DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 121

[Docket No. 26930; Notice No. 92-9]

RIN 2120-AE51

Aircraft Ground Deicing and Anti-Icing Program

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: This proposed amendment would establish a requirement for part 121 certificate holders to develop an FAA-approved ground deicing/anti-icing program and to comply with that program any time conditions are such that frost, ice, or snow could adhere to the aircraft's wings, control surfaces, propellers, engine inlets, and other critical surfaces.

This rule is necessary because several accidents and the recent International Conference on Airplane Ground Deicing indicate that, under present procedures, the pilot in command may be unable to effectively determine whether the aircraft's wings, control surfaces, propellers, engine inlets, and other critical surfaces are free of all frost, ice, or snow prior to attempting a takeoff.

The proposal is intended to provide an added level of safety to flight operations in adverse weather conditions. This proposed rule and associated airport and air traffic control procedures would provide, to the extent possible, enhanced procedures to allow safe takeoffs during adverse weather conditions.

DATES: Comments must be submitted on or before August 7, 1992. The FAA is not able to provide a longer comment period for this NPRM because the FAA intends to issue a final rule in time to implement the proposed programs before the 1992-93 winter season. Comments received after the comment period closes will not be considered nor will the FAA consider requests to extend the comment period.

ADDRESSES: Comments on this notice should be mailed, in triplicate, to: Federal Aviation Administration, Office of the Chief Counsel, Attention: Rules Docket (AG-10), Docket No. 26930, 800 Independence Avenue, SW., Washington, DC 20591. Comments delivered must be marked Docket No. 26930. Comments may be examined in room 915G weekdays between 8:30 a.m. and 5 p.m., except on Federal Holidays.

FOR FURTHER INFORMATION CONTACT: Larry Youngblut, Flight Standards Service, Regulations Branch, AFS-240, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, DC 20591, telephone (202) 267-3755.

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. Comments relating to the environmental, energy, federalism, or economic impact that might result from adopting the proposals in this notice are also invited. Substantive comments should be accompanied by cost estimates. Comments should identify the regulatory docket or notice number and should be submitted in triplicate to the Rules Docket address specified above. All comments received on or before the closing date for comments specified will be considered by the Administrator before taking action on this proposed rulemaking. The proposal contained in this notice may be changed in light of comments received. All comments received will be available, both before and after the closing date for comment, in the rules Docket for examination by interested persons. A report summarizing each substantive public contact with Federal Aviation Administration (FAA) personnel concerned with this rulemaking will be filed in the docket. Commenters wishing the FAA to acknowledge receipt of their comments submitted in response to this notice must include a preaddressed, stamped postcard on which the following statement is made: "Comments to Docket No. 26930." The postcard will be date stamped and mailed to the commenter.

Availability of NPRMs

Any person may obtain a copy of this NPRM by submitting a request to the Federal Aviation Administration, Office of Public Affairs, Attention: Public Inquiry Center, APA-430, 800 Independence Avenue, SW., Washington, DC 20591, or by calling (202) 267-3484. Communications must identify the notice number of this NPRM.

Persons interested in being placed on the mailing list for future NPRMs should request from the above office a copy of Advisory Circular No. 11-2A, Notice of Proposed Rulemaking Distribution System, which describes the application procedure.

Background

Section 121.629(a) of the Federal Aviation Regulations (14 CFR 121.629(a)) states, in pertinent part, that no person may dispatch or release an aircraft when, in the opinion of the pilot in command or aircraft dispatcher, icing conditions are expected or met that might adversely affect the safety of flight. Section 121.629(b) states, in pertinent part, that no person may take off an aircraft when frost, ice, or snow is adhering to the wings, control surface, or propellers of the aircraft. These requirements, which have been virtually unchanged for over 40 years, are based on what is commonly referred to as the "clean aircraft concept." The basis of this concept is that the presence of even minute amounts of frost, ice, or snow on particular aircraft surfaces (referred to as "contamination") can cause degradation of aircraft performance and changes in aircraft flight characteristics.

When conditions conducive to the formation of frost, ice, or snow on aircraft surfaces exist at the time of takeoff, or it is suspected that these contaminants are adhering to aircraft surfaces, common practice developed by the North American and European aviation community over many years of operational experience is to deice or anti-ice the aircraft before takeoff. Under the Federal Aviation Regulations, in icing conditions, as in all other conditions, ultimate responsibility for determining whether the aircraft is free of contamination—and thus airworthy—rests with the pilots in command.

Aircraft are commonly deiced and anti-iced during icing weather conditions. Deicing is the removal of accumulated frost, ice, or snow from aircraft surfaces by application of heated water followed by undiluted glycol-based fluid or the application of a heated water/glycol solution. Anti-icing is the treatment with undiluted glycol-based fluid to prevent frost, ice, or snow from adhering to aircraft surfaces. Normally, deicing and anti-icing are accomplished by a single application process; however, there may be two separate applications of deicing/anti-icing fluid. Two types of deicing/anti-icing fluids are used. AEA Type I fluids are unthickened fluids that are normally applied as a mixture of glycol and water. These fluids mainly provide protection against refreezing when no delays or only short delays occur between deicing and takeoff. AEA Type II fluids are thickened fluids. They provide protection against refreezing when longer delays occur. Type II fluid is used extensively in Canada and Europe, but is used less often in the United States because it is more expensive than Type I, more difficult to apply, and has a gel consistency that

may reduce a runway's coefficient of friction, thereby reducing an airplane's braking capability. Type II fluid provides longer holdover times. Holdover time is the estimated time deicing or anti-icing will prevent the formation of frost or ice and the accumulation of snow or slush on the treated surfaces of an aircraft.

According to the National Transportation Safety Board (NTSB), in the last 23 years there have been 15 accidents related to the failure to deice aircraft adequately before takeoff. Seven of the 15 accidents were in part 121 passenger-carrying or all-cargo operations. An eighth accident, for which the NTSB has not yet issued a probable cause finding, involved a USAir flight discussed more fully below. In all of these accidents, contamination on the aircraft surfaces during takeoff was the cause or a contributing cause of the accident. Specifically, the part 121 major accidents at least partially caused by ground deicing include the following:

December 27, 1968, Ozark DC–9–15, Sioux City, Iowa.
November 27, 1978, TWA DC–9, Newark, New Jersey.
January 13, 1982, Air Florida B–737, Washington DC.
February 5, 1985, ABX DC–9, Philadelphia, Pennsylvania.
February 5, 1985, BO–S–AIRE, DC–3, Charlotte, North Carolina.
November 15, 1987, Continental DC–9, Denver, Colorado.
February 17, 1991, Ryan DC–9, Cleveland, Ohio.
March 22, 1992, USAir F–28, La Guardia, New York.*

The NTSB investigations of the Air Florida and Continental accidents indicate that ice formation after deicing was a major contributing factor.

At Washington National Airport on January 13, 1982, Air Florida Flight 90, a Boeing 737, crashed into the 14th Street Bridge over the Potomac River shortly after takeoff. At the time of takeoff, the airport was experiencing moderate to heavy snowfall and low visibility. The aircraft failed to achieve a sufficient rate of climb, struck the 14th Street Bridge about 4,500 feet from the departure end of the runway, and crashed into the Potomac River. Seventy-four of the 79 persons aboard the aircraft were killed either on impact or by drowning, and 4 persons in automobiles on the bridge were killed when the vehicles were struck by the descending aircraft.

The aircraft had been deiced before it taxied from the gate area; however, it was exposed to continuing snowfall for about 50 minutes before takeoff. The conversation between the captain and the first officer, recorded by the cockpit voice recorder, showed that they were aware that some snow and ice had accumulated on the aircraft while waiting for takeoff.

The NTSB determined that the probable causes of the accident were the flight crew's failure to use the engine anti-ice (a system that detects and removes ice from the aircraft's engine nacelle and inlet guide vanes) during both ground operation and takeoff, their decision to take off with snow and ice on the airfoil surfaces of the aircraft, and the failure of the captain to reject the takeoff when anomalous engine instrument readings were noticed. Among other things contributing to the accident was the prolonged ground delay between deicing and takeoff.

On November 15, 1987, at Denver's Stapleton International Airport, Continental Airlines Flight 1713, a DC–9, was cleared for takeoff following a delay of approximately 27 minutes after deicing. The takeoff roll was uneventful, but following a rapid rotation, the airplane crashed. Both pilots, one flight attendant, and 25 passengers died. The NTSB concluded that the airplane was adequately deiced before it departed the deice pad. Nevertheless, since the airplane was exposed to a moderate snowstorm in subfreezing conditions for approximately 27 minutes after deicing, the NTSB concluded that portions of the airframe became contaminated with a thin, rough layer of ice. Several surviving passengers reported seeing some ice on engine inlets or patches on the wing after deicing.

According to McDonnell Douglas, even minute amounts of ice or other contaminants (equivalent to medium grit sandpaper) on the leading edges or upper surfaces of the wings of a DC–9–10 series airplane could result in the degradation of wing lift, causing the airplane to stall at lower than normal angles–of–attack during takeoff. The contamination of the airframe surfaces was a contributing factor in the crash of Flight 1713. This contamination of the airframe surfaces could have been eliminated or its formation delayed if the airplane had been anti-iced following the deicing.

These aircraft accidents probably could have been prevented if the pilot had been given more information to help determine whether the aircraft was free of all frost, ice, and snow prior to takeoff.

Until recently, the FAA and the aviation community in general had placed priority on emphasizing the need during icing conditions for the pilot in command to ensure "clean wings" before takeoff. The FAA believed that pilot education appeared key to combatting the threat of wing icing. Although the FAA still believes the pilot in command must ultimately make the decision on whether to take off, and that the decision must be based on a thorough understanding of factors involved in icing, the FAA has determined that the certificate holder must provide the pilot in command with criteria on which to make a proper decision. This proposed rule would require that the pilot in command be provided with information to assist the pilot in determining if the aircraft is free of contamination before takeoff.

In response to a USAir F–28–100 accident at La Guardia Airport on March 22, 1992, the FAA mounted a sharply focused effort to resolve the ground deicing issue before the winter of 1992/1993. USAir flight 405 crashed on takeoff in a snowstorm during nighttime operations. While the NTSB has not yet issued a probable cause finding for this accident, the FAA has proceeded on the assumption that the accident was caused, at least in part, by icing. The airplane had been deiced approximately 35 minutes before takeoff. On May 28 and 29, 1992, as a major part of the effort to resolve the ground deicing issue, the FAA held the International Conference on Airplane Ground Deicing in Reston, Virginia. The FAA has based this proposed rule, in part, on the results of this conference. Recommendations of the conference are discussed later in the preamble.

In April 1992, the FAA received a petition for rulemaking from Edward F. Ford (Docket No. 26848) on the issue of aircraft deicing and anti-icing. Mr. Ford's petition contains a number of proposals that were also discussed at the Reston conference and that are addressed in this NPRM; therefore, the FAA considers this NPRM to be a response to that petition for rulemaking.

NTSB Recommendations

As a result of accident investigations, the NTSB has issued 30 safety recommendations that address issues involving aircraft ground icing and deicing.

These recommendations cover such subjects as informing operators about the characteristics of deicing/anti-icing fluids; informing flight crews about ice formation after deicing; reviewing information that air carrier operators

* The NTSB has not yet established probable cause for this accident.

provide to flight crews on runway contamination and engine anti-ice during ground operations; requiring flight crew inspections before takeoff if takeoff is delayed after deicing; emphasizing to air carrier maintenance departments the importance of maintaining ground support equipment; and requiring air carrier training programs to cover the effect of wing leading edge contamination on aerodynamic performance.

In addition, the number of NTSB recommendations involve issuing airworthiness directives or air carrier operations bulletins directing specific procedures for specific aircraft that have characteristics that make them more susceptible to icing problems.

Previous FAA Actions

The FAA has taken various actions on its own and in response to the NTSB recommendations involving accidents in which ground icing was the cause or a contributing factor. The FAA has disseminated advisory circulars, bulletins, memoranda, informative articles, and notices related to winter operations. The FAA also published Air Carrier Operations Bulletins, Maintenance Bulletins, and Maintenance Action Notices. These materials were intended to impress upon operators the dangers of aircraft wing and control surface contamination and the need to assist the pilot in determining if the aircraft is free of contamination before takeoff.

On December 17, 1982, in response to several icing-related takeoff accidents involving transport category and general aviation airplanes, the FAA issued Advisory Circular 20–117. The purpose of this advisory circular (AC) was to emphasize the clean aircraft concept. This AC was directed to all segments of aviation including aircraft manufacturers; airline engineering, maintenance, service, and operations organizations; and flight crewmembers of all aircraft types and categories. Information in the AC was general and dealt with over a dozen variables.

The AC covered the following areas:

Aircraft deicing and anti-icing.

Preflight inspection.

Pretakeoff inspection.

Common or suggested practices necessary to assure the pilot has adequate supporting information for his/her judgments.

Suggested practices for pilots to assure that the aircraft is free of contamination.

AC 20–117 also contained an extensive bibliography of related FAA and private sector publications, training materials, and other deicing or related information. In 1988, in response to the Continental DC–9–14 accident in Denver, the FAA republished and widely distributed AC 20–117 to ensure that airlines, pilots, and other affected persons were fully apprised of its contents.

For several years, the FAA has conducted research and development on aircraft icing characterization, protection concepts, and deicing/anti-icing fluids. These projects have included among others:

Characterization of worldwide environmental icing conditions (freezing precipitation, mixed conditions, snow, etc.) to provide recommended design criteria for aircraft, ice protection equipment, and deicing facilities.

Development of standard icing severity terminology (i.e., trace, light, moderate, severe) applicable to aviation industry, manufacturers, certification officials, weather forecasters, air traffic controllers, and flight crews.

Determination of the feasibility of development of a device or methodology for predicting the effective time of deicing/anti-icing fluids during freezing precipitation in an operational airport environment.

Field measurements of effective time of advanced anti-icing fluids for various freezing precipitation conditions.

Investigation of the effects of underwing frost and/or ice on the takeoff performance of large transport category aircraft.

Development of a condensed and pocket-sized advisory circular for pilots on contamination.

Assessment of simplified methods for determining holdover times.

Feasibility assessment of predicting holdover times.

Development of a training video tape on aircraft icing.

In September 1988, the FAA organized, coordinated, and co-chaired the joint SAE/FAA Aircraft Ground Deicing Conference in Denver, Colorado. The conference was held to disseminate information to the aviation community and to inspire further knowledge of the principles of aircraft ground deicing and anti-icing.

The Reston Conference

In response to the USAir Flight 405 accident at La Guardia, the FAA held the International Conference on Airplane Ground Deicing on May 28 and 29, 1992, in Reston, Virginia. The conference brought together leading experts from all over the world to share information on the ground deicing/anti-icing of transport category airplanes and to recommend short-term actions for preventing accidents caused by icing and long-term actions for continuing improvement of flight safety under adverse weather conditions.

The two-day conference was attended by representatives from air carriers and air carrier associations, crewmember associations, manufacturers and manufacturing associations, airport operators, and air traffic controllers and other FAA personnel, as well as by scientific experts on weather, deicing fluids, and deicing equipment. Over 800 people attended the conference. Areas covered by working groups at the conference were aircraft design; ground deicing and anti-icing system; air traffic control and sequencing; deicing personnel, procedures, and training; and ice detection, recognition, and crew training.

Two major recommendations made by the working groups that support this rulemaking are: (1) Critical aircraft surfaces must be kept free of frost, ice, and snow; and (2) Each air carrier should have an approved aircraft deicing program that will assure full compliance with the clean aircraft concept. The program should include ground deicing, a comprehensive training program for flight crewmembers, holdover timetables to be used as guidelines, and criteria for determining if a pretakeoff inspection after deicing is needed. (There was no consensus on when a pretakeoff inspection must be conducted.)

The working groups also recommended training of ground personnel and flight crews, appropriate use of Type I and Type II fluids, developing holdover guidelines for Type I and Type II fluids, using pretakeoff inspections when exceeding holdover time guidelines, and establishing procedures for communications between ground and cockpit crews.

Recommendations made at the conference that are beyond the scope of this rulemaking cover long-term actions, including additional research, and actions which pertain to manufacturers, airports, and air traffic controllers.

A complete report on working group recommendations is in the docket established for this NPRM.

The Proposed Rule

As previously discussed, the clean aircraft concept, which for many years has been the basis for federal safety regulations applicable in icing conditions, relies almost exclusively on the pilot in command's responsibility for determining the airworthiness of the aircraft before takeoff. Recent icing-related accidents, together with the research and activities previously

described, have convinced the FAA that a new approach is needed. The pilot in command needs guidance and certificate holder-developed procedures and, under certain conditions, ground personnel support in determining the aircraft's airworthiness in potential icing conditions.

The range of subjects covered by the conference and by FAA research and other actions indicates that the icing problem involves a broad spectrum of factors: Weather conditions and reporting, weather procedures at airports, traffic controllers, air carriers, ground personnel, as well as the technology available to support bad weather operations, such as deicing/anti-icing equipment, deicing/anti-icing fluids, and aircraft design. As the conference illustrates, the problem is being attacked in all of these areas and in varying ways. But all of the knowledge and all of the planning eventually focus on the decision of the pilot in command to take off.

The accident information shows that icing accidents occur at different types of airports and in many different operations. After the USAir accident at La Guardia, the FAA announced its intention to put in place before next winter a rule that would improve safety during icing conditions. This proposed rule, if adopted, would be among the agency's actions to resolve the problem of ground icing. The proposed rule is directed at all part 121 passenger-carrying and cargo-carrying operations. It does not include part 135 operations. Specifically, part 135 accident statistics do not indicate that an urgent ground deicing problem currently exists. The FAA also believes that part 135 flight crewmembers are better able to determine if contaminants are adhering to their aircraft because of both size and design. The FAA will continue to study those part 135 operations that could experience ground icing problems to determine if future rulemaking is needed.

Formulated as a rule affecting operations under Part 121 of the Federal Aviation Regulations, the proposal does not directly affect operations of foreign airlines. Safety regulation of international commercial air transport operations is effected by the state of the operator in accordance with comprehensive standards issued by the International Civil Aviation Organization (ICAO). The FAA actively solicits and shares safety information with other countries. As discussed above, international participation in deliberations leading to the formulation of this rule (the "Reston Conference") has been extensive, and the proposal draws heavily on the experience of other countries. The FAA will continue to work aggressively with other nations' civil aviation authorities to learn from their safety regulatory experiences and share those of the U.S. so that we all may develop and adopt the most effective and efficient regulations to improve the safety of all aircraft during icing conditions. Accordingly, the FAA will request that ICAO initiate a review of pre-takeoff deicing and inspection procedures used by all air carriers.

Other factors, such as airport planning, aircraft design, air traffic control, and deicing/anti-icing technology, are being otherwise addressed and are briefly discussed later in this preamble. This proposed rule is what the FAA, in cooperation with part 121 certificate holders, can do before next winter to assure that the highest practicable standards in operations during icing conditions are met.

The proposed rule would require part 121 certificate holders to develop and comply with an FAA-approved ground deicing/anti-icing program that includes procedures that must be followed whenever ground conditions exist that might result in frost, ice, or snow adhering to the aircraft surfaces unless it uses the alternate inspection procedures described below under "Implementation of Program." The program is intended to provide the pilot in command with more complete information, procedures, and ground support which he or she needs for deciding if takeoff can be safely accomplished. Each program would include a detailed description of how the certificate holder determines that ground deicing/anti-icing procedures must be in effect, who is responsible for deciding that such procedures must be in effect, the operational procedures for implementing ground deicing, and the specific duties and responsibilities of each operational position or group responsible for getting the aircraft safely airborne while such procedures are in effect.

The FAA is proposing that, to be approved, each ground deicing/anti-icing program must cover at least the following areas:

(1) Ground training and qualification testing requirements for all flight crewmembers and all other personnel the certificate holder uses in implementing the approved ground deicing/anti-icing program.

(2) Procedures for the use of holdover times.

(3) Deicing/anti-icing and accompanying inspection procedures.

Each of these areas is discussed more fully below.

Training of Flight Crewmembers and Other Personnel

To be approved, ground deicing/anti-icing programs would have to include initial and recurrent ground training and qualification testing for all flight crewmembers, and all other personnel (e.g., aircraft dispatchers, maintenance crews, or contract personnel) the certificate holder uses in implementing its approved program. Initial training for all affected personnel would cover the areas described below and would include airplane-specific training as appropriate. Recurrent training would include a review of areas covered in initial training plus coverage of any changes in a certificate holder's ground deicing/anti-icing program and changes that relate to specific airplanes.

At a minimum, an individual would receive initial and recurrent training in the individual's specific responsibilities and duties as outlined in the certificate holder's program, as well as the certificate holder's overall program and any pertinent airplane-specific requirements. In addition to the above, training would have to address the following areas:

(1) Holdover times developed by the certificate holder, how the calculated holdover times are determined and used, and what variables might adversely affect the calculated holdover times. (See the "Use of Holdover Times" section below for further discussion.)

(2) Aircraft deicing/anti-icing inspection procedures and responsibilities to ensure that the aircraft's wings, control surfaces, propellers, engine inlets, and other critical surfaces are free of contamination.

(3) Procedures for communication between flight crewmembers and other deicing/anti-icing personnel on deicing/anti-icing procedures when those procedures are being used.

(4) Aircraft surface contamination and critical area identification and how aircraft contamination adversely affects aircraft performance and flight characteristics.

(5) The certificate holder's deicing/anti-icing procedures including types of fluids, fluid characteristics, and concentration percentage of these fluids.

(6) Cold weather (not limited to icing conditions) preflight inspection procedures.

(7) Techniques for recognizing contamination on the aircraft.

Other areas that should be included as appropriate are:

(1) Who is responsible for actual deicing/anti-icing for the certificate holder (the certificate holder or a contractor).

(2) Any other systems installed on the aircraft that may provide the pilot with information concerning contamination on the aircraft.

(3) Procedures to be followed if the deicing/anti-icing is interrupted for any reason.

(4) For personnel other than flight crewmembers, operation and capabilities of deicing/anti-icing equipment as well as any equipment required to inspect the aircraft after deicing/anti-icing.

The Use of Holdover Times

Holdover time is the estimated time the application of deicing or anti-icing fluid will prevent the adherence of frost, ice, or snow on the treated surfaces of an aircraft. Holdover time begins when aircraft ground deicing/anti-icing commences and expires when the deicing/anti-icing fluid applied to the aircraft wings, control surfaces, propellers, engine inlets, and other critical surfaces loses its effectiveness.

The Society of Automotive Engineers (SAE) has taken the lead in developing holdover time guidelines for particular freezing point depressant fluids (e.g., Association of European Airlines Type I and Type II fluids). SAE has taken into consideration a number of variables, such as type of fluid, wing surface temperature, type of precipitation, etc., that individually or in combination with others increase a decrease holdover time.

The certificate holder would develop for its approved program holdover timetables based upon information from the SAE-developed tables, the particular aircraft manufacturer, and the deicing/anti-icing fluid manufacturer. The certificate holder would develop and use approved procedures regarding its flight crewmembers' use of these tables. The certificate holder's procedures would include provisions for its flight crewmembers to determine holdover times following aircraft deicing/anti-icing and would prohibit takeoff following expiration of the holdover time unless approved alternative actions are taken.

For certain airplanes without wing leading edge devices (i.e., airplanes commonly referred to as "hard wing"), Airworthiness Directives issued by the FAA require a pretakeoff inspection whether or not a holdover time has been exceeded. Certificate holders operating these hard wing airplanes must include the procedures required by these ADs in their ground deicing/anti-icing programs. The FAA invites comments on the need for a mandatory pretakeoff inspection requirement for any other airplane types.

Takeoff after the expiration of any holdover time would be permitted only if—(1) a pretakeoff inspection has ensured that the wings, control surfaces, propellers, engine inlets, and other critical surfaces are free of frost, ice, snow; (2) it is otherwise determined that these surfaces are free of frost, ice, or snow; or (3) the wings, control surfaces, propellers, engine inlets, and other critical surfaces have been redeiced and a new holdover time has been determined. A pretakeoff inspection is an inspection of the wings, control surfaces, propellers, engine inlets, and other critical surfaces conducted within five minutes prior to implementing takeoff. This inspection may be accomplished from either inside or outside the aircraft, depending on the aircraft's design. Critical surfaces may be "otherwise determined" to be free of contamination, if, for example, precipitation has ended, ambient temperature has risen significantly, or approved new techniques have been developed for determining whether any surfaces are contaminated.

The certificate holder will develop procedures to allow flight crewmembers to increase or decrease the determined holdover time if changing conditions warrant. The certificate holder will also develop procedures to allow a pilot in command to require a pretakeoff inspection whenever the pilot in command believes one is warranted.

The requirement that holdover times may not be exceeded unless a pretakeoff inspection is accomplished is consistent with a recommendation from one of the working groups at the conference. There was not, however, conference-wide consensus on this issue. Therefore, the FAA invites comments on whether exceeding holdover times should be prohibited. In particular, the FAA is interested in receiving specific information about the cost, if any, that would be caused by a prohibition on exceeding holdover times and about alternative procedures that could ensure an equivalent level of safety.

Inspection Procedures

In addition to procedures for the flight crewmembers to scan the visible areas of the aircraft, each approved ground deicing/anti-icing program would have to include complete pretakeoff inspection procedures (i.e., visual, tactile, aids, etc.). This inspection must be accomplished from outside the aircraft unless the program specifies otherwise. Pretakeoff inspection procedures would be required to cover a variety of contingencies. For example, if weather conditions significantly improve after a deicing, it is possible that a holdover time could be extended so that no pretakeoff inspection is required. Or, if weather conditions deteriorate, it may be necessary to shorten the originally determined holdover time.

The pretakeoff inspection procedures would include coordination procedures between all personnel involved in the inspection. If a facility is available for a remote pretakeoff inspection, procedures for that inspection would be covered in the program.

Implementation of Program

The effective date for all part 121 certificate holders, as stated in the proposed rule, is November 1, 1992. A certificate holder who intends to operate in icing conditions on or after November 1, 1992, would have to have an approved program and would have to operate in compliance with that program. A certificate holder who does not have an approved program or has not implemented its program, would not be allowed to operate aircraft in icing conditions on or after November 1, 1992, unless it uses the alternative inspection procedure described below.

The FAA is aware that requiring all flight cremembers and other affected personnel (e.g., aircraft dispatchers, maintenance crews, contract personnel) to be fully trained and qualified by the effective date could be impractical for some certificate holders both financially and logistically. Therefore, in instances where training cannot be completed as part of a certificate holder's initial and recurrent training programs by the effective date, the certificate holder may submit for approval with its program a training implementation plan. For example, a certificate holder could implement the training requirements by providing initial training to flight crewmembers and other personnel by mailing to them a video cassette, written training and qualification materials, or computer-based instruction that explains and instructs on procedures contained in the certificate holder's deicing/anti-icing program.

The FAA recognizes that, given the short compliance time proposed for this rule, some certificate holders may be unable to submit a program in time for approval prior to the effective date. Other certificate holders who seldom fly in ground deicing conditions may

determine that it is impractical to develop a deicing program. Therefore, in proposed paragraph (d), the rule would allow continued operations under § 121.629 if the certificate holder includes in its operations specifications and complies with a requirement that, any time conditions are such that frost, ice, or snow may reasonably be expected to adhere to the aircraft, no aircraft will take off unless it has been inspected to ensure that the wings, control surfaces, propellers, engine inlets, and other critical surfaces are free of frost, ice, or snow. This inspection must occur within five minutes before takeoff. The inspection must be accomplished from outside the airplane. The FAA invites comments on this alternative inspection procedure.

Long-Term FAA Actions

As the background portion of this preamble states, the problem of airplane ground deicing/anti-icing is much broader than just the issue of the last-minute decision of a pilot in command on whether to attempt a takeoff. Airport and air traffic control procedures, airplane design, and other areas have been addressed in NTSB recommendations and were addressed at the Reston Conference. The FAA and the aviation industry are continuing their efforts to address these related issues. Efforts is some areas, such as airport and air traffic control procedures, are already underway and will continue concurrently with this rulemaking. Other efforts, such as potential design changes that require long-term research, will be undertaken, either by the FAA or as joint government/industry projects, subject to available funding.

This rulemaking, when implemented, will ensure that he FAA and part 121 certificate holders have taken every practical step possible to improve safety in icing conditions before the 1992/1993 winter season. In this regard, the FAA is aware that part 121 certificate holders have already, under the leadership of the ATA, taken steps to develop a standard model industry program that would meet the goals of this rulemaking.

Paperwork Reduction Act

The reporting and recordkeeping requirement associated with this rule is being submitted to the Office of Management and Budget for approval in accordance with 44 U.S.C. chapter 35 under the following:

DOT No: ____
OMB No: New.
Administration: FAA.
Title: Aircraft Ground Deicing and Anti-icing Program.

Need for Information: If adopted this NPRM requires each part 121 air carrier certificate holder develop an FAA approved ground deicing/anti-icing program.

Proposed Use of this Information: The FAA requires this information to evaluate each certificate holders proposed program and ensure certificate holders are operating at the highest possible level of safety during ground icing conditions.

Frequency: One-time.
Burden Estimate: 7616 total hours.
Respondents: Part 121 certificate holders.
Forms(s): None.
Average Burden Hours per Respondent: 144.

For further information contact: The Information Requirements Division, M-34, Office of the Secretary of Transportation, 400 Seventh Street, SW., Washington, DC 20590, (202) 366-4735 or the Office of Management and Budget, Office of Information and Regulatory Affairs, Desk Office for the FAA, New Executive Office Building, room 3228, Washington, DC 20503, (202) 395-7340. It is requested that the comments sent to OMB also be sent to the FAA rulemaking docket for this proposed action.

Regulatory Evaluation Summary

This section summarizes the regulatory evaluation prepared by the FAA. The regulatory evaluation provides more detailed information on estimates of the potential economic consequences of this proposal. This summary and the evaluation quantify, to the extent practicable, estimated costs of the rule to the private sector, consumers, and Federal, State, and local governments, and also the anticipated benefits.

Executive Order 12291, dated February 17, 1981, directs Federal agencies to promulgate new regulations or modify existing regulations only if potential benefits to society for each regulatory change outweigh potential costs. The order also requires the preparation of a Regulatory Impact Analysis of all "major" rules except those responding to emergency situations or other narrowly defined exigencies. A "major" rule is one that is likely to result in an annual effect on the economy of $100 million or more, a major increase in consumer costs, or a significant adverse effect on competition.

The FAA has determined that this proposal is not "major" as defined in the executive order. Therefore, a full regulatory impact analysis, which includes the identification and evaluation of cost-reducing alternatives to the proposal has not been prepared. Instead, the agency has prepared a more concise document termed a "regulatory evaluation," which analyzes only this proposal without identifying alternatives. In addition to a summary of the regulatory evaluation, this section also contains an initial regulatory flexibility determination required by the 1980 Regulatory Flexibility Act (Pub. L. 96-354) and an international trade impact assessment. If the reader desires more detailed economic information that this summary contains, then he or she should consult the regulatory evaluation contained in the docket.

Costs

For those elements of the proposed rule for which the FAA was able to estimate costs, the total present value cost of the proposed rule was estimated to be $38.6 million. Of this total, the 31 large part 121 air carriers, or those that own or operate more than nine airplanes, would incur present value costs of $37.8 million. The 22 small part 121 carriers would incur present value costs of $710,000. The present value cost associated with the purchase and operating of deicing equipment is $18.5 million. Approximately $18.0 million of this total would be incurred by large part 121 air carriers and $508,000 would be incurred by small part 121 air carriers. About $18.5 million of the total present value cost representing 48 percent of the estimated total would occur the first year.

To more accurately determine the total cost impact of this proposed rule, the FAA solicits comment on the following items.

1. Initially the change in procedures may add to delays already experienced during ground icing conditions. The FAA is uncertain as to the magnitude of such delays and seeks comment on this issue, including any methodology that could be used to measure this variable. Examples of information that would be of value include, but are not limited to, the following:

- The difference in delays that air carriers experience when using Type 1 and Type 2 fluids.
- The added time and associated cost (at various airports) to return for a second deicing (including the number of airplanes that have been delayed due to coming back for an additional or second deicing).
- The secondary effect of delays on the flow of air traffic. This includes airplanes waiting in queue to land or takeoff at the affected airport as well as on operators at other connecting hubs.

2. Initial deicing will occur at the gate or at a central deicing station. The FAA seeks comment on the way airlines would perform deicing and additional deicing under the proposed rule.

3. There may be a switch to Type 2 fluids in later years to allow for longer holdover times. The FAA seeks comment on the likelihood that Type 2 fluids will replace Type 1 fluids in the future.

4. Part 121 air carriers will also incur costs at foreign airports where icing conditions may occur. What is the extent of icing at these airports, and how much will it cost to comply with the proposed rule?

Delay Costs

This section on delay costs is divided into two parts. Part I is an explanatory overview on the availability of delay data to the FAA. Part II describes a methodology that could be employed to measure potential incremental delay costs.

Part I—Availability of Delay Data

Air traffic control (ATC) personnel throughout the U.S. gather information daily required by the FAA. That information includes, among others, how many flights were delayed more than 15 minutes and the reasons for those delays. Data is collected for use in reports to Congress, reports to users of the National Airspace System, and for statistical purposes. FAA Order 6040.15B, the National Airspace Performance Reporting System, sets forth requirements and procedures as guidance for reporting interruptions to facilities and services in the National Airspace System. It requires that interruptions be reported in a uniform manner using standard definitions, criteria, procedures, and terminology. In addition, this order establishes requirements and procedures for reporting air traffic delays and air traffic counts. These delays result from the Air Traffic Control System detaining an aircraft at the gate, short of the runway, on the runway, on a taxiway and/or in a holding configuration en route. This Order defines weather related delays as delays to aircraft resulting from weather conditions which result in arrival, departure and/or en route delays. It defines weather related delays due to snow and ice as "poor or nil braking action because of snow or ice on runways, snow removal operations, and runways closed by snow." The definition does not include contamination of aircraft surfaces.

The FAA Office of Air Traffic System Management generated a computer database of air carrier departure delays reportedly due to snow and ice for the period June 1990 to May 1992. Between June 1, 1990, and May 31, 1991, and between June 1, 1991, and May 31, 1992, there were a total of 2,068 delays and 1,194 such delays, respectively. However, as the samples below demonstrate "snow and ice" delays are not related to delays attributable to contamination of aircraft surfaces.

The FAA examined the time period surrounding two icing related accidents to determine if delays due to snow and ice were reported during that time. The first accident occurred at Cleveland-Hopkins International Airport on February 17, 1991 at 12:19 a.m. No weather delays (for snow and ice or any other conditions) were reported at Cleveland-Hopkins on this day. The second accident occurred at LaGuardia International Airport on March 22, 1992, about 9:30 p.m. (Although the NTSB has not made a finding in this accident, we know that LaGuardia had experienced some periods of snow during that day.) There were 22 snow and ice air carrier delays reported on March 22 due to snow at LaGuardia, however, these delays occurred between 2 and 2:35 a.m. The FAA examination of the database revealed there were no snow or ice delays reported to the FAA Air Traffic Operations Management System during the time period these two accidents occurred. In other words, during two recent icing accidents, there were no delays attributed to snow and ice. Accordingly, the FAA concludes that snow and ice delays as reported pursuant to FAA Order 6040.15B do not correlate with ground icing conditions on critical aircraft surfaces. Further, given reliable data showing those delays due to contamination of aircraft surfaces, the FAA would still find it difficult to distinguish between those delays that would normally occur under the present rule and those that might occur under the proposed rule.

Part II—Delay Cost Methodology

As stated above, whether there are any delays resulting from the proposed rule cannot be reliably estimated at this time. In order to estimate potential delay costs, several prerequisite variables would have to be examined. The following is a general step-by-step procedure to estimate potential delay costs:

Step 1. Determine the total number of severe winter weather delays that take place, primarily between November and March.

Step 2. Adjust downward the number of delays caused by severe winter weather, by subtracting those delays that would not result from ice, snow, or frost. An example of delays to be subtracted from the total would be those delays due to weather where the airport was closed.

Step 3. The result is the number of flights potentially delayed by the proposed rule. Some flights will need a pretakeoff inspection, which could delay takeoff. If no ice is found, the delay would be, at most, the time taken to make the pretakeoff inspection. If ice is found, the aircraft must be re-deiced. No delay attributed to the proposed rule would occur where pretakeoff inspections show the presence of ice. Under the existing rule, the airplane is currently not allowed to takeoff if there is ice on the critical surfaces. The cost of returning could be attributed to the existing rule.

The remaining number of delays, which is likely to represent a low percentage of the total number of delays in the system, would be representative of the baseline to measure delays associated with this proposed rule. The FAA requests information on the incremental delay cost factor that can be used to formulate the best possible final rule.

Benefits

The FAA expects the proposed rule to generate total potential safety benefits estimated at $230 million (10 years, 1991 dollars). On a discounted basis, total potential benefits would amount to an estimated $136 million. This discounted total estimate of benefits is comprised of $125 million for significantly reducing the likelihood of ice-related accidents for passenger-carrying part 121 airplanes and $11 million for part 121 cargo airplanes. The derivation of these benefits were derived from two categories: (1) Part 121 passenger-carrying air carriers and (2) part 121 cargo-carrying air carriers. Each of these categories is discussed below.

Part 121 Passenger Carrier Benefits

Under the current rule, it is the responsibility of the pilot to decide whether ice, frost, or snow has accumulated on the structure of an airplane. This decision can be very difficult to make, especially when the airplane is sitting at the end of a runway waiting to take off during inclement weather. It is at these times that the likelihood of the pilot making the wrong decision is greatest.

Over the past 15 years, there have been five passenger-carrying air carrier accidents where ice, frost, or snow accumulations on the airplane was the primary factor. These accidents resulted in 135 fatalities and 66 serious injuries. In addition, four of the airplanes were destroyed and the other sustained substantial damage.

Based on estimated historical accident and casualty rates, the FAA expects

that over the next 10 years, approximately 4 accidents will occur, with 131 fatalities and 64 serious injuries. The present value dollar benefits of preventing these accidents and casualties, is estimated to be $166 million (discounted).

The FAA has attempted to develop a proposed rule that would be 100 percent effective in preventing all accidents by incorporating program development, training, testing, capital equipment, maintenance, etc. There is some uncertainty, however, as to how effective these components would be. It is conceivable that some aircraft could pass through the system due, in part, to human error and adverse weather conditions, thereby, reducing the effectiveness of the proposed rule. While the actual effectiveness rate would be lower than 100 percent, the FAA estimates that a rate of 75 percent rate would reflect the reality of correcting a problem that is influenced by a multitude of factors (weather, human error, etc.). Multiplying the $166 million benefits by the 75 percent effectiveness rate results in adjusted benefits of $125 million ($166 million × .75).

Part 121 Cargo Carrier Benefits

The proposed rule would also potentially reduce accidents among large part 121 cargo aircraft. Over the past eight years, there have been three accidents involving large cargo aircraft. These three accidents resulted in two fatalities and two serious injuries. Two of the aircraft were substantially damaged and one was destroyed.

Based on these rates, over the next 10 years, there would be approximately 4 accidents, 3 fatalities and 3 serious injuries. The estimated value of these potential cargo accidents would be $15 million (discounted). Multiplying the $15 million in cargo benefits by the 75 percent effectiveness rate results in adjusted benefits of $11 million ($15 million × .75).

In conclusion, the proposed rule would enhance air carrier safety under conditions of ground icing. The proposed rule would reduce pilot error related to taking off with ice on the airframe by using holdover times and ground inspection. The proposed rule is expected to generate potential total benefits over the next ten years estimated at $136 million (discounted).

Conclusion

The FAA estimates the discounted present value cost of the proposed rule, excluding the cost of delays, is about $39 million over the next 10 years. This includes the cost of plan development, training, qualification testing, and capital expenditures. This estimate also does not include the cost of overseas operations. The FAA seeks comment on the extent of these costs.

The benefits of this proposed rule are estimated at $136 million (discounted) over the next decade. These benefits are derived from avoided accidents due to reduced risk during ground icing conditions.

The FAA did not estimate the cost of delays and overseas operations for this proposed rule. If the present value cost of delays and overseas operations is less than approximately $97 million, this proposed rule would still be cost beneficial.

International Trade Impact

The proposed rule is not expected to have a significant incremental impact on international trade. This assessment is based on the belief that while U.S. part 121 operators are expected to incur total compliance costs of $54 million (undiscounted), they would not be placed at a competitive trade disadvantage.

The average cost of an international round trip airplane ticket is approximately $650. With a potential average cost increase of 4 cents per round trip ticket representing less than one-hundredth of a percent of the total cost of a ticket (without consideration of potential delay costs), the likelihood of U.S. air carriers being placed at a competitive trade disadvantage becomes extremely remote. For a more detailed analysis, the reader is referred to the full international trade impact assessment contained in the docket.

Initial Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA) was enacted by Congress to ensure that small entities (small business and small not-for-profit organizations that are independently owned and operated, and small government jurisdictions) are not unnecessarily and disproportionately burdened by Federal regulations. The RFA requires regulatory agencies to review rules that may have "a significant economic impact on a substantial number of small entities." A substantial number of small entities means a number that is not less than eleven and that is more than one-third of the small entities subject to a proposed or existing rule.

The proposed rule potentially impacts operators of an aircraft for hire with nine aircraft owned but not necessarily operated. Of the 53 active U.S. commercial domestic carriers, the FAA has identified 22 of them that own or operate nine or fewer airplanes under part 121. The FAA has determined that this is a substantial number since all 22 of these small entities are expected to be affected by the proposed rule.

To determine whether there is a significant cost impact on small part 121 operators, the annualized cost of the proposed rule must exceed the annualized cost threshold established by FAA Order 2100.14A. The threshold established by the Order for scheduled operators of aircraft for hire falls under two categories. The first category is scheduled operators whose entire fleet has a seating capacity of over 60. The cost threshold for these operators is $112,600. The second category is other scheduled operators with seating capacities less than 60. Their cost threshold is $62,900.

The FAA estimated the annualized cost of the proposed rule to an individual small operator to be $7,110. This number was derived by first summing the undiscounted costs for small operators. These costs are:

Initial Plan Development	$5,145
Initial Training	80,436
Qualification Testing	201,090
Initial Capital	289,440
Recurring Maintenance & Operating Costs	384,990
Total Undiscounted Costs	961,101

The $961,101 total cost is then divided by the 22 small operators to get the $43,686 average undiscounted cost for any single small operator. This number is then multiplied by a capital recovery factor of .16275 (10% interest rate for 10 years) to give an annualized cost of $7,110.

The $7,110 annualized cost does not exceed the $62,900 cost threshold prescribed above. Thus, the proposed rule would not impose a significant cost on a substantial number of small Part 121 operators.

Environmental Assessment

The proposed rule is a federal action that is subject to National Environmental Policy Act (NEPA). Under applicable guidelines of the President's Council on Environmental Quality and agency procedures implementing NEPA, the FAA will prepare an environmental assessment (EA) to determine the need for an environmental impact statement (EIS) or whether a finding of no significant impact (FONSI) would be appropriate. 40 CFR 1501.3, FAA Order 1050.1D, appendix 7, par. 3(a).

The FAA's preliminary review suggests that an EIS would not be required. The FAA believes that the rule will not promote significant additional use of the current Type I deicing fluid. However, the FAA invites comments on any environmental issues associated with this proposed rule, and specifically requests comments on the following: (1) Whether the proposed rule will increase the use of Type I deicing fluid, (2) whether the proposed rule will encourage the use of Type II deicing fluid, (3) the impact, if any, of using these deicing fluids on taxiways "just prior to takeoff," and (4) containment methods currently used that can be adopted to other locations on an airport.

Upon receiving public comments on these issues, the FAA will, after consideration of all relevant issues, determine the potential environmental impacts of the proposed ground deicing and anti-icing rule.

Federalism Implications

The changes proposed by this NPRM would not have a substantial direct effect 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 the proposed amendments would not have federalism implications requiring the preparation of a Federalism Assessment.

Conclusion

For the reasons discussed in the preamble, and based on the findings in the Initial Regulatory Flexibility Determination and the International Trade Impact Analysis, the FAA has determined that this proposed regulation is not major under Executive Order 12291. In addition, the FAA certifies that this proposal, if adopted, 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. This proposal is considered significant under Order DOT 2100.5, Policies and Procedures for Simplification, Analysis, and Review of Regulations. A draft regulatory evaluation of the proposal, including an Initial Regulatory Flexibility Determination and International Trade Impact Analysis, has been placed in the docket. A copy may be obtained by contacting the person identified under "FOR FURTHER INFORMATION CONTACT."

List of Subjects in 14 CFR Part 121

Air safety, Air transportation, Aviation safety, Reporting and recordkeeping requirements, Safety, Transportation.

The Proposed Amendment

In consideration of the foregoing, the Federal Aviation Administration proposes to amend part 121 of the Federal Aviation Regulations (14 CFR part 121) as follows:

PART 121—CERTIFICATION AND OPERATIONS: DOMESTIC, FLAG, AND SUPPLEMENTAL AIR CARRIERS AND COMMERCIAL OPERATORS OF LARGE AIRCRAFT

1. The authority citation for part 121 continues to read as follows:

Authority: 49 U.S.C. 1354(a), 1355, 1356, 1357, 1401, 1421–1430, 1472, 1485, and 1502; 49 U.S.C. 106(g) (revised, Pub. L. 97–449, January 12, 1983).

2. Section 121.629 is amended by revising paragraph (b) and by adding new paragraphs (c) and (d) to read as follows:

§ 121.629 Operation in icing conditions.

* * * * *

(b) No person may take off an aircraft when frost, ice, or snow is adhering to the wings, control surfaces, propellers, engine inlets, or other critical surfaces of the aircraft or when the takeoff would not be in compliance with paragraph (c) of this section.

(c) Except as provided in paragraph (d) of this section, on or after November 1, 1992, no person may dispatch, release, or take off an aircraft any time conditions are such that frost, ice, or snow may reasonably be expected to adhere to the aircraft, unless the certificate holder has an approved deicing program in its operations specifications and unless the dispatch, release, and takeoff comply with that program. The approved deicing program must include at least the following items:

(1) A detailed description of—

(i) How the certificate holder determines that conditions at an airport are such that frost, ice, or snow may reasonably be expected to adhere to the aircraft and that ground deicing/anti-icing operational procedures must be in effect;

(ii) Who is responsible for deciding that ground deicing/anti-icing operational procedures must be in effect;

(iii) The operational procedures for implementing ground deicing/anti-icing operational procedures;

(iv) The specific duties and responsibilities of each operational position or group responsible for getting the aircraft safely airborne while ground deicing/anti-icing operational procedures are in effect.

(2) Initial and annual recurrent ground training and qualification testing for flight crewmembers and all other affected personnel (e.g., aircraft dispatchers, maintenance crews, contract personnel) concerning the specific requirements of the approved program and each person's responsibilities and duties under the approved program, specifically covering the following areas:

(i) The use of holdover times.

(ii) Aircraft deicing/anti-icing inspection procedures and responsibilities.

(iii) Communications procedures.

(iv) Aircraft surface contamination (i.e., adherence of frost, ice, or snow) and critical area identification, and how contamination adversely affects aircraft performance and flight characteristics.

(v) Types and characteristics of deicing/anti-icing fluids.

(vi) Cold weather preflight inspection procedures.

(vii) Techniques for recognizing contamination on the aircraft.

(3) The certificate holder's holdover times, specific to each aircraft type, and the procedures for the use of these times by the certificate holder's personnel. Holdover time is the estimated time the application of deicing or anti-icing fluid will prevent the adherence of frost, ice, or snow on the treated surfaces of an aircraft. Holdover time begins when aircraft ground deicing/anti-icing commences and expires when the deicing/anti-icing fluid applied to the aircraft wings, control surfaces, propellers, engine inlets, and other critical surfaces loses its effectiveness. The holdover times must be supported by data acceptable to the Administrator. The certificate holder's program must include procedures for flight crewmembers to increase or decrease the determined holdover time in changing conditions. The program must provide that takeoff after the expiration of any holdover time is permitted only when at least one of the following conditions exists:

(i) A pretakeoff inspection, as defined in paragraph (c)(4) of this section, determines that the wings, control surfaces, propellers, engine inlets, and other critical surfaces are free of frost, ice, or snow.

(ii) It is otherwise determined by an alternate procedure approved by the Administrator in accordance with the certificate holder's approved program that the wings, control surfaces, propellers, engine inlets, and other

critical surfaces are free of frost, ice, or snow.

(iii) The wings, control surfaces, propellers, engine inlets, and other critical surfaces are redeiced and a new holdover time is determined.

(4) Aircraft deicing/anti-icing inspection procedures and responsibilities and pretakeoff inspection procedures and responsibilities for use when a holdover time has been exceeded. A pretakeoff inspection is an inspection of the wings, control surfaces, propellers, engine inlets, and other critical surfaces conducted within five minutes prior to implementing takeoff. This inspection must be accomplished from outside the aircraft unless the program specifies otherwise.

(d) A certificate holder may continue to operate under this section without a program as required in paragraph (c) of this section, if it includes in its operations specifications a requirement that, any time conditions are such that frost, ice, or snow may reasonably be expected to adhere to the aircraft, no aircraft will take off unless it has been inspected to ensure that the wings, control surfaces, propellers, engine inlets, and other critical surfaces are free of frost, ice, and snow. The inspection must occur within five minutes prior to implementing takeoff. This inspection must be accomplished from outside the aircraft.

Issued in Washington, DC on July 17, 1992.

Thomas C. Accardi,

Director, Flight Standards Service.

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