DICK HILL

Federal Register

Monday
August 21, 1989

Part VI

Department of Transportation

Federal Aviation Administration

14 CFR Part 39

Airworthiness Directives; Boeing Models 707, 727, 737, 747, and 757 Series Airplanes; and McDonnell Douglas Models DC-8, DC-9 (Including MD-80 Series) and DC-10 Series Airplanes; Final Rule

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 88-NM-80-AD; Amdt. 39-6301]

Airworthiness Directives; Boeing Models 707, 727, 737, 747, and 757 Series Airplanes; and McDonnell Douglas Models DC-8, DC-9 (Includes MD-80 Series), and DC-10 Series Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule, request for comments.

SUMMARY: This amendment adopts a new airworthiness directive (AD), applicable to certain transport category airplanes, certificated for operation with a main deck Class B cargo compartment. This AD requires that certain operational and equipment changes and design modifications be accomplished to maximize cargo fire detection and control. This amendment is prompted by the loss of a Boeing Model 747-200 "Combi" airplane that apparently developed a major fire in the main deck cargo compartment. This condition, if not corrected, could result in an uncontrolled cargo fire that could cause systems and structural damage, leading to the loss of the airplane.

DATES: *Effective* September 25, 1989.

Comments must be received by September 25, 1989.

ADDRESSES: The applicable service information may be obtained from Boeing Commercial Airplanes, P.O. Box 3707, Seattle, Washington 98124; or McDonnell Douglas Corporation, 3855 Lakewood Boulevard, Long Beach, California 90846, Attention: Director, Publications and Training, C1-750 (54-60). This information may be examined at the FAA, Northwest Mountain Region, Transport Airplane Directorate, 17900 Pacific Highway South, Seattle, Washington; the Seattle Aircraft Certification Office, 9010 East Marginal Way South, Seattle, Washington; or the Los Angeles Aircraft Certification Office, 3229 East Spring Street, Long Beach, California.

FOR FURTHER INFORMATION CONTACT: Mr. Weston B. Slifer, Systems & Equipment Branch, ANM-130S, FAA, Northwest Mountain Region, Seattle Aircraft Certification Office, 17900 Pacific Highway South, C-68966, Seattle, Washington 98168, telephone (206) 431-1945; or Mr. Kevin Kuryoshi, Systems & Equipment Branch, ANM-130L, FAA, Northwest Mountain Region, Los Angeles Aircraft Certification Office, 3229 East Spring Street, Long Beach, California 90806, telephone (213) 988-5337.

SUPPLEMENTARY INFORMATION: A proposal to amend part 39 of the Federal Aviation Regulations to include an airworthiness directive, applicable to Boeing Models 707, 727, 737, 747, and 757 series airplanes, and McDonnell Douglas Models DC-8, DC-9 (includes MD-80 series), and DC-10 series airplanes, which requires either (1) modification of all Class B cargo compartments to Class C cargo compartments, or (2) the use of flame penetration-resistant cargo containers equipped with smoke detection and fire extinguishing systems, was published in the Federal Register on July 15, 1988 (53 FR 26786).

Interested persons have been afforded an opportunity to participate in the making of this amendment. Due consideration has been given to the comments received.

There were a total of 38 commenters, representing manufacturers, airlines, crew unions, consumer advocates, and foreign airworthiness authorities.

Some commenters stated that not enough technical/research data is available either to substantiate that an unsafe condition exists or to determine a consummate design modification to address the unsafe condition, and suggested that the proposal be withdrawn. The FAA disagrees. As explained in the Notice, the FAA conducted an in-depth review of existing regulations, policies, and procedures pertaining to the certification of large main deck Class B cargo compartments with volumes exceeding 200 cu. ft. This review revealed that, notwithstanding compliance with the existing regulations, airplanes equipped with main deck Class B cargo compartments do not provide an acceptable level of safety in terms of smoke and fire protection, for the following reasons:

1. The existing rules, policies, and procedures being applied to the certification of Class B cargo or baggage compartments in terms of smoke and fire protection, are inadequate.

2. While entry into the cargo compartment is available, not all cargo is accessible.

3. It is unlikely that personnel would have the means available to extinguish a fire (particularly a deep-seated fire).

4. The quantity of fire extinguishing agent and the number of portable extinguishers are inadequate.

5. The level of visibility available in a smoke filled cargo compartment is not adequate for locating and fighting a fire with a portable fire extinguisher.

6. Most existing transport airplane smoke or fire detection systems were certified prior to FAR 25 Amendment 25-54 and are incapable of giving timely warning.

7. Current designs do not provide adequate means to monitor conditions in the cargo compartment after fire warning and firefighting procedures have been implemented.

8. Cargo compartment lining does not provide adequate fire containment.

9. Current designs do not provide a means to shut off ventilation air into the cargo compartment to limit oxygen to the fire.

In addition to that study, data available from full-scale fire tests at the FAA Technical Center reveals the rapid, exponential growth of cargo fires and the quick loss of visibility in the compartment. Past testing in Class C, D, and E compartments indicates that, without a fire suppression system, "cargo fires can easily reach dangerous proportions in any size compartment." (Reference 1) It was also concluded that "fire in large loaded cargo compartments may be expected to result in a flash fire shortly after detection and the shutoff of ventilation air." (Reference 2) Testing utilizing smoke detection systems similar to those presently used in newer Class B compartments led to the conclusion that "the smoke detection system did not always give early warning of fire and subsequently gave false warnings of fire and subsequently gave false indications of the level of smoke in the compartment." (Reference 3) Although a shorter detection time could increase the time available for fire fighting, all the referenced FAA studies indicate that a flash fire could occur in as little as 2 to 3 minutes after ignition of standard type cargo packing material in cardboard boxes. It was concluded from testing in References 3 and 4 studies that a Halon 1301 suppression system could effectively suppress and control a cargo fire as long as the initial concentration was in excess of 5 percent and at least a 3 percent concentration was maintained.

References

Reference 1—Blake, D.R. and Hill, R.G., *Fire Containment Characteristics of Aircraft Class D Cargo Compartments*, FAA Technical Report No. DOT/FAA/82-156, March 1983.

Reference 2—Gassmann, Julius J., *Characteristics of Fire in Large Cargo Aircraft (Phase 11)*, FAA RD-70-42, September 1970.

Reference 3—Blake, David R., *Suppression and Control of Class C*

Cargo Compartment Fires, DOT/FAA/CT-84/21, February 1985.

Reference 4—Gassmann, Julius J. and Hill, Richard G., *Fire Extinguishing Methods for New Passenger/Cargo Aircraft*, FAA-RD-71-68, November 1971.)

In light of the considerable amount of data and information available, the FAA has determined that an unsafe condition exists with regard to Class B cargo compartments, and considers this AD action a positive step in addressing the unsafe condition posed by fire in Class B cargo compartments.

Some commenters contend that the proposed AD would be inflexible, ineffective, or inappropriate, and that the means of dealing with the described safety deficiency would be more appropriate as a change to FAR part 25 or FAR part 121. The FAA disagrees with these comments. FAR part 39 provides for the issuance of airworthiness directives when an unsafe condition exists in a product and is likely to exist or develop in other products of the same type design. As discussed in the Notice, the FAA has determined that an unsafe condition exists with regard to fire hazards in the Class B cargo compartment. The proposal was prompted by information from a specific accident, a Boeing Model 747 "Combi" airplane operating with a main deck Class B cargo compartment, as defined by FAR 25.857(b), that was lost over the Indian Ocean on November 28, 1987. Although no formal findings have been issued by the foreign authority having jurisdiction over the accident investigation, there is firm evidence that an inflight fire occurred in a Class B cargo compartment, which contributed to the loss of the airplane.

Some commenters suggested that the Class C compartment was not as good as a Class B because a Class B compartment can be accessed by an individual to identify and evaluate the fire situation. Further, this method prevents adverse action being taken in the event there is a smoke alarm failure instead of a fire. The FAA acknowledges that for the false warning situation, where there is no fire, the Class B cargo compartment has an advantage over the Class C. Verification that there is a fire, or that the fire is extinguished is not an option with the Class C compartment. It is generally assumed for a Class C cargo compartment that a fire warning constitutes a fire, the compartment is flooded with Halon, and the airplane is landed at the nearest suitable airport. If there is no fire then it is only a case of inconvenience, lost time, and fuel, but safety is not adversely affected. When there is a fire in a cargo compartment, which is the critical situation as opposed to the false warning condition, optimum safety within technological limits has been provided by the Class C cargo compartment. That is not the case with the Class B cargo compartment. Simulated fire tests have shown that the smoke detection systems and the compartment liner materials may not be adequate to contain the fire until it can be reached by a fire fighter with extinguishing agent. Further, the fire fighter may not be able to locate the fire to extinguish it because of the presence of smoke and obstructing cargo.

Over the years, the size of Class B cargo compartments and the size of cargo packages has increased, making timely fire detection, fire location identification, and manual fire suppression much more complicated, difficult, and ineffective. In Class C cargo compartments, cargo is not accessible by a fire fighter; therefore, the equipment is equipped with cargo liners for containment, control of ventilation and drafts, and fire detection and suppression systems to control or extinguish the fire. There are no known cases of loss of aircraft due to fire in Class C cargo compartments.

Several commenters agreed with the intent of the rule, but opposed the proposed requirements. In general, these commenters pointed out significant technical difficulties with converting in-service airplanes with Class B cargo compartments to Class C cargo compartments. There are significant design considerations, since most Class B compartments are designed for easy and quick conversion for carriage of passengers or cargo on short notice. Therefore, to maintain the proper fire extinguishing agent concentration, major changes would be necessary not only to provide compartment ventilation and air exhaust, but also to provide protection against rapid decompression. The commenters stated that conversion to a Class C cargo compartment would probably prevent them from having the needed flexibility of rapid compartment size changes to support certain customer requirements. These commenters suggested that there were other alternate actions and/or modifications to the Class B compartment that were appropriate safety improvements and more easily accomplished. The following were suggested as areas of improvements:

1. Reducing the detection time to 1 minute.

2. Providing a means to "knock down" fire, plus a method to stop direct flow of ventilation system air into the compartment.

Note: "Knock down" is a term often used to refer to a process that occurs when a sufficient concentration level of extinguishing agent is present at the fire to reduce it to a non-threatening level.

3. Improving the firefighting training.

4. Providing an improved smoke "barrier."

5. Providing public address (PA) speakers in the compartment.

6. Providing improved lighting in the compartment.

7. Reviewing the "access" to cargo within the compartment.

8. Installing viewing ports in access doors to the compartment for monitoring compartment conditions.

As stated in the preamble to the Notice, the FAA recognized that other alternative design changes may be developed which would provide a level of safety equivalent to the options proposed in the Notice. Therefore, as a result of these concerns raised by the commenters, the high cost of retrofit of Class C cargo compartments, and the jeopardy to certain highly desirable cargo operations, the FAA has evaluated the suggested alternative design features and concurs in part with the commenters. In regards to the suggestions listed above, the FAA has determined that the following design changes and procedures are appropriate to achieve major fire safety improvements for Class B cargo compartments:

1. Provide a smoke or fire detection system that meets FAR 25.858 (Amdt. 25-54), FAR 25.1309, and also provide an aural and visual warning to the station assigned to individuals trained to fight cargo fires.

2. Requiring a compartment fire extinguishing system that provides an extinguishant concentration to "knock down" a fire and suppress it, allowing time for a trained individual to find and extinguish a fire, or to verify that the fire is extinguished; and provide a means to shut off ventilation system air inflow to the compartment from the flight deck.

3. Requiring individuals trained to fight cargo fires.

4. Provide a cargo compartment liner that meets FAR 25.855 (Amdt. 25-60).

5. Provide two-way communication means between the flight deck, the station assigned to the trained individual, and the interior of the cargo compartment.

6. Provide improved illumination within the cargo compartment.

7. Requiring cargo loading envelopes and limitations to provide access to all the cargo for fighting a fire.

8. Provide a cargo compartment temperature indication system to the flight deck and designated station.

In addition to the above items, the FAA has determined that the following features are necessary to ensure that an acceptable level of safety is attained:

1. Additional portable fire extinguishers appropriately located for use in the compartment and a means to effectively discharge portable fire extinguishers into each container or into each pallet that is covered. This will provide sufficient extinguishing agent and will ensure a means to properly use that agent in containers or covered pallets.

2. Protective garments and protective breathing equipment for individuals fighting a cargo fire. This will provide protection for the individual assigned to control a cargo compartment fire.

3. Fire thermal protective covers for cockpit voice and flight data recorders, windows, safety devices, wiring, flight controls (unless it can be shown that a fire could not result in jamming or loss of affected control systems), and other equipment necessary for safe flight and landing that is located within the compartment. This is necessary to ensure that items which are not critical for continued safe flight, but are essential for the overall safe operation of the airplane, are not damaged in the event of a cargo compartment fire.

Accordingly, the final rule has been revised to include the accomplishment of the design changes and procedures specified above as an alternate method of compliance with the rule. The FAA has determined that if these items are incorporated, they will adequately address the unsafe condition. This alternative action is a logical outgrowth of the proposal and is responsive to the commenters.

Several commenters stated that discontinued use of pallets for cargo is not practical and would result in serious adverse economic consequences to the operators and to very remote communities that heavily rely upon the Combi service. Other commenters stated that cargo loads are often transferred from one airplane size to another of different size. In addition, cargo loads are transferred from airline to airline creating compatibility, logistic, and airworthiness control problems for cargo containers that have a detection and extinguisher system and meet the flame resistant liner requirements.

It is not the FAA's intent to deny the use of pallets in "Combi" aircraft. The issue is the fire control and containment capability with cargo loaded on pallets. With the present practice, in which the cargo is loaded on pallets, a deep-seated fire could develop and result in the compartment being filled with dense smoke. By revising the final rule, as described above, the FAA has addressed these concerns by requiring a means to discharge portable extinguishers into covered pallets, improved access, lighting, and protective equipment for the individual fighting the fire.

Numerous commenters indicated that the 180-day compliance time is unrealistic. After further consideration, the FAA concurs. The FAA has determined that certain of the equipment and operational changes described above (including the formulation and implementation of a training program for fighting cargo compartment fires) can be reasonably accomplished within one year after the effective date of the final rule and will provide an acceptable level of safety as an interim measure. In addition, the FAA has determined that the originally proposed alternatives or the remaining design changes described above can be reasonably accomplished within three years after the effective date and will provide an acceptable level of safety thereafter.

Several commenters provided cost estimates, based on discussions with airplane manufacturers, that indicate the cost of converting a Class B cargo compartment to a Class C cargo compartment would be approximately $2,500,000 for a wide body airplane and about $1,000,000 for a standard body. The FAA agrees that these cost estimates are reasonable, and has revised the economic impact analysis paragraph below, to incorporate these figures.

After careful review of the available data, including the comments noted above, the FAA has determined that air safety and the public interest require adoption of the rule with the changes previously described. The FAA has determined that these changes will neither increase the economic burden on any operator nor increase the scope of the AD.

There are approximately 278 Boeing Model 707, 727, 737, and 747 series airplanes and 124 McDonnell Douglas Model DC-8, DC-9, and DC-10 series airplanes of the affected desitificated to operate with a Class B main deck cargo compartment. Many of these airplanes have been permanently operated in the all-passenger configuration and are, therefore, not affected by this proposal. Approximately 40 of these airplanes are presently operated by U.S. operators in the mixed cargo/passenger configuration. Based on the estimated cost of conversion submitted by several commenters, $1,000,000 per standard body airplane and $2,500,000 per wide body airplane, the costs associated with incorporating additional design features, enhanced protective systems and equipment, and fire control procedures for the Class B cargo compartment are estimated to be $800,000 per standard body airplane and $2,200,000 per wide body airplane. (These estimated figures are based on the fact that these changes require less redesign than is required for conversion to a Class C compartment.)

Because this final rule contains a significant alternative to the proposed requirements, interested persons are invited to submit such written data, views, or arguments as they may desire regarding this AD. Communications should identify the docket number and be submitted to the Federal Aviation Administration, Northwest Mountain Region, Transport Airplane Directorate, ANM-103, Attention: Airworthiness Rules Docket No. 88-NM-80-AD, 17900 Pacific Highway South, C-68966, Seattle, Washington 98168. All communications received by the deadline date indicated above will be considered by the Administrator, and the AD may be changed in light of the comments received.

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.

For the reasons discussed above, I certify that this action (1) is not a "major rule" under Executive Order 12291; (2) is not a "significant rule" under DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979); and (3) 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. A final evaluation has been prepared for this action and is contained in the regulatory docket. A copy of it may be obtained from the Rules Docket.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Safety.

Adoption of the Amendment

Accordingly, pursuant to the authority delegated to me by the Administrator, the Federal Aviation Administration

amends part 39 of the Federal Aviation Regulations as follows:

PART 39—[AMENDED]

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 1354(a), 1421 and 1423; 49 U.S.C. 106(g) (Rev. Pub. L. 97-449, Jan. 12, 1983); and 14 CFR 11.89.

§ 39.13 [Amended]

2. Section 39.13 is amended by adding the following new airworthiness directive:

Boeing and McDonnell Douglas: Applies to Boeing Models 707, 727, 737, 747, and 757 series airplanes; and McDonnell Douglas Models DC-8, DC-9 (includes MD-80 series), and DC-10 series airplanes, equipped with a main deck Class B cargo compartment, as defined by FAR 25.857(b) or its predecessors, with a volume exceeding 200 cu. ft., certificated in any category. Compliance required as indicated, unless previously accomplished.

To minimize the hazard associated with a main deck Class B cargo compartment fire, accomplish the following:

A. Within one year after the effective date of this rule, or prior to carrying cargo in a Class B cargo compartment, whichever occurs later, accomplish the following in accordance with the appropriate technical data approved by the Manager, Seattle Aircraft Certification Office (for Boeing series airplanes); or the Manager, Los Angeles Aircraft Certification Office (for McDonnell Douglas series airplanes):

1. Revise the Limitations Section of the FAA-approved Airplane Flight Manual (AFM) to include the following:

For each flight in which cargo is transported in the class B cargo compartment:

a. For airplanes having compartments with 200 square feet or less of cargo/baggage floor area a minimum of one individual trained to fight cargo fires must be provided. (This individual is in addition to crewmembers required by the operational rules.) The training program must be approved by the FAA.

b. Prior to flight, the pilot, copilot, or individual required by paragraph A.1.a., above, must make a visual inspection throughout the Class B cargo compartment to verify access to cargo and the general fire security of the compartment after cargo door is closed and secured.

c. At intervals not to exceed 30 minutes in flight and continuously after a smoke alarm, the individual trained to fight cargo fires must conduct a visual inspection throughout the Class B cargo compartment to monitor for evidence of fire, unless an approved temperature (thermal) monitoring system is installed.

d. For airplanes having compartments with more than 200 square feet of cargo/baggage floor area provide an additional person trained to fight cargo fires to work with the individual required by paragraph A.1.a., above. (This individual may be a required flight attendant.)

e. Establish firefighting procedures for controlling cargo compartment fires.

2. Incorporate the following systems and equipment:

a. Provide appropriate protective garments stored adjacent to the cargo compartment entrance for use by the designated individuals trained to fight cargo fire required by paragraphs A.1.(a) and A.1.(d) above.

b. Provide a minimum of 30 minutes of protective breathing and an additional quantity of oxygen sufficient to conduct the inspections required by paragraph A.1.c., above. The equipment must meet the requirements of Technical Standard Order (TSO) C-116, Action Notice 8150.2A, or equivalent, and be stored adjacent to the cargo compartment entrance.

c. Provide a minimum of 48 lbs. Halon 1211 fire extinguishant, or its equivalent, in portable fire extinguisher bottles readily available for use in the cargo compartment. At least two bottles must be a minimum of 18 lb. capacity.

d. Provide at least two Underwriters Laboratories (UL)2A (2½ gallon) rated water portable fire extinguisher, or its equivalent, adjacent to the cargo compartment entrance for use in the compartment.

e. Provide a means for two-way communications between the following:

(1) The flight deck and the station assigned to the individual trained to fight cargo fires.

(2) The flight deck and the interior of the cargo compartment.

f. Install placards in conspicuous place(s) within the cargo compartment clearly defining the cargo loading envelope and limitations that provide sufficient access of sufficient width for firefighting along the entire length of at least two sides of a loaded pallet or container. Amend the appropriate Weight and Balance and loading instructions by description and diagrams to include this information.

Note: In accordance with paragraph C., below, if the requirements of paragraph B.1. or B.2. are accomplished within one year after the effective date of this AD, compliance with paragraph A. of this AD is unnecessary.

B. Within three years after the effective date of this rule, or prior to carrying cargo in a Class B cargo compartment, whichever occurs later, accomplish the requirements of paragraph B.1., B.2., or B.3., below:

1. Modify the Class B cargo compartment to comply with the requirements for a Class C cargo compartment, as defined in FAR 25.855 (Amdt. 25-60), 25.857(c) and 25.858(Amdt. 25-54).

2. Modify all main deck Class B cargo compartments to require the following placard installed in conspicuous locations approved by the Manager, Seattle Aircraft Certification Office, FAA, Northwest Mountain Region (for Boeing airplanes), or the Manager, Los Angeles Aircraft Certification Office, FAA, Northwest Mountain Region (for McDonnell Douglas airplanes), throughout the compartment:

Cargo carried in this compartment must be loaded in an approved flame penetration-resistant container meeting the requirements of FAR 25.857(c), with ceiling and sidewall liners and floor panels that meet the requirements of FAR 25, Appendix F, Part III, (Amdt. 25-60).

3. In addition to the requirements of paragraph A., above, modify Class B cargo compartments and associated systems in accordance with technical data approved by the Manager, Seattle Aircraft Certification Office (for affected Boeing series airplanes), or the Manager, Los Angeles Aircraft Certification Office (for affected McDonnell Douglas series airplanes), to include the following:

a. Provide a cargo compartment fire "knock down" extinguishing system that provides an initial fire extinguishant concentration of at least 5 percent of the empty compartment volume of Halon 1301 or equivalent, and a fire suppression extinguishant concentration of at least 3 percent of the empty compartment volume of Halon 1301 or equivalent, for a period of time not less than 15 minutes.

b. Provide a smoke or fire detection system that meets the requirements of FAR 25.858 (Amdt. 25.54) and also provides an aural and visual warning to the station assigned to the individual trained to fight cargo fire. The designated station must be located adjacent to the inflight access door to the cargo compartment.

c. Provide a means from the flight deck to shut off ventilation system inflow to the cargo compartment.

d. Provide a temperature indication system to the flight deck and station designated for the individual trained to fight cargo fire to advise of potentially hazardous conditions within the cargo compartment.

e. Provide a cargo compartment liner that meets the requirements of FAR 25.855, (Amdt. 25-60). The smoke/fire barrier between the occupants and cargo compartment must extend from the cargo compartment floor to the ceiling liner, or top skin of the airplane, and from the right side liner to the left side liner of the cargo compartment. The liner and barrier seals must also be constructed of materials that meet the Flame Penetration Resistance requirements of FAR 25, Appendix F, Part III (Amdt. 25-60), except that currently-installed glass fiber reinforced resin material is acceptable. In addition, provide protective covers for cockpit voice and flight data recorders, windows, wiring, and primary flight control systems (unless it can be shown that a fire could not cause jamming or loss of control), and other equipment within the compartment that is required for safe flight and landing; those covers must be constructed of materials that meet the Flame Penetration Resistance requirements of FAR 25, Appendix F, Part III (Amdt. 25-60).

f. Provide illumination in the cargo compartment as follows:

(1) General area illumination of the cargo with an average illumination of 0.1 foot-candle measured at 40-inch intervals both at one-half the pallet or container height, and at the full pallet or container height.

(2) Illumination of the access pathways required by paragraph A.2.f., above, under visibility conditions likely to be encountered after fire and discharge of the fire extinguishant, and prior to the decay of

extinguishant concentration below 3 percent, must provide an average of 0.1 foot-candle measured at each 40-inch interval, with not less than 0.05 foot-candle minimum along a line that is within 2 inches of and parallel to the floor centered on the pathway.

g. Provide a safe means to effectively discharge portable fire extinguishers into each container or into each pallet that is covered.

h. Demonstrate the following features and functions during flight tests:

(1) Fire Extinguishant Concentration, required by paragraph B.3.a., above.

(2) Smoke or Fire detection system, required by paragraph B.3.b., above.

(3) Prevention of smoke penetration into occupied compartments. (Refer to FAR 25.857(b)2 and 25.855(e)2.)

(4) Compartment temperature indication, required by paragraph B.3.d., above.

(5) Cargo accessibility, required by paragraph A.2.f., above.

(6) Firefighting procedures, required by paragraph A.1.e., above.

i. Items specified in paragraphs B.3.h(5) and B.3.h(6), above, must be evaluated under reduced visibility conditions representative of those likely to occur with cargo fires.

C. Compliance with the requirements of paragraph SB.1 or B.2., above, constitutes terminating action for the requirements of paragraph A., above.

D. An alternate means of compliance or adjustment of the compliance time, which provides an acceptable level of safety, may be used when approved by the Manager, Seattle Aircraft Certification Office, FAA, Northwest Mountain Region.

Note: The request should be forwarded through an FAA Principal Maintenance Inspector (PMI), who will either concur or comment, and then send it to the Manager, Seattle Aircraft Certification Office.

E. Special flight permits may be issued in accordance with FAR 21.197 and 21.199 to operate airplanes to a base in order to comply with the requirements of this AD.

All persons affected by this directive who have not already received the appropriate service information from the manufacturer may obtain copies upon request to Boeing Commercial Airplanes, P.O. Box 3707, Seattle, Washington 98124, or McDonnell Douglas Corporation, 3855 Lakewood Boulevard, Long Beach, California 90846, Attention: Director, Publications and Training, C1-750 (54-60). This information may be examined at the FAA, Northwest Mountain Region, Transport Airplane Directorate, 17900 Pacific Highway South, Seattle, Washington; the Seattle Aircraft Certification Office, FAA, Northwest Mountain Region, 9010 East Marginal Way South, Seattle, Washington; or the Los Angeles Aircraft Certification Office, 3229 East Spring Street, Long Beach, California.

This amendment becomes effective September 25, 1989.

Issued in Seattle, Washington, on August 10, 1989.

Leroy A. Keith,

Manager, Transport Airplane Directorate, Aircraft Certification Service.

[FR Doc. 89-19676 Filed 8-17-89; 11:41 a.m.]

BILLING CODE 4910-13-M