

Issued in Kansas City, Missouri, on February 6, 1998.

**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. 97-CE-51-AD; Amendment 39-10332; AD 98-04-20]

RIN 2120-AA64

**Airworthiness Directives; Partenavia Costruzioni Aeronauticas, S.p.A. Model P68, AP68TP 300, AP68TP 600 Airplanes**

**AGENCY:** Federal Aviation Administration, DOT.

**ACTION:** Final rule.

**SUMMARY:** This amendment adopts a new airworthiness directive (AD) that applies to Partenavia Costruzioni Aeronauticas, S.p.A. Model P68, AP68TP 300, AP68TP 600 airplanes. This action requires revising the FAA-approved Airplane Flight Manual (AFM) to specify procedures that would prohibit flight in severe icing conditions (as determined by certain visual cues), limit or prohibit the use of various flight control devices while in severe icing conditions, and provide the flight crew with recognition cues for, and procedures for exiting from, severe icing conditions. This AD is prompted by the results of a review of the requirements for certification of these airplanes in icing conditions, new information on

the icing environment, and icing data provided currently to the flight crew. The actions specified by this AD are intended to minimize the potential hazards associated with operating these airplanes in severe icing conditions by providing more clearly defined procedures and limitations associated with such conditions.

**DATES:** Effective March 13, 1998.

**ADDRESSES:** This information may be examined at the Federal Aviation Administration (FAA), Central Region, Office of the Regional Counsel, Attention: Rules Docket 97-CE-51-AD, Room 1558, 601 E. 12th Street, Kansas City, Missouri 64106.

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

**SUPPLEMENTARY INFORMATION:**

**Events Leading to the Issuance of This AD**

A proposal to amend part 39 of the Federal Aviation Regulations (14 CFR part 39) to include an AD that would apply to Partenavia Costruzioni Aeronauticas, S.p.A. Model P68, AP68TP 300, AP68TP 600 airplanes was published in the **Federal Register** on September 16, 1997 (62 FR 48524). That action proposed to require the Limitations Section of the FAA-approved AFM to specify procedures that would:

- Require flight crews to immediately request priority handling from Air Traffic Control to exit severe icing conditions (as determined by certain visual cues);

- Prohibit flight in severe icing conditions (as determined by certain visual cues);

- Prohibit use of the autopilot when ice is formed aft of the protected surfaces of the wing, or when an unusual lateral trim condition exists; and

- Require that all icing wing inspection lights be operative prior to flight into known or forecast icing conditions at night.

That action also proposed to require revising the Normal Procedures Section of the FAA-approved AFM to specify procedures that would:

- Limit the use of the flaps and prohibit the use of the autopilot when ice is observed forming aft of the protected surfaces of the wing, or if unusual lateral trim requirements or autopilot trim warnings are encountered; and

- Provide the flight crew with recognition cues for, and procedures for exiting from, severe icing conditions.

**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.

In addition to the proposed rule described previously, in September 1997, the FAA issued 24 other similar proposals that address the subject unsafe condition on various airplane models (see below for a listing of all 24 proposed rules). These 24 proposals also were published in the **Federal Register** on September 16, 1997. This final rule contains the FAA's responses to all public comments received for each of these proposed rules.

Docket No.	Manufacturer/airplane model	Federal Register citation
97-CE-49-AD .....	Aerospace Technologies of Australia, Models N22B and N24A .....	62 FR 48520
97-CE-50-AD .....	Harbin Aircraft Mfg. Corporation, Model Y12 IV .....	62 FR 48513
97-CE-51-AD .....	Partenavia Costruzioni Aeronauticas, S.p.A., Models P68, AP68TP 300, AP68TP 600 .....	62 FR 48524
97-CE-52-AD .....	Industrie Aeronautiche Meccaniche Rinaldo Piaggio S.p.A., Model P-180 .....	62 FR 48502
97-CE-53-AD .....	Pilatus Aircraft Ltd., Models PC-12 and PC-12/45 .....	62 FR 48499
97-CE-54-AD .....	Pilatus Britten-Norman Ltd., Models BN-2A, BN-2B, and BN-2T .....	62 FR 48538
97-CE-55-AD .....	SOCATA—Groupe Aerospatiale, Model TBM-700 .....	62 FR 48506
97-CE-56-AD .....	Aerostar Aircraft Corporation, Models PA-60-600, -601, -601P, -602P, and -700P .....	62 FR 48481
97-CE-57-AD .....	Twin Commander Aircraft Corporation, Models 500, -500-A, -500-B, -500-S, -500-U, -520, -560, -560-A, -560-E, -560-F, -680, -680-E, -680FL(P), -680T, -680V, -680W, -681, -685, -690, -690A, -690B, -690C, -690D, -695, -695A, -695B, and 720.	62 FR 48549
97-CE-58-AD .....	Raytheon Aircraft Company, Models E55, E55A, 58, 58A, 58P, 58PA, 58TC, 58TCA, 60 series, 65-B80 series, 65-B90 series, 90 series, F90 series, 100 series, 300 series, and B300 series.	62 FR 48517
97-CE-59-AD .....	Raytheon Aircraft Company, Model 2000 .....	62 FR 48531
97-CE-60-AD .....	The New Piper Aircraft Corporation, Models PA-46-310P and PA-46-350P .....	62 FR 48542
97-CE-61-AD .....	The New Piper Aircraft Corporation, Models PA-23, PA-23-160, PA-23-235, PA-23-250, PA-E23-250, PA-30, PA-39, PA-40, PA-31, PA-31-300, PA-31-325, PA-31-350, PA-34-200, PA-34-200T, PA-34-220T, PA-42, PA-42-720, PA-42-1000.	62 FR 48546
97-CE-62-AD .....	Cessna Aircraft Company, Models P210N, T210N, P210R, and 337 series .....	62 FR 48535
97-CE-63-AD .....	Cessna Aircraft Company, Models T303, 310R, T310R, 335, 340A, 402B, 402C, 404, F406, 414, 414A, 421B, 421C, 425, and 441.	62 FR 48528

Docket No.	Manufacturer/airplane model	Federal Register citation
97-CE-64-AD .....	SIAl-Marchetti S.r.l. (Augusta), Models SF600 and SF600A .....	62 FR 48510
97-NM-170-AD .....	Cessna Aircraft Company, Models 500, 501, 550, 551, and 560 series .....	62 FR 48560
97-NM-171-AD .....	Sabreliner Corporation, Models 40, 60, 70, and 80 series .....	62 FR 48556
97-NM-172-AD .....	Gulfstream Aerospace, Model G-159 series .....	62 FR 48563
97-NM-173-AD .....	McDonnell Douglas, Models DC-3 and DC-4 series .....	62 FR 48553
97-NM-174-AD .....	Mitsubishi Heavy Industries, Model YS-11 and YS-11A series .....	62 FR 48567
97-NM-175-AD .....	Frakes Aviation, Model G-73 (Mallard) and G-73T series .....	62 FR 48577
97-NM-176-AD .....	Fairchild, Models F27 and FH227 series .....	62 FR 48570
97-NM-177-AD .....	Lockheed, L-14 and L-18 series .....	62 FR 48574

*Comment 1. Unsubstantiated Unsafe Condition for This Model*

One commenter suggests that the AD's were developed in response to a suspected contributing factor of an accident involving an airplane type unrelated to the airplanes specified in the proposal. The commenter states that these proposals do not justify that an unsafe condition exists or could develop in a product of the same type design. Therefore, the commenter asserts that the proposal does not meet the criteria for the issuance of an AD as specified 14 CFR part 39 (Airworthiness Directives) of the Federal Aviation Regulations.

The FAA does not concur. As stated in the Notice of Proposed Rulemaking (NPRM), the FAA has identified an unsafe condition associated with operating the airplane in severe icing conditions. As stated in the preamble to the proposal, the FAA has not required that airplanes be shown to be capable of operating safely in icing conditions outside the certification envelope specified in Appendix C of part 25 of the Federal Aviation Regulations (14 CFR part 25). This means that any time an airplane is flown in icing conditions for which it is not certificated, there is a potential for an unsafe condition to exist or develop and the flight crew must take steps to exit those conditions expeditiously. Further, the FAA has determined that flight crews are not currently provided with adequate information necessary to determine when an airplane is operating in icing conditions for which it is not certificated or what action to take when such conditions are encountered. The absence of this information presents an unsafe condition because without that information, a pilot may remain in potentially hazardous icing conditions. This AD addresses the unsafe condition by requiring AFM revisions that provide the flight crews with visual cues to determine when icing conditions have been encountered for which the airplane is not certificated, and by providing procedures to safely exit those conditions.

Further, in the preamble of the proposed rule, the FAA discussed the investigation of roll control anomalies to explain that this investigation was not a complete certification program. The testing was designed to examine only the roll handling characteristics of the airplane in certain droplets the size of freezing drizzle. The testing was not a certification test to approve the airplane for flight into freezing drizzle. The results of the tests were not used to determine if this AD is necessary, but rather to determine if design changes were needed to prevent a catastrophic roll upset. The roll control testing and the AD are two unrelated actions.

Additionally, in the preamble of the proposed rule, the FAA acknowledged that the flight crew of any airplane that is certificated for flight in icing conditions may not have adequate information concerning flight in icing conditions outside the icing envelope. However, in 1996, the FAA found that the specified unsafe condition must be addressed as a higher priority on airplanes equipped with pneumatic deicing boots and unpowered roll control systems. These airplanes were addressed first because the flight crew of an airplane having an unpowered roll control system must rely solely on physical strength to counteract roll control anomalies, whereas a roll control anomaly that occurs on an airplane having a powered roll control system need not be offset directly by the flight crew. The FAA also placed a priority on airplanes that are used in regularly scheduled passenger service. The FAA has previously issued AD's to address those airplanes. Since the issuance of those AD's, the FAA has determined that similar AD's should be issued for similarly equipped airplanes that are not used in regularly scheduled passenger service.

*Comment 2. AD is Inappropriate to Address Improper Operation of the Airplane*

One commenter requests that the proposed AD be withdrawn because an unsafe condition does not exist within

the airplane. Rather, the commenter asserts that the unsafe condition is the improper operation of the airplane. The commenter further asserts that issuance of an AD is an inappropriate method to address improper operation of the airplane.

The FAA does not concur. The FAA has determined that an unsafe condition does exist as explained in the proposed notice and discussed previously. As specifically addressed in Amendment 39-106 of part 39 of the Federal Aviation Regulations (14 CFR part 39), the responsibilities placed on the FAA statute (49 U.S.C. 40101, formerly the Federal Aviation Act) justify allowing AD's to be issued for unsafe conditions however and wherever found, regardless of whether the unsafe condition results from maintenance, design defect, or any other reason.

This same commenter considers part 91 (rather than part 39) of the Federal Aviation Regulations (14 CFR part 91) the appropriate regulation to address the problems of icing encounters outside of the limits for which the airplane is certificated. Therefore, the commenter requests that the FAA withdraw the proposal.

The FAA does not concur. Service experience demonstrates that flight in icing conditions that is outside the icing certification envelope does occur. Apart from the visual cues provided in these final rules, there is no existing method provided to the flight crews to identify when the airplane is in a condition that exceeds the icing certification envelope. Because this lack of awareness may create an unsafe condition, the FAA has determined that it is appropriate to issue an AD to require a revision of the AFM to provide this information.

One commenter asserts that while it is prudent to advise and routinely remind the pilots about the hazards associated with flight into known or forecast icing conditions, the commenter is opposed to the use of an AD to accomplish that function. The commenter states that pilots' initial and bi-annual flight checks are the appropriate vehicles for advising the pilots of such hazards, and

that such information should be integrated into the training syllabus for all pilot training.

The FAA does not concur that substituting advisory material and mandatory training for issuance of an AD is appropriate. 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 such advisory materials and training alone are not adequate to address the unsafe condition. The only method of ensuring that certain information is available to the pilot is through incorporation of the information into the Limitations Section of the AFM. The appropriate vehicle for requiring such a revision of the AFM is issuance of an AD. No change is necessary to the final rule.

#### *Comment 3. Inadequate Visual Cues*

One commenter provides qualified support for the AD. The commenter notes that the recent proposals are identical to the AD's issued about a year ago. Although the commenter supports the intent of the AD's as being appropriate and necessary, the commenter states that it is unfortunate that the flight crew is burdened with recognizing icing conditions with visual cues that are inadequate to determine certain icing conditions. The commenter points out that, for instance, side window icing (a very specific visual cue) was determined to be a valid visual cue during a series of icing tanker tests on a specific airplane; however, later testing of other models of turboprop airplanes revealed that side window icing was invalid as a visual cue for identifying icing conditions outside the scope of Appendix C.

The FAA does not concur with the commenter's request to provide more specific visual cues. The FAA finds that the value of visual cues has been substantiated during in-service experience. Additionally, the FAA finds that the combined use of the generic cues provided and the effect of the final rules in increasing the awareness of pilots concerning the hazard of operating outside of the certification icing envelope will provide an acceptable level of safety. Although all of the cues may not be exhibited on a particular model, the FAA considers that at least some of the cues will be exhibited on all of the models affected by this AD. For example, some airplanes may not have side window cues in freezing drizzle, but would exhibit other cues (such as accumulation of ice aft of the protected area) under those

conditions. For these reasons, the FAA considers that no changes regarding visual cues are necessary in the final rule. However, for those operators that elect to identify airplane-specific visual cues, the FAA would consider a request for approval of an alternative method of compliance, in accordance with the provisions of this AD.

#### *Comment 4. Request for Research and Use of Wing-Mounted Ice Detectors*

One commenter requests that wing-mounted ice detectors, which provide real-time icing severity information (or immediate feedback) to flight crews, continue to be researched and used throughout the fleet. The FAA infers from this commenter's request that the commenter asks that installation of these ice detectors be mandated by the FAA.

While the FAA supports the development of such ice detectors, the FAA does not concur that installation of these ice detectors should be required at this time. Visual cues are adequate to provide an acceptable level of safety; therefore, mandatory installation of ice detector systems, in this case, is not necessary to address the unsafe condition. Nevertheless, because such systems may improve the current level of safety, the FAA has officially tasked the Aviation Rulemaking Advisory Committee (ARAC) to develop a recommendation concerning ice detection. Once the ARAC has submitted its recommendation, the FAA may consider further rulemaking action to require installation of such equipment.

#### *Comment 5. Particular Types of Icing*

This same commenter also requests that additional information be included in paragraph (a) of the AD that would specify particular types of icing or particular accretions that result from operating in freezing precipitation. The commenter asserts that this information is of significant value to the flightcrew.

The FAA does not concur with the commenter's suggestion to specify types of icing or accretion. The FAA has determined that supercooled large droplets (SLD) can result in rime ice, mixed (intermediate) ice, and ice with glaze or clear appearance. Therefore, the FAA finds that no type of icing can be excluded from consideration during operations in freezing precipitation, and considers it unnecessary to cite those types of icing in the AD.

#### **The FAA's Determination**

After careful review of all available information related to the subject presented above, the FAA has

determined that air safety and the public interest require the adoption of the rule as proposed except for minor editorial corrections. The FAA has determined that these minor corrections will not change the meaning of the AD and will not add any additional burden upon the public than was already proposed.

#### **Cost Impact**

The FAA estimates that 5 airplanes in the U.S. registry will be affected by this AD, that it will take approximately 1 workhour per airplane to accomplish this action, and that the average labor rate is approximately \$60 an hour. Since an owner/operator who holds at least a private pilot's certificate as authorized by sections 43.7 and 43.9 of the Federal Aviation Regulations (14 CFR 43.7 and 43.9) can accomplish this action, the only cost impact upon the public is the time it will take the affected airplane owners/operators to incorporate this AFM revision.

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

In addition, the FAA recognizes that this action may impose operational costs. However, these costs are incalculable because the frequency of occurrence of the specified conditions and the associated additional flight time cannot be determined. Nevertheless, because of the severity of the unsafe condition, the FAA has determined that continued operational safety necessitates the imposition of the costs.

#### **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 copy of the final 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.

### 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 a new airworthiness directive (AD) to read as follows:

#### 98-04-20 Partenavia Construzioni

**Aeronauticas, S.p.A:** Amendment 39-10332; Docket No. 97-CE-51-AD.

**Applicability:** Model P68, AP68TP 300, AP68TP 600 airplanes (all serial numbers), 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, unless already accomplished.

To minimize the potential hazards associated with operating the airplane in severe icing conditions by providing more clearly defined procedures and limitations associated with such conditions, accomplish the following:

(a) Within 30 days after the effective date of this AD, accomplish the requirements of paragraphs (a)(1) and (a)(2) of this AD.

**Note 2:** Operators should initiate action to notify and ensure that flight crewmembers are apprised of this change.

(1) Revise the FAA-approved Airplane Flight Manual (AFM) by incorporating the following into the Limitations Section of the

AFM. This may be accomplished by inserting a copy of this AD in the AFM.

#### “Warning

Severe icing may result from environmental conditions outside of those for which the airplane is certificated. Flight in freezing rain, freezing drizzle, or mixed icing conditions (supercooled liquid water and ice crystals) may result in ice build-up on protected surfaces exceeding the capability of the ice protection system, or may result in ice forming aft of the protected surfaces. This ice may not be shed using the ice protection systems, and may seriously degrade the performance and controllability of the airplane.

• During flight, severe icing conditions that exceed those for which the airplane is certificated shall be determined by the following visual cues. If one or more of these visual cues exists, immediately request priority handling from Air Traffic Control to facilitate a route or an altitude change to exit the icing conditions.

—Unusually extensive ice accumulation on the airframe and windshield in areas not normally observed to collect ice.

—Accumulation of ice on the lower surface of the wing aft of the protected area.

—Accumulation of ice on the engine nacelles and propeller spinners farther aft than normally observed.

• Since the autopilot, when installed and operating, may mask tactile cues that indicate adverse changes in handling characteristics, use of the autopilot is prohibited when any of the visual cues specified above exist, or when unusual lateral trim requirements or autopilot trim warnings are encountered while the airplane is in icing conditions.

• All wing icing inspection lights must be operative prior to flight into known or forecast icing conditions at night. [NOTE: This supersedes any relief provided by the Master Minimum Equipment List (MMEL).]”

(2) Revise the FAA-approved AFM by incorporating the following into the Normal Procedures Section of the AFM. This may be accomplished by inserting a copy of this AD in the AFM.

#### “THE FOLLOWING WEATHER CONDITIONS MAY BE CONDUCTIVE TO SEVERE IN-FLIGHT ICING

• Visible rain at temperatures below 0 degrees Celsius ambient air temperature.

• Droplets that splash or splatter on impact at temperatures below 0 degrees Celsius ambient air temperature.

#### PROCEDURES FOR EXITING THE SEVERE ICING ENVIRONMENT

These procedures are applicable to all flight phases from takeoff to landing. Monitor the ambient air temperature. While severe icing may form at temperatures as cold as -18 degrees Celsius, increased vigilance is warranted at temperatures around freezing with visible moisture present. If the visual cues specified in the Limitations Section of the AFM for identifying severe icing conditions are observed, accomplish the following:

• Immediately request priority handling from Air Traffic Control to facilitate a route

or an altitude change to exit the severe icing conditions in order to avoid extended exposure to flight conditions more severe than those for which the airplane has been certificated.

• Avoid abrupt and excessive maneuvering that may exacerbate control difficulties.

• Do not engage the autopilot.

• If the autopilot is engaged, hold the control wheel firmly and disengage the autopilot.

• If an unusual roll response or uncommanded roll control movement is observed, reduce the angle-of-attack.

• Do not extend flaps when holding in icing conditions. Operation with flaps extended can result in a reduced wing angle-of-attack, with the possibility of ice forming on the upper surface further aft on the wing than normal, possibly aft of the protected area.

• If the flaps are extended, do not retract them until the airframe is clear of ice.

• Report these weather conditions to Air Traffic Control.

(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, FAA, 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 3:** Information concerning the existence of approved alternative methods of compliance with this AD, if any, may be obtained from the Small Airplane Directorate.

(e) All persons affected by this directive may examine information related to this AD at the FAA, Central Region, Office of the Regional Counsel, Room 1558, 601 E. 12th Street, Kansas City, Missouri 64106.

(f) This amendment (39-10332) becomes effective on March 13, 1998.

Issued in Kansas City, Missouri, on February 6, 1998.

**Michael Gallagher,**

*Manager, Small Airplane Directorate, Aircraft Certification Service.*

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