

# Recommendation Report

Friday, December 09, 2005

MODE:AVIATION ISSUE DATE:1/1/2004 - 12/31/2005 STATUS:O\* KEYWORD 1:Cessna  
208

**Log Number** 2924  
**Issue Date** 12/15/2004

From 1987 to 2003, 26 icing-related accidents and incidents involving Cessna 208 series airplanes occurred, resulting in at least 36 fatalities. As a result, the National Transportation Safety Board became concerned about a possible systemic problem with the airplane's design or with the operation of the airplane. In late 2003, the Board initiated an in-depth assessment of these 26 icing-related events. The Board's assessment focused on certification of the Cessna 208 for in-flight icing conditions, the atmospheric conditions often encountered during cold weather ground and flight operations, airplane dispatch considerations, and Cessna 208 pilot experience and training information.

<b>Recommendation #</b>	<b>A-04-064</b>	<b>Overall Status</b>	<b>Priority</b>
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OAA

The National Transportation Safety Board recommends that the Federal Aviation Administration expeditiously do the following: Require all pilots and operators of Cessna 208 series airplanes equipped for flight into known icing conditions to undergo seasonal training for ground deicing and flight into icing conditions on an annual basis. This seasonal training should be timed to precede the operator's cold weather operations and should specifically address (1) the limitations of the Cessna 208 in icing situations; (2) the Cessna 208 deice and anti-icing systems and controls and their use; (3) pilot actions during cold weather ground operations, with emphasis on the need for careful visual and tactile examination of wing and horizontal stabilizer upper surfaces during the preflight inspection to ensure that they are free of ice before takeoff; (4) pilot actions during cold weather flight operations, with emphasis on the timely recognition of potentially dangerous accumulations of ice and the importance of having an appropriate strategy for escaping the icing conditions and acting on that strategy promptly; (5) the hazards of performance degradation caused by ice that remains after activation of the deice boots; and (6) Cessna 208 Pilot Operating Handbook icing-related limitations, warnings, and notes.

FAA

Open - Acceptable Response

3/17/2005 Addressee Letter Mail Controlled 3/28/2005 2:05:07 PM MC# 2050133: Annual recurrent training in icing is required by existing regulations in 14 CFR Parts 121 and 135. The Board is concerned with systemic problems involving the design and operation specifically of the Cessna 208. Accordingly, the Federal Aviation Administration's Aircraft Certification Service is working with Cessna to revise the airplane flight manual (AFM) to reflect additional limitations and operating procedures developed specifically for the Cessna 208 in icing conditions. Once the revisions are made, the FAA's Flight Standards Service will require or recommend that operators of Cessna 208 airplanes implement revised training as appropriate.  
I will keep the Board informed of the FAA's progress on this safety recommendation.

9/13/2005 NTSB The Safety Board notes that the FAA indicated that annual recurrent training in icing is required by existing regulations for Parts 121 and 135 operators and that to address the concerns in this recommendation the FAA's Aircraft Certification Service is working with Cessna to revise the airplane flight manual (AFM) to reflect additional limitations and operating procedures developed specifically for the Cessna 208 in icing conditions. The FAA further indicated that once the revisions to the AFM are made, the FAA will require or recommend that operators of Cessna 208 airplanes implement the revised training.

The FAA's plans to revise the AFM in consultation with Cessna and to then require that operators implement the revised training is responsive to this recommendation. The Safety Board notes that to be fully responsive to this recommendation, the AFM revisions need to address the six specific topics in the recommendation and the implementation of the training needs to ensure it is timed to precede the operator's cold weather operations. Pending appropriate revisions to the Cessna 208 AFM and a requirement to implement this recurrent training, Safety Recommendation A-04-64 is classified "Open--Acceptable Response."

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208

Recommendation #	A-04-065	Overall Status	Priority
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OAA

The National Transportation Safety Board recommends that the Federal Aviation Administration expeditiously do the following: Require Cessna Aircraft Company, working with Cessna 208 operators, to develop effective operational strategies (for example, cold weather preflight strategies in remote locations, viable methods of collecting icing-related weather information before and during flight, ice detection and monitoring cues, optimal use of anti-ice and deice systems, minimum airspeeds for all phases of flight, proper use of flaps and engine power in icing conditions, and development of ice accumulation limitations and exit strategies for pilots in icing conditions) and related guidance materials to minimize the chance of Cessna 208 ground and in-flight icing accidents or incidents; the FAA should then verify that these strategies and guidance materials are incorporated into Cessna 208 operator manuals and training programs in a timely manner.

FAA	Open - Acceptable Response
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3/17/2005 Addressee Letter Mail Controlled 3/28/2005 2:05:07 PM MC# 2050133: The FAA is working with Cessna on an AFM revision to incorporate significant changes and additions to operating limitations and procedures in icing conditions. This work is based on a review of icing-related accidents and incidents and certification data.

The FAA is also working with Cessna to solicit information from Cessna C208 operators. On December 22, 2004, an Airworthiness Concern Sheet was issued to pertinent user groups to solicit information on proposed AFM changes, proposed equipment requirements, and weather briefing strategies. Cessna is investigating if there are other sources of operator information beyond that provided by the Airworthiness Concern Sheet. The FAA will initiate an airworthiness directive to mandate incorporation of the AFM revision as soon as it is made available.

The FAA is planning icing tunnel research, with Cessna and Goodrich participation, to address pneumatic deicing boot performance and optimum deicing boot activation procedures at Cessna C208 operating airspeeds. It is anticipated that this testing will occur in the first half of 2005. Lessons learned from this testing will be incorporated into the AFM, if required. The FAA plans on issuing guidance concurrently to operators and to FAA inspectors that will announce the existence of important new information regarding operation of Cessna 208 airplanes in icing conditions and explain how to get that information. Where the information appears in the Limitations section of the AFM, all parties will be reminded that such information is regulatory and, therefore, must be observed in operations and must be included in the manuals used by pilots and in their training programs. Inspectors will be reminded that enforcement action is appropriate to ensure compliance with the Limitation section. Where new information is found elsewhere in the AFM, the FAA will include directions on how to get it and will strongly recommend that it be observed in operations and that it be included in the manuals used by pilots and in their training programs.

I will keep the Board informed of the FAA's progress on this safety recommendation.

9/13/2005 NTSB The Safety Board notes that the FAA is working with Cessna on an AFM revision to incorporate changes and additions to operating limitations and procedures in icing conditions, based on a review of icing-related accidents, incidents, and certification data. The Board further notes that the FAA is also working with Cessna to solicit information from Cessna 208 operators and that as part of this work the FAA issued an Airworthiness Concern Sheet to solicit information on proposed AFM changes, proposed equipment requirements, and weather briefing strategies. In addition, Cessna is investigating if there are other sources of operator information beyond that provided by the Airworthiness Concern Sheet. The FAA indicates that it will issue an airworthiness directive (AD) to mandate incorporation of the AFM revision as soon as it is available. In addition to soliciting information from Cessna 208 operators, the FAA is planning icing wind tunnel research, with Cessna and Goodrich participation, to address pneumatic deicing boot performance and optimum deicing boot activation procedures. The FAA plans to incorporate lessons learned from this testing into the AFM revision. After the AFM revisions are complete, and other guidance and test results are available, the FAA plans to issue guidance to operators and to FAA inspectors. This guidance will announce the existence of the new information regarding operation of Cessna 208 airplanes in icing conditions. Where the information appears in the "limitations" section of the AFM, the guidance will reinforce that such information is regulatory and, therefore, must be observed in operations and must be included in the manuals used by pilots and in their training programs.

The FAA's planned actions are responsive to this recommendation. Pending revisions to the Cessna 208 AFM and issuance of guidance reinforcing that the limitations section of the AFM must be observed by all operators, Safety Recommendation A-04-65 is classified "Open--Acceptable Response."

# Recommendation Report

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## Recommendation # A-04-066

Overall Status  
OAA

Priority

The National Transportation Safety Board recommends that the Federal Aviation Administration expeditiously do the following: Require all pilots and operators of Cessna 208 series airplanes to conduct a visual and tactile examination of the wing and horizontal stabilizer leading edges and upper surfaces to ensure that those surfaces are free of ice and/or snow contamination before any flight from a location at which the temperatures are conducive to frost or ground icing.

FAA	Open - Acceptable Response
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3/17/2005 Addressee Letter Mail Controlled 3/28/2005 2:05:07 PM MC# 2050133: The NORMAL PROCEDURES section of the AFM currently has five WARNINGS to remove "even small amounts of frost, ice, or snow from wing, tail, and control surfaces." The FAA is currently working with Cessna to develop a tactile pretakeoff check, The FAA intends to add this check to the AFM Limitations section. The FAA will initiate an airworthiness directive to mandate incorporation of the AFM revision as soon as it is made available. In accordance with 14 CFR 91.9(a), the Limitation will have to be incorporated into operator manuals.

9/13/2005 NTSB The Safety Board notes that the FAA is working with Cessna to develop a tactile pretakeoff check and that the FAA intends to add this check to the AFM limitations section. Compliance with the limitations section of the AFM is required. The FAA plans to issue an AD mandating incorporation of the AFM revision as soon as available. Pending revisions to the AFM requiring a tactile examination of the wing and horizontal stabilizer leading edges and upper surfaces to ensure that those surfaces are free of ice and/or snow contamination and issuance of an AD mandating incorporation of the AFM revisions, Safety Recommendation A-04-66 is classified "Open--Acceptable Response."

## Recommendation # A-04-067

Overall Status  
OAA

Priority

The National Transportation Safety Board recommends that the Federal Aviation Administration expeditiously do the following: Evaluate its current procedures for surveillance of operators of Cessna 208 series airplanes equipped for flight into known icing conditions to determine whether the surveillance effectively ensures that these operators are in compliance with Federal deicing requirements and, if necessary, modify the surveillance procedures to ensure such compliance.

FAA	Open - Acceptable Response
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3/17/2005 Addressee Letter Mail Controlled 3/28/2005 2:05:07 PM MC# 2050133: The FAA will notify inspectors and operators of Cessna 208 airplanes of the relatively high rate of icing-related accidents and incidents involving these airplanes. Further, pending development of revised limitations and procedures for the Cessna 208 in icing conditions, inspectors and operators will be encouraged to be particularly diligent in observing existing regulations regarding icing, including deicing requirements. Operators will be encouraged to do more, namely, to implement voluntarily additional ground deicing procedures known to be effective such as those contained in the current versions of Advisory Circular (AC) 20-117, AC 120-58, AC 120-60, and AC 135-17.

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9/13/2005 NTSB

The Safety Board notes that the FAA has indicated that it will notify FAA inspectors and Cessna 208 operators of the high rate of icing-related accidents and incidents involving Cessna 208s. In addition, pending development of revised limitations and procedures for the Cessna 208 in icing conditions, the FAA will encourage inspectors and operators to be particularly diligent in observing existing regulations regarding icing, including deicing requirements.

The Safety Board's December 15, 2004, letter references a 2001/2002 safety evaluation study of the Cessna 208 conducted by the FAA's Alaskan Region System Safety Analysis Branch. That report stated the following:

FAA systems did not detect that operator training and qualification programs were not meeting the initial and recurrent training requirements of FAR [Federal Aviation Regulation] Part 135. In addition, normal FAA surveillance did not detect that Cessna 208 pilots were not properly trained for operations in ground icing conditions.

The FAA's report recommended that its certificate management teams should "revisit" and "retarget" surveillance practices for Cessna 208 operators to ensure that deficiencies in those operators' icing-related training programs, personnel monitoring, and manuals and guidance are identified and corrected. At the time this recommendation was issued, the FAA had not taken this action.

Although acknowledging that notifying FAA inspectors to be vigilant of icing considerations with Cessna 208 operators is a step in the right direction, the Safety Board questions whether this action is fully responsive to the recommendation. The evaluation report completed by the Alaskan Region found that FAA systems did not detect deficiencies in operator training and qualification programs or problems with training for icing operations. Further, it is not clear that the FAA's proposed action is responsive to the recommendation in the Alaska Region's report that certificate management teams revisit and retarget Cessna 208 operators.

The Safety Board asks the FAA to explain how notifying inspectors of the problems of icing in Cessna 208 operations and encouraging diligence in observing existing icing regulations addresses the need for certificate management teams to "revisit" and "retarget" operators who fly Cessna 208 aircraft in icing conditions. Pending consideration of the Board's comments, Safety Recommendation A-04-67 is classified "Open--Acceptable Response."

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**Total Number of Recommendations for Recommendation Report: 4**

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## Selection for Report:

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