DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 99–NM–154–AD]

RIN 2120–AA64

Airworthiness Directives; Short Brothers Model SD3–30, SD3–60, SD3-SHERPA, and SD3–60 SHERPA Series Airplanes

AGENCY: Federal Aviation Administration, DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: This document proposes the adoption of a new airworthiness directive (AD) that is applicable to certain Short Brothers Model SD3–30, SD3–60, SD3–SHERPA, and SD3–60 SHERPA series airplanes. This proposal would require revising the Airplane Flight Manual (AFM) to include requirements for activation of the airframe pneumatic deicing boots. This proposal 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 the proposed 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.

DATES: Comments must be received by August 16, 1999.

ADDRESSES: Submit comments in triplicate to the Federal Aviation Administration (FAA), Transport Airplane Directorate, ANM–114, Attention: Rules Docket No. 99–NM–154–AD, 1601 Lind Avenue, SW., Renton, Washington 98055–4056. Comments may be inspected at this location between 9:00 a.m. and 3:00 p.m., Monday through Friday, except Federal holidays.

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:

Comments Invited

Interested persons are invited to participate in the making of the proposed rule by submitting such written data, views, or arguments as they may desire. Communications shall identify the Rules Docket number and be submitted in triplicate to the address specified above. All communications received on or before the closing date for comments, specified above, will be considered before taking action on the proposed rule. The proposals contained in this notice may be changed in light of the comments received.

Comments are specifically invited on the overall regulatory, economic, environmental, and energy aspects of the proposed rule. All comments submitted will be available, both before and after the closing date for comments, in the Rules Docket for examination by interested persons. A report summarizing each FAA-public contact concerned with the substance of this proposal will be filed in the Rules Docket.

Commenters wishing the FAA to acknowledge receipt of their comments submitted in response to this notice must submit a self-addressed, stamped postcard on which the following statement is made: ''Comments to Docket Number 99–NM–154–AD.'' The postcard will be date stamped and returned to the commenter.

Availability of NPRMs

Any person may obtain a copy of this NPRM by submitting a request to the FAA, Transport Airplane Directorate, ANM–114, Attention: Rules Docket 99–NM–154–AD, 1601 Lind Avenue, SW., Renton, Washington 98055–4056.

Discussion

On January 9, 1997, an Empresa Brazileira de Aeronautica, S.A. (EMBRAER) Model EMB–120RT series airplane was involved in an uncommanded roll excursion and consequent rapid descent that resulted in an accident near Monroe, Michigan. The post-accident investigation conducted by the National Transportation Safety Board (NTSB) concluded that the airplane had accumulated a thin, rough layer of ice on its lifting surfaces. That accumulation of ice, in combination with the slowing of the airplane to an airspeed inappropriate for the icing conditions in which the airplane was flying, resulted in loss of control that was not corrected before the airplane impacted the ground. The NTSB also concluded that the flight crew did not activate the wing and tail pneumatic deicing boots. An NTSB recommendation related to this accident requested that the FAA mandate that pneumatic deicing boots be turned on as soon as the airplane enters icing conditions.

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. That factor was present in the accident discussed previously and, as such, constitutes an unsafe condition.

Request for Information

On October 1, 1998, the FAA sent letters to certain manufacturers of airplanes certified in accordance with part 25 of the Federal Aviation Regulations (14 CFR part 25). The letters requested certain icing system design information and operational procedures applicable to their airplanes concerning flight during icing conditions. The letters also requested that manufacturers provide data showing that the aircraft has safe operating characteristics with ice accreted on the protected surfaces (boots). The manufacturers were asked to provide data using the following assumptions: The most adverse ice accumulation possible during operation in the icing envelope specified in part 25, Appendix C of the Federal Aviation Regulations (14 CFR part 25), and that recommended procedures for deicing boot operation were used. Additionally, the manufacturers were asked to provide information related to operation of the autopilot during icing conditions, and for information related to appropriate operating speeds for icing operations.

No information received, as a result of that request, has caused the FAA to reconsider the previous conclusion that an unsafe condition may exist.

Public Meeting

Subsequent to the collection of those design and operational data, the FAA held an international conference on ''Inflight Operations in Icing Conditions'', in Washington, DC, on February 2–4, 1999. The purpose of the conference was to discuss the status of the FAA Icing Plan and other related efforts. Additionally, the conference provided a forum for representatives of industry to express their viewpoints on current information related to activation of deicing boots, minimum airspeeds, autopilot operation in icing conditions, flightcrew information needs, and flightcrew training. Certain information presented at that meeting is discussed in

this proposed rule in the following section.

Delayed Activation of Pneumatic Deicing Boots

In accordance with manufacturer instructions and FAA-approved airplane flight manual (AFM) procedures, the flightcrews of most airplanes equipped with pneumatic deicing boots delay the initial activation of the boots until a certain quantity of ice has accumulated on the protected surfaces (boots). Some crews routinely wait for ¼ to ½ inch of ice to accumulate, and at least one airplane type is routinely flown with up to 1½ inches of ice on the protected surfaces before the initial activation of the deicing boots.

Ice Bridging

In the past, concern about ''ice bridging'' on early pneumatic deicing boot designs resulted in the common practice of delaying activation of ice protection. Ice bridging of pneumatic deicing boots occurred when a thin layer of ice is sufficiently plastic to deform to the shape of the inflated deicing boot tube without being fractured and shed during the ensuing tube deflation. As the deformed ice hardens and accretes additional ice, the deicing boot becomes ineffective in shedding the ''sheath'' of ice. However, ice accumulation resulting from delayed activation may pose an unsafe condition due to the resultant adverse aerodynamic effects on the airplane's performance or handling qualities.

In November 1997, the FAA and the National Aeronautics and Space Administration (NASA) co-sponsored an international workshop on aircraft deicing boot ice bridging. The objective of the workshop was to provide an open forum for investigating the existence of deicing boot bridging and other concerns related to activating ice protection systems at the initial detection of inflight icing. Sixty-seven representatives from airframe and deicing boot manufacturers, various airlines, the pilot community, NASA, the National Transportation Safety Board, non-US civil aviation authorities, and the FAA participated. At the workshop no evidence was presented to substantiate that aircraft with modern deicing boot designs experience ice bridging. The general consensus of the workshop participants was that ice bridging is not a problem for modern pneumatic deicing boot designs due to the use of higher air supply pressures, faster boot inflation and deflation cycles, and smaller boot chambers. Icing wind tunnel and flight testing of these newer design features with automatic cycling have demonstrated successful shedding of ice when activated at the onset of ice accretion, with ice not shed on the initial deicing boot cycle continuing to increase in thickness and being shed during subsequent cycles.

During the previously discussed November 1997 international workshop, the inability of flightcrews to accurately gauge wing and control surfaces ice accretion thickness before activating the deicing boots was recognized. Also, increased airplane drag resulting from ice accretion was recognized as a potential contributing cause of inadvertent airspeed loss that characterized most in-flight icing related accidents and incidents. Two airframe manufacturers, whose products comprise a substantial percentage of the turbopropeller transport fleet, reported that, because of these concerns they recommend activating the automatic airframe deicing system at first onset of airframe icing. Those manufacturers have received no reports of deicing boot ice bridging events for these airplanes.

The FAA considers that ice accumulation on protected surfaces due to delayed boot activation constitutes a potential safety concern. However, the FAA recognizes that not all airplanes may be equipped with ''modern'' deicing boots (as that term is used in this NPRM). The FAA specifically invites the submission of comments and other data regarding the effects of this proposed AD on airplanes equipped with older pneumatic deicing boots, including arguments for the retention of existing activation delays for these older-style deicing boots.

Residual Ice

During the February conference, the attendees agreed that the airplane is at risk while the airplane is accreting ice, and that the airplane must be adequately protected to ensure that no adverse handling and performance characteristics develop. An additional concern discussed at the conference was the possibility that early activation of the ice protection system might degrade the ice shedding effectiveness of the deicing boots, resulting in increased residual ice, i.e., there would be more ice fragments remaining on the deicing boots than would exist if a more substantial quantity of ice was allowed to form before the first ice shedding cycle. However, the FAA does not concur. No data has been provided that shows that the presence of residual ice following an earlier activation of the deicing boots is more hazardous than delaying cycling of the boots until the ice accretes to a larger, specific thickness. In fact, testing in icing conditions has shown that residual ice remaining on the boots after the initial boot cycle is removed during subsequent cycles.

As reported during the November 1997 international workshop, manufacturers of a substantial percentage of the turbopropeller transport fleet have reported satisfactory in-flight icing operations of their products with recommended procedures to activate operation of the deicing boots in the automatic mode at the onset of airframe icing.

Therefore, the FAA considers that the activation of pneumatic wing and tail deicing boots at the first signs of ice accumulation is warranted. The FAA specifically invites the submission of data to substantiate that operating the deicing boots at the first sign of ice accretions is more hazardous than delaying boot activation until a specific thickness of ice has accumulated.

Other Considerations

The FAA recognizes that there may be some phases of flight during which use of the deicing boots may be inappropriate. For example, a deicing boot inflation cycle that begins immediately before or during the landing flare or the takeoff rotation may cause unexpected loss of lift or other adverse aerodynamic events. This proposed AD explicitly does not supersede procedures in the AFM that specify not using deicing boots for certain phases of flight (e.g., during take-off, final approach, and landing).

The FAA specifically invites the submission of comments and other data regarding adverse effects that may occur during specific phases of flight, including takeoff, final approach, or landing. Any recommended speed restrictions or other operational procedures that would be necessary in order to mitigate any adverse aerodynamic effects of deicing boot inflation during critical phases of flight should be fully explained and documented.

FAA's Determinations

The FAA is aware that, based on previous procedures provided to flightcrews of many airplanes equipped with deicing boots, an historical precedent has been set that permits waiting to activate the deicing equipment. In light of this information and based on reports received, the FAA considers that certain procedures should be included in the Limitations Section of the AFM for Short Brothers SD3–30, SD3–60, SD3–SHERPA, and SD3–60 SHERPA series airplanes to require immediate activation of the ice

protection systems when any ice accumulation is detected on the airplane.

This proposed action is one of a number of proposed ADs being issued on airplanes that have been determined to be subject to the same identified unsafe conditions. Additionally, certain other airplanes are also being reviewed by the Small Airplane Directorate to determine specifically which airplanes may be subject to the identified unsafe condition. Currently proposed AD's for other airplanes that are equipped with pneumatic deicing boots address the following airplanes:

Airplane models	Docket No.
Cessna Aircraft Company, Models 500, 550, and 560 Series Airplanes	99–NM–136–AD.
Sabreliner Corporation, Models 40, 60, 70, and 80 Series Airplanes	99–NM–137–AD.
Gulfstream Aerospace, Model G–159 Series Airplanes	99–NM–138–AD.
McDonnell Douglas, Models DC–3 and DC–4 Series Airplanes	99–NM–139–AD.
Mitsubishi Heavy Industries, Model YS–11 and YS–11A Series Airplanes	99–NM–140–AD.
Frakes Aviation, Model G–73 (Mallard) and G–73T Series Airplanes	99–NM–141–AD.
Lockheed, Models L–14 and L–18 Series Airplanes	99–NM–142–AD.
Fairchild, Models F27 and FH227 Series Airplanes	99–NM–143–AD.
Aerospatiale, Models ATR–42/ATR–72 Series	99–NM–144–AD.
Jetstream, Model BAe ATP Airplanes	99–NM–145–AD.
Jetstream, Model 4101 Airplanes	99–NM–146–AD.
British Aerospace, Model HS 748 Series Airplanes	99–NM–147–AD.
Saab, Model SF340A/SAAB 340B/SAAB 2000 Series Airplanes	99–NM–148–AD.
CASA, Model C–212/CN–235 Series Airplanes	99–NM–149–AD.
Dornier, Model 328–100 Series Airplanes	99–NM–150–AD.
Lockheed, Model 1329–23 and 1329–25 (Lockheed Jetstar) Series Airplanes	99–NM–151–AD.
de Havilland, Model DHC–7/DHC–8 Series Airplanes	99–NM–152–AD.
Fokker, Model F27 Mark 100/200/300/400/500/600/700/050 Series Airplanes	99–NM–153–AD.
Short Brothers, Model SD3–30/SD3–60/SD3–SHERPA Airplanes	99–NM–154–AD.

Explanation of Requirements of Proposed Rule

Since an unsafe condition has been identified that is likely to exist or develop on other products of this same type design, the proposed AD would require revising the Limitations Section of the AFM to include requirements for activation of pneumatic deicing boots at the first indication of ice accumulation on the airplane.

Cost Impact

The FAA estimates that 138 airplanes of U.S. registry would be affected by this proposed AD.

The FAA estimates that it would take approximately 1 work hour per airplane to accomplish the proposed AFM revisions, at the average labor rate of $60 per work hour. Based on these figures, the cost impact of the proposed AD on U.S. operators is estimated to be $8,280, or $60 per airplane.

The cost impact figures discussed above are based on assumptions that no operator has yet accomplished any of the proposed 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 proposed herein would 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 proposal would not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

For the reasons discussed above, I certify that this proposed regulation (1) is not a ''significant regulatory action'' under Executive Order 12866; (2) is not a ''significant rule'' under the DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979); and (3) if promulgated, 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 copy of the draft regulatory evaluation prepared for this action is contained in the Rules Docket. A copy of it may be obtained by contacting 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.

The Proposed Amendment

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

Short Brothers PLC: Docket 99–NM–154–AD.

Applicability: Model SD3–30, SD3–60, SD3–SHERPA, and SD3–60 SHERPA 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 for certain phases of flight where the AFM specifies that deicing boots should not be used (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 leaving icing

conditions and after the airplane is determined to be clear of ice.''

(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, 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 §§ 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.

Issued in Renton, Washington, on June 30, 1999.

D.L. Riggin,

Acting Manager, Transport Airplane Directorate, Aircraft Certification Service.

[FR Doc. 99–17547 Filed 7–15–99; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 99–NM–150–AD]

RIN 2120–AA64

Airworthiness Directives; Dornier Model 328–100 Series Airplanes

AGENCY: Federal Aviation Administration, DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: This document proposes the adoption of a new airworthiness directive (AD) that is applicable to certain Dornier Model 328–100 series airplanes. This proposal would require revising the Airplane Flight Manual (AFM) to include requirements for activation of the airframe pneumatic deicing boots. This proposal 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 the proposed 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.

DATES: Comments must be received by August 16, 1999.

ADDRESSES: Submit comments in triplicate to the Federal Aviation Administration (FAA), Transport Airplane Directorate, ANM–114, Attention: Rules Docket No. 99–NM–150–AD, 1601 Lind Avenue, SW., Renton, Washington 98055–4056. Comments may be inspected at this location between 9:00 a.m. and 3:00 p.m., Monday through Friday, except Federal holidays.

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.

SUPPLEMENTAY INFORMATION:

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Availability of NPRMs

Any person may obtain a copy of this NPRM by submitting a request to the FAA, Transport Airplane Directorate, ANM–114, Attention: Rules Docket 99–NM–150–AD, 1601 Lind Avenue, SW., Renton, Washington 98055–4056.

Discussion

On January 9, 1997, an Empresa Brazileira de Aeronautica, S.A. (EMBRAER) Model EMB–120RT series airplane was involved in an uncommanded roll excursion and consequent rapid descent that resulted in an accident near Monroe, Michigan. The post-accident investigation conducted by the National Transportation Safety Board (NTSB) concluded that the airplane had accumulated a thin, rough layer of ice on its lifting surfaces. That accumulation of ice, in combination with the slowing of the airplane to an airspeed inappropriate for the icing conditions in which the airplane was flying, resulted in loss of control that was not corrected before the airplane impacted the ground. The NTSB also concluded that the flight crew did not activate the wing and tail pneumatic deicing boots. An NTSB recommendation related to this accident requested that the FAA mandate that pneumatic deicing boots be turned on as soon as the airplane enters icing conditions.

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