manufacturer's SF-340 Aircraft Operation Manual which states that the volume of the baggage compartment is 225 cubic feet. A copy of the pertinent pages of that manual has been placed in the docket for this rulemaking. To be conservative, the regulatory evaluation prepared for this final rule is based on the assumption that the SF-340 airplanes would have to meet the new standards. Another commenter notes that the forward and aft cargo bay ceiling panels of 12 Airbus A-300B4 airplanes of U.S. registry would have to be replaced. This additional information is addressed in the new regulatory evaluation prepared for these amendments.

The regulatory evaluation prepared for Notice 87-11 was based on the assumption that there would be a slight increase in airplane weight due to the use of heavier materials needed to comply with the proposed new standards. One commenter submitted data showing that new materials which would meet the new standards and save about half the weight of glass fiber reinforced resin liners are available. This information is also addressed in the new regulatory evaluation prepared for these amendments.

Since the time Notice 87-11 was prepared, it has come to the attention of the FAA that the practice of incorporating certain provisions of Part 121 in Part 135 by reference may cause confusion. In order to preclude any confusion in this regard, Part 135 is amended to include the new standards explicitly rather than by reference. This is a nonsubstantive editorial change.

Except as noted above, Parts 121 and 135 are amended as proposed in Notice 87-11.

Regulatory Evaluation

The following is a summary of the final cost impact and benefit assessment of this regulation amending Parts 121 and 135 of the FAR. These amendments upgrade the fire safety standards for cargo or baggage compartment liner materials in certain transport category airplanes used in air carrier, air taxi, or commercial service. Transport category airplanes type certificated after January 1, 1958, will be required to have ceiling and sidewall panels constructed of either glass fiber reinforced resin, aluminum (only for liner installations approved prior to the effective date of this rule), or materials meeting the test requirements of Part 25, Appendix F, Part III.

The FAA issued a rule in 1986 mandating similar, but more stringent, standards for newly type certificated transport category airplanes, and a NPRM (52 FR 42512; November 5, 1987) proposing retrofitting cargo or baggage compartment liners in transport category airplanes already in service.

Several of the written comments received as of May 3, 1988, in response to the NPRM pertain to the economic impact of the proposal. Commenters include an organization representing air carriers, and a manufacturer of lining materials, as well as others.

One commenter objects to the inclusion of 44 Saab SF-340 airplanes in the initial regulatory evaluation's list of airplanes that would require modification. This commenter indicates that the Saab SF-340 would not be affected by the proposed standards, since its largest cargo or baggage compartment has only 189 cubic feet of volume, whereas the NPRM would only affect compartments larger than 200 cubic feet.

The FAA has not been able to corroborate this assertion. The manufacturer's SF-340 Aircraft Operations Manual states that the volume of the baggage compartment is 225 cubic feet. Therefore, the FAA assumes, for purposes of this evaluation, that all Saab SF-340 airplanes operating under Part 121 will require retrofit of their cargo or baggage compartment liners.

Another commenter notes that 12 Airbus A300-B4 airplanes of U.S. registry would require replacement of cargo bay ceiling panels, in addition to the airplanes listed in the initial regulatory evaluation as requiring modification.

The FAA disagrees with this comment. The manufacturer of the A300-B4 has indicated that it, and all other types of Airbus airplanes, have cargo compartment liners constructed of glass fiber reinforced resin, which would meet the proposed requirements.

The same commenter also indicates that the initial regulatory evaluation's estimate of the total cost of the proposed rule excludes additional costs of up to $47 million annually, resulting from the removal of aircraft from service to comply with the proposed rule within the specified two year compliance period.

The FAA disagrees that affected airplanes would need to be removed from service to comply with the proposed rule within two years. Existing liners are routinely removed more frequently than every two years, for inspection of structure surrounding the cargo or baggage compartments. Replacement liners could easily be installed during these inspections.

Therefore, compliance with the proposed rule within two years would not cause any additional costs due to removal of airplanes from service.

The commenter indicates as well that the initial regulatory evaluation does not take into account any additional costs due to the required replacement of design features, such as joints and fixtures, in addition to the large panel surface areas.

The FAA's initial cost projections for materials and labor were based on estimates of the costs of complete kits for replacing cargo or baggage compartment liners, including engineering and certification costs. The FAA believes that the costs of replacement of design features would not add significantly to the total cost of liner replacement since very few of these features would be likely to require replacement. Therefore, the FAA has not increased its estimates of the cost per aircraft of liner replacement in the final regulatory evaluation.

Many design features are mounted on the liner panels and could fail without compromising the fire containment characteristics of the liner itself. Such features would not require replacement. Furthermore, information available to the FAA indicates that support or attachment structure for cargo or baggage compartment liner panels in virtually all of the affected airplanes is constructed of aluminum, or the panels are mounted directly to the airframe structure with aluminum or steel fasteners. Since aluminum is an acceptable material for the construction of liners, according to the proposed rule, such support or attachment structures would not need to be tested or replaced. The FAA also considers that steel fasteners meet the new fire protection standards and that no further testing is needed for such fasteners.

Finally, another commenter indicates that new materials containing layers of organic fibers and fire blocking material could meet the proposed burnthrough requirements, while saving as much as one-half the weight of glass reinforced liners with similar impact resistance.

The FAA recognizes that materials may now exist or may be developed in the future that contain fire as effectively as glass fiber reinforced resin panels, but weigh less and provide cost savings from reduced fuel consumption. However, in order not to underestimate the costs of this rule, the FAA continues to assume in the final regulatory evaluation that all cargo or baggage compartment retrofits will employ the heavier glass fiber reinforced panels.

Total costs of these amendments are expected to be $21.3 million in 1987 dollars, or $15.5 million discounted present value, and are evaluated over the ten-year period following the expected 1991 compliance date. These costs include labor and material costs of installing cargo compartment liners in certain airplanes that do not already meet the standards set forth in the amendments, as well as the additional fuel consumed by these airplanes because of the slight increase in the weight of these new liners. Total costs can be broken down as follows:

	1987 dollars (in millions)	Present dollar value (in millions)
Cost retrofit	14.1	11.7
Cost of additional fuel	7.2	3.8
Total costs	21.3	15.5

Cost estimates have been adjusted from the initial regulatory evaluation to account for new projections of the composition and size of the fleet of affected airplanes, and are updated from 1986 to 1987 dollars. Airplanes expected to be effected by these amendments include certain Boeing 727, 737, 747, 757 and 767's, Lockheed L-1011's, and Saab SF-340's.

This rule will be cost beneficial if it succeeds in preventing only one accident. Comparing the potential benefit of avoiding airplane property loss alone (ranging from approximately $2.6 million to $23 million) against the costs of bringing all airplanes of a specific model into compliance, the benefit would greatly exceed the costs. Taking into account the overall costs and the benefits of preventing fatalities as well as property loss, should the only accident prevented involve the smallest airplane subject to the rule change (the Saab SF-340, with an average load of 20 passengers), the cost per fatality avoided would be $645 thousand. Economists generally agree that this figure is well below the $1 million criterion for "cost per life saved." Furthermore, if this rule succeeds in preventing an accident involving a larger or more fully loaded airplane, the cost per fatality avoided will be lower.

Regulatory Flexibility Act Determination

The FAA has identified 20 small entity air carriers that operate airplane models affected by this rule. All but three of these carriers operate only Boeing 727 and 737 airplanes among the affected airplanes, the least expensive models to bring into compliance. Should these air carriers operate as many as nine of these airplanes, the largest number allowed for an operator to be considered a small entity, then the annualized retrofit cost for each operator would be under $750. This is far less than the threshold value of $3,600 prescribed in FAA Order 2100.14A, *Regulatory Flexibility Criteria and Guidance*, for determining significant economic impact on unscheduled operators, and significantly lower than the $92,700 threshold value for scheduled operators. For these reasons, these amendments are not expected to result in a significant economic impact on a substantial number of small entities. Nonetheless, they are expected to provide a benefit for those small entities engaged in manufacturing cargo compartment liner material. The FAA believes, however, that this benefit will not be significant.

International Trade Impact Analysis

This rulemaking will have little or no impact on trade for either U.S. firms doing business in foreign countries or foreign firms doing business in the United States. Foreign air carriers, which are not affected by this rule, will not gain any competitive advantage over the domestic operations of U.S. carriers because they are prohibited from transporting passengers between origin-destination points within the United States.

In international operations, foreign air carriers may realize a slight cost advantage. However, the costs of this rule are extremely small in comparison to the overall cost of engaging in international air transportation. Therefore, no appreciable trade impact is expected to result from these amendments.

Federalism Implications

The regulations adopted herein will not have substantial direct effects 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, in accordance with Executive Order 12612, it is determined that this final rule does not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

Conclusion

For the reasons discussed earlier in the preamble, the FAA has determined

that this is not a major rule as defined in Executive Order 12291. The FAA has determined that this action is significant under DOT Regulatory Policies and Procedures (44FA 11034; February 26, 1979). In addition, the FAA certifies that this rule will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act, since the magnitudes of the impacts are not significant. A regulatory evaluation of this action, including a Regulatory Flexibility Determination and a Trade Impact Assessment, has been prepared for this regulation and has been placed in the docket. A copy of this evaluation may be obtained by contacting the person identified under the caption **"FOR FURTHER INFORMATION CONTACT."**

List of Subjects

14 CFR Part 121

Aviation safety, Safety, Air carriers, Air transportation, Aircraft, Airplanes, Flammable materials, Transportation, Common carriers.

14 CFR Part 135

Aviation safety, Safety, Air carriers, Air transportation, Aircraft, Airplanes, Cargo, Hazardous baggage, Materials, Transportation, Mail.

Adoption of the Amendments

Accordingly, Parts 121 and 135 of the Federal Aviation Regulations (FAR) 14 CFR, Parts 121 and 135, are amended as follows:

PART 121—CERTIFICATION AND OPERATIONS: DOMESTIC, FLAG, AND SUPPLEMENTAL AIR CARRIERS AND COMMERCIAL OPERATORS OF LARGE AIRCRAFT

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

Authority: 49 U.S.C. 1354(a), 1355, 1356, 1357, 1401, 1421-1430, 1472, 1485, and 1502; 49 U.S.C. 106(g) (Revised Pub. L. 97-449, January 12, 1983); 49 CFR 1.47(a).

2. By adding new § 121.314 to read as follows:

§ 121.314 Cargo and baggage compartments.

(a) After March 20, 1991, each Class C or D compartment, as defined in § 25.857 of Part 25 of this Chapter, greater than 200 cubic feet in volume in a transport category airplane type certificated after January 1, 1958, must have ceiling and sidewall liner panels which are constructed of:

(1) Glass fiber reinforced resin;

(2) Materials which meet the test requirements of Part 25, Appendix F, Part III of this Chapter; or

(3) In the case of liner installations approved prior to March 20, 1989, aluminum.

(b) For compliance with this section, the term "liner" includes any design feature, such as a joint or fastener, which would affect the capability of the liner to safely contain a fire.

PART 135—AIR TAXI OPERATORS AND COMMERCIAL OPERATORS

3. The authority citation for Part 135 continues to read as follows:

Authority: 49 U.S.C. 1354(a), 1355, 1356, 1357, 1401, 1421-1431, and 1502; 49 U.S.C. 106(g) (Revised Pub. L. 97-449, January 12, 1983), 49 CFR 1.47(a).

4. By amending § 135.169 by adding a new paragraph (d) to read as follows:

§ 135.169 Additional airworthiness requirements.

* * * * *

(d) Cargo or baggage compartments:

(1) After March 20, 1991, each Class C or D compartment, as defined in § 25.857 of Part 25 of this Chapter, greater than 200 cubic feet in volume in a transport category airplane type certificated after January 1, 1958, must have ceiling and sidewall panels which are constructed of:

(i) Glass fiber reinforced resin;

(ii) Materials which meet the test requirements of Part 25, Appendix F, Part III of this Chapter; or

(iii) In the case of liner installations approved prior to March 20, 1989, aluminum.

(2) For compliance with this paragraph, the term "liner" includes any design feature, such as a joint or fastener, which would affect the capability of the liner to safely contain a fire.

Issued in Washington, DC, on February 10, 1989.

T. Allan McArtor,

Administrator.

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