

- 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) Incorporating the AFM revisions, as required by this AD, may be performed by the owner/operator holding at least a private pilot certificate as authorized by section 43.7 of the Federal Aviation Regulations (14 CFR 43.7), and must be entered into the aircraft records showing compliance with this AD in accordance with section 43.9 of the Federal Aviation Regulations (14 CFR 43.9).

(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) An alternative method of compliance or adjustment of the compliance time that provides an equivalent level of safety may be approved by the Manager, Small Airplane Directorate, 1201 Walnut, suite 900, Kansas City, Missouri 64106. The request shall be forwarded through an appropriate FAA Maintenance Inspector, who may add comments and then send it to the Manager, Small Airplane Directorate.

Note 2: Information concerning the existence of approved alternative methods of compliance with this AD, if any, may be obtained from the Small Airplane Directorate.

(e) Information related to this AD may be examined at the FAA, Central Region, Office of the Regional Counsel, Room 1558, 601 E. 12th Street, Kansas City, Missouri 64106.

Issued in Kansas City, Missouri, on October 4, 1999.

Michael Gallagher,

Manager, Small Airplane Directorate, Aircraft Certification Service.

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 99-CE-47-AD]

RIN 2120-AA64

Airworthiness Directives; AeroSpace Technologies of Australia Pty Ltd. Models N22B and N24A Airplanes

AGENCY: Federal Aviation Administration, DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: This document proposes to adopt a new airworthiness directive (AD) that would apply to all AeroSpace Technologies of Australia Pty Ltd. (AeroSpace Technologies) Models N22B and N24A airplanes. The proposed AD would require revising the Airplane Flight Manual (AFM) to include requirements for activation of the airframe pneumatic deicing boots. The proposed AD is the result of reports of in-flight 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 assure 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 on or before December 1, 1999.

ADDRESSES: Submit comments in triplicate to the Federal Aviation Administration (FAA), Central Region, Office of the Regional Counsel, Attention: Rules Docket No. 99-CE-47-AD, Room 1558, 601 E. 12th Street, Kansas City, Missouri 64106. Comments may be inspected at this location between 8 a.m. and 4 p.m., Monday through Friday, holidays excepted.

FOR FURTHER INFORMATION CONTACT: Mr. John P. Dow, Sr., Aerospace Engineer, FAA, Small Airplane Directorate, 1201 Walnut, suite 900, Kansas City, Missouri 64106; telephone: (816) 426-6932; facsimile: (816) 426-2169.

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 should 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 that summarizes 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 No. 99-CE-47-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, Central Region, Office of the Regional Counsel, Attention: Rules Docket No. 99-CE-47-AD, Room 1558, 601 E. 12th Street, Kansas City, Missouri 64106.

Discussion

On January 9, 1997, an Empresa Brasileira 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 1/4 to 1/2 inch of ice to accumulate, and at least one airplane type is routinely flown with up to 1 1/2 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 prohibit 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.

The FAA's Determination

The FAA is aware that, based on previous procedures provided to flightcrews of many airplanes equipped with deicing boots, a 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 all AeroSpace Technologies Models N22B and N24A 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 AD's being issued on airplanes that have been determined to be subject to the same identified unsafe conditions. Currently proposed AD's for other airplanes that are equipped with pneumatic deicing boots address the following airplanes:

Airplane models	Docket No.
Industrie Aeronautiche e Meccaniche, Model Piaggio P-180 Airplanes	99-CE-34-AD
Pilatus Britten-Norman Ltd., BN-2T Series Airplanes	99-CE-35-AD
Pilatus Aircraft Ltd., Models PC-12 and PC-12/45 Airplanes	99-CE-36-AD
Partenavia Costruzioni Aeronauticas, S.p.A., Models AP68TP 300 "Spartacus" and AP68TP 600 "Viator" Airplanes	99-CE-37-AD
Mitsubishi Heavy Industries, Ltd., MU-2B Series Airplanes	99-CE-38-AD
LET, a.s., Model L-420 Airplanes	99-CE-39-AD
British Aerospace, Jetstream Models 3101 and 3201 Airplanes	99-CE-40-AD
Harbin Aircraft Manufacturing Corp., Model Y12 IV airplanes	99-CE-41-AD
Empresa Brasileira de Aeronautica S.A. (Embraer), Models EMB-110P1 and EMB-110P2 Airplanes	99-CE-42-AD
Dornier Luftfahrt GmbH, 228 Series Airplanes	99-CE-43-AD
Bombardier Inc., DHC-6 Series Airplanes	99-CE-44-AD
The Cessna Aircraft Company, 208 Series Airplanes	99-CE-45-AD
Raytheon Aircraft Company, 90, 99, 100, 200, 300, 1900, and 2000 Series Airplanes	99-CE-46-AD
Short Brothers & Harland Ltd., Models SC-7 Series 2 and SC-7 Series 3 Airplanes	99-CE-48-AD
The New Piper Aircraft, Inc., PA-31 Series Airplanes	99-CE-49-AD
SOCATA—Groupe AEROSPATIALE, Model TBM 700 Airplanes	99-CE-50-AD
Twin Commander Aircraft Corporation, 600 Series Airplanes	99-CE-51-AD
Fairchild Aircraft Corporation, SA226 and SA227 Series Airplanes	99-CE-52-AD
The Cessna Aircraft Company, Models 425 and 441 Airplanes	99-CE-53-AD
Cessna Aircraft Company, Models 500, 550, and 560 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 Airplanes	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 Series Airplanes	99-NM-154-AD

Explanation of the Provisions of the Proposed AD

Since an unsafe condition has been identified that is likely to exist or develop in other AeroSpace Technologies Models N22B and N24A airplanes of the same type design registered in the United States, the FAA is proposing AD action. 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 10 airplanes in the U.S. registry would be affected by the proposed AD, that it would take approximately 1 workhour per airplane to accomplish the proposed AFM revisions. Accomplishing the proposed AFM revision requirements of this NPRM may be performed by the owner/operator holding at least a private pilot certificate as authorized by section 43.7 of the Federal Aviation Regulations (14 CFR 43.7), and must be entered into the aircraft records showing compliance with the proposed AD in accordance with section 43.9 of the Federal Aviation Regulations (14 CFR 43.9). The only cost impact of the proposed AD is the time it would take each owner/operator of the affected airplanes to insert the information into the AFM.

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 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) 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 has been placed 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 a new airworthiness directive (AD) to read as follows:

Aerospace Technologies of Australia Pty Ltd.: Docket No. 99-CE-47-AD.

Applicability: Models N22B and N24A airplanes, all serial numbers equipped with pneumatic deicing boots, certificated in any category.

Note 1: This AD applies to each airplane identified in the preceding applicability provision, regardless of whether it has been modified, altered, or repaired in the area subject to the requirements of this AD. For airplanes that have been modified, altered, or repaired so that the performance of the requirements of this AD is affected, the owner/operator must request approval for an alternative method of compliance in accordance with paragraph (d) of this AD. The request should include an assessment of the effect of the modification, alteration, or repair on the unsafe condition addressed by this AD; and, if the unsafe condition has not been eliminated, the request should include specific proposed actions to address it.

Compliance: Required as indicated in the body of this AD, unless already accomplished.

To assure 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) Incorporating the AFM revisions, as required by this AD, may be performed by the owner/operator holding at least a private pilot certificate as authorized by section 43.7 of the Federal Aviation Regulations (14 CFR 43.7), and must be entered into the aircraft records showing compliance with this AD in accordance with section 43.9 of the Federal Aviation Regulations (14 CFR 43.9).

(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) An alternative method of compliance or adjustment of the compliance time that provides an equivalent level of safety may be approved by the Manager, Small Airplane Directorate, 1201 Walnut, suite 900, Kansas City, Missouri 64106. The request shall be forwarded through an appropriate FAA Maintenance Inspector, who may add comments and then send it to the Manager, Small Airplane Directorate.

Note 2: Information concerning the existence of approved alternative methods of compliance with this AD, if any, may be obtained from the Small Airplane Directorate.

(e) Information related to this AD may be examined at the FAA, Central Region, Office of the Regional Counsel, Room 1558, 601 E. 12th Street, Kansas City, Missouri 64106.

Issued in Kansas City, Missouri, on October 4, 1999.

Michael Gallagher,

Manager, Small Airplane Directorate, Aircraft Certification Service.

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 99-CE-50-AD]

RIN 2120-AA64

Airworthiness Directives; SOCATA—Groupe AEROSPATIALE Model TBM 700 Airplanes

AGENCY: Federal Aviation Administration, DOT.

ACTION: Notice of proposed rulemaking (NPRM).