under the criteria of the Regulatory Flexibility Act. A final evaluation has been prepared for this action and it is contained in the Rules Docket. A copy of it may be obtained from the Rules Docket at the location provided under the caption **ADDRESSES**.

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 (14 CFR part 39) as follows:

PART 39—AIRWORTHINESS DIRECTIVES

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

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

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

99–19–14 SAAB Aircraft AB: Amendment 39–11303. Docket 99–NM–148–AD.

Applicability: SAAB SF340A, SAAB 340B, and SAAB 2000 series airplanes equipped with pneumatic deicing boots, certificated in any category.

Compliance: Required as indicated, unless accomplished previously.

To ensure that flightcrews activate the wing and tail pneumatic deicing boots at the first signs of ice accumulation on the airplane, accomplish the following:

(a) Within 10 days after the effective date of this AD: Revise the Limitations Section of the FAA-approved Airplane Flight Manual (AFM) to include the following requirements for activation of the ice protection systems. This may be accomplished by inserting a copy of this AD in the AFM.

''• Except if the AFM otherwise specifies that deicing boots should not be used for certain phases of flight (*e.g.*, take-off, final approach, and landing), compliance with the following is required.

• Wing and Tail Leading Edge Pneumatic Deicing Boot System, if installed, must be activated:

—At the first sign of ice formation anywhere on the aircraft, or upon annunciation from an ice detector system, whichever occurs first; and

—The system must either be continued to be operated in the automatic cycling mode, if available; or the system must be manually cycled as needed to minimize the ice accretions on the airframe.

• ''The wing and tail leading edge pneumatic deicing boot system may be deactivated only after completion of an entire deicing cycle after leaving icing conditions.''

(b) An alternative method of compliance or adjustment of the compliance time that provides an acceptable level of safety may be used if approved by the Manager, International Branch, ANM–116, FAA, Transport Airplane Directorate. The request shall be forwarded through an appropriate FAA Operations Inspector, who may add comments and then send it to the Manager, International Branch, ANM–116 ACO.

Note 1: Information concerning the existence of approved alternative methods of compliance with this AD, if any, may be obtained from the International Branch, ANM–116 ACO.

(c) Special flight permits may be issued in accordance with sections 21.197 and 21.199 of the Federal Aviation Regulations (14 CFR 21.197 and 21.199) to operate the airplane to a location where the requirements of this AD can be accomplished.

(d) This amendment becomes effective on December 27, 1999.

Issued in Renton, Washington, on November 10, 1999.

John J. Hickey,

Manager, Transport Airplane Directorate, Aircraft Certification Service.

[FR Doc. 99–30139 Filed 11–19–99; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 99–NM–149–AD; Amendment 39–11304; AD 99–19–15]

RIN 2120–AA64

Airworthiness Directives; CASA C–212 and CN–235 Series Airplanes

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule.

SUMMARY: This amendment adopts a new airworthiness directive (AD), applicable to certain CASA C–212 and CN–235 series airplanes, that requires revising the Airplane Flight Manual (AFM) to include requirements for activation of the airframe pneumatic deicing boots. This amendment is prompted by reports of inflight incidents and an accident that occurred in icing conditions where the airframe pneumatic deicing boots were not activated. The actions specified by this AD are intended to ensure that flightcrews activate the pneumatic wing and tail deicing boots at the first signs of ice accumulation. This action will prevent reduced controllability of the aircraft due to adverse aerodynamic effects of ice adhering to the airplane prior to the first deicing cycle.

EFFECTIVE DATE: December 27, 1999.

ADDRESSES: Information pertaining to this rulemaking action may be examined at the Federal Aviation Administration (FAA), Transport Airplane Directorate, Rules Docket, 1601 Lind Avenue, SW., Renton, Washington.

FOR FURTHER INFORMATION CONTACT: Norman Martenson, Aerospace Engineer, Manager, International Branch, ANM–116, FAA, Transport Airplane Directorate, 1601 Lind Avenue, SW., Renton, Washington 98055–4056; telephone (425) 227–2110; fax (425) 227–1149.

SUPPLEMENTARY INFORMATION: A proposal to amend part 39 of the Federal Aviation Regulations (14 CFR part 39) to include an airworthiness directive (AD) that is applicable to certain CASA C–212 and CN–235 series airplanes was published in the **Federal Register** on July 16, 1999 (64 FR 38348). That action proposed to require revising the Airplane Flight Manual (AFM) to include requirements for activation of the airframe pneumatic deicing boots.

Related Proposals

In addition to the proposed rule described previously, in June 1999, the FAA issued 18 other similar proposals that address the subject unsafe condition on various airplane models (see below for a listing of all 19 proposed rules). These 18 proposals also were published in the **Federal Register** on July 16, 1999. (Docket 99–NM–153–AD, for Fokker Model F27 Mark 100, 200, 300, 400, 500, 600, and 700 series airplanes, was also issued as a supplemental notice of proposed rulemaking, and published in the **Federal Register** on August 6, 1999.) This final rule contains the FAA's responses to all relevant public comments received for each of these proposed rules.

Manufacturer airplane model	Number	Federal Register Citation
Cessna Aircraft Company Models 500, 550, and 560 Series Airplanes	99–NM–136–AD	64 FR 38374.
Sabreliner Corporation Models 40, 60, 70, and 80 Series Airplanes	99–NM–137–AD	64 FR 38358.
Gulfstream Aerospace Model G–159 Series Airplanes	99–NM–138–AD	64 FR 38341.
McDonnell Douglas Models DC–3 and DC–4 Series Airplanes	99–NM–139–AD	64 FR 38325.

Manufacturer airplane model	Number	Federal Register Citation
Mitsubishi Heavy Industries Model YS–11 and YS–11A Series Airplanes	99–NM–140–AD	64 FR 38371.
Gulfstream American (Frakes Aviation) Model G–73 (Mallard) and G–73T Series Airplanes.	99–NM–141–AD	64 FR 38355.
Lockheed, Models L–14 and L–18 Series Airplanes	99–NM–142–AD	64 FR 38338.
Fairchild Models F–27and FH–227 Series Airplanes	99–NM–143–AD	64 FR 38322.
Aerospatiale Models ATR–42/ATR–72 Series	99–NM–144–AD	64 FR 38368.
Jetstream Model BAe ATP Airplanes	99–NM–145–AD	64 FR 38351.
Jetstream Model 4101 Airplanes	99–NM–146–AD	64 FR 38335.
British Aerospace Model HS 748 Series Airplanes	99–NM–147–AD	64 FR 38319.
Saab Model SF340A/SAAB 340B/SAAB 2000 Series Airplanes	99–NM–148–AD	64 FR 38365.
CASA Model C–212/CN–235 Series Airplanes	99–NM–149–AD	64 FR 38348.
Dornier Model 328–100 Series Airplanes	99–NM–150–AD	64 FR 38332.
Lockheed Model 1329–23 and 1329–25 (Lockheed Jetstar) Series Airplanes	99–NM–151–AD	64 FR 38316.
de Havilland Model DHC–7/DHC–8 Series Airplanes	99–NM–152–AD	64 FR 38362.
Fokker Model F27 Mark 100/200/300/400/500/600/700/050 Series Airplanes	99–NM–153–AD	64 FR 42870.
Short Brothers Model SD3–30/SD3–60/SD3–SHERPA Airplanes	99–NM–154–AD	64 FR 38329.

Comments

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

1. Support for the Rule

One commenter supports the proposed rule.

2. Request To Withdraw the Proposal: No Unsafe Condition

Several commenters request that the proposal be withdrawn because no unsafe condition exists on certain airplanes. One of these commenters states that the FAA is merely speculating that the proposed Airplane Flight Manual (AFM) revision will improve safety. Further, the commenter contends that the FAA cannot substantiate that the proposed AFM revision will prevent ice bridging. This same commenter also asks if the FAA met its own standards by testing the proposed procedure on each of the affected airplanes.

The FAA does not concur that no unsafe condition exists. As discussed in the preamble of the proposed rule, the FAA has reviewed the icing-related incident history of certain airplanes, and has determined that icing incidents may have occurred because pneumatic deicing boots were not activated at the first evidence of ice accretion. As a result, the handling qualities or the controllability of the airplane may have been reduced due to the accumulated ice. The FAA also discussed an accident that occurred as a result of the failure of the flightcrew to activate the wing and tail pneumatic deicing boots.

Although there may have been no reported cases of incidents or accidents on a specific airplane model, the potential still exists for reduced controllability of all airplanes equipped with pneumatic deicing boots due to adverse aerodynamic effects of ice adhering to the airplane. This AD addresses this unsafe condition.

Further, ice bridging of deicing boots was considered during development of the proposed rule. A broad representation of the aviation community was consulted, including airframe manufacturers, air carriers, airline pilot associations, airplane owner associations, deicing boot manufacturers, and National Aeronautics and Space Administration (NASA). Also, articles readily accessible by the general piloting community solicited operational information concerning ice bridging of deicing boots. The FAA considers that the general consensus of the aviation community is that little or no evidence exists of ice bridging of deicing boots with current deicing boot designs, and ice that is not shed after the initial boot cycle continues to increase in thickness and sheds during subsequent cycles.

In addition, many airplanes equipped with pneumatic deicing boots to protect the engine are operated when icing conditions are present, *i.e.*, visible moisture and a specific temperature are observed. As discussed in Comment #3 (following this response), at least two airplane manufacturers have issued AFM's that contain procedures to activate the deicing boots at the first sign of ice accumulation. The FAA is unaware of any ice bridging problems associated with early operations of either the airfoil or engine pneumatic deicing boots.

In response to the commenter's question regarding the FAA meeting its own standards, the FAA infers that the commenter is requesting the basis for the FAA's determination that the proposed procedures are safe. Most aircraft certification programs have not considered the reduced controllability of the aircraft due to adverse aerodynamic effects of ice adhering to the pneumatic boots. The requirements of this AD (activation of the deicing boot system at the first sign of ice formation anywhere on the aircraft, or upon annunciation from an ice detector system, whichever occurs first, along with the periodic cycling of the boots) will minimize the ice accretions and thereby reduce the adverse aerodynamic effects.

3. Request To Withdraw the Proposal: Possible Adverse Effects of Residual Ice

Several commenters state that deicing boots do the best job of shedding ice on a single cycle, if ice is permitted to accrete to ¼ or ½ inch before activation of the boots. One of these commenters further contends that the effect of continuous cycling in auto mode may not produce a clean shed of ice on each activation, and that residual ice must be taken into consideration before any revision to the AFM is required. Another commenter states that, although operation in the continuous mode upon first indication of ice accretion would eliminate the problem of identification of accretion, the commenter is concerned that there would then be a potential for degraded performance due to residual ice.

The FAA does not concur that the proposal should be withdrawn because of concerns over residual ice. Operation of pneumatic deicing boots typically results in persistent ice accretions on the boot surfaces, even when ¼ to ½ inch of ice is allowed to accrete prior to activation of the boots. The persistent residual and inter-cycle ice accretions typically result in adverse aerodynamic effects and degraded airplane flying qualities. Activation of the wing and tail pneumatic deicing boots at the first sign of ice accretion, or at the annunciation of an ice detector system and periodic

operation of the deicing boots will also result in persistent ice accretions. However, the proposed procedure will minimize the residual and intercycle ice accretions because the ice will be shed when the minimum thickness or mass required for shedding is reached. The residual and intercycle ice accretion thickness resulting from this procedure is less than the ice accretion thickness typically recommended prior to operation of the pneumatic deicing boot. Adverse airplane flying qualities resulting from ice accretions typically are affected by the thickness, shape, texture, and location of the ice accretion.

At least two airplane manufacturers have issued AFM's that contain procedures to activate the deicing boots at the first sign of ice accumulation. Those two airplane models have different wing and stabilizer design characteristics and different deicing boot configurations. Further, those two airplane models represent a large proportion of the airplane fleet equipped with pneumatic deicing boots. The FAA has received no reports indicating any adverse effects of residual ice resulting from early activation of the deicing boots for these airplane designs.

In addition, a number of airplane models are equipped with deicing boot systems that include automatic operating modes, wherein the boots automatically cycle at specific time intervals after being activated. This automatic cycling has surely resulted in operation of the boots with less than the recommended thickness of ice accreted. The FAA has received no reports indicating any adverse effects resulting from the use of the automatic mode.

4. Request To Withdraw or Delay: Develop More Data

Several commenters request that the FAA delay issuance of the rule until more data are developed and reviewed. Certain of these commenters also state that at the public meeting on icing (February 2–4, 1999), the consensus was that a uniform procedure cannot be adopted for all airplanes. That is, a ''blanket'' proposal for numerous airplanes (regardless of design) is inappropriate without specific consideration for the individual designs. Another one of these commenters points out that each airplane model is unique and that the operating instructions for the ice protection system for one airplane model may not be appropriate for another airplane model. That commenter further adds that the airframe manufacturer is in the best position to determine appropriate limitations.

Another one of the commenters requests that, if the proposal is not withdrawn, the issuance of any rulemaking be delayed since certain language of the requirements of the AD is confusing.

The FAA does not concur that a delay in issuing this action is appropriate. The FAA concurs that the airframe manufacturers present at the February public meeting did not support a common procedure for the operation of deicing boots. However, as mentioned previously, there have been no adverse reports on the airplane fleet equipped with pneumatic deicing boots that operate the boots at the first sign of ice accretion. With the exception of ''older'' pneumatic boots (reference comment #7, below), the FAA finds that a common procedure for boot operation is appropriate. The FAA has determined that the common procedures for operation of deicing boots as required by this AD (activation of the deicing boot system at the first sign of ice formation anywhere on the aircraft, or upon annunciation of an ice detector system, whichever occurs first, and periodic cycling of the boots) will minimize the ice accretions and thereby reduce the adverse aerodynamic effects.

To withdraw or delay this AD would be inappropriate since the FAA has determined that an unsafe condition exists, and that the required AFM revision must be accomplished to ensure continued safety of the fleet. The fact that other data may be developed at a later time does not negate the FAA's responsibility to address the existing identified unsafe condition in a timely manner. No change is necessary to the final rule in this regard.

The FAA is unable to respond to one commenter's statement that certain language of the proposal was confusing since no example was specified.

5. Request To Withdraw Proposals for Certain Airplanes

Three commenters, all airframe manufacturers, request that the proposal be withdrawn for several airplane models [British Aerospace Model ATP airplanes, British Aerospace Model HS 748 airplanes, Dornier Model 328–100 series airplanes, and deHavilland Model DHC–7/DHC–8 series airplanes] since they have been certified to be in compliance with part 25 of the Federal Aviation Regulations (14 CFR 25.1419). Additionally, the commenters point out that those airplanes have been certificated in accordance with the appropriate foreign civil airworthiness authorities. The commenters further explain that service experience of those airplanes does not indicate any deficiencies with regard to handling and performance due to airframe accreted ice. In conclusion, the commenters state that, in the absence of any evidence to suggest deficiencies regarding this subject, they cannot support the intent of the rule.

The FAA acknowledges that an airplane model may have design characteristics that mitigate the adverse airplane flying qualities resulting from ice accretion on deicing boot surfaces. As discussed in the proposal for this AD, the FAA has previously requested that interested persons provide information on icing system design and operations procedures concerning flight during icing conditions. The request also asked manufacturers, who are in the best position to determine those operating procedures, to provide data showing that their aircraft have safe operating characteristics with ice accreted on the protected surfaces (boots). That information was requested specifically by letter on October 1, 1998, to certain manufacturers of airplanes certified in accordance with part 25 of the Federal Aviation Regulations (14 CFR part 25). Except as discussed in Item 6 of the comment section of this final rule, no other information received caused the FAA to reconsider that an unsafe condition may exist, or that a revision of the AFM, such as required by this AD, was unsafe for those airplanes.

Additionally, similar information was specifically requested in the discussion section of the proposed rule. Of the comments to the proposal that were received by the FAA, no additional data was included for Dornier Model 328–100 series airplanes, or de Havilland Model DHC–7/DHC–8 series airplanes that caused the FAA to reconsider the previous conclusion that an unsafe condition exists. Further, no data was provided to indicate that the proposal to require activation of wing and tail pneumatic deicing boots at the first sign of ice accretion or annunciation of an ice detector system was unsafe for any particular airplane model.

United Kingdom Accident Investigation Board Preliminary Report EWC 91/18 indicated that, while on climb to 16,000 feet in the vicinity of Oxford, England, on August 11, 1991, a British Aerospace Model ATP airplane suffered a significant degradation of flying qualities and propeller icing. According to that report, the deicing boots of the airplane were not activated, and the airplane stalled, experienced severe uncontrolled roll oscillations, severe vibration that rendered the

electronic flight instruments partially unreadable, and developed a high rate of descent. The deicing boots were finally activated and control of the airplane was regained after a loss of 3,500 feet in altitude. The report identified causal factors of the incident which included rapid accumulation of glaze ice that was not evident to the flightcrew, difficulty of the flightcrew to visually gauge the ice accretion thickness on the wing's leading edge, and propeller vibrations that disguised the onset of wing stall. Even though this incident occurred outside of the United States, and although this airplane model demonstrated acceptable in-flight icing airworthiness relative to FAA and Joint Airworthiness Authorities (JAA) requirements, the incident illustrates the vulnerability of this airplane model to the safety condition addressed by this AD.

One commenter, British Aerospace, has requested until October 20, 1999, to provide additional data to substantiate that the Model ATP airplanes and Model HS 748 airplanes can safely operate with ice accumulations on the protected surfaces. As discussed previously and in the NPRM, the FAA considers that this same vulnerability exists on all airplanes equipped with pneumatic deicing boots.

In the interest of safety, the FAA finds that it is not prudent to delay issuance of the final rules on those airplane models. However, British Aerospace and any other manufacturer is encouraged to request approval of an alternative method of compliance with the airworthiness directive based on substantiating data indicating that a particular aircraft can safely be operated with the ice that would accumulate on the protected surfaces prior to activation of the ice protection system.

6. Request To Withdraw the Proposal for Certain Other Airplanes

Two manufacturers request that the proposals regarding Cessna Model 500, 501, 550, 551, and 560 series airplanes, and British Aerospace (Jetstream) Model 4101 airplanes be withdrawn. The manufacturers advise that the testing summarized in their comments provides evidence that the current procedures provide a safe method to operate those airplane models. The manufacturers conclude that, based on the service history and data provided to the FAA, the proposed AFM revision for those models is unnecessary.

The FAA concurs that the notice of proposed rulemaking for Cessna Model 500, 501, 550, 551, and 560 series airplanes should be withdrawn based on the following information. The manufacturer performed a complete evaluation of the stall and handling characteristics with simulated ice shapes on the Model 550 (Bravo) series airplanes. Stall speeds and warning margins were evaluated with a ½-inch glaze ice shape and with an ice shape associated with the system failure. This ½-inch ice shape simulated the ice shape prior to deicing boot activation. Maneuver margin testing consisted of left and right 40-degree bank turns. Stall characteristics were evaluated with a ½-inch rime ice shape configuration. Stall characteristic testing consisted of wings level and 30-degree bank turns. At the conclusion of the testing it was determined that the airplane had an acceptable stall warning margin with ice shapes present. The manufacturer maintains that Model 500/501, Model 550/551, and Model 550 (Bravo) series airplanes all use a common wing airfoil with some minor differences in span and wing loading. These aircraft also use a common tail configuration (airfoil, span, and leading edge sweep).

Additionally, the FAA reviewed the Type Inspection Report (TIR) for Model 550 (Bravo) series airplane testing and found that ice shapes were placed on both the protected and unprotected surfaces.

The Model 560 (Ultra) series airplanes underwent an extensive ice shape stall investigation. This investigation consisted of stall testing of the baseline airplane and the airplane with the most adverse simulated intercycle ice shapes. The ice shapes consisted of ½-inch shapes on the surfaces protected by boots and 3-inch shapes on unprotected flight surfaces. The stall speeds determined by this testing were incorporated into the Safeflight Angle of Attack computer to increase the stall warning margin during flight in icing conditions. The Model 560 series airplanes angle of attack computer was also updated to incorporate a normal mode and an ice mode stall warning system. The changes to the angle of attack computer on Model 560 and 560 (Ultra) series airplanes were proposed by Rules Docket No. 98–NM–312–AD.

The FAA notes that extensive testing of Model 550 and 560 series airplanes (in which acceptable stall protection and maneuver margins at operational speeds were demonstrated with expected ice accretion on the deicing boot surfaces) indicates that these airplanes can safely operate with ice accretions associated with the AFM normal operations procedures of the deicing boots. These attributes demonstrate that Model 550 and 560 series airplanes satisfactorily address the unsafe condition addressed by this AD. Since Model 500 series airplanes are similar to Model 550 series airplanes, the Model 500 series airplanes also satisfactorily address the unsafe condition addressed by this AD. The FAA also notes that testing of Model 560 series airplanes revealed problems in the stall warning margin for flight in icing conditions that were addressed by previously issued airworthiness directives.

The FAA also concurs that the notice of proposed rulemaking for British Aerospace Jetstream Model 4101 airplanes should be withdrawn based on the following information. In response to the FAA's October 1, 1998, letter (discussed previously), British Aerospace submitted a summary of the handling and performance flight test results that were produced during the original flight in icing certification. This summary was referenced in their response to the proposed rulemaking. The commenter volunteered to provide any reports referenced in the summary. The FAA requested and subsequently received copies of the full handling and performance flight test results for certification in the icing conditions specified in Appendix C of part 25 of the Federal Aviation Regulations (14 CFR part 25), and the JAA draft issue of AMJ25.1419, which was used as guidance for compliance with JAR/FAR 25.1419. The FAA reviewed these reports and guidance material and finds that the Jetstream 4101 airplane was adequately tested with a variety of natural ice accretions on both the protected and unprotected surfaces. Handling and performance flight test was accomplished for the following: Normal Operation of the Deicing Boots, ½- to ¾-inch of ice on the protected wing leading edges and up to 3 inches of ice on unprotected leading edges; Simulated Failure of the Deicing Boots, approximately 1 to 1½ inches of ice on all leading edges; Ice Accreted During the Take-off Phase, a thin rough layer of ice accreted during the initial take-off phase to 400 feet, prior to operation of deicing boots.

These ice accretion depths were established to address the following: Ice accreted during the rest-time of a deicing cycle, delayed operation or failure of the system, and residual ice accumulations. The flight testing examined stall speeds, stall warning margins, stall characteristics, maneuver margins, longitudinal controllability, flap configuration changes, ability to trim, susceptibility to tailplane stall, and longitudinal, lateral, and directional stability. The angles of attack for activation of the stall warning system and stall identification system (*i.e.*, stick

shaker or stick pusher) are reset to lower values (*i.e.*, higher speeds) for flight in icing and safe flight speeds (minimum operating speeds) established accordingly. Affected AFM performance information was derived for icing conditions based on the higher operating speeds, in accordance with JAA draft AMJ25.1419.

The Cessna and British Aerospace aircraft models discussed in this comment have been tested and, where appropriate, changes have been made to ensure the airplanes are safe for operations with ice accretions on the protected surfaces. Without this type of testing and substantiation, the FAA must conclude the aircraft affected by this final rule may be subject to adverse aerodynamic effects due to ice accretions on the protected surfaces prior to deicing boot operation. Other manufacturers may also develop the necessary data to substantiate that their airplanes are safe with these accretions and request approval of an alternative method of compliance.

7. Request To Differentiate Between ''Modern'' Boot Systems and ''Older'' Boot Systems

Several commenters request that the difference between the ''older'' boot systems and the ''modern'' boot systems be explained. These commenters express concern that although both systems are addressed in the proposal, there may not be a sound technical reason to apply the requirements of the proposal to both types of boot systems.

The FAA acknowledges that definitions of ''older'' and ''modern'' pneumatic boot systems should be provided. Therefore, for the purposes of this AD, ''modern'' pneumatic boot systems may be characterized by short segmented, small diameter tubes, which are operated at relatively high pressures [18–23 pounds per square inch (psi)] by excess bleed air that is provided by turbine engines. ''Older'' pneumatic boot systems may be characterized by long, uninterrupted, large diameter tubes, which were operated at low pressures by engine driven pneumatic pumps whose pressure varied with engine revolutions per minute (rpm). This low pressure coupled with long and large diameter tubes caused early de-ice systems to have very lengthy inflation and deflation cycles and dwell times. (Dwell time is the period of time that the boot remains fully expanded following the completion of the inflation cycle until the beginning of the deflation cycle.)

8. Request To Withdraw the Proposal for Airplanes With ''Older'' Boots

Two commenters request that the proposed rules applying to Gulfstream Model G–159 series airplanes and McDonnell Douglas Model DC–3 and DC–4 series airplanes be withdrawn. Both commenters state that those airplane models do not meet the common definition of the word ''modern.'' (See Comment #7 of this final rule for a definition of ''modern'' as used in this AD.) One commenter states that the current AFM specifically directs the flightcrew to wait for ¼-inch of ice before activating the boots. Further, the commenter asserts that the current procedure was developed during certification and is the basis for the airplane's approval for flight into known icing. Additionally, the commenters assert that the in-service safety records for more than 40 years indicates that the existing procedures are appropriate for these airplanes. The commenter concludes that the proposed AFM revision is in direct opposition to the certification findings.

The FAA acknowledges that early activation of the ''older'' pneumatic deicing boots may create the hazard of ice bridging on the ''older'' systems. As discussed in Comment #2 previously, ''older'' boots may be susceptible to ice bridging, and the FAA concurs that requiring the activation of the boots at the first sign of icing may actually introduce an unsafe condition on those airplanes. In order to address this issue, the FAA is taking the following steps. First, to accommodate certain airplane models of the fleet (*i.e.*, Gulfstream Model G–159 series airplanes and McDonnell Douglas Model DC–3 and DC–4 series airplanes) that may be equipped with the ''older'' pneumatic deicing boot system, the FAA is considering the issuance of supplemental NPRM's for those airplane models. The purpose of the supplemental NPRM's would be to require an inspection to determine which type of pneumatic deicing boots are installed on the airplanes, and to require operation of the boots at the first sign of ice accretion if the airplanes have been retrofitted with ''modern'' boots. Second, for aircraft with ''older'' pneumatic boots installed, the FAA will continue to investigate other solutions to the unsafe condition of reduced handling qualities or controllability of the airplane due to ice accumulations on the protected surfaces. If other solutions are identified, the FAA may consider further rulemaking.

9. Request To Revise AFM Change

One commenter requests that the proposal to operate the boots at the first sign of ice accretion be limited to the holding and approach phases of flight. The commenter states that the Aviation Rulemaking Advisory Committee (ARAC) Ice Protection Harmonization Working Group (IPHWG) completed a comprehensive review of past icing accidents/incidents. The IPHWG concluded that the only phases of flight that demonstrate a safety concern are holding patterns and various approach segments; since these operations are conducted at lower airplane speed, instability could occur as a result of ice accumulations on the wing and tail surfaces.

The FAA does not concur that the AFM revision should be limited to the holding and approach phases of flight. The FAA acknowledges that the IPHWG is working on a proposed operations rule that may only be applicable during holding and approach phases of flight. However, the IPHWG continues to work on the proposed rule and has not reached technical agreement. Since discussions are ongoing, it would not be appropriate to assume that the IPHWG positions as presented by the commenter will necessarily be reflected in the actual published proposal.

Another commenter, an airplane manufacturer, stated that the AFM for Model SF340A/SAAB340B/SAAB 2000 series airplanes currently does not limit the operation of the deicing boots during specific phases of flight. The commenter requests that the AFM change required by paragraph (a) of the proposal be revised to limit the applicable phases of flight where the AFM specifies that deicing boots should not be used. Specifically, the commenter requests that the language be revised to read ''Deicing boots must not be used during take-off and landing.''

The FAA partially concurs, and acknowledges that clarification is necessary. It was the FAA's intent that the boots do not have to be operated at the first sign of ice accretion during those phases of flight if there are existing procedures in the AFM that prohibit the operation of the boots during specific phases of flight. However, the boots must always be operated at the first sign of ice accretion if, in accordance with the AFM, it is acceptable to operate the boots during all phases of flight. Therefore, the FAA has revised paragraph (a) of the final rule to state, ''Except if the AFM otherwise specifies that deicing boots should not be used for certain phases of flight (e.g., take-off, final approach, and

landing), compliance with the following is required.''

With respect to the request to specify that the deicing boots must not be used during take-off and landing, it would be desirable to customize the AFM limitation for specific models of airplanes. This would allow the AFM to clearly indicate to the flightcrew when the deicing boots should be deactivated, rather than necessitating that the flightcrew first determine if there are other portions of the AFM that indicate that the deicing boots should not be used during specific phases of flight. Therefore, the FAA encourages requests for approval of alternative methods of compliance to customize the AFM limitation to the specific airplane model.

However, the FAA does not concur with the request to revise the final rule that applies to Saab Model SAAB SF340A/SAAB340B/SAAB 2000 series airplanes since the existing Saab AFM does not indicate that the deicing boots should not be used during take-off and landing. If the commenter has data to indicate that the deicing boots should not be used during those phases of flight, the commenter should take action to revise the AFM and request approval of an alternative method of compliance.

10. Request To Revise Instructions on When To Deactivate the Boot System

One commenter requests that two changes be made to paragraph (a) of the proposal. The first change would be to specify that the wing and tail leading edge pneumatic deicing boot system may be deactivated only after completion of an entire deicing cycle after leaving icing conditions. The commenter also requests that the proposal be revised to add related procedures for operating speeds, and that related procedures for operation of the autopilot (if any) be discontinued only after the airplane is determined to be clear of ice. The commenter states that natural ice shedding, melting, or sublimation from the protected areas will mostly eliminate residual ice.

Regarding the commenter's first request, the FAA concurs. For the reasons the commenter stated, the FAA has revised paragraph (a) of the final rule from: ''The wing and tail leading edge pneumatic deicing boot system may be deactivated only after leaving icing conditions and after the airplane is determined to be clear of ice;'' to ''The wing and tail leading edge pneumatic deicing boot system may be deactivated only after completion of an entire deicing cycle after leaving icing conditions.''

Regarding the commenter's second request, the FAA considers that, since the suggested change would alter the actions currently required by this AD, additional rulemaking would be required. The FAA finds that to delay this action would be inappropriate in light of the identified unsafe condition. However, the FAA is considering additional rulemaking concerning operating speeds during icing conditions.

11. Requests the FAA Consider the Pilot Workload

One commenter states that the proposal would require the pilot to monitor ice formation and to activate the deicing system almost constantly. Another commenter suggests that such increase of the pilot's workload could, of itself, cause an indirect adverse impact on operational safety. The commenters request that the FAA consider the additional pilot workload if the proposal is adopted.

The FAA has previously considered the effects on the pilot of requiring that the deicing boots be activated at the first sign of ice formation anywhere on the airplane, or upon annunciation from an ice detector system. The FAA acknowledges that current procedures recommending activation of the deicing boots at a specific ice accretion thickness require the flightcrew to closely monitor the ice accretion. However, since a number of airplanes affected by this AD are equipped with deicing boot systems with automatic operating modes, operating the deicing boots at the first sign of ice accretion in an appropriate automatic mode will favorably influence flightcrew workload. For airplanes not equipped with automatic deicing boot operating modes, periodic operation of the boots can be accomplished based on time intervals consistent with existing icing conditions. The FAA considers that periodic operation of the boots is not a greater workload burden than closely monitoring the ice accretion thickness.

For the reasons stated, the FAA has determined that it is unnecessary to revise the final rule.

12. Request To Withdraw the Proposal: Provide Training Instead

Several commenters request that the FAA withdraw the proposal and ensure that appropriate information and training regarding the use of the boots is provided to pilots. The commenters also suggest that a testing program be accomplished by industry. The commenters assert that such training, along with an analysis of the testing program, would eliminate the need for requiring that the deicing boots be activated in accordance with the proposal. One commenter also adds that the AFM should only be changed to add a warning that delayed activation of the pneumatic boot system may be unsafe. Another commenter adds that the language of the proposed AFM revision may conflict with current AFM procedures and could confuse operators.

The FAA does not concur that substituting mandatory training for issuance of an AD is appropriate in this case. The FAA acknowledges that, in addition to the issuance of an AD, information specified in the revision to the AFM should be integrated into the pilot training syllabus. However, the development and use of advisory materials and training alone are not adequate to address the unsafe condition. The only method of ensuring that certain information is available to, and mandatory for, the pilot is through incorporation of the information into the Limitations Section of the AFM. The appropriate vehicle for requiring such revision of the AFM is issuance of an AD. No change is necessary to the final rule in this regard.

13. Request To Consider Procedures Already in Normal Procedures Section

One commenter requests concurrence that procedures existing in the Normal Procedures section of the AFM be considered as compliant with the requirements of the proposed AD.

The FAA does not concur that procedures specified in the Normal Procedures section of the AFM are an equivalent method of compliance with the AD. The FAA considers that, since the Limitations section of the AFM is the only section of the AFM that is mandatory [§ 91.9 of the Federal Aviation Regulations (14 CFR 91.9)], the subject required revision to the AFM must be included in the Limitations section. No change is necessary to the final rule in this regard.

14. Request To Limit the AD to Only Those Operations Conducive to Icing

Two commenters request that the AFM limitation specified in paragraph (a) of the proposal be limited to those conditions where operations conducive to icing exist. The commenters provide examples of conditions where operations not conducive to icing may exist such as Hawaii; the Caribbean; short, low altitude flights in the summer; etc. One of these commenters states that, ''under the proposal, dispatch with an inoperative boot would be considered prohibited even though the deicing would never be needed.''

The FAA does not concur that revision of the AD is necessary in this regard. Paragraph (a) of the AD specifically states that wing and tail leading edge pneumatic deicing boot systems must be activated at the first sign of ice formation anywhere on the aircraft, or upon annunciation from an ice detector system, whichever occurs first. The FAA considers that, regardless of what geographic area an airplane may be flying in or what season of the year it may be, the boot system must be activated if those specified conditions occur.

Regarding dispatch with an inoperative boot, current Master Minimum Equipment List (MMEL) procedures prohibit dispatch of the airplane into known or forecast icing conditions if the deicing boots are inoperative. In the event that icing conditions are inadvertently encountered during operation in accordance with MMEL provisions, procedures exist to instruct the flightcrew to exit the icing conditions immediately. The FAA considers that those existing procedures will prevent conflict between the requirements of this AD and perceived problems regarding dispatch with inoperative boots. No change is necessary to the final rule in this regard.

15. Request To Consider Differences in Airplanes Systems

One commenter requests that the AFM revision specified in paragraph (a) of the proposed rule be revised for those airplanes that are equipped with icing detection systems. Such a revision should read ''activate the wing and tail leading edge pneumatic deicing boot system upon annunciation from an ice detector,'' rather than ''at the first sign of ice anywhere on the aircraft, or upon annunciation from an ice detector system, whichever occurs first.'' The commenter states that, since the sensor for the ice detection system detects ice buildup at the boot, it would make sense for airplanes that have an ice detection system to activate the boot only when ice is detected at the boot by the ice detection system. The commenter further points out that activating the boot when ice is not forming on the boot will not remove the ice formations elsewhere on the airplane, but will simply deteriorate the condition of the boot and provide no safety benefit. Additionally, the commenter adds that if the ice detection system were inoperative for dispatch, it would be appropriate as a Master Minimum Equipment List (MMEL) condition to activate the boot at the first sign of icing.

The FAA does not concur that the final rule should be revised to address procedures specifically for airplanes equipped with icing detection systems. Visual detection of icing by the flightcrew has been certificated as the primary means of ice detection. Therefore, the FAA has determined that, although ice detection systems may alert the flightcrew to the presence of icing, the flightcrew is still responsible to monitor the airframe for ice accretion. No change is necessary to the final rule in this regard. However, in the event a turbopropeller airplane equipped with pneumatic deicing boots was also equipped with an ice detection system that was approved as the primary ice detection system, the operator could request an alternative method of compliance in accordance with paragraph (b) of the final rule.

16. Request To Require Additional Operational Procedures

Several commenters propose that the FAA consider that minimum speed restrictions be used in conjunction with the early activation of the deicing boots. Some of the commenters specify that these speed additions be applied during landing approach. One of the commenters expresses concern that various reports and research indicate that increasing the angle-of attack with even a small ice formation on the airfoil can cause large increases in drag and loss of lift. The commenter contends that control of the angle-of-attack is critical in maintaining airfoil performance, and concludes that additional operational procedures must be added.

The FAA concurs that certain operational procedures may be beneficial when used with early activation of the deicing boots. As a complement to this AD, the FAA is considering rulemaking regarding minimum speeds in icing conditions. As mentioned previously, the FAA encourages manufacturers to present data via a request for approval of an alternative method of compliance to substantiate that their airplanes are either capable of flying safely with ice that accumulates prior to boot activation, or that they are not capable of flying safely but there are other means to address the unsafe condition.

For example, in the case of Cessna Model 560 series airplanes, the stall warning margins were modified to ensure the airplane could safely operate with ice accretions on the protected surfaces. No change is necessary to the final rule in this regard.

17. Request To Mandate Installation of an Ice Detection System

One commenter suggests that a required installation of a reliable ice detection system might alleviate the difficulties associated with flightcrew recognition of airfoil ice accretions. The commenter notes that, historically, the problem of ice detection has been the ability of the flightcrew to either identify that the airfoil has ice adhering to it or accurately determine that a certain thickness of ice exists on the airfoil prior to activation of the boot system.

The FAA concurs that installation of a reliable ice detection system would alleviate the difficulties associated with flightcrew recognition of airfoil ice accretions. This issue is being addressed by an ARAC working group. Upon receipt of a recommendation from ARAC, the FAA may consider further rulemaking. In the interim, the FAA is issuing these airworthiness directives to impose a relatively simple deicing boot operational change to address the reduced handling qualities or controllability of the airplane due to ice accumulations on the protected surfaces. No change is necessary to the final rule in this regard.

18. Request To Require Action To Reduce Adhesion Characteristics

One commenter requests that action be taken to minimize or reduce the ice adhesion characteristics of boot material. The commenter asserts that one reason flightcrews may be seeing large amounts of residual ice may be that, as the boot ages, the tendency for residual ice to stick to the boot surface may increase if the adhesion qualities of the boot materials are not properly maintained. In addition, the commenter suggests that the use of certain compounds (*e.g.*, ICEX, an ice-phobic chemical spray) can reduce ice adhesion by substantial margins.

The FAA does not concur with the commenter's request to require rulemaking to reduce adhesion characteristics of boot material. The FAA considers that normal wear and tear on the deicing boot materials is to be expected, and the adhesion characteristics of the boot increases as the boot surface degrades over time. Operators have the responsibility to monitor the performance of the deicing boots installed on their airplanes, and to perform maintenance as required.

The FAA acknowledges that use of certain ice-phobic chemicals may provide an additional safety benefit. However, a variety of factors (*e.g.*, normal wear and tear, ''patching,'' and

oxidation of boot material) exist in varying degrees on individual airplanes. As a result, the optimum frequency of application will vary during the life of the boot. The FAA has received no quantitative data to demonstrate the adequacy of particular amounts of ice phobic chemical sprays or to provide adequate intervals of application. Therefore, the FAA cannot establish an appropriate application interval at this time. However, if additional data becomes available, the FAA may consider further rulemaking.

19. Request To Consider the Associated Maintenance Procedures and Increased Costs

Several commenters point out that certain maintenance requirements should be considered if the proposed AFM revision is required. One commenter notes that a detailed review of maintenance procedures should be conducted regarding the deicing boots to ensure that, as the boot ages, the boot system continues to effectively shed ice.

Several commenters request that the FAA also consider the additional costs that the proposed AFM revision would require. One commenter states that the added cycling of the boots will require additional maintenance. The commenters express concern that the boots will wear out faster, need to be replaced at an accelerated rate, and thereby add additional costs.

The FAA acknowledges the concerns of these commenters. The FAA considered the deicing boot fatigue issues surrounding the proposed AD, such as the reliability of the deicing boots. Reliability of the deicing boots is affected by several factors, including: maintenance practices; abrasion during dry air, rain, hail, snow, and icing operations; oxidation; and, fatigue resulting from boot cycling.

However, none of the commenters provided cost estimates for any of the maintenance costs or replacement costs. The FAA did receive certain other information from a large operator of two airplane models that will be affected by this final rule. (One of the airplane models in that fleet currently observes the early-activation procedures required by this final rule and the other airplane model does not.) The operator stated that the largest contributor to periodic replacement of deicing boots on the fleet was erosion of the boot surface, rather than fatigue that would be caused by activation of deicing boots at the first sign of ice accretion.

The FAA recognizes that, in accomplishing the requirements of any AD, operators may incur ''incidental'' costs in addition to the ''direct'' costs that are reflected in the cost analysis presented in the AD preamble. However, the cost analysis in AD rulemaking actions typically does not include incidental costs. In the case of this AD, for example, the requirements are to revise the AFM to include certain information. How operators actually ''implement'' that information thereafter (once it is placed in the AFM) may vary greatly among them: for some operators, implementation may necessitate extensive retraining among their flightcrews; for others, implementation may merely be considered a typical part of the routine, continuous training of their flightcrews. In light of this, it would be nearly impossible for the FAA to calculate accurately or to reflect all costs associated with the AFM revision required by this AD. The FAA has determined that direct and incidental costs are still outweighed by the safety benefits of the AD.

Conclusion

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

Cost Impact

The FAA estimates that 36 airplanes of U.S. registry will be affected by this AD.

It will take approximately 1 work hour per airplane to accomplish the required AFM revisions, at the average labor rate of $60 per work hour. Based on these figures, the cost impact of the AD on U.S. operators is estimated to be $2,160, or $60 per airplane.

The cost impact figure discussed above is based on assumptions that no operator has yet accomplished any of the requirements of this AD action, and that no operator would accomplish those actions in the future if this AD were not adopted.

Regulatory Impact

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 ''significant regulatory action'' under Executive Order 12866; (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 it is contained in the Rules Docket. A copy of it may be obtained from the Rules Docket at the location provided under the caption **ADDRESSES**.

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 (14 CFR part 39) as follows:

PART 39—AIRWORTHINESS DIRECTIVES

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

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

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

99–19–15 **Construcciones Aeronauticas, S.A. (CASA):** Amendment 39–11304. Docket 99–NM–149–AD.

Applicability: C–212 and CN–235 series airplanes equipped with pneumatic deicing boots, certificated in any category.

Compliance: Required as indicated, unless accomplished previously.

To ensure that flightcrews activate the wing and tail pneumatic deicing boots at the first signs of ice accumulation on the airplane, accomplish the following:

(a) Within 10 days after the effective date of this AD: Revise the Limitations Section of the FAA-approved Airplane Flight Manual (AFM) to include the following requirements for activation of the ice protection systems. This may be accomplished by inserting a copy of this AD in the AFM.

• Except if the AFM otherwise specifies that deicing boots should not be used for certain phases of flight (*e.g.*, take-off, final approach, and landing), compliance with the following is required.

• Wing and Tail Leading Edge Pneumatic Deicing Boot System, if installed, must be activated:

—At the first sign of ice formation anywhere on the aircraft, or upon annunciation from an ice detector system, whichever occurs first; and

—The system must either be continued to be operated in the automatic cycling mode, if available; or the system must be manually cycled as needed to minimize the ice accretions on the airframe.

• The wing and tail leading edge pneumatic deicing boot system may be deactivated only after completion of an entire deicing cycle after leaving icing conditions.''

(b) An alternative method of compliance or adjustment of the compliance time that provides an acceptable level of safety may be used if approved by the Manager, International Branch, ANM–116, FAA, Transport Airplane Directorate. The request shall be forwarded through an appropriate FAA Operations Inspector, who may add comments and then send it to the Manager, International Branch, ANM–116 ACO.

Note 1: Information concerning the existence of approved alternative methods of compliance with this AD, if any, may be obtained from the International Branch, ANM–116 ACO.

(c) Special flight permits may be issued in accordance with sections 21.197 and 21.199 of the Federal Aviation Regulations (14 CFR 21.197 and 21.199) to operate the airplane to a location where the requirements of this AD can be accomplished.

(d) This amendment becomes effective on December 27, 1999.

Issued in Renton, Washington, on November 10, 1999.

John J. Hickey,

Manager, Transport Airplane Directorate, Aircraft Certification Service.

[FR Doc. 99–30140 Filed 11–19–99; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 99–NM–150–AD; Amendment 39–11305; AD 99–19–16]

RIN 2120–AA64

Airworthiness Directives; Dornier Model Dornier 328–100 Series Airplanes

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule.

SUMMARY: This amendment adopts a new airworthiness directive (AD), applicable to certain Dornier Model Dornier 328–100 series airplanes, that requires revising the Airplane Flight Manual (AFM) to include requirements for activation of the airframe pneumatic deicing boots. This amendment is prompted by reports of inflight incidents and an accident that occurred in icing conditions where the airframe pneumatic deicing boots were not activated. The actions specified by this AD are intended to ensure that flightcrews activate the pneumatic wing and tail deicing boots at the first signs of ice accumulation. This action will prevent reduced controllability of the aircraft due to adverse aerodynamic effects of ice adhering to the airplane prior to the first deicing cycle.

EFFECTIVE DATE: December 27, 1999.

ADDRESSES: Information pertaining to this rulemaking action may be examined at the Federal Aviation Administration (FAA), Transport Airplane Directorate, Rules Docket, 1601 Lind Avenue, SW., Renton, Washington.

FOR FURTHER INFORMATION CONTACT: Norman Martenson, Aerospace Engineer, Manager, International Branch, ANM–116, FAA, Transport Airplane Directorate, 1601 Lind Avenue, SW., Renton, Washington 98055–4056; telephone (425) 227–2110; fax (425) 227–1149.

SUPPLEMENTARY INFORMATION: A proposal to amend part 39 of the Federal Aviation Regulations (14 CFR part 39) to include an airworthiness directive (AD) that is applicable to certain Dornier Model Dornier 328–100 series airplanes was published in the **Federal Register** on July 16, 1999 (64 FR 38332). That action proposed to require revising the Airplane Flight Manual (AFM) to include requirements for activation of the airframe pneumatic deicing boots.

Related Proposals

In addition to the proposed rule described previously, in June 1999, the FAA issued 18 other similar proposals that address the subject unsafe condition on various airplane models (see below for a listing of all 19 proposed rules). These 18 proposals also were published in the **Federal Register** on July 16, 1999. (Docket 99–NM–153–AD, for Fokker Model F27 Mark 100, 200, 300, 400, 500, 600, and 700 series airplanes, was also issued as a supplemental notice of proposed rulemaking, and published in the **Federal Register** on August 6, 1999.) This final rule contains the FAA's responses to all relevant public comments received for each of these proposed rules.

Manufacturer airplane model	Number	Federal Register citation
Cessna Aircraft Company Models 500, 550, and 560 Series Airplanes	99–NM–136–AD	64 FR 38374.
Sabreliner Corporation Models 40, 60, 70, and 80 Series Airplanes	99–NM–137–AD	64 FR 38358.
Gulfstream Aerospace Model G–159 Series Airplanes	99–NM–138–AD	64 FR 38341.
McDonnell Douglas Models DC–3 and DC–4	99–NM–139–AD	64 FR 38325.
Mitsubishi Heavy Industries Model YS–11 and YS–11A	99–NM–140–AD	64 FR 38371
Gulfstream American (Frakes Aviation) Model G–73 (Mallard) and G–73T Series Airplanes.	99–NM–141–AD	64 FR 38355.
Lockheed, Models L–14 and L–18 Series Airplanes	99–NM–142–AD	64 FR 38338.
Fairchild Models F–27 and FH–227 Series Airplanes	99–NM–143–AD	64 FR 38322.
Aerospatiale Models ATR–42/ATR–72 Series	99–NM–144–AD	64 FR 38368.
Jetstream Model BAe ATP Airplanes	99–NM–145–AD	64 FR 38351.
Jetstream Model 4101 Airplanes	99–NM–146–AD	64 FR 38335.
British Aerospace Model HS 748 Series Airplanes	99–NM–147–AD	64 FR 38319.
Saab Model SF340A/SAAB 340B/SAAB 2000 Series Airplanes	99–NM–148–AD	64 FR 38365.
CASA Model C–212/CN–235 Series Airplanes	99–NM–149–AD	64 FR 38348.
Dornier Model 328–100 Series Airplanes	99–NM–150–AD	64 FR 38332.
Lockheed Model 1329–23 and 1329–25 (Lockheed Jetstar) Series Airplanes	99–NM–151–AD	64 FR 38316.
de Havilland Model DHC–7/DHC–8 Series Airplanes	99–NM–152–AD	64 FR 38362.
Fokker Model F27 Mark 100/200/300/400/500/600/700/050 Series Airplanes	99–NM–153–AD	64 FR 42870.
Short Brothers Model SD3–30/SD3–60/SD3–SHERPA Airplanes	99–NM–154–AD	64 FR 38329.